AirborneM2M™

APXx-Q5xxx Family User Manual

Revision: 1.2

January 2015

B+B SMARTWORX

International Headquarters

B&B Electronics Mfg. Co. Inc.

707 Dayton Road

Ottawa, IL 61350 USA

Phone (815) 433-5100 -- **General Fax** (815) 433-5105

Website: **www.bb-elec.com**

European Headquarters

B&B Electronics Ltd.

Westlink Commercial Park

Oranmore, Co. Galway, Ireland

Phone +353 91-792444 -- **Fax** +353 91-792445

Website: **www.bb-europe.com**

Contents

Figures

Tables

1.0 Conventions

The following section outlines the conventions used within the document. Where convention is deviated from, the deviation takes precedence and should be followed. If you have any question related to the conventions used or clarification of indicated deviation please contact B&B Electronics Sales or Wireless Support.

1.1 Terminology

APXx-Q5xxx is used in the opening section to describe the device detailed in this document. After this section the term ***module*** or ***device*** will be used to describe the device.

1.2 Notes

A note contains information that requires special attention. The following convention will be used. The area next to the indicator will identify the specific information and make any references necessary.

The area next to the indicator will identify the specific information and make any references necessary.

1.3 Caution

A caution contains information that, if not followed, may cause damage to the product or injury to the user. The shaded area next to the indicator will identify the specific information and make any references necessary.

The area next to the indicator will identify the specific information and make any references necessary.

1.4 File Format

These documents are provided as Portable Document Format (PDF) files. To read them, you need Adobe Acrobat Reader 4.0.5 or higher. For your convenience, Adobe Acrobat Reader is provided on the software CD. Should you not have the CD, you can download the latest version of Adobe Acrobat Reader at the Adobe Web site: www.adobe.com

2.0 Product Description

B&B Electronics' APXx-Q5xxx industrial grade access point enables a piece of M2M equipment to become the center of a self-sufficient Wi-Fi network. This makes it easy to access equipment data as well as resources from other Wi-Fi enabled devices, like laptops, tablets and handhelds. The other devices can be powered by Android, iOS or Windows. The APXx-Q5xxx includes a 10/100 Ethernet port that supports both bridge and router modes, and two serial ports that are compatible with RS232/422/485 devices. Users may make multiple connections to the same machine, and all ports may be used simultaneously in any serial data configuration. This allows the APXx-Q5xxx to provide more port configuration options than any competing device in the industry.

The APXx-Q5xxx also includes a wide range power supply input (5-36 VDC) with terminal block and barrel jack connections. It is packaged in a rugged metal enclosure. The APXx-Q54x8 models support 802.3af Class 1 based Power over Ethernet (PoE).

The Airborne™ family of access points includes models dual band radios: the APXN supports 802.11a/b/g/n.

B&B Electronics is the industry leader in industrial grade 802.11 wireless serial-to-Ethernet converters, access points, Ethernet bridges and Ethernet adapters. The APXx-Q5xxx is the newest member of B&B Electronics' Airborne™ series, a family of fully integrated 802.11 wireless LAN bridge, serial device server, and access point products designed to provide wireless LAN and Internet connectivity in industrial, scientific, medical and automotive applications. The highly integrated hardware and software enables plug-and-play capability and significantly reduces the complexity of wireless system deployment and network connectivity.

All Airborne™ 802.11 access point products include Airborne Management Center software for web browser-based configuration and administration. The Airborne Management Center makes it easy to install and configure Airborne devices. The same interface is employed across the entire product line. If you've used one Airborne device, you know how to use them all.

3.0 Features

- Wi-Fi Radio with 32-bit ARM9 CPU (256Mb SDRAM, 64Mb Flash)
  - APXG models support 802.11b/g
  - APXN models support 802.11a/b/g/n
- Fully functional M2M Access Point and Wireless Router.
- Software selectable as AirborneM2M™ or AirborneDirect™ client device server.
- Integrated Airborne Device Server and Wireless Adapter technology.
- The AirborneM2M™ Access Point supports integrated:
  - 802.11 radio
  - TCP/IP stack, UDP, telnet, FTP server
  - Ethernet bridge mode (Access Point)
  - Ethernet router mode (Wireless Router)
  - Dual Serial ports (RS232/422/485)
  - Data bridging and buffering
  - Command Line Interface
  - Web interface
  - WEP/WPA/WPA2-PSKSecurity
  - DHCP Server (For wireless clients)
  - Firewall and Port Forwarding (Ethernet Router Mode)
  - Transmit RF power control
  - FTP Server
- Operating Temperature(-40°C to 85°C)
- Storage temp (-40°C to 85°C)
- Industry standard wired connections:
  - D-9 Serial connectors (RS232/422/485)
  - RJ-45 (10/100 Ethernet)
- Multiple host interfaces supported:
  - Dual Serial (RS232/422/485) – up to 921K BAUD
  - 10/100 Ethernet
- Dual RP-SMA antenna connectors.
- Integrated standard and wide range (J1455) Power Supply (5-36VDC)
- Power connector options include 2.1mm Barrel Jack, Terminal Block
- Power Over Ethernet (PoE) using an 802.3af Class 1 PSE device (APXx-Q5xx8 models)
- Integrated Site Survey mode.
- Advanced Low power modes.
- Rugged mounting options.
- Worldwide Regulatory Support (FCC, IC, CE)

4.0 Device Types

This manual covers the AirborneM2M™ Access Point/Wireless Router/Client. Information on the variations and functionality available in the AirborneDirect™ device family can be found in the ABDN Family User Manual. If you are not certain which type you have or would like clarification on the available options please contact B&B Sales or Technical Support.

The AirborneM2M™ supports the following host interfaces:

4.1 Serial

This device supports dual serial ports and provides serial to 802.11 bridging. The following serial interface types are available:

- RS-232
- RS-422
- RS-485

Default configuration is RS-232. Conversion to RS-422/485 is software selectable. Changing the serial port configuration is covered later in the manual.

4.2 Ethernet

The Ethernet adapter provides a wireless interface to an existing Ethernet port (RJ-45). The connection to the Ethernet port of the host is made via the RJ-45 socket.

The device supports a 10/100 Ethernet interface with auto configuration. Manual control of the interface is possible through the web or CLI interface.

4.3 Flexport™

This AirborneM2M™ allows for simultaneous connection of Serial and Ethernet ports in any combination. You may maintain network-based connections to both the Ethernet and Serial ports without compromising functionality or performance.

Each interface can be configured and operated independently of the others. Connection to the serial port can be made via both the wireless and Ethernet ports. In this mode the device is capable of supporting redundant network connectivity for high reliability applications.

4.4 Industrial Packaging

Developed to support the demands of the industrial and automotive environments, the packaging supports the full industrial operating temperature range and the complete set of functional capabilities of the Airborne Access Point, Airborne Device Server and Wireless Adapter technology.

Figure 1 - Industrial AirborneM2M™ Device

The device includes a metal enclosure and a wide range power supply capable of exceeding the SAE J1455 power supply requirements.

The industrial packaging is ideal for the following application types:

- CNC/DNC equipment.
- Vehicle diagnostics.
- Telematics.
- Remote monitoring and management.
- Industrial control.

5.0 Pinout and Connectors

The following defines the pinouts for the wired interfaces.

5.1 Serial Ports

The AirborneM2M™ unit supports two serial ports. The Port pinout can change depending upon the interface configuration chosen. Table 1 shows the pinout for the interface selected.

Figure 2- DE-9 (DB-9) Connector Pin-out

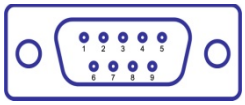


Table 1–Serial Port Pin Definition

Pin	RS232 (DTE)	RS232 w/Power on pin 9[2]	RS422/RS485 4-wire	RS485 2-wire
1	No Connect	No Connect	No Connect	No Connect
2	RxD	RxD	RxD+	Connect to pin 3[3]
3	TxD	TxD	TxD+	TxD+/RxD+
4	No Connect	No Connect	No Connect	No Connect
5	GND	GND	GND	GND
6	No Connect	No Connect	RxD-	Connect to pin 9[3]
7	RTS	RTS	No Connect	No Connect
8	CTS	CTS	No Connect	No Connect
9	No Connect	5VDC (Input)	TxD-	TxD-/RxD-

1. For 2-wire operation, the user must externally connect pin 3 to pin 2 and pin 6 to pin 9.

The Port 1 and Port 2 interfaces support the following configurations:

- BAUD: 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200, 230400, 460800, 921600
- Flow Control: None, Hardware (CTS/RTS), Software (XON/XOFF)
- Port 1 Default settings: 9600, 8, N, 1, No Flow Control.
- Port 2 Default settings: 9600, 8, N, 1, No Flow Control.

5.2 Ethernet Port

The AirborneM2M™10/100Mbps interface supports auto negotiation. The interface also supports both half and full duplex for 10Mbps and 100Mbps.Table 2 shows the interface pinout.

In some models, the Ethernet port supports Power over Ethernet (PoE) when connected to an 802.3af Class 1 PSE device. Both Mode A (MDI and MDI-X) and Mode B powering schemes are supported (Table 3).

Figure 3 - Ethernet Jack Pinout

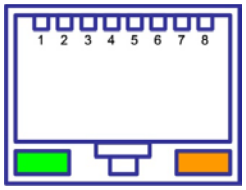


Table 2 - Ethernet Connector Pinout

Pin	RJ45 Socket
1	TxD+
2	TxD-
3	RxD+
4	NC
5	NC
6	RxD-
7	NC
8	NC
Green LED	Unused
Yellow LED	Ethernet Link/Activity: **Off** No Ethernet Link **On** Ethernet Link active **Flashing** Network activity

Table 3 - PoE Pinout Alternatives

Pin	Alternate A (MDI-X)	Alternate A (MDI)	Alternate B (All)
1	Negative V_{PSE}	Positive V_{PSE}	
2	Negative V_{PSE}	Positive V_{PSE}	
3	Positive V_{PSE}	Negative V_{PSE}	
4			Positive V_{PSE}
5			Positive V_{PSE}
6	Positive V_{PSE}	Negative V_{PSE}	
7			Negative V_{PSE}
8			Negative V_{PSE}

5.3 Connector Definition

The AirborneM2M™ device has five connectors. Table 4 provides definitions for the connectors.

Table 4 - Connector Description

Type	Description
Serial	DE-9 Connector Male
Ethernet	RJ45 Socket
Antenna	RP-SMA
Power	2.1mm Barrel Jack
Power	2 Position Terminal Block

5.4 Default Switch (Factory Reset)

The AirborneM2M™ device will let you reset the configuration back to OEM defaults and start over again. This is useful when a device has been incorrectly configured. An incorrect configuration can make it impossible to communicate on any of the available ports. That would prevent access to the configuration interfaces and block your ability to correct the configuration.

Performing a Factory RESET will return the device to the original OEM defaults. If no OEM configuration is installed the device will return to the B&B factory defaults. That will restore your ability to communicate with the device.

The following Table 5 describes the sequence for resetting the AirborneM2M™ device to the OEM defaults

Table 5 - Reset Procedure

1	Disconnect or turn off the power supply.
2	Press and hold in the Default (factory reset) button. This may require the use of a small, narrow object. Do not use anything sharp, as that may damage the unit.
3	While the Default button is pressed and held in, re-apply power to the unit.
4	Continue to hold in the Default button for 5-6 seconds after power has been applied.
5	Release the Default button.

6	The device will restart with the installed OEM defaults. If no OEM configuration exists the device will return to B&B Electronics factory defaults. See section 11.6 on use of OEM factory configurations.

The AirborneM2M™ Default button is on the Ethernet/Power end of the box, next to the 2.1mm barrel connector (See section 8.0)

5.5 Indicator LEDs

The indicator LEDs provide feedback on the state of the device when it is configured as an AP/WR. If the device is configured for any other operation please refer to the appropriate device manual. The LEDs are a useful tool during installation and troubleshooting.

Table 6 - LED Indicators

LED	Color	Airborne Device State
POWER	○	Adapter is not powered.
	●	(Blue) Adapter is powered.
POST	○	Adapter is not powered.
	●	(Red) Adapter failed Power On Self Test (POST).
	●	(Orange) Adapter passed POST but is not configured for wireless network communication.
	●	(Green) Adapter passed POST and is configured for wireless AP communication.
LINK	○	Adapter is not powered or the Wireless radio is off.
	●	(Green) Adapter is powered and the Wireless radio is on.
COMM	○	• If Power LED and COMM LED are both Off the Adapter is not powered. • If Power LED is On but the COMM LED is Off, it means that an Ethernet link has been detected, but no TCP session from the WLAN or Ethernet interface has been established. The LED will flash Red when Ethernet network traffic occurs.
	●	(Red) The device is powered and no Ethernet link has been detected.
	●	(Orange) A TCP connection to the adapter has been established from the Wireless interface and no Ethernet link has been detected.
	●	(Green) A TCP connection to the adapter has been established from the Wireless or Ethernet interface. An Ethernet link has been detected. The LED will flash Orange when Ethernet network traffic occurs.

6.0 Electrical& RF Specification

Table 7- Absolute Maximum Values[1]

Parameter	Min	Max	Unit
Maximum Supply Voltage	5.0	36	VDC
PoE 802.3af Class1 – Q5xx8 models	37	57	VDC
Power Dissipation		3.00	W
Operating Temperature Range	-40	85	°C
Storage Temperature	-40	85	°C

Note: 1. Values are absolute ratings, exceeding these values may cause permanent damage to the device.

Table 8 - RF Characteristics – 802.11a/b/g/n

Symbol	Parameter	Rate (Mb/s)	Min	Average dBm / mW		Peak dBm / mW		Units
P_{OUTB}	Transmit Power Output 802.11b	11, 5.5, 2, 1		15.0	31.6			dBm
P_{OUTG}	Transmit Power Output 802.11g	6, 9, 12, 18, 24, 36, 48, 54		12.6	18.2			dBm
P_{OUTA}	Transmit Power Output 802.11a	6, 9, 12, 18, 24, 36, 48, 54		17.0	50.1			dBm
P_{RSENB}	Receive Sensitivity 802.11b	11		-86				dBm
		1		-92				
P_{RSENG}	Receive Sensitivity 802.11g	54		-72				dBm
		36		-78				
		18		-84				
		6		-89				
P_{RSENA}	Receive Sensitivity 802.11a	54		-74				dBm
		36		-80				
		18		-86				
		6		-90				
$F_{RANGEBG}$	Frequency Range		2412			2484		MHz
F_{RANGEA}	Frequency Range 802.11a		4910 5150 5470			4990 5350 5825		MHz

The transmit power is automatically controlled by the device for minimum power consumption.

The transmit power at the antenna connector is listed in Table 8 above (±2dBm).

Table 9 - Supported Data Rates by Band

Band	Supported Data Rates (Mb/s)
802.11b	11, 5.5, 2, 1
802.11a/g	54, 48, 36, 24, 18, 12, 9, 6
802.11n	65, 58.5, 42, 39, 26, 19.5 13, 6.5

Table 10 - Operating Channels

Band	Region	Freq Range (GHz)	No. of Channels	Channels
802.11b[1,2]	US/Canada	2.401 - 2.473	11	1 – 11
	Europe	2.401 - 2.483	13	1 – 13
802.11g[1,2]	US/Canada	2.401 - 2.473	11	1 – 11
	Europe	2.401 - 2.483	13	1 – 13
802.11a	US/Canada	5.15 - 5.35, 5.725 - 5.825	13	36,40,44,48,52,56,60,64,149,153,157, 161,165
	Europe	5.15 - 5.35, 5.47 - 5.725	19	36,40,44,48,52,56,60,64,100,104,108, 112,116,120,124,128,132,136,140

1. Only channels 1, 6 and 11 are non-overlapping.
2. Channel count denotes number of non-overlapping channels. Channels shown represent non-overlapping channel numbers.

6.1 AC Electrical Characteristics – Transmitter

Transmit power is automatically managed by the device for minimum power consumption. The transmit power at the RF connector is listed in Table 8 for 802.11a/b/g Modes (all rates).

6.2 Performance/Range

The following table illustrates the typical data rates, performance and range the device can provide using an omni-directional antenna.

Table 11 - Radio Typical Performance Range

Data Rate	Typical Outdoor Distance (Unity gain antenna)	Typical Outdoor Distance (2dBi antenna gain on each end for B/G mode)
1.0 Mb/s	240m	380m
11.0 Mb/s	135m	215m
6Mb/s 802.11g	135m	215m
6Mb/s 802.11a	49m	155m
54Mb/s 802.11g	12m	19m
54Mb/s 802.11a	4.5m	14m

Ranges are affected by receiver sensitivity; transmit power, free-space path loss, antenna gain, and link margin. Actual range will vary from those stated. Non-line-of-site applications will result in lower typical values than those shown above.

The Data Rate is the supported connection rate for the wireless link. The actual data throughput for the link will be less than the stated data rates.

7.0 Antenna

The unit supports antenna connection through two (2) RP-SMA connectors, located on the sides of the enclosure.

Any antenna used with the system must be designed for operation within the 2.4GHz ISM band and specifically support the 2.412GHz to 2.482GHz for 802.11b/g, the 5GHz ISM band and must specifically support 5.1GHz to 5.9GHz for 802.11a operation. They are required to have a VSWR of 2:1 maximum referenced to a 50Ω system impedance.

7.1 Antenna Selection

The Airborne radio supports a number of antenna options. The correct antenna option will be determined by a number of factors, including consideration of the application, mechanical construction and desired performance. Since the number of possible combinations is endless we will review some of the more common solutions in this section. If your application is not covered during this discussion please contact Technical Support for more specific answers.

Due to FCC/IC regulatory restrictions only antenna covered by the approvals listed on the device may be used with the device. Please contact Technical Support for a full list of approved antenna.

7.2 Antenna Location

Antenna location can determine the success or failure of the Wi-Fi implementation.

There are several factors that need to be considered when choosing the location:

- Distance of Antenna from radio
- Location of host system
  - Proximity to RF blocking or absorbing materials
  - Proximity to potential noise or interference
  - Position relative to infrastructure (Access Points or Laptops)
- Orientation of host system relative to infrastructure
  - Is it known
  - Is it static

To minimize the impact of these factors, take the following steps during the development process:

- Minimize the distance between the radio and the antenna. As the length of the connecting cable increases, so does the negative impact on Transmit Power and Receive Sensitivity.
- Avoid situations where metal surfaces come into contact with the antenna, or are close to the location of the antenna.
- Avoid locations where RF noise or overlapping ISM bands may be present. This would include microwave ovens and wireless telephone systems in the 2.4GHz and 5.0GHz frequency range.
- Elevate the antenna as much as you can.

- Locate the antenna where there is a minimum of obstruction between the antenna and the location of the Access Points. Access Points are typically located in the ceiling or high on walls.
- Keep the main antenna's polarization vertical, or in-line with the antenna of the Access Points. 802.11 systems utilize vertical polarization and aligning both transmit and receive antenna maximizes the link quality.

No connection will ever be perfect. Experiment with the various possibilities until you get the best connection permitted by the circumstances.

7.3 Performance

Performance will vary according to the application and the circumstances. In most cases your primary concern will be the link quality, which is a function of the bandwidth available between two devices. In general, as the link rate drops the radio's Transmit Power, Receive Sensitivity and link quality improve.

Measurement of link quality can be made in several ways. Bit Error Rate (BER), Signal to Noise (SNR) ratio and Signal Strength are all very useful. The link quality is used by the radio to determine the link rate. When the link quality for a given link rate falls below a predefined limit, the radio will drop to the next lowest link rate and try to communicate using that one.

The reverse is also true. If the radio observes good link quality at one rate it will try to move up to the next rate to see if communication can be maintained at the higher rate.

So consider your application's actual bandwidth requirements and tailor your link rate to optimize the link quality. For example, the link quality at 6Mb/s is likely to be better than it would be for 54Mb/s. If the application only needs 2Mb/s of data throughput, the 6Mb/s rate would provide a better link quality.

Aside from the radio performance, there are a number of other things that contribute to the link quality. These include the items discussed earlier and choices made when looking at the overall antenna gain. The antenna gain contributes to the Equivalent Isotropically Radiated Power (EIRP) of the system. This is part of Link Margin, an overall measurement of link quality.

Link Margin provides a measurement of all the parts of the RF path that impact the communications between two systems. The basic equation looks like this:

EIRP (dB) = TxP + TxA – TxC

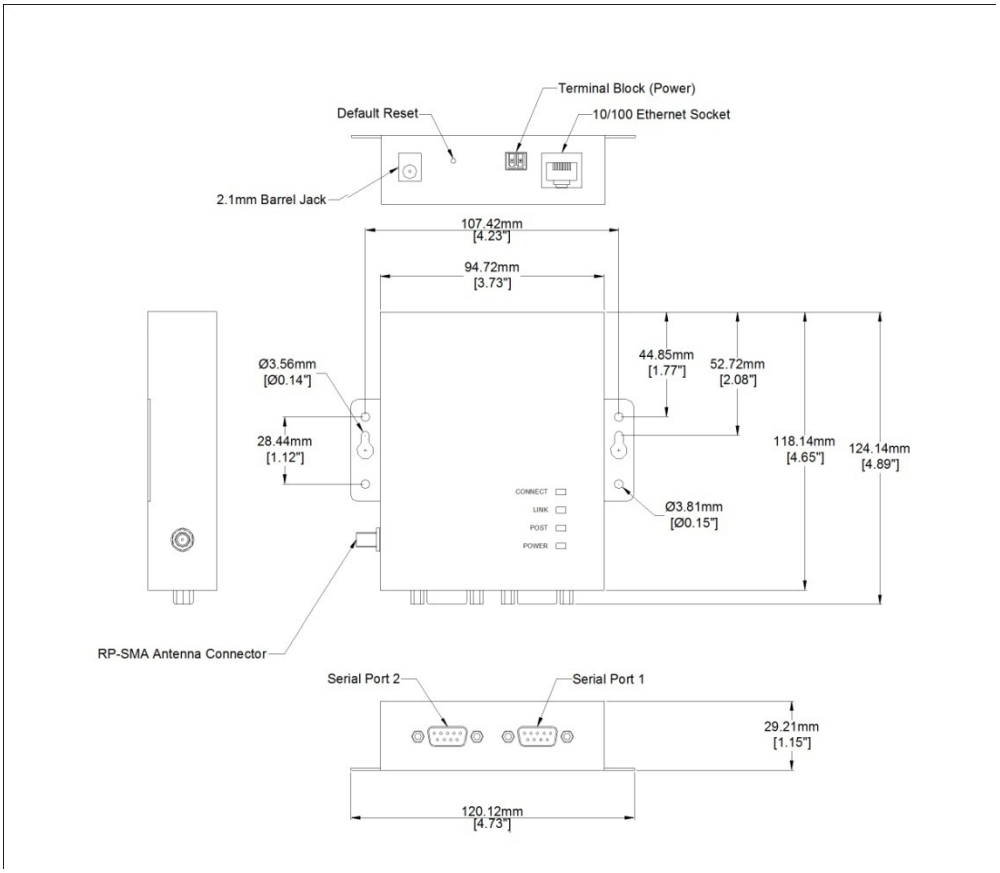
Link Margin (dB) = EIRP – FPL + (RxS + RxA – RxC)

Where:
TxP = Transmitter output power (dBm)
TxA = Transmitter antenna gain (dBi)
TxC = Transmitter to Antenna coax cable loss (dB)
FPL = Free Path Loss (dB)
RxS = Receiver receive sensitivity (dBm)
RxA = Receiver antenna gain (dBi)
RxC = Receiver to Antenna coax cable loss (dB)

To learn more about Link Margin, visit B&B Electronics' online technical library.

.

8.0 Mechanical Outline – Industrial Class



Antenna Connector:	**RP-SMA (Reverse Polarity – SMA)** Requires 2.4GHz/5GHz ISM band antenna, 50 input impedance, RP-SMA connector
Serial Connector:	**DB-9M (Male)** Requires DB-9F (Female)
Ethernet Connector:	**RJ-45 Socket** Requires RJ-45 plug, 10/100 Ethernet interface
Power Connector:	**2.1mm Barrel Jack** Requires 2.1mm ID, 5.5mm OD, +5-36 VDC center pin.
Power Connector:	**Terminal Block (2 connector)** Requires16-30 AWG gauge wire.

9.0 Getting Started

9.1 Unpack the AirborneM2M™ Device

Unpack the AirborneM2M™ Device and compare the package contents with the items listed on the front of the included Quick Start Guide. If any item is missing or damaged, contact B&B immediately.

Contact details can be found at www.bb-elec.com.

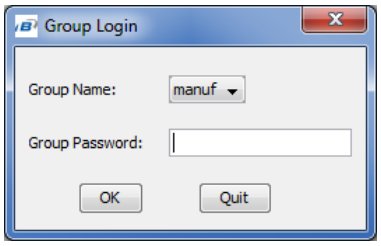
Be sure you have the following:

Wireless Access Point
CD with Airborne Command Center Software and User Manual
(2) Antennas.

10.0 Setup (APXx-Q542x)

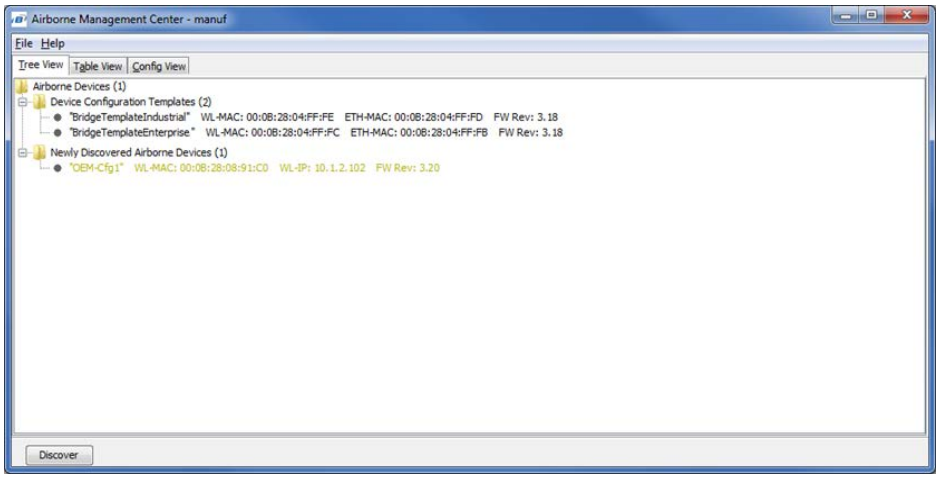
The instructions in Table 12 provide a step-by-step guide for configuration of the AirborneM2M™ Access Point/Wireless Router (APXx-Q542x).

Table 12- APXx Accessing the Web Interface

1	Place the AirborneM2M™ CD in the CD/DVD drive of the laptop or desktop you will be using to configure the AirborneM2M™ device. Follow the on screen directions for installation.
2	Use a piece of Cat5 cable to connect the Ethernet port on the APXx to a network that supports DHCP, or directly to the Ethernet port on your laptop or desktop. Note: When connected directly to a computer Ethernet port, disable all other installed Ethernet adapters, wireless or wired, during configuration process.
3	Apply power to the APXx-Q542x. The unit will boot and display the following LED patterns: COMM: ●**RED** LINK : ●**OFF** POST: ●**ORANGE** POWER: ●**BLUE**
4	Run the Airborne Management Center (AMC) application. This was installed during the CD installation and a menu item will be found in the Airborne folder located in the programs directory of your system. The application will display the following dialog:  Select Group Name: **manuf** and enter Group Password: **dpac**

5

The AMC will load and discover the attached device.

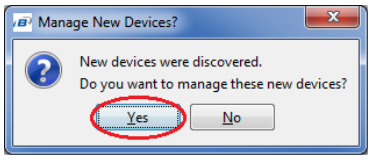


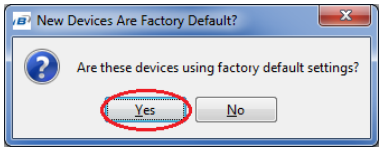
Note: You may be required to wait up to 180 seconds before the APXx is discovered and displayed. This is due to the use of the AutoIP fallback function when connected directly to the APXx.

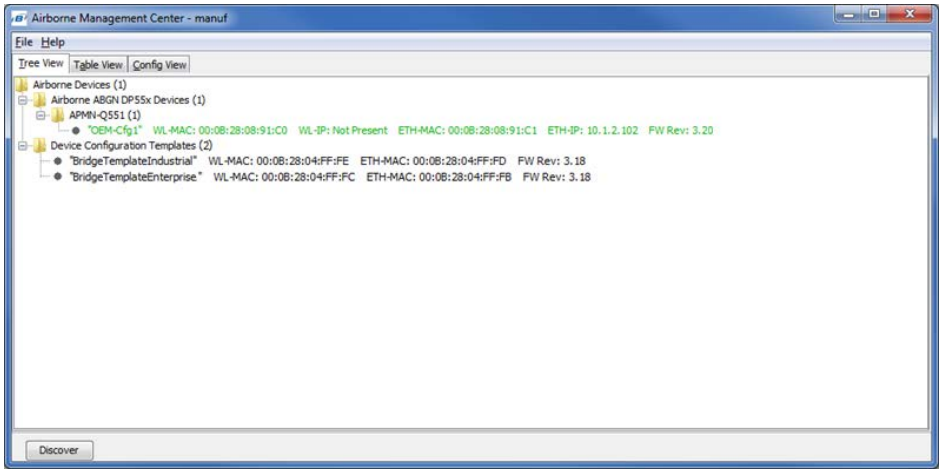
If the unit is not detected please verify that your firewall is disabled. Run a "Discover", if the unit is still not being detected, close down AMC and restart it by doing a Right Click on the AMC icon and select "Run as administrator".

6

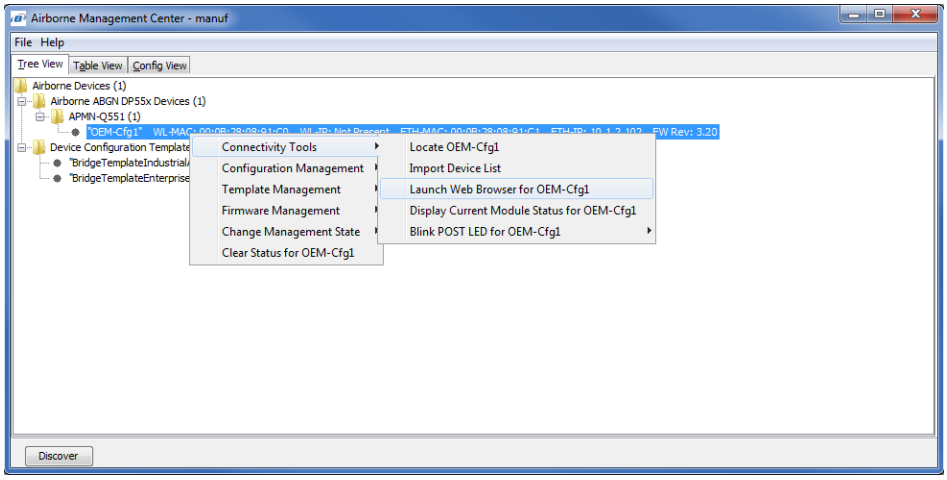
Manage Your Device



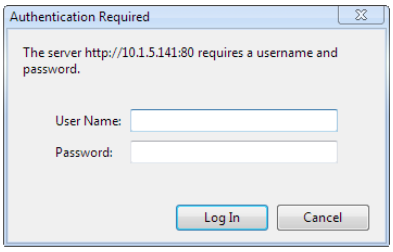




Right Click the device's name. Under "Connectivity Tools" choose "launch web browser for OEM-Cfg1." This will open the device's browser-based management window.



Username= "dpac"
Password = "dpac"



7

If this is not the first time you have accessed the web interface it will default to the Module Status page. If is the first time, the web browser will default to the Express setup page. To access the Express Setup Page, select the Configuration tab the top of the page (dark blue bar).

Then select the Express Setup link in the left hand column (light blue column) You are now ready to configure your device.

Note that none of your changes will take effect until you click the "Commit" button at the bottom of the page and then reboot the device.

8

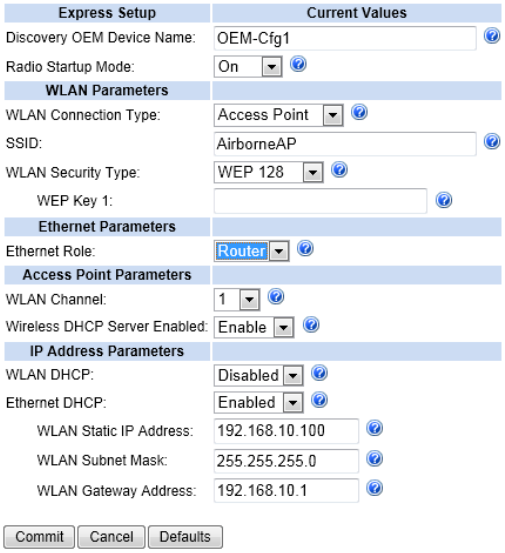
If your device is connected and configured correctly you will see the following LED status.

COMM: ●**RED**
LINK : ●**GREEN**
POST: ●**GREEN**
POWER: ●**BLUE**

9

Access Point in Router Mode
(Connected wireless devices are set up on their own network)

Discovery OEM Device Name = (Users option)
Radio Startup Mode = On
WLAN Connection Type = Access Point
SSID = (Users option)
WLAN Security Type = (Users option)
Ethernet Role = Router
WLAN Channel: = (Users option)
Wireless DHCP Server Enabled = Enable
WLAN DHCP: (Client) = (Not used)
Ethernet DHCP(for networks with DHCP servers) = Enabled
WLAN Static IP address = 192.168.10.100 (first IP ad dress assigned by WLAN DHCP server.)
WLAN Subnet Mask = 255.255.255.0
WLAN Gateway Address = 192.168.10.1

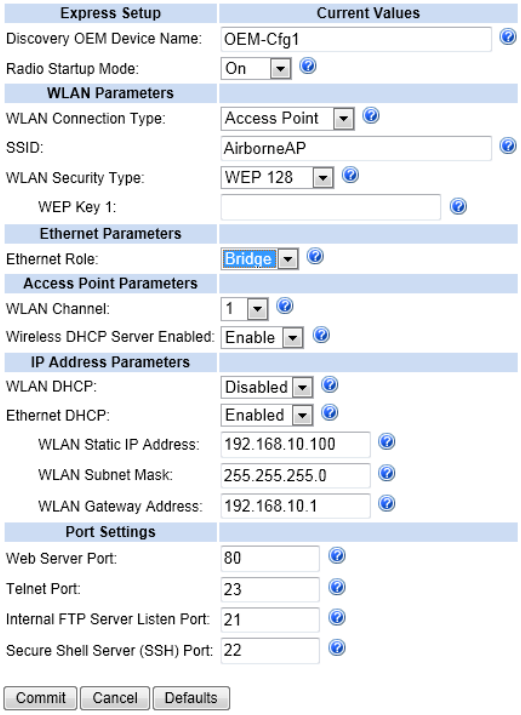


10

Access Point in Bridge Mode

(Connected wireless devices are connected to corporate network)

Discovery OEM Device Name = (Users option)
Radio Startup Mode = On
WLAN Connection Type = Access Point
SSID = (Users option)
WLAN Security Type = (Users option)
Ethernet Role = Bridge
WLAN Channel: = (Users option)
Wireless DHCP Server Enabled = (Not used)
WLAN DHCP: (Client) = (Not used)
Ethernet DHCP (for networks with DHCP servers) = (Users option)
WLAN Static IP address = 192.168.10.100 (Not used in Bridge Mode)
WLAN Subnet Mask = 255.255.255.0 (Not used in Bridge Mode)
WLAN Gateway Address = 192.168.10.1 (Not used in Bridge Mode)



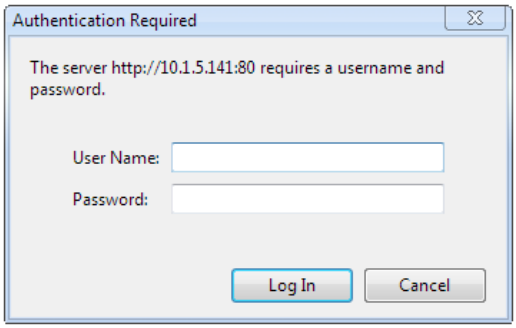
11.0 Using the Web Interface

AirborneDirect™ Device Servers and Wireless Adapters include a web interface that provides access to module status, parameter modification and certificate and configuration file management. To use the web interface follow the steps outlined in section "*Error! Reference source not found*" to establish the IP address of the module. After you know the IP address you can open a web browser and enter the IP address of the module in the URL window.

The web interface currently supports Internet Explorer v6.0 thru 9.0, Firefox v3.x+, Opera v9.6+, Chrome v4.0+ and Safari v5.0.5+.

When the authentication request is returned enter username "dpac" and password "dpac".

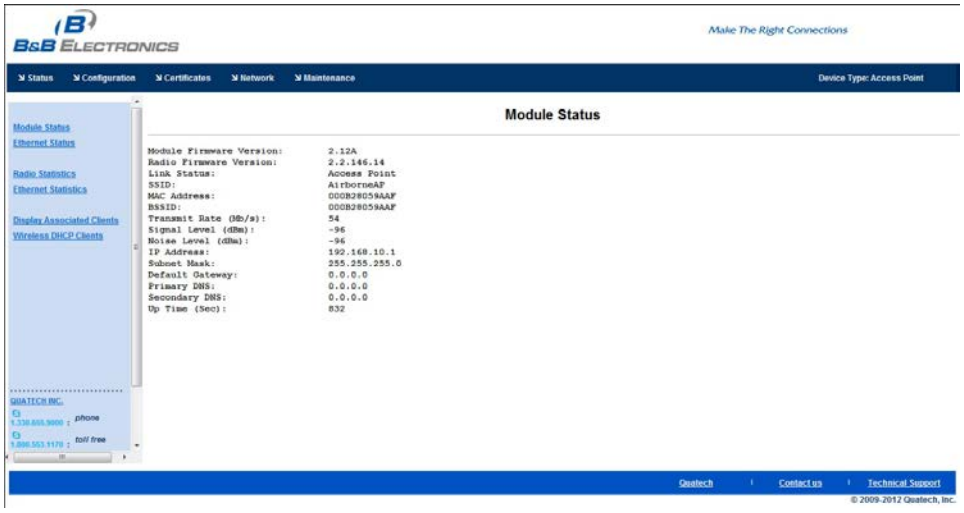
Figure 4 - Website Login



Username: dpac
Password: dpac

After successfully authenticating with the module, you will be logged into the web server. If this is the first time you have accessed the device the Express Setup page will be displayed. See section 12.0 for configuration of the device using this page. If you have previously configured the device the default home page will be displayed (See Figure 5).From here you can update device settings if required. A quick overview of the web interface follows.

Figure 5 - Default Home Page



11.1 Navigation Bar

Figure 6- Website Navigation Bar

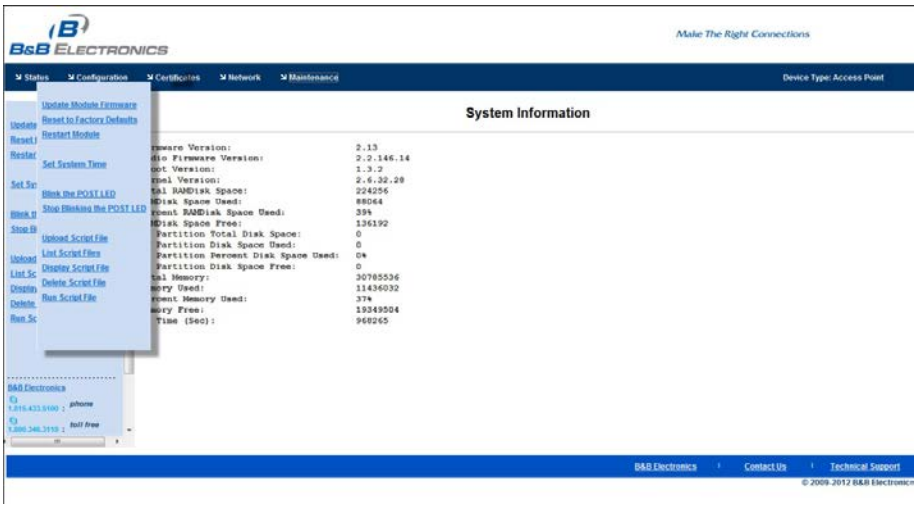
Table 13 - Navigation Bar Items

Title	Description
Status	Provides status and performance characteristics for the network interfaces available. Includes radio statistics and Ethernet statistics.
Configuration	Allows viewing and configuration of all the interface settings including wireless LAN, network connectivity, security, FTP client, serial port and web server. Includes the interface for delivery of OEM and user configuration files, as well as management and viewing of current configurations.
Certificates	This menu item provides the interface for certificate delivery and management. Included in this section are the abilities to view resident certificates, upload and delete certificates.
Network	With this section it is possible to locate other Airborne Device Server modules on the current network. It is also possible to scan for available Access Points.
Maintenance	This section allows the updating of the modules firmware. You can also revert the device settings to OEM defaults and restart the module remotely. The module locate function is also enabled in this section.

11.2 Feature Links

Each Navigation Bar link gives you access to a set of Features/Fields. These are different for each Navigation option and change for different device selections. The Feature Links are located in the left hand panel of the web page. (See Figure 7.)

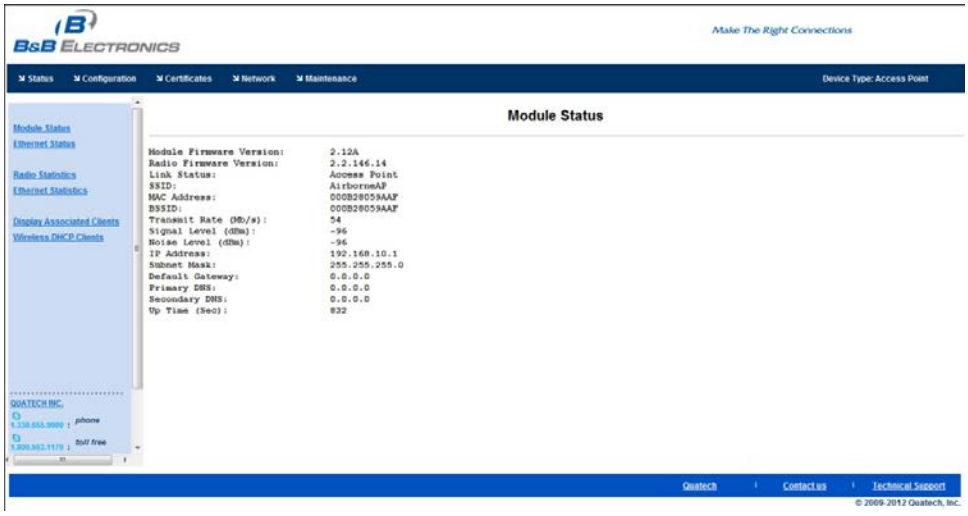
Figure 7- Feature Links



11.3 Navigating the Website

A standard web page looks like Figure 8. The navigation bar runs along the top of the page. Page-specific feature links are listed in the left hand pane of the page. The specific parameters are shown in the main display panel.

Figure 8 - Airborne Web Page



To select any of the items, move your cursor over the item and press the left-hand mouse button. The items in the Navigation bar and the Feature Links are hyperlinks and will cause the mouse cursor to change from an arrow pointer to a finger pointer when placed over them.

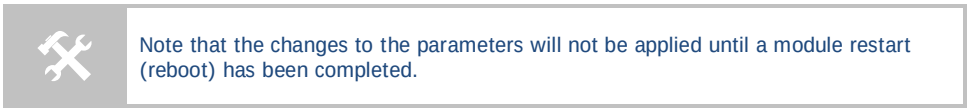
To find out what a specific field does, click on the question mark next to the field. A help balloon will appear. It will provide details on the function of the field and its valid range of values.

11.4 Updating a Field

To update a field, select the field by pressing the Left Hand mouse button. Then either type in the appropriate content or select it from the pull down menu.

Once you have finished modifying parameters, scroll to the bottom of the page and press the **Commit** button. The page will then indicate that the changes have been completed successfully. It will offer you the choice of returning to the configuration page by pressing the **Reload** button or restarting the module by pressing the **Reboot** button. Changes to the parameters will not be applied until a module restart (reboot) has been completed**.**

Before the **Commit** button has been pressed, all modified fields can be returned to their original state by pressing the **Cancel** button.



11.5 Uploading Certificates

Adding certificates to the Airborne Device Server module is very easy when using the web interface.

Figure 9 - Upload Certificate Web Page

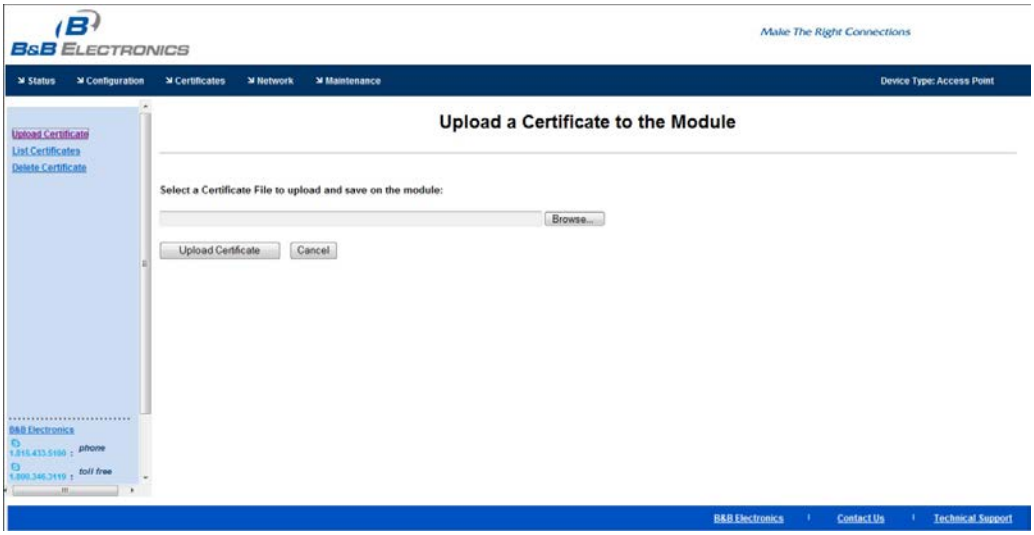


Table 14 - Uploading Certificates

Step	Description
Navigation Bar Select **Certificates**	You will see a list of certificates currently resident on the module when you enter the Certificate File List window.
Feature Link Select **Upload Certificates**	You will see a field for entering the location of the certificate you want to upload.
Press **Browse...** Button	This will open a dialog box in which you can locate the certificate you wish to upload to the module. Select the Certificate file and press **Open**. This will return you to the Certificate Upload window. The file you have chosen will now be listed next to the **Browse...** button.
Press **Upload Certificate**	You will see a notice that the certificate has been successfully uploaded to the module.
Press **List Certificates Files**	This will show the current certificates resident on the module and will include the file you have just uploaded.

11.6 Upload Configuration Files

The Airborne Device Server module supports both OEM and User configuration files for provisioning the module. Delivery of these configuration files can be performed through the web interface. A full description of these files can be found in the Airborne CLI manual.

To upload configuration files follow the steps in Table 15.

Figure 10 - Upload Configuration Web Page

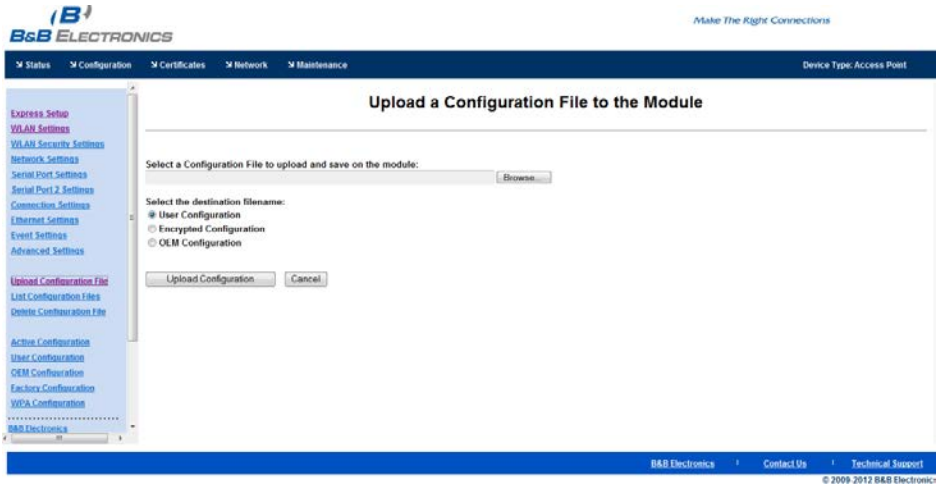


Table 15 - Uploading Configurations

Step	Description
Navigation Bar Select **Configuration**	You will see major WLAN parameters displayed.
Feature Link Select **Upload Configuration File**	The page will present you with a field for entering the location of the configuration you want to upload, along with a choice of OEM, User or Encrypted Configuration.
Press **Browse...** Button	This will open a dialog box in which you can locate the certificate you wish to upload to the module. Select the configuration file and press **Open**. This will return you to the Configuration Upload window. The file you have chosen will appear in the field next to the **Browse...** button.
Select **User** or **OEM Configuration**	This defines the configuration you are installing. OEM Configurations will survive a factory reset, User will not.
Press **Upload Configuration**	You will see a notice that the configuration has been successfully uploaded to the module.
Press **List Configuration Files**	This will display the current configuration files resident on the module and will include the file you have just uploaded.

Uploading a configuration file will overwrite any configuration file already stored on the module. This will cause a change in configuration when a module restart is performed.

IMPORTANT: Confirm that the OEM or USER settings in the configuration files will allow the user to communicate with the module after the upload and a restart has been completed.

11.7 Updating Firmware

The module's firmware may be updated using the web interface. Please refer to Table 16 for the procedure to do this.

Updating the firmware will not alter any existing configuration files or certificates loaded on the module.

You can obtain the version of firmware you wish to install from the B&B Electronics website or B&B Electronics technical support. The firmware will be a binary image file (.img) and will indicate the version of the firmware in the file name.

Once you have obtained the firmware, save the firmware file to a location on the system that you are using to control the module, or at a location that is accessible to that system. Use the Firmware Update page to locate and upload the new firmware.

Figure 11 - Firmware Update Page

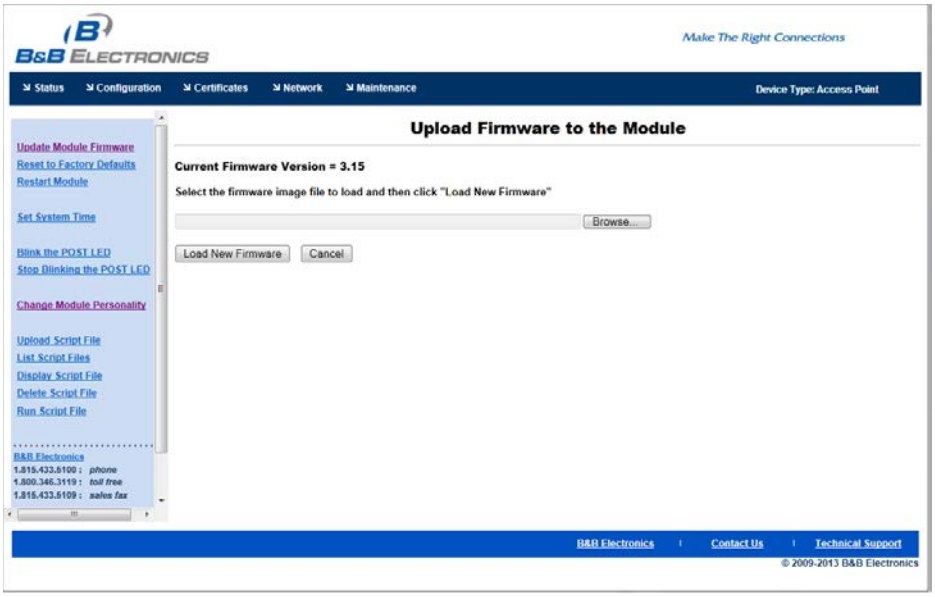


Figure 12 - Firmware Update in Progress

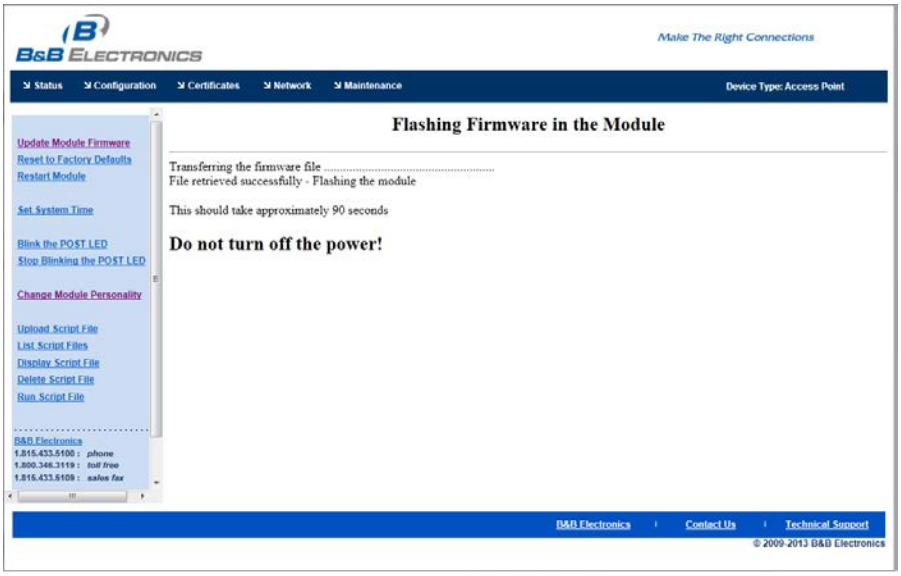
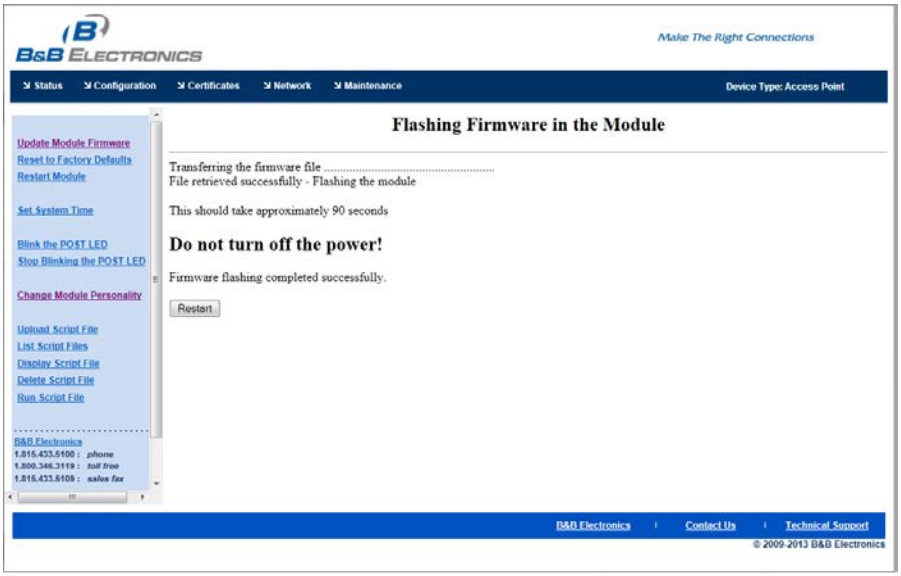


Figure 13 - Firmware Update Complete



When the firmware has been successfully flashed, "Firmware flashing completed successfully" will appear on screen. Select the Restart button. You may confirm the change on the Module Status page.

Table 16 - Updating Firmware

Step	Description
Navigation Bar Select **Maintenance**	This will open a window showing the current module status.

Step	Description
Feature Link Select **Update Module Firmware**	The page will present you with a field to enter the location of the module firmware you want to upload. The current firmware version number is displayed at the top of the page.
Press **Browse...** Button	This will open a dialog box to help you locate the firmware image that you wish to upload to the module. Select the firmware image file and press **Open**. This will return you to the Upload Firmware window. The location and file name of the firmware image you wish to upload will now appear in the field next to the **Browse...** button.
Press **Load New Firmware**	You will then see a notice that the firmware upload has begun (Figure 12). When the upload has been completed successfully and the firmware has been updated, a window indicating this will appear (Figure 13).
Press **Reboot**	This will restart the module and the new firmware will be loaded.

DO NOT REMOVE POWER FROM THE MODULE DURING THE FIRMWARE UPDATE.

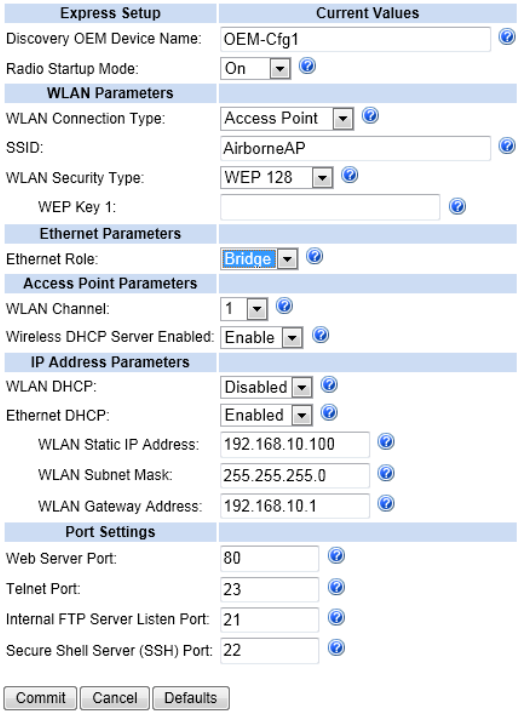
This may cause the device to become non-operational. If this happens please contact B&B Electronics Technical Support.

12.0 Express Setup Configuration Page

When the device's web interface is accessed for the first time an Express Setup page will be shown. This page is designed to allow a quick device setup by presenting the most popular device configuration options in a single location. For more advanced configurations the full set of options are available in the feature links (left-hand column).

The Express Setup web page will display the necessary fields based upon the selections made during configuration. The Express Setup page looks like (Figure 14):

Figure 14 - Express Setup Page



To configure the device for operation each field must be configured correctly. The following steps should be taken to configure the device (Note: Default settings may hide certain fields that are not part of default configuration):

Table 17 - Express Page Setup

Step	Description
Navigation Bar Select **Configuration**	You will see a group of fields under the banner of WLAN Parameters.
Feature Link Select **Express Setup**	This step is optional. If this is the first time the device has been configured this page will automatically be displayed.

Step	Description
Select **Discovery OEM Device Name**	This parameter allows you to name the device uniquely or group it into a functional set. When device discovery is used this name identifies the found device. If you wanted to uniquely identify the device you could mark it with a label like Dev1, for example, and then enter Dev1 in this field. When the device is found it will identify itself as Dev1. Alternately you could indicate the type of equipment the device is attached to, like a Haas TL-2 (CNC Turning Center), by giving the unit a name like Haas_TL_2. When discovered you can then identify the device you are accessing. Enter the text string if you wish to change the default value. This field is optional.
Select **Radio Startup Mode**	Select **On** from the drop down menu for the radio to operate.
Select **WLAN Connection Type**	Default mode is Access Point. To use the device as a wireless router (default mode) or as an Infrastructure Access Point (member of an existing wireless network) the connection type should be **Access Point**.
Select **SSID**	Enter the name of the wireless network you wish to setup. This field is case sensitive and may include spaces.
Select **Wireless LAN Security Type**	Select the security type you wish to use with your wireless network. Depending upon the option you choose you may have to enter additional information. Once you have selected the security type the required inputs will be displayed. All displayed fields must be completed. If an option is displayed, but grayed out, that option is unavailable in Access Point mode.
Select **Ethernet Role**	The default setting is Wireless Router. In this mode devices on the wired port are assigned static IP addresses or there must be a DHCP server on the network. A firewall and port forwarding are available to allow/restrict access between the WLAN and Ethernet networks. Change this to **Bridge** if your application has Ethernet devices on the wired port. All devices can be on the same subnet and wireless clients will have access to resources on the wired port.
Select **WLAN Channel**	This is the channel the Access Point will use to communicate with clients. It is recommended that you use only one Access Point per channel. The default is 1.
Select **Wireless DHCP Server Enabled**	When **Enabled** this will provide IP addresses to clients that are using a DHCP client for IP address assignment. (Router mode) When the Ethernet port is in Bridge mode, the DHCP server will provide IP addresses for Ethernet clients also.
Select **WLAN DHCP**	This parameter is ignored in AP mode.
Select **Ethernet DHCP**	The function of this field depends upon the Ethernet mode setting. If Ethernet mode is **Client**; enabling this will cause the Ethernet interface to obtain an IP address from a DHCP on the network attached to the Ethernet port. If Ethernet Mode or **Bridge** is **Router**; This parameter is ignored.

Step	Description
Select **WLAN Static IP**	The function of this field depends upon whether or not the DHCP Server is enabled on the WLAN interface. If the DHCP Server is **disabled,** this field defines the static IP address for the wireless interface. If the DHCP Server is **enabled,** this field defines the first IP address leased by the DHCP server. Addresses are incremented as new clients are leased addresses. Default: **192.168.10.100**
Select **WLAN Subnet Mask**	The function of this field depends upon whether or not the DHCP Server is enabled on the WLAN interface. If the DHCP Server is **disabled,** this field defines the subnet mask used by the wireless interface. If the DHCP Server is **enabled,** this field defines the subnet mask provided by the DHCP server. Default: **255.255.255.0**
Select **WLAN Gateway Address**	The function of this field depends upon whether or not the DHCP Server is enabled on the WLAN interface. If the DHCP Server is **disabled,** this field defines the gateway IP address used by the wireless interface. If the DHCP Server is **enabled,** this field defines the gateway IP address provided by the DHCP server. If the DHCP Server is **enabled,** this field defines the IP address of the WLAN interface of the APXx. Default: **192.168.10.1**
Select **Ethernet Static IP**	The function of this field depends upon whether or not the Ethernet Mode setting. If Ethernet Mode is **Client,** this field defines the IP address to be used if DHCP is not being used or if DHCP fails. If Ethernet Mode is **Bridge** or **Router,** this field defines the static IP address to be used by the Ethernet interface. When the Ethernet Mode is **Bridge** it is recommended that this field be set to an IP address within the same subnet as the WLAN Static IP address. Default: **192.168.2.100**
Select **Ethernet Subnet Mask**	This field defines the subnet to be used with the Ethernet Static IP address. Default: **255.255.255.0**
Select **Ethernet Gateway Address**	This field defines the Gateway IP address to be used by the Ethernet port. Default: **0.0.0.0**
(Optional) Select **Web Server Port**	Only displayed when Ethernet Mode is set to Bridge. Defines the port number used by the device for HTTP access (web interface). It is recommended that this be changed from the default 80.
(Optional) Select **Telnet Port**	Only displayed when Ethernet Mode is set to Bridge. Defines the port number used by the device for Telnet & TCP/IP access (CLI interface).
(Optional) Select **Internal FTP Server Listen Port**	Only displayed when Ethernet Mode is set to Bridge. Defines the port number used by the device to listen for FTP access.
(Optional) Select **Secure Shell Server (SSH) Port**	Only displayed when Ethernet Mode is set to Bridge. Defines the port number used by the device to listen for SSH access.
Press **Commit** [Button]	Saves changes to the device.

Step	Description
Optional Press **Reload** [Button]	Reloads the **Express Settings** page. Select this if you have further configuration options to change.
Optional Press **Restart** [Button]	Restarts the device. After the device is rebooted it will attempt to authenticate to the configured network. As long as the network is in range the wireless interface will connect. If the network is using DHCP an IP address will be assigned to the WLAN interface and IP connectivity is possible over the WLAN network. If the network is using static IP addresses it will be necessary to configure the network interface. See the next step.

The web interface supports advanced configuration of the device through the additional pages. The following sections provide guidance on how to use these pages for specific configurations.

13.0 Configuring the Wireless Interface

For configurations other than Access Point please refer to the AirborneDirect™ User Manual.

14.0 Configuring the Security Settings

Almost all 802.11 networks use some sort of security to protect the network from unauthorized use. There are many types of security options available. The following section will cover configurations for the most popular options.

14.1 Configuring for WEP Security

Although an old protocol, WEP is still used by many networks. The Airborne device supports many variations of WEP. However, we will only cover the most popular in the following table.

Table 18 - Configuring for WEP Security

Step	Description
Navigation Bar Select **Configuration**	You will see a group of fields under the banner of WLAN Parameters.
Feature Link Select **WLAN Security Settings**	The wireless interface must be configured before configuring the security for the network. A page showing the range of security options and fields is displayed.
Select **Wireless LAN Security**	Select **WEP64** or **WEP128** from the drop down list. The options identify the length of the key that will be used with the security protocol.
Select **Authentication Type**	Select **Auto** from the drop down list. This field should not need to be changed. Only modify it if you have been specifically told to do so by the network administrator.
Select **Default WEP Key**	Select the default key you wish to use with the AP. There must be a valid key in the selected key number field.
Select **WEP Key 1 - 4**	Select the key field that matches the one selected in Default WEP Key field. If **WEP64** is selected the key length is 10 digits. If **WEP128** is selected the key length is 26 digits. More than one key field can be completed.
Press **Commit** [Button]	Saves changes to the device.
Optional Press **Reload** [Button]	Reloads the **WLAN Settings** page. Select this if you have further configuration options to change.
Optional Press **Restart** [Button]	Restarts the device. After the device has rebooted WEP security will be applied to the network. Any client using the network will need to be configured to match the installed settings.

14.2 Configuring for WPA-PSK Security

This security type is a very popular type and is easy to configure. Most often used in small office and home environments.

Table 19 - Configuring for WPA Security

Step	Description
Navigation Bar Select **Configuration**	You will see a group of fields under the banner of WLAN Parameters.
Feature Link Select **WLAN Security Settings**	The wireless interface must be configured before configuring the security for the network. A page showing the range of security options and fields is displayed.
Select **Wireless LAN Security**	Select **WPA-PSK** from the drop down list.
Select **WPA Protocol Version**	Select **Auto** from the drop down list. This field should not need to be changed. Only modify it if you have been specifically told to do so by the network administrator.
Select **WPA / WPA2 Pre Shared Key (PSK)**	Enter the PreShared Key (PSK) you wish to use on the network. It must be a minimum of eight characters long. The PSK cannot include spaces.
Press **Commit** [Button]	Saves changes to the device.
Optional Press **Reload** [Button]	Reloads the **WLAN Settings** page. Select this if you have further configuration options to change.
Optional Press **Restart** [Button]	Restarts the device. After the device has rebooted WPA-PSK security will be applied to the network. Any client using the network will need to be configured to match the installed settings.

14.3 Configuring for WPA2-PSK Security

This security type is a very popular type and is easy to configure. This provides the highest level of security available for the APXx in Access Point mode.

Table 20 - Configuring for WPA2 Security

Step	Description
Navigation Bar Select **Configuration**	You will see a group of fields under the banner of WLAN Parameters.
Feature Link Select **WLAN Security Settings**	The wireless interface must be configured before configuring the security for the network. A page showing the range of security options and fields is displayed.
Select **Wireless LAN Security**	Select **WPA2-PSK** from the drop down list.
Select **WPA / WPA2 Pre Shared Key (PSK)**	Enter the PreShared Key (PSK) you wish to use with the network. The PSK cannot include spaces.
Press **Commit** [Button]	Saves changes to the device.
Optional Press **Reload** [Button]	Reloads the **WLAN Settings** page. Select this if you have further configuration options to change.

Step	Description
Optional Press **Restart** [Button]	Restarts the device. After the device has rebooted WPA2-PSK security will be applied to the network. Any client using the network will need to be configured to match the installed settings.

15.0 Configuring the Serial Device Server

The APXx-Q524x can be used as a Serial Device Server even when in Access Point mode. The following section will cover the full configuration of a Serial Device.

The following section explains how to manually configure the unit to accept TCP/IP connections and automatically setup a data tunnel with one of the serial ports. The configuration is independent of the source of the request, as the tunnel ports are available to both the WLAN and Ethernet interfaces.

Airborne devices support conditional tunnel binding based upon rules included in the configuration. The major options will be included.

15.1 Configuring Serial Port for Access on Telnet Port

A data tunnel can be made using the device's telnet port as the network connection port. This does require authenticating with the device and manually initiating the tunnel connection. Configuring the device to support this approach is covered in the following table.

Table 21–Configure Data Tunnel on Telnet Port

Step	Description
Navigation Bar Select **Configuration**	You will see a group of fields under the banner of WLAN Parameters.
Feature Link Select **Connection Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. A page is displayed that shows the configuration options for TCP/IP and UDP connections to the device. You may configure Telnet, HTTP and SSH ports on this page.
Select **Telnet Port**	Enter the port number you wish to use for a telnet (TCP/IP) connection to the device. The default **23** should only be changed if your application requires access to port 23 for another purpose.
Press **Commit** [Button]	Saves changes to the device.
Press **Reload** [Button]	Reloads the **Connection Settings** page.
Feature Link Select **Serial Port 1 Settings/Serial Port 2 Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. Displays a page showing the serial port configuration. You may set the default mode of operation for the serial interfaces on this page
Select **Serial CLI Default Mode**	Select **Listen** from the drop down menu.
Press **Commit** [Button]	Saves changes to the device.
Optional Press **Reload** [Button]	Reloads the **Serial Port Settings** page. Select this if you have further configuration options to change.

Step	Description
Optional Press **Restart** [Button]	Restarts the device. After the device has rebooted it will attempt to authenticate to the configured network. As long as the network is in range the wireless interface will connect. Once authenticated to the network it is possible for a TCP/IP connection to be made on the Telnet port.

To establish a data tunnel and gain access to the serial data from the WLAN or Ethernet interface follow the steps in Table 22.

Table 22 - Data Tunnel using Telnet Port

Step	Description
Open TCP socket to device	Using the WLAN IP Address and configured telnet port number.
Authenticate with device	`authdpacdpac` Any user level above L5 can authenticate with the unit. Device responds `OK`
Open data tunnel to serial port	`pass-x` Where `x` can be `p1`, `p2` or `any`. **`p1`** or **`p2`** binds to the indicated serial port, as long as the serial port is in listen mode and does not already have a data tunnel open. **`Any`** binds to the first serial port which is in listen mode and does not already have a data tunnel open.

15.2 Configuring Serial Port 1 for Access on Tunnel Port

A data tunnel can be made using the device's tunnel port as the network connection port. This does not require authenticating with the device and automatically initiates the tunnel connection. Configuring the device to support this approach is covered in the following table.

Table 23 – Configure Data Tunnel on Serial Port 1 Tunnel Port (TCP)

Step	Description
Navigation Bar Select **Configuration**	You will see a group of fields under the banner of WLAN Parameters.
Feature Link Select **Connection Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. A page appears showing the configuration options for TCP/IP and UDP connections to the device. Configuration of Telnet, HTTP and SSH ports can be done on this page.
Select **Tunnel Enabled**	Select **Enabled**.

Step	Description
Select **Tunnel Port**	Enter the port to be used for the tunnel. Default is **8023.** This should only be changed if a port is already defined for the application server or it is already being used by another service.
Select **Tunnel Mode**	Select **TCP** from drop down menu.
Press **Commit** [Button]	Saves changes to the device.
Press **Reload** [Button]	Reloads the **Connection Settings** page.
Feature Link Select **Serial Port Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. Displays a page showing the serial port configuration. You will set the default mode of operation for the serial interface here.
Select **Serial CLI Default Mode**	Select **Listen** from the drop down menu.
Press **Commit** [Button]	Saves changes to the device.
Optional Press **Reload** [Button]	Reloads the **Serial Port Settings** page. Select this if you have further configuration options to change.
Optional Press **Restart** [Button]	Restarts the device. After the device has rebooted it will attempt to authenticate to the configured network. As long as the network is in range the wireless interface will connect. After authenticated is completed you will be able to make a TCP/IP connection on the Telnet port.

To establish a data tunnel and gain access to the serial data from the WLAN or Ethernet interface follow the steps in Table 24.

Table 24 - Data Tunnel using Tunnel Port on Serial Port 1

Step	Description
Open TCP socket to device	Using the WLAN IP Address and configured tunnel port number for Serial Port 1 (Default 8023).

15.3 Configuring Serial Port 2 for Access on Tunnel Port

A data tunnel can be made using the device's tunnel port as the network connection port. This does not require authenticating with the device and automatically initiates the tunnel connection. Configuring the device to support this approach is covered in the following table.

Table 25 – Configure Data Tunnel on Serial Port 2 Tunnel Port (TCP)

Step	Description
Navigation Bar Select **Configuration**	You will see a group of fields under the banner of WLAN Parameters.

Step	Description
Feature Link Select **Connection Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. A page showing the configuration options for TCP/IP and UDP connections to the device. Configuration of Telnet, HTTP and SSH ports is possible through this page.
Select **Tunnel Enabled – Serial Port 2**	Select **Enabled**.
Select **Tunnel Port – Serial Port 2**	Enter the port to be used for the tunnel. Default is **8024**, this should only be changed if a port is already defined for the application server or it is already being used by another service.
Select **Tunnel Mode – Serial Port 2**	Select **TCP** from drop down menu.
Press **Commit** [Button]	Saves changes to the device.
Press **Reload** [Button]	Reloads the **Connection Settings** page.
Feature Link Select **Serial Port 2 Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. Displays a page showing the serial port configuration, setting the default mode of operation for the serial interface is done in this page.
Select **Serial CLI Default Mode**	Select **Listen** from the drop down menu.
Press **Commit** [Button]	Saves changes to the device.
Optional Press **Reload** [Button]	Reloads the **Serial Port 2 Settings** page. Select this if you have further configuration options to change.
Optional Press **Restart** [Button]	Restarts the device. After the device has rebooted it will attempt to authenticate to the configured network. As long as the network is in range the wireless interface will connect. Once authenticated the network it is possible for a TCP/IP connection to be made on the Telnet port.

To establish a data tunnel and gain access to the serial data from the WLAN or Ethernet interface follow the steps in Table 26.

Table 26 - Data Tunnel using Tunnel Port on Serial Port 2

Step	Description
Open TCP socket to device	Using the WLAN IP Address and configured tunnel port number for Serial Port 2 (Default 8024).

15.4 Configuring Serial Port 1 as TCP Client

In this mode the device will attempt to initiate a TCP connection to a network based server and establish a data tunnel with Serial Port 1 on a successful network connection.

Table 27 - Configure Serial Port 1 as TCP Client

Step	Description
Navigation Bar Select **Configuration**	You will see a group of fields under the banner of WLAN Parameters.
Feature Link Select **Connection Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. You will see a page showing the configuration options for TCP/IP and UDP connections to the device. You may configure Telnet, HTTP and SSH ports on this page.
Select **TCP Port**	Enter the port on which the target server is listening for TCP connections.
Select **TCP Timeout**	Enter the inactivity timeout in seconds, after which the device will close the open data tunnel on Serial Port 1. The default **0** disables the timeout.
Select **TCP Retry Time**	Enter the period(in seconds)that the device should use to retry establishing the TCP connection to the target server.
Select **Primary TCP Target Server IP Address**	Enter the IP address of the primary target server. The address must be in the format: **XXX.XXX.XXX.XXX**
Optional Select **Secondary TCP Target Server IP Address**	Enter the IP address of the secondary target server. The address must be in the format: **XXX.XXX.XXX.XXX** This address will be used if the initial attempts to connect to the primary server fail. This field is optional.
Press **Commit** [Button]	Saves changes to the device.
Press **Reload** [Button]	Reloads the **Connection Settings** page.
Feature Link Select **Serial Port 1 Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. You will see a page showing the serial port configuration. You may set the default mode of operation for the serial interface on this page.
Select **Serial CLI Default Mode**	Select **Pass** from the drop down menu.
Press **Commit** [Button]	Saves changes to the device.
Optional Press **Reload** [Button]	Reloads the **Serial Port 1 Settings** page. Select this if you wish to change additional configuration options.

Step	Description
Optional Press **Restart** [Button]	Restarts the device. After the device has rebooted it will attempt to authenticate to the configured network. As long as the network is in range the wireless interface will connect. Once authenticated to the network the device will attempt to make a TCP connection with primary target server, using the configured port number.

15.5 Configuring Serial Port 2 as TCP Client

In this mode the device will attempt to initiate a TCP connection to a network based server and establish a data tunnel with Serial Port 2 on a successful network connection.

Table 28 - Configure Serial Port 2 as TCP Client

Step	Description
Navigation Bar Select **Configuration**	You will see a group of fields under the banner of WLAN Parameters.
Feature Link Select **Connection Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. You will see a page showing the configuration options for TCP/IP and UDP connections to the device. You may configure Telnet, HTTP and SSH ports on this page.
Select **TCP Port – Serial Port 2**	Enter the port on which the target server is listening for TCP connections.
Select **TCP Timeout – Serial Port 2**	Enter the inactivity timeout in seconds, after which the device will close the open data tunnel on Serial Port 1. The default **0** disables the timeout.
Select **TCP Retry Time – Serial Port 2**	Enter the period (in seconds) the device should use to retry establishing the TCP connection to the target server.
Select **Primary TCP Target Server IP Address – Serial Port 2**	Enter the IP address of the primary target server. The address must be in the format: **XXX.XXX.XXX.XXX**
Optional Select **Secondary TCP Target Server IP Address – Serial Port 2**	Enter the IP address of the secondary target server. The address must be in the format: **XXX.XXX.XXX.XXX** This address will be used if the initial attempts to connect to the primary server fail. This field is optional.
Press **Commit** [Button]	Saves changes to the device.
Press **Reload** [Button]	Reloads the **Connection Settings** page.

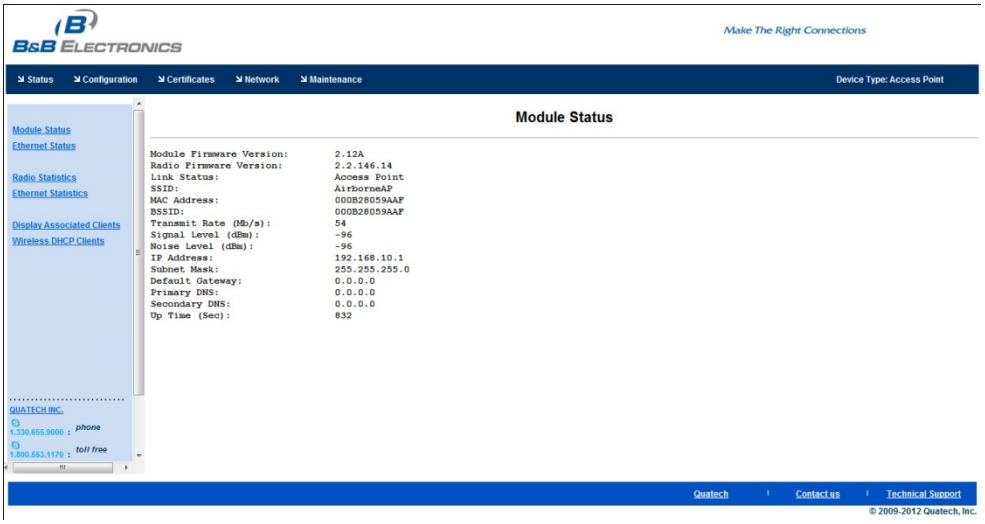
Step	Description
Feature Link Select **Serial Port 2 Settings**	The wireless interface and security must be configured before configuring the Ethernet settings. You will see a page showing the serial port configuration. You may set the default mode of operation for the serial interface on this page.
Select **Serial CLI Default Mode**	Select **Pass** from the drop down menu.
Press **Commit** [Button]	Saves changes to the device.
Optional Press **Reload** [Button]	Reloads the **Serial Port 2 Settings** page. Select this if you wish to change additional configuration options.
Optional Press **Restart** [Button]	Restarts the device. After the device has rebooted it will attempt to authenticate to the configured network. As long as the network is in range the wireless interface will connect. Once authenticated to the network the device will attempt to make a TCP connection with primary target server, using the configured port number.

16.0 Web Page Overview

The following section highlights the contents of each web page and provides a reference to the associated CLI command. For further explanation of each of the fields please refer to the referenced command in the table (See Airborne Enterprise Command Line Reference Manual). When using CLI command, typing a command followed by a space and a '?' will display help for the command (e.g. "wl-type ?").

Module Status

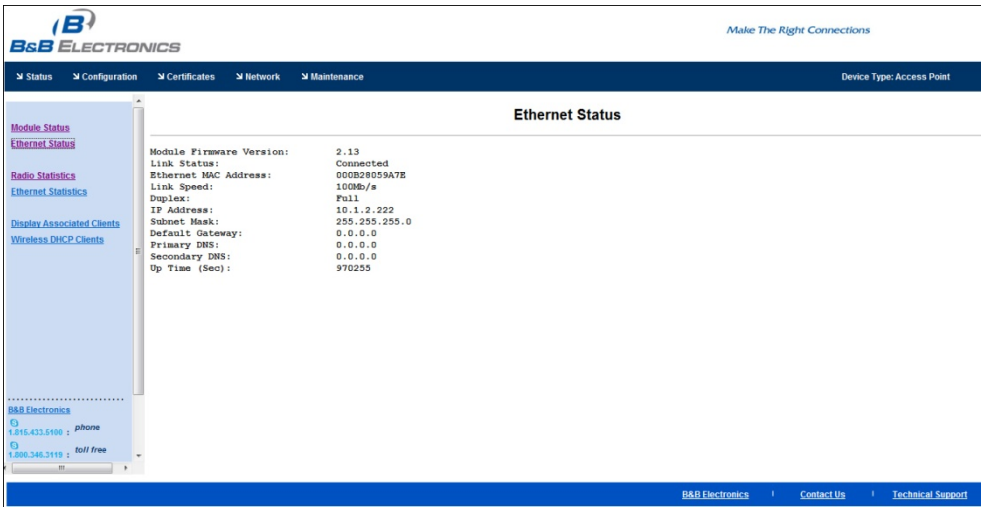
URL	/Status/Module Status
Description	When authenticated to the Airborne device, this page provides important information about the device's firmware version, wireless connection status and wireless interface network configuration.



Field	CLI Command
Displayed Page	`wl-info`

Ethernet Status

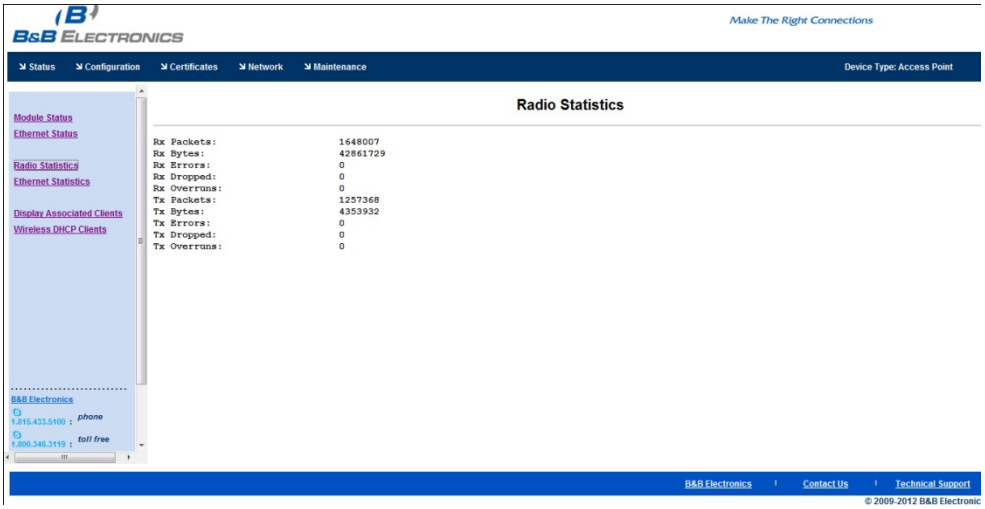
URL	/Status/Ethernet Status
Description	Provides important information about the device's firmware version, Ethernet connection status and Ethernet interface network configuration.



Field	CLI Command
Displayed Page	`eth-info`

Radio Statistics

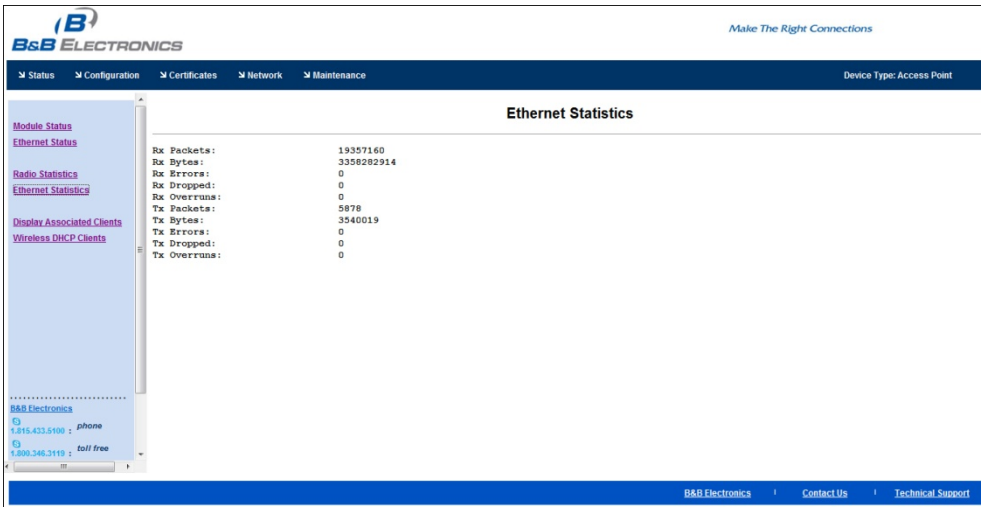
URL	/Status/Radio Statistics
Description	Provides information about the packet transmit and receive performance of the wireless interface.



Field	CLI Command
Displayed Page	`stats<blank> or radio`

Ethernet Statistics

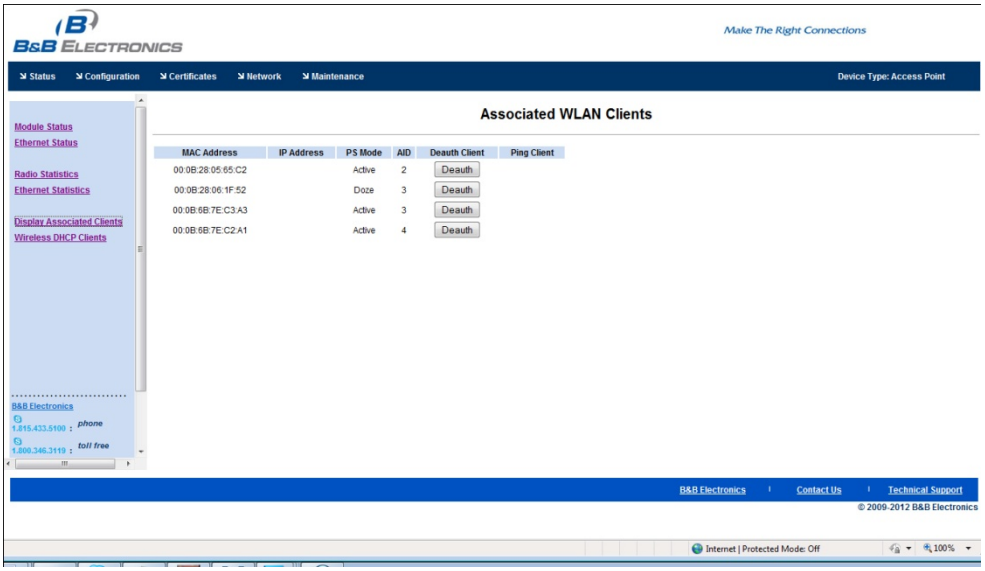
URL	/Status/Ethernet Statistics
Description	Provides information about the packet transmit and receive performance of the Ethernet interface.



Field	CLI Command
Displayed Page	`statsethernet`

Display Associated Clients

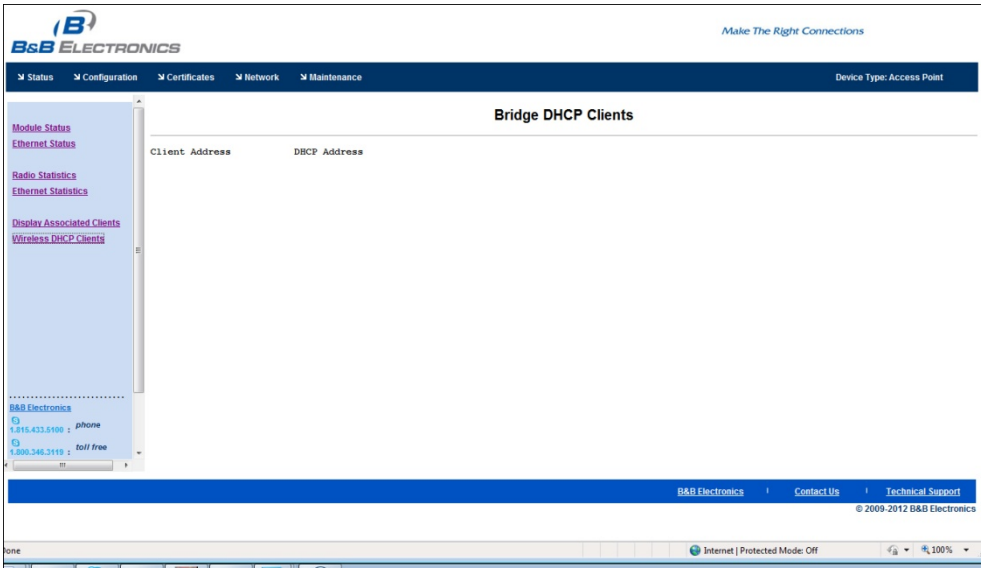
URL	/Status/Display Associated Clients
Description	Displays associated clients.



Field	CLI Command
Displayed Page	`eth-clients`

Wireless DHCP Clients

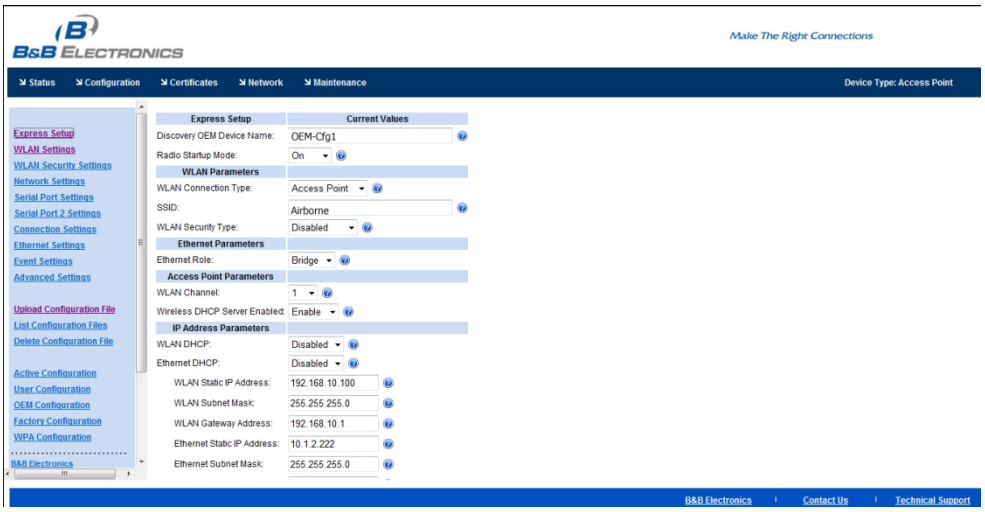
URL	/Status/Wireless DHCP Clients
Description	Displays wireless DHCP clients.



Field	CLI Command
Displayed Page	`eth-dhcp-clients`

Express Setup

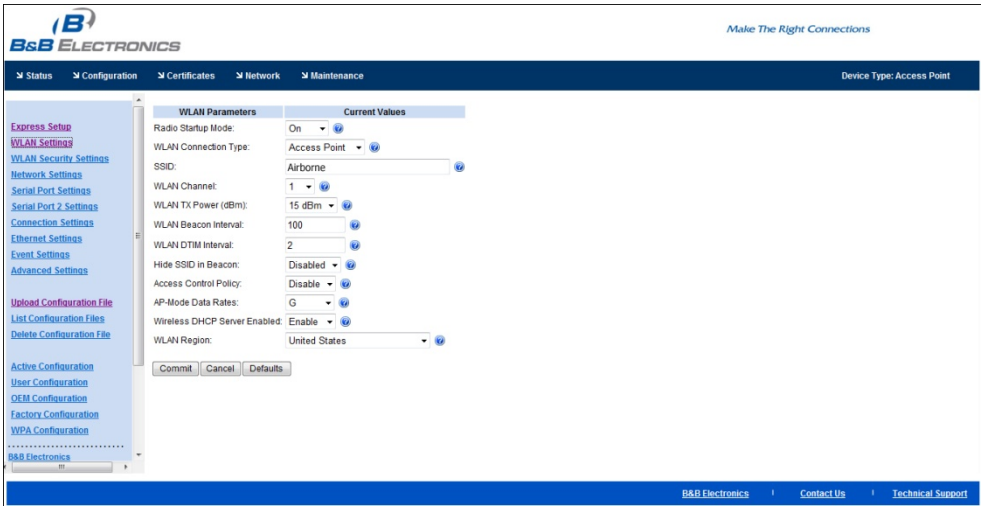
URL	/Configuration/Express Setup
Description	Provides a simplified configuration option set in a single page. This will be the default home page when configuring the device for the first time, or after a factory reset has been performed.



Field	CLI Command
Discovery OEM Device Name	`name-oem`
Radio Startup Mode	`radio-on, radio-off`
Wireless LAN Connection Type	`wl-type`
SSID	`wl-ssid`
Wireless LAN Security Type	`wl-security`
WEP Key 1	`wl-key-1`
WPA/WPA2Pre Shared Key (PSK)	`pw-wpa-psk`
Ethernet Role	`eth-role`
WLAN Channel	`wl-chan`
Wireless DHCP Server Enabled	`wl-dhcp-server`
WLAN DHCP	`wl-dhcp`
Ethernet DHCP	`eth-dhcp`
WLAN Static IP Address	`wl-ip`
WLAN Subnet Mask	`wl-subnet`
WLAN Gateway Address	`wl-gateway`
Ethernet Static IP Address	`eth-ip`
Ethernet Subnet Mask	`eth-subnet`
Ethernet gateway Address	`eth-gateway`
Web Server Port	`wl-http-port`
Telnet Port	`wl-telnet-port`
Internal FTP Server Listen Port	`ftp-server-listen-port`
Secure Shell Server (SSH) Port	`wl-ssh-port`

WLAN Settings

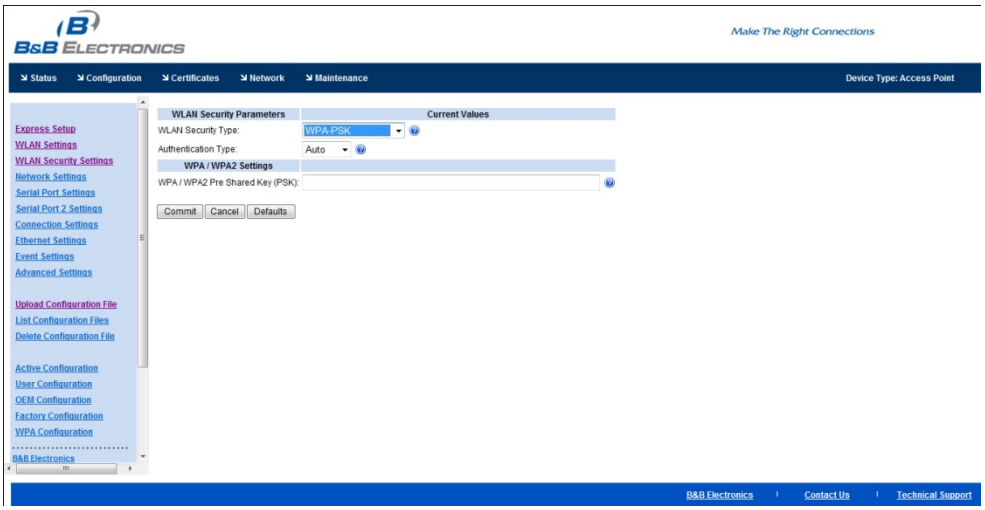
URL	/Configuration/WLAN Settings
Description	Configures the wireless interface settings, including network name and type.

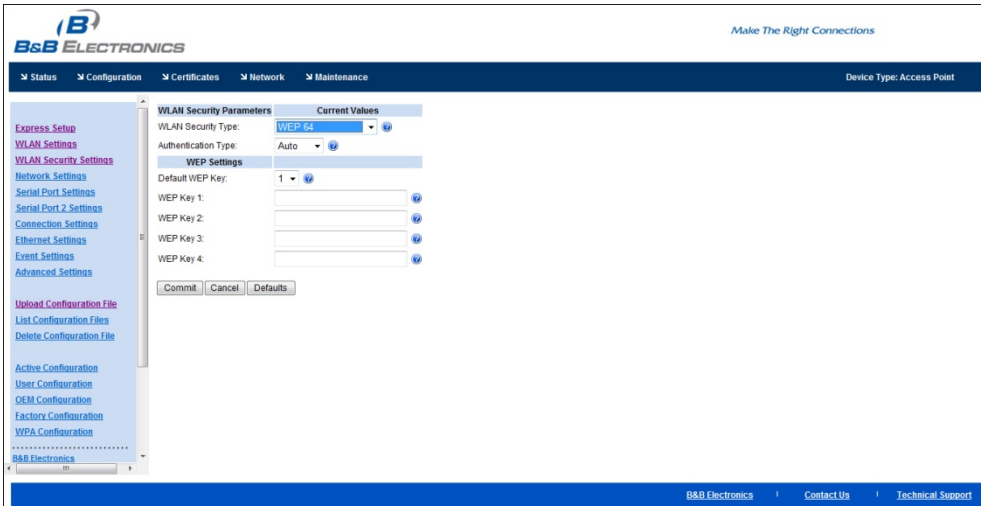


Field	CLI Command
Radio Startup Mode	`radio-on, radio-off`
Wireless LAN Connection Type	`wl-type`
SSID	`wl-ssid`
Wireless LAN Channel	`wl-chan`
WLAN TX Power (dBm)	`wl-tx-power`
WLAN Beacon Interval	`wl-beacon-int`
WLAN DTIM Interval	`wl-dtim-int`
Hide SSID in Beacon	`wl-hide-ssid`
Access Control Policy	`wl-acl-policy`
Access Control Policy MAC Addresses	`wl-acl-mac`
AP-Mode Default Data Rates	`wl-mode`
Wireless DHCP Server Enabled	`wl-dhcp-server`
Wireless LAN Region	`wl-region`

WLAN Security Settings

URL	/Configuration/WLAN Security Settings
Description	Configures the security settings for the target network.

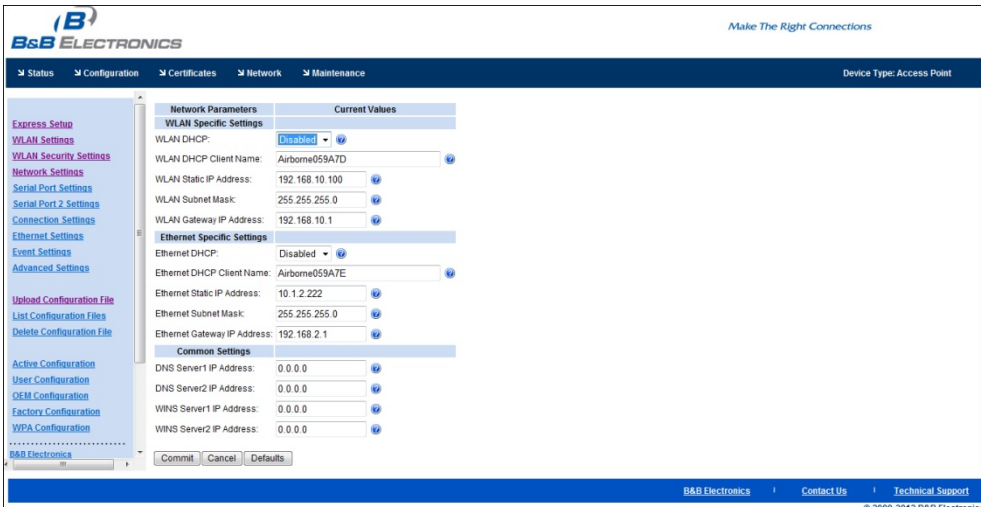




Field	CLI Command
Wireless LAN Security Type	`wl-security`
Authentication Type	`wl-auth`
Default WEP Key	`wl-def-key`
WEP Key 1 - 4	`wl-key-1, wl-key-2, wl-key-3, wl-key-4`
WPA/WPA2 Pre Shared Key (PSK)	`pw-wpa-psk`

Network Settings

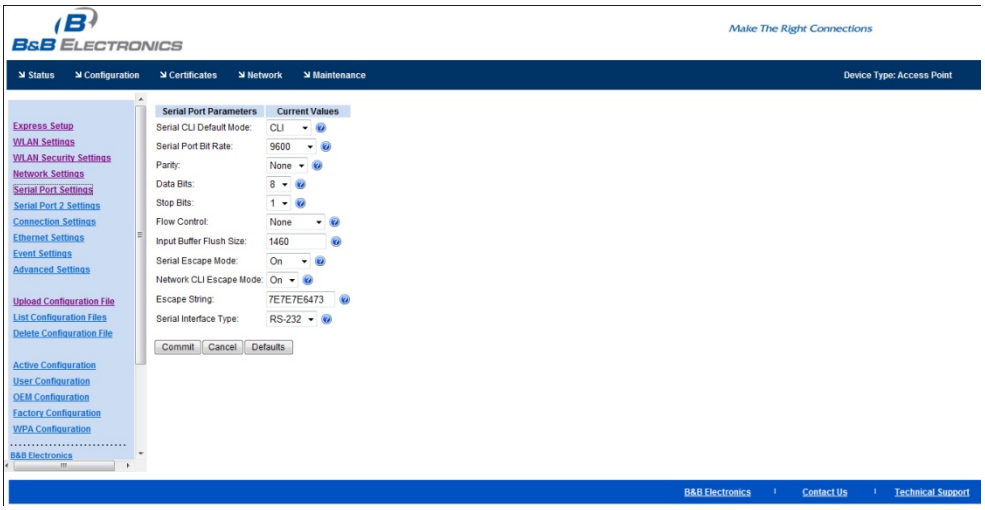
URL	/Configuration/Network Settings
Description	Configures the wireless and Ethernet interface network settings including DHCP, static IP and Fallback configurations.



Field	CLI Command
WLAN DHCP	`wl-dhcp`
WLAN DHCP Client Name	`wl-dhcp-client`
WLAN Static IP Address	`wl-ip`
WLAN Subnet Mask	`wl-subnet`
WLAN Gateway IP Address	`wl-gateway`
Ethernet DHCP	`eth-dhcp`
Ethernet DHCP Client Name	`eth-dhcp-client`
Ethernet Static IP Address	`eth-ip`
Ethernet Subnet Mask	`eth-subnet`
Ethernet Gateway IP Address	`eth-gateway`
DNS Server1/2 IP Address	`dns-server1, dns-server2`
WINS Server 1/2 IP Address	`wins-server1, wins-server2`

Serial Port Settings

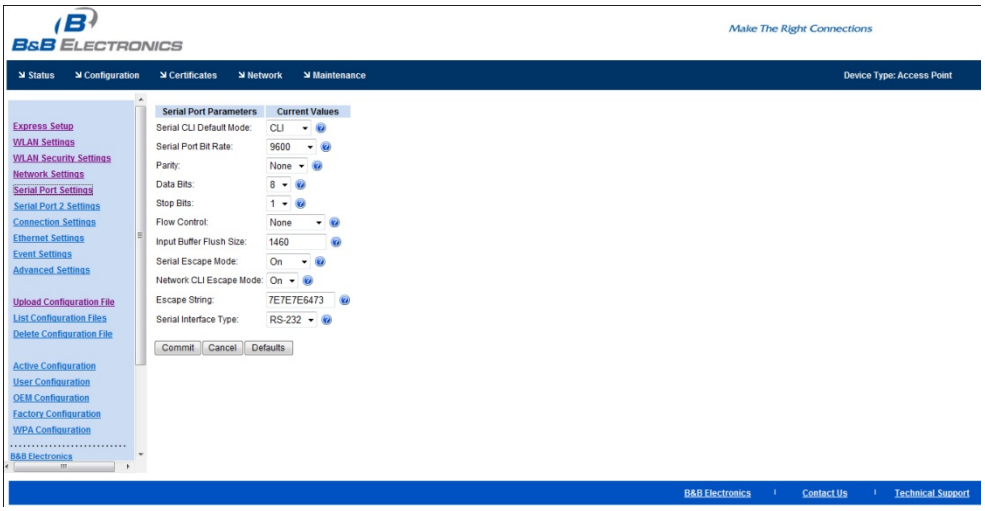
URL	/Configuration/Serial Port Settings
Description	Configures the serial port settings on the primary serial port.



Field	CLI Command
Serial CLI Default Mode	`serial-default, serial-default-p1`
Serial Port Bit Rate	`bit-rate, bit-rate-p1`
Parity	`parity, parity-p1`
Data Bits	`data-bits, data-bits-p1`
Stop Bits	`stop-bit, stop-bit-p1`
Flow Control	`flow, flow-p1`
Serial Assert	`serial-assert, serial-assert-p1`
Input Buffer Flush Size	`input-size, input-size-p1`
Serial Escape Mode	`esc-mode-serial, esc-mode-serial-p1`
Network CLI Escape Mode	`esc-mode-lan, esc-mode-lan-p1`
Escape String	`esc-str, esc-str-p1`
Serial Interface Type	`intf-type`

Serial Port 2 Settings

URL	/Configuration/Serial Port 2 Settings
Description	Configures the serial port settings on the secondary serial port.

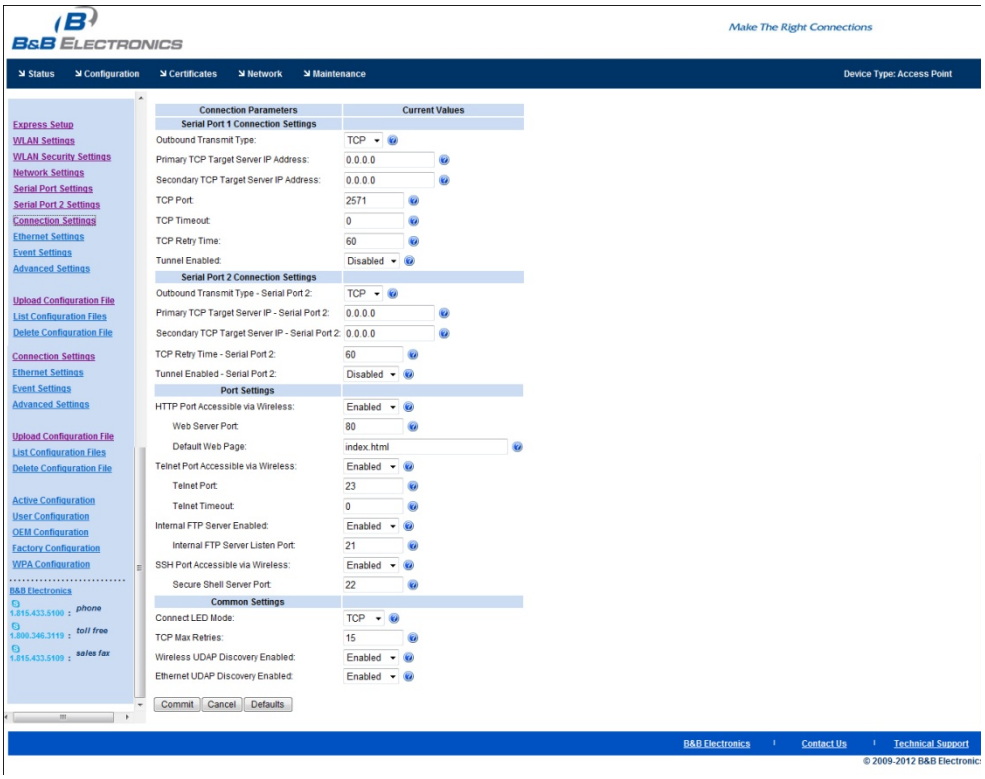


Field	CLI Command
Serial CLI Default Mode	`serial-default-p2`
Serial Port Bit Rate	`bit-rate-p2`
Parity	`parity-p2`
Data Bits	`data-bits-p2`
Stop Bits	`stop-bit-p2`
Flow Control	`flow-p2`
Serial Assert	`serial-assert-p2`
Input Buffer Flush Size	`input-size-p2`
Serial Escape Mode	`esc-mode-serial-p2`
Wireless LAN CLI Escape Mode	`esc-mode-lan-p2`
Escape String	`esc-str-p2`
Serial Interface Type	`intf-type`

Serial port 2 cannot run in RS-485 mode and will assume RS-422 mode even if it is set to RS-485 mode. Serial port 2 cannot run half duplex and must have a 4 wire connection.

Connection Settings

URL	/Configuration/Connection Settings
Description	Configures the data tunnel and network port settings for both serial ports. Includes management of port access and service availability.

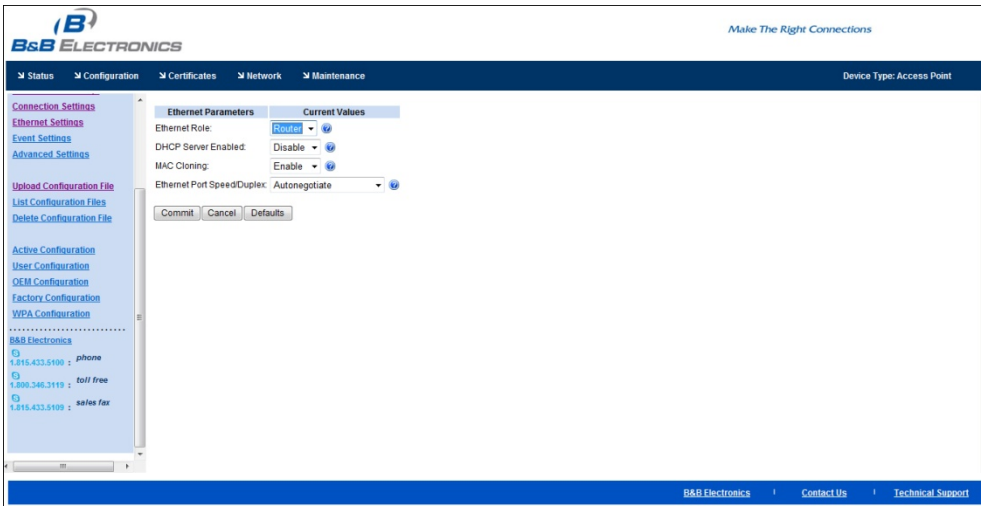


Field	CLI Command
Outbound Transmit Type	`wl-xmit-type, wl-xmit-type-p1`
Primary TCP Target Server IP Address	`wl-tcp-ip, wl-tcp-ip-p1`
Secondary TCP Target Server IP Address	`wl-tcp-ip2, wl-tcp-ip2-p1`
TCP Port	`wl-tcp-port, wl-tcp-port-p1`
TCP Timeout	`wl-tcp-timeout, wl-tcp-timeout-p1`
TCP Retry Time	`wl-retry-time, wl-retry-time-p1`
Tunnel Enabled	`wl-tunnel, wl-tunnel-p1`
UDP Target Server IP Address	`wl-udp-ip, wl-udp-ip-p1`
UDP Port	`wl-udp-port, wl-udp-port-p1`
UDP Receive Port	`wl-udp-rxport, wl-udp-rxport-p1`
UDP Transmit Mode	`wl-udp-xmit, wl-udp-xmit-p1`
Outbound Transmit Type – Serial Port 2	`wl-xmit-type-p2`
Primary TCP Target Server IP Address – Serial Port 2	`wl-tcp-ip-p2`
Secondary TCP Target Server IP Address – Serial Port 2	`wl-tcp-ip2-p2`
TCP Port – Serial Port 2	`wl-tcp-port-p2`
TCP Timeout – Serial Port 2	`wl-tcp-timeout-p2`

TCP Retry Time – Serial Port 2	wl-retry-time-p2
Tunnel Enabled – Serial Port 2	wl-tunnel-p2
UDP Target Server IP Address – Serial Port 2	wl-udp-ip-p2
UDP Port – Serial Port 2	wl-udp-port-p2
UDP Receive Port – Serial Port 2	wl-udp-rxport-p2
UDP Transmit Mode – Serial Port 2	wl-udp-xmit-p2
HTTP Port Accessible via Wireless	http-port
Web Server Port	wl-http-port
Default Web Page	<index.html>
Telnet Port Accessible via Wireless	telnet-port
Telnet Port	wl-telnet-port
Telnet Timeout	wl-telnet-timeout
Internal FTP Server Port	ftp-server-port
Internal FTP Server Listen Port	ftp-server-listen-port
SSH Port Accessible via Wireless	ssh-port
Secure Shell Server Port	wl-ssh-port
Connect LED Mode	wl-con-led
TCP Max Retries	tcp-retries
Wireless UDAP Discovery Enabled	wl-udap
Ethernet UDAP Discovery Enabled	eth-udap

Ethernet Settings

URL	/Configuration/Ethernet Settings
Description	Configures the Ethernet interface for AirborneDirect™ Ethernet devices.



Field	CLI Command
Ethernet Role	`eth-role`
DHCP Server Enabled	`eth-dhcp-server`
MAC Cloning	`wl-mac-clone`
Ethernet Port Speed/Duplex	`eth-mode`

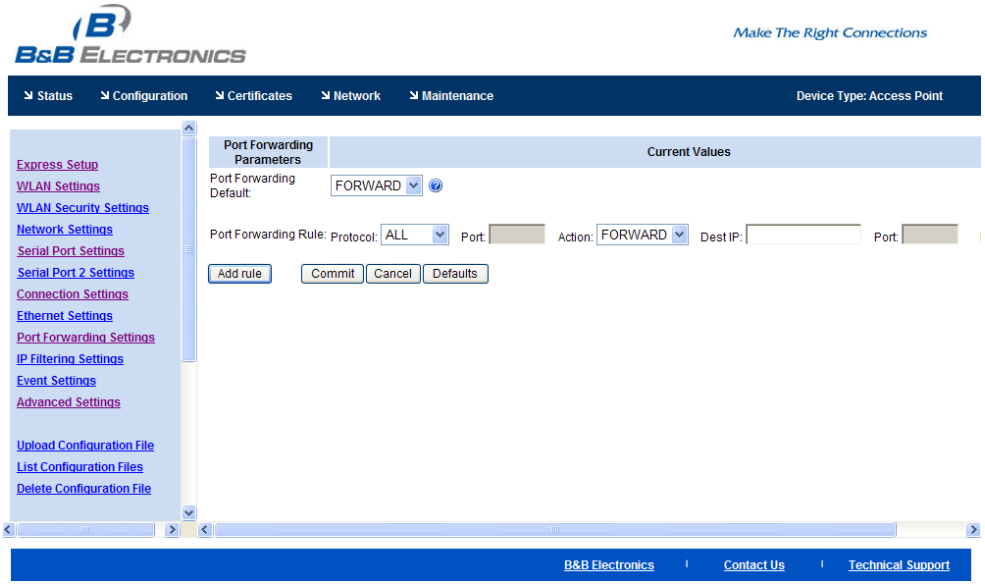
Event Settings

URL	/Configuration/Event Settings
Description	Event Settings

Field	CLI Command
TBD	

Port Forwarding Settings

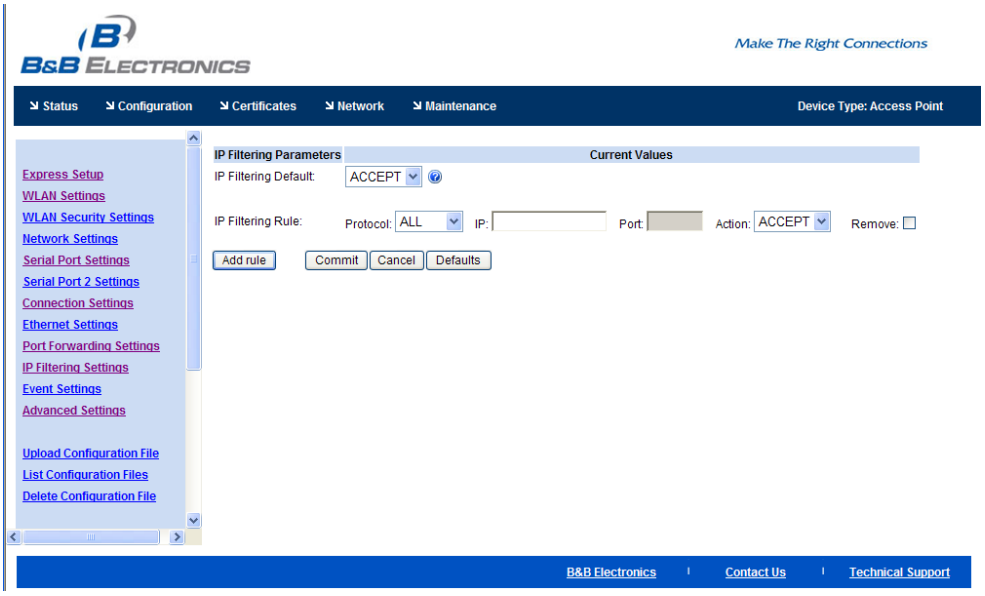
URL	/Configuration/Port Forwarding Settings
Description	Configures port forwarding.



Field	CLI Command
Port Forwarding Default	`wl-route-default`
Port Forwarding Rule	`wl-route`

IP Filtering Settings

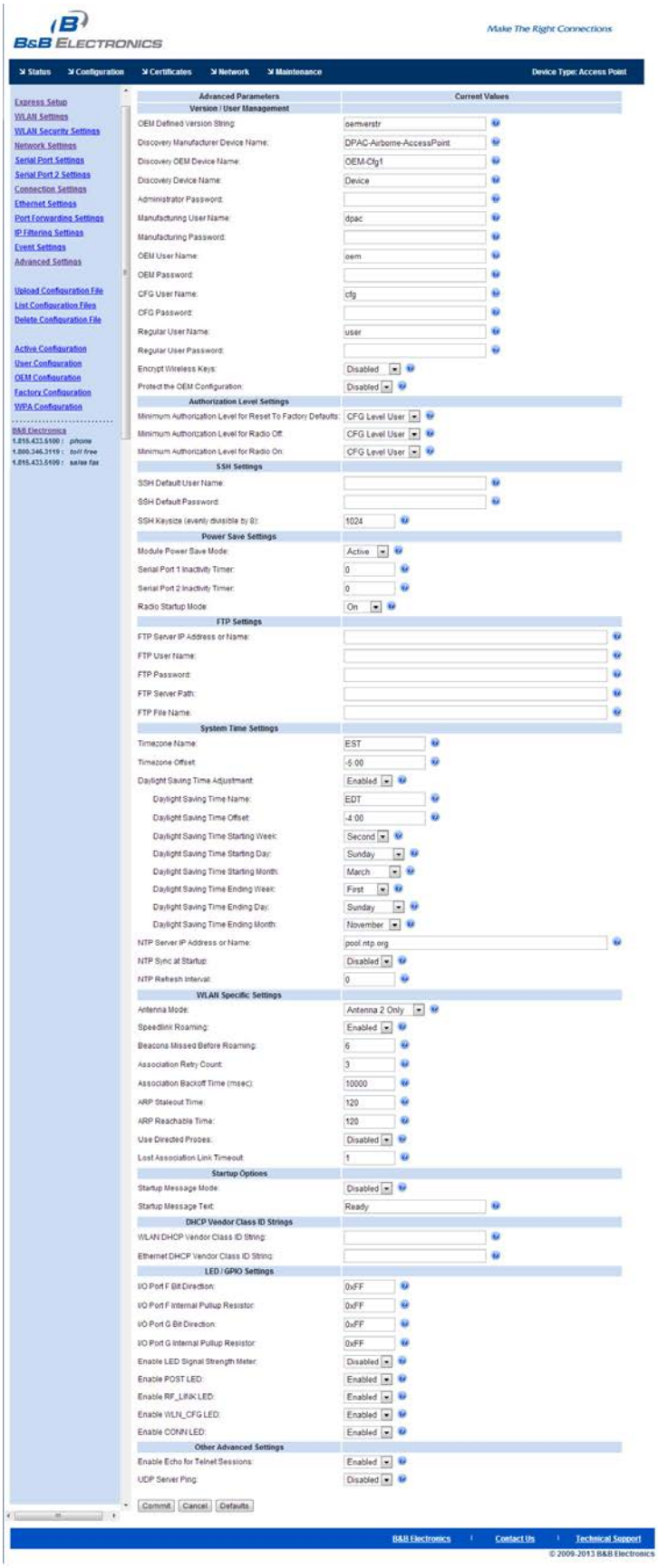
URL	/Configuration/IP Filtering Settings
Description	Configures IP filtering.



Field	CLI Command
IP Filtering Default	`eth-route-default`
IP Filtering Rule	`eth-route`

Advanced Settings

URL	/Configuration/Advanced Settings
Description	Configures the advanced configuration settings for the unit, including authentication usernames and passwords, configuration of SSH, power save setup, GPIO, indicator LED and FTP settings.

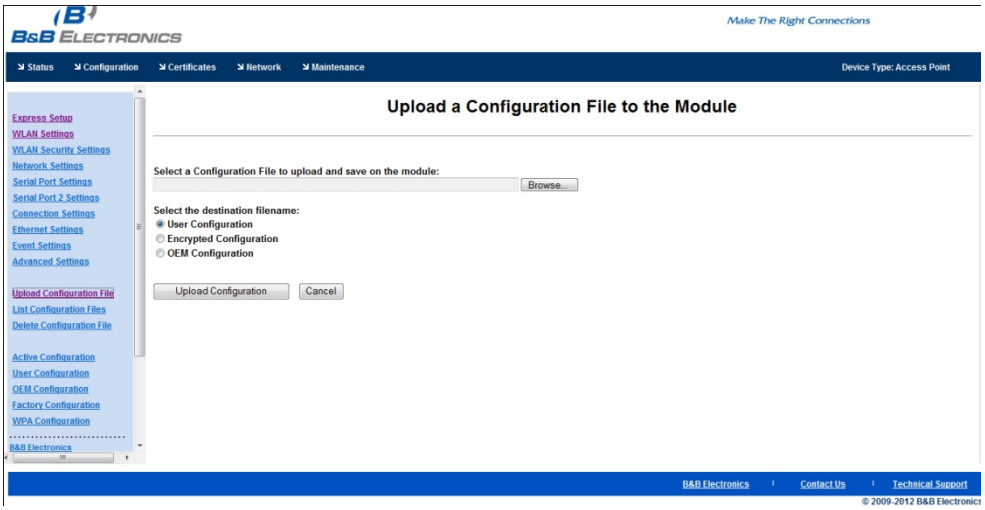

B&B ELECTRONICS
Make The Right Connections
Status
Configuration
Certificates
Network
Maintenance
Device Type: Access Point
Express Setup
WLAN Settings
WLAN Security Settings
Network Settings
Serial Port Settings
Serial Port 2 Settings
Connection Settings
Ethernet Settings
Port Forwarding Settings
IP Filtering Settings
Event Settings
Advanced Settings
Upload Configuration File
List Configuration Files
Delete Configuration File
Active Configuration
User Configuration
OEM Configuration
Factory Configuration
WPA Configuration
B&B Electronics
1.815.433.5100 : phone
1.800.346.3119 : toll free
1.815.433.5109 : sales fax
Advanced Parameters
Current Values
Version / User Management
OEM Defined Version String: oemverstr
Discovery Manufacturer Device Name: DPAC-Airborne-AccessPoint
Discovery OEM Device Name: OEM-Cfg1
Discovery Device Name: Device
Administrator Password:
Manufacturing User Name: dpac
Manufacturing Password:
OEM User Name: oem
OEM Password:
CFG User Name: cfg
CFG Password:
Regular User Name: user
Regular User Password:
Encrypt Wireless Keys: Disabled
Protect the OEM Configuration: Disabled
Authorization Level Settings
Minimum Authorization Level for Reset To Factory Defaults: CFG Level User
Minimum Authorization Level for Radio Off: CFG Level User
Minimum Authorization Level for Radio On: CFG Level User
SSH Settings
SSH Default User Name:
SSH Default Password:
SSH Keysize (evenly divisible by 8): 1024
Power Save Settings
Module Power Save Mode: Active
Serial Port 1 Inactivity Timer: 0
Serial Port 2 Inactivity Timer: 0
Radio Startup Mode: On
FTP Settings
FTP Server IP Address or Name:
FTP User Name:
FTP Password:
FTP Server Path:
FTP File Name:
System Time Settings
Timezone Name: EST
Timezone Offset: -5:00
Daylight Saving Time Adjustment: Enabled
Daylight Saving Time Name: EDT
Daylight Saving Time Offset: -4:00
Daylight Saving Time Starting Week: Second
Daylight Saving Time Starting Day: Sunday
Daylight Saving Time Starting Month: March
Daylight Saving Time Ending Week: First
Daylight Saving Time Ending Day: Sunday
Daylight Saving Time Ending Month: November
NTP Server IP Address or Name: pool.ntp.org
NTP Sync at Startup: Disabled
NTP Refresh Interval: 0
WLAN Specific Settings
Antenna Mode: Antenna 2 Only
Speedlink Roaming: Enabled
Beacons Missed Before Roaming: 6
Association Retry Count: 3
Association Backoff Time (msec): 10000
ARP Stateout Time: 120
ARP Reachable Time: 120
Use Directed Probes: Disabled
Lost Association Link Timeout: 1
Startup Options
Startup Message Mode: Disabled
Startup Message Text: Ready
DHCP Vendor Class ID Strings
WLAN DHCP Vendor Class ID String:
Ethernet DHCP Vendor Class ID String:
LED / GPIO Settings
I/O Port F Bit Direction: 0xFF
I/O Port F Internal Pullup Resistor: 0xFF
I/O Port G Bit Direction: 0xFF
I/O Port G Internal Pullup Resistor: 0xFF
Enable LED Signal Strength Meter: Disabled
Enable POST LED: Enabled
Enable RF_LINK LED: Enabled
Enable WLN_CFG LED: Enabled
Enable CONN LED: Enabled
Other Advanced Settings
Enable Echo for Telnet Sessions: Enabled
UDP Server Ping: Disabled
Commit
Cancel
Defaults
B&B Electronics
Contact Us
Technical Support
© 2009-2013 B&B Electronics

Field	CLI Command
OEM Defined Version String	oemstr
Device Manufacture Discovery Name	name-manuf
Device OEM Discovery Name	name-oem
Discovery Device Name	name-device
Administrator Password	pw-root
Manufacturing User Name	pw-manuf
Manufacturing Password	user-manuf
OEM User Name	pw-oem
OEM Password	user-oem
CFG User Name	pw-cfg
CFG Password	user-cfg
Regular User Name	pw
Regular User Password	user
Encrypt Wireless Keys	cfg-encrypt
Protect the OEM Configuration	cfg-oem-protect
Minimum Authorization Level for Reset	auth-level reset
Minimum Authorization Level for Radio off	auth-level radio-off
Minimum Authorization Level for Radio on	auth-level radio-on
SSH Default User Name	ssh-default-user
SSH Default Password	ssh-default-password
SSH Key Size (evenly divisible by 8)	ssh-keysize
Module Power Save Mode	pm-mode
Serial Port 1 Inactivity Timeout	wl-tcp-timeout
Serial Port 2 Inactivity Timeout	wl-tcp-timeout-p2
Radio Startup Mode	radio-startup
FTP Server IP Address or Name	ftp-server-ip-address
FTP User Name	ftp-user
FTP Password	ftp-password
FTP Server Path	ftp-server-path
FTP File Name	ftp-server-filename
Timezone Name	timezone-name
Timezone Offset	timezone-offset
Daylight Savings Adjustment	daylight-saving-time
Daylight Savings Time Name	daylight-saving-name
Daylight Savings Time Offset	daylight-saving-offset
Daylight Savings Time Starting Week	daylight-saving-startweek
Daylight Savings Time Starting Day	daylight-saving-startday
Daylight Savings Time Starting Month	daylight-saving-startmonth
Daylight Savings Time Ending Week	daylight-saving-stopweek
Daylight Savings Time Ending Day	daylight-saving-stopday
Daylight Savings Time Ending Month	daylight-saving-stopmonth
NTP Server IP Address or Name	ntp-server-address
NTP Sync at Startup	ntp-startup-sync
NTP Refresh Interval	ntp-refresh-interval

Antenna Mode	wl-ant
Speedlink Roaming	speedlink
Beacons Missed Before Roaming	wl-beacons-missed
Association Retry Count	wl-assoc-retries
Association Backoff Time (ms)	wl-assoc-backoff
ARP Staleout Time	arp-staleout-time
ARP Reachable Time	arp-reachable-time
Use Directed Probes	wl-specific-scan
Lost Association Link Timeout	wl-link-timeout
Startup Message Mode	startup-msg
Startup Message Text	startup-text
WLAN DHCP Vendor Class ID String	wl-dhcp-vendorid
Ethernet DHCP Vendor Class ID String	eth-dhcp-vendorid
I/O Port F Bit Direction	io-dir-f
I/O Port F Bit Internal Pullup Resistor	io-pullup-f
I/O Port G Bit Direction	io-dir-g
I/O Port G Bit Internal Pullup Resistor	io-pullup-g
Enable LED Signal Strength Meter	led-mode
Enable POST LED	post-led
Enable RF_LINK LED	rf-link-led
Enable WLN_CFG LED	wln-cfg-led
Enable CONN LED	conn-led
Enable Echo for Telnet Sessions	telnet-echo
UDP Server Ping	udp-ping

Upload Configuration File

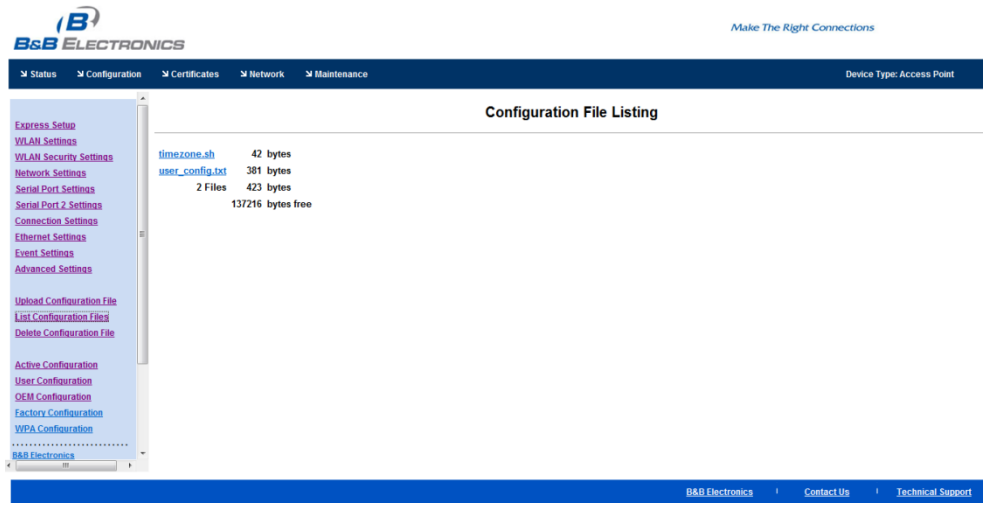
URL	/Configuration/Upload Configuration File
Description	Allows user, OEM or encrypted configuration files to be uploaded to the device.



Field	CLI Command
Upload Configuration [button]	`put-cfg`
User Config	`put-cfg user_config.txt`
Encrypted Configuration	`put-cfguser_enc_config.uue`
OEM Configuration	`put-cfg oem_config.txt`

List Configuration File

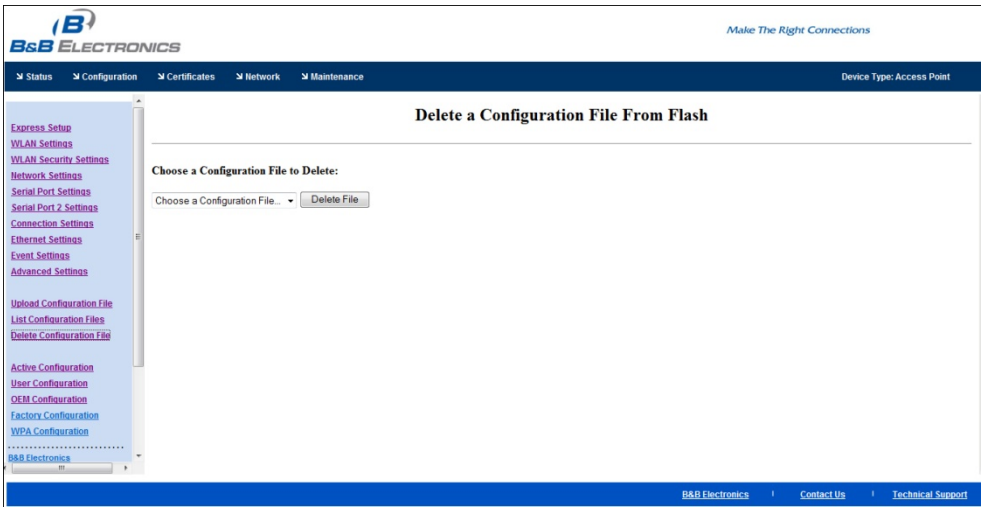
URL	/Configuration/List Configuration File
Description	Displays a list of the configuration files saved to the device.



Field	CLI Command
Displayed Page	`list-cfg`

Delete Configuration File

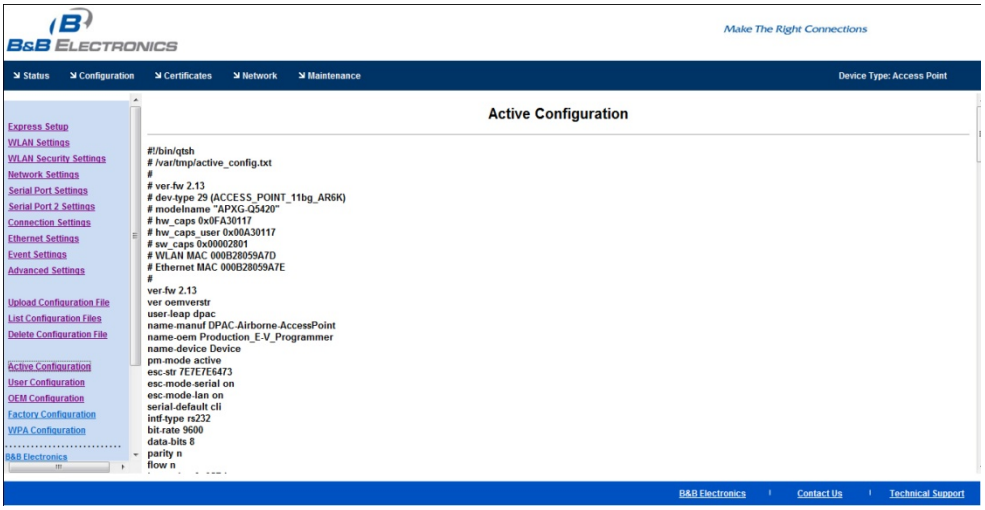
URL	/Configuration/Delete Configuration File
Description	Lets you delete previously saved configuration files.



Field	CLI Command
Delete File [Button]	`del-cfg`

Active Configuration

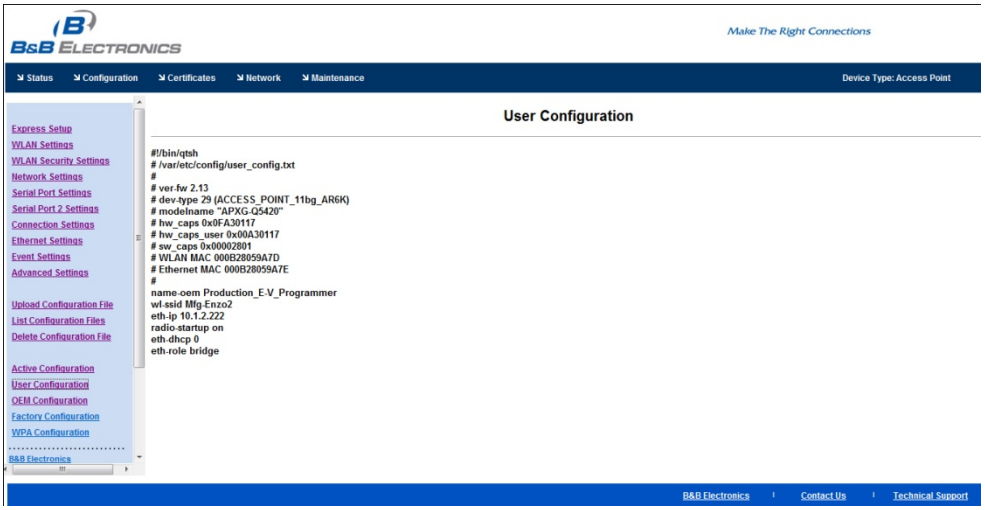
URL	/Configuration/Active Configuration
Description	Displays the current configuration settings.



Field	CLI Command
Displayed Page	`cfg-dump active`

User Configuration

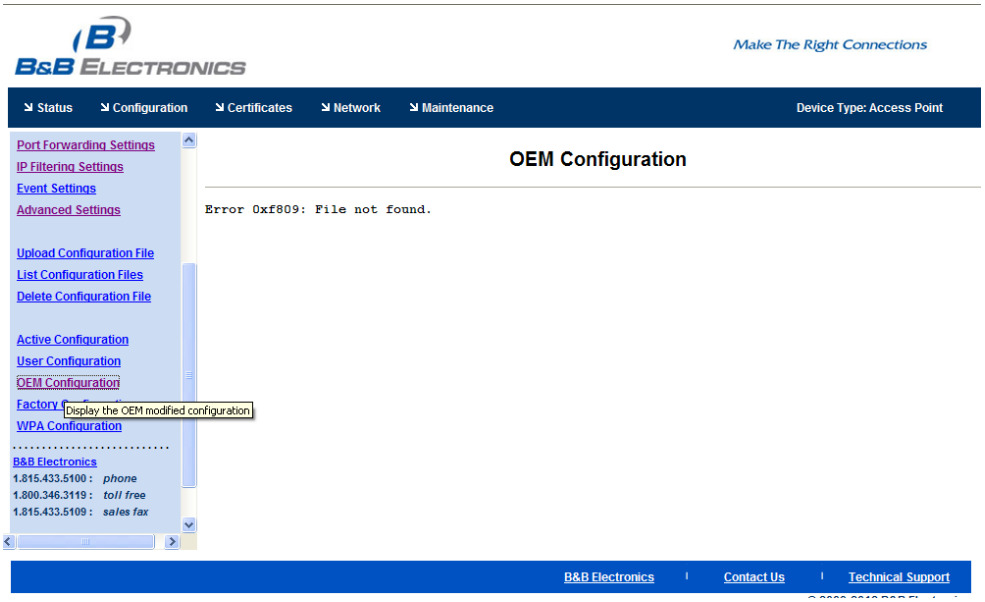
URL	/Configuration/User Configuration
Description	Displays the contents of the user_config.txt configuration file.



Field	CLI Command
Displayed Page	`cfg-dump user`

OEM Configuration

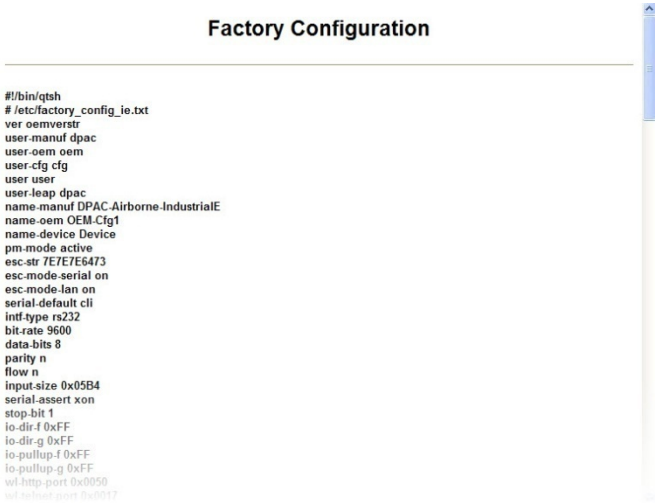
URL	/Configuration/OEM Configuration
Description	Displays the contents of the oem_config.txt configuration file.



Field	CLI Command
Displayed Page	`cfg-dump oem`

Factory Configuration

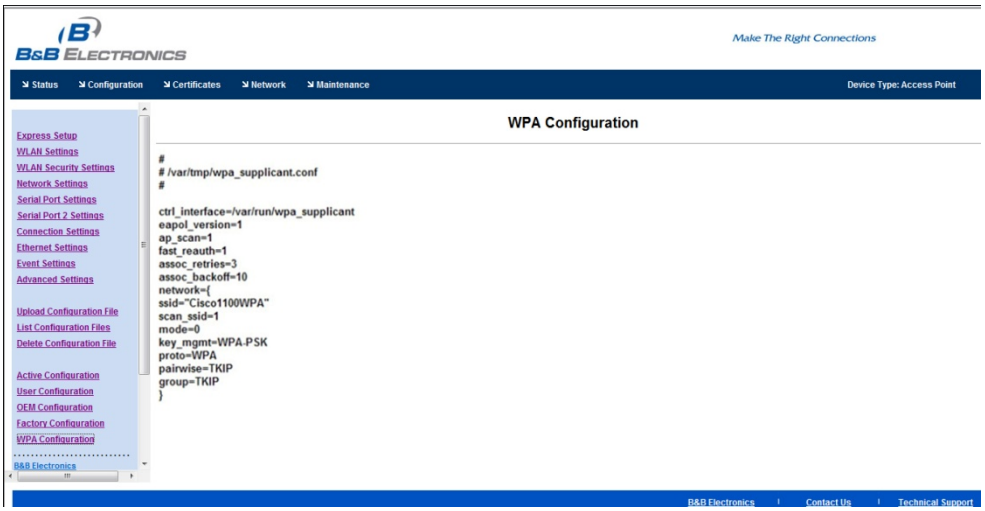
URL	/Configuration/Factory Configuration
Description	Displays the factory configuration settings. These are the default settings delivered from the B&B Electronics factory.



Field	CLI Command
Displayed Page	`cfg-dump factory`

WPA Configuration

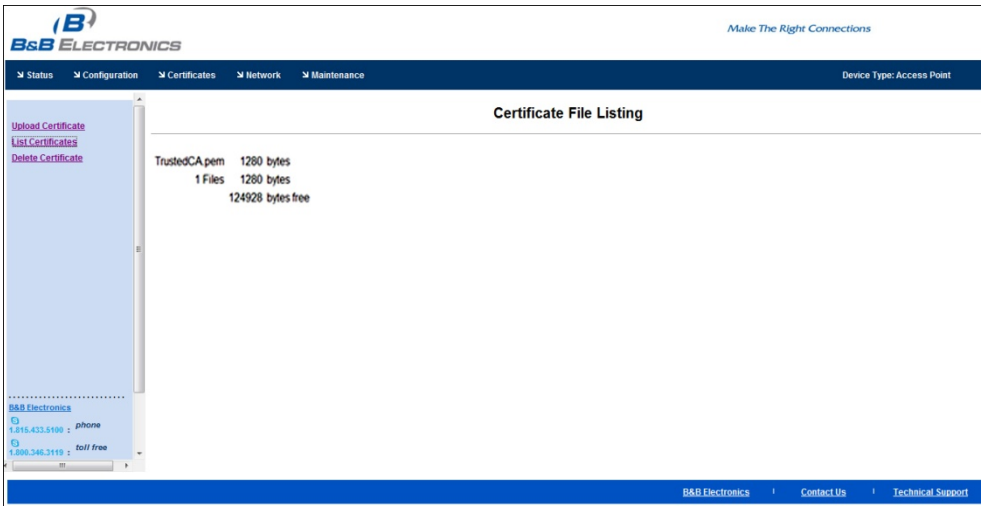
URL	/Configuration/WPA Configuration
Description	Displays the current security configuration settings being used by the device.



Field	CLI Command
Displayed Page	`cfg-dump wpa`

List Certificates

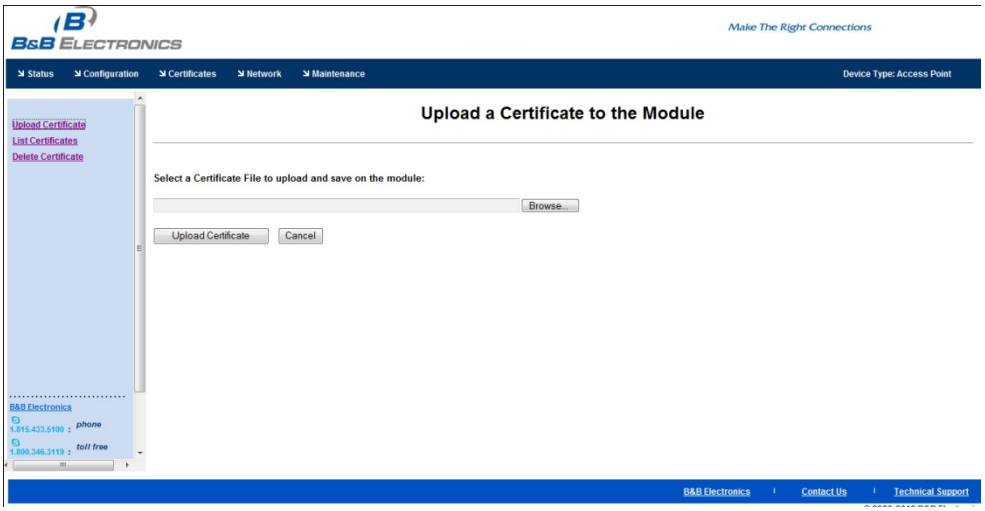
URL	/Certificates/List Certificates
Description	Displays a list of the certificates saved to the device. This is the home page for the Certificates link.



Field	CLI Command
Displayed Page	`list-cert`

Upload Certificate

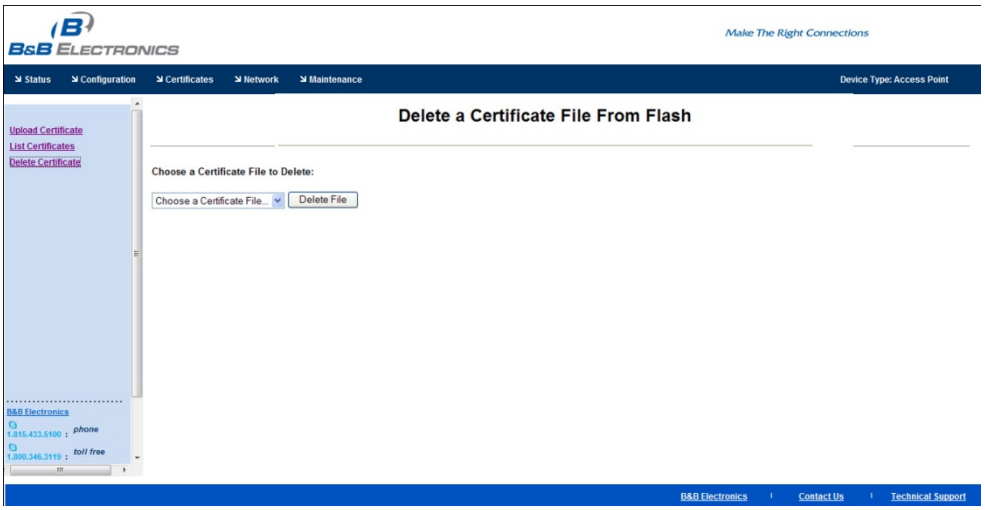
URL	/Certificates/Upload Certificate
Description	Lets you upload certificates and private keys to the device.



Field	CLI Command
Upload Certificate [Button]	`put-cert`

Delete Certificate

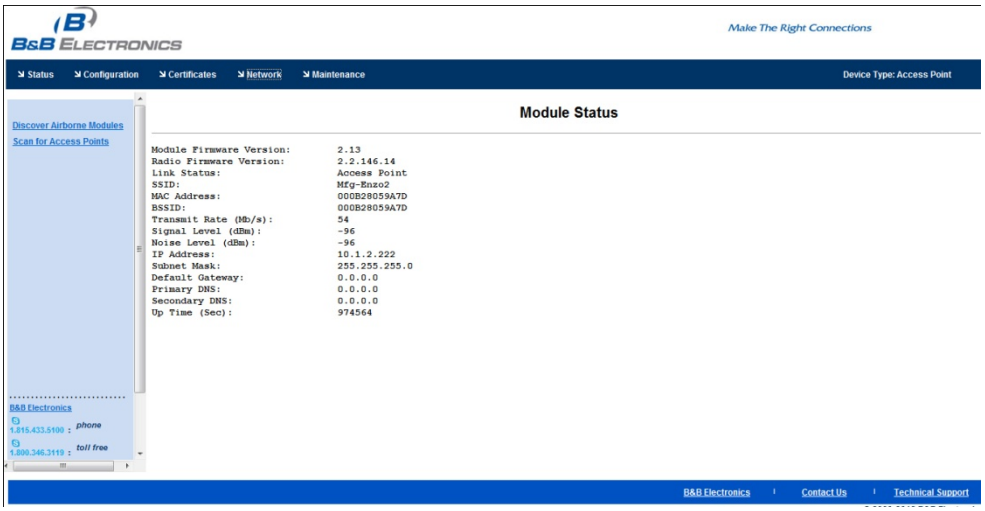
URL	/Certificates/Delete Certificate
Description	Allows you to delete certificates stored on the device.



Field	CLI Command
Delete Certificate [Button]	`del-cert`

Network (Home Page)

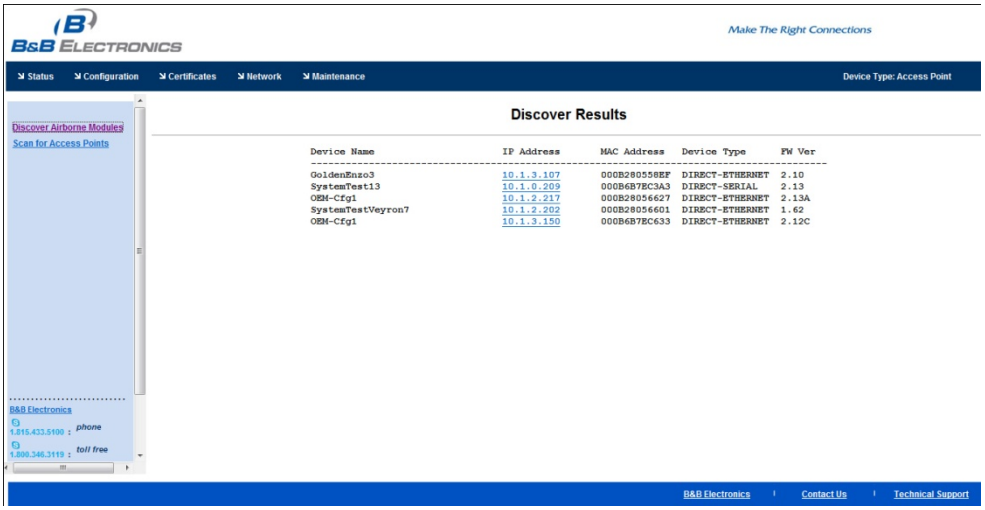
URL	/Network
Description	Home page for the network-related pages.



Field	CLI Command
Displayed Page	`wl-info`

Discover Airborne Modules

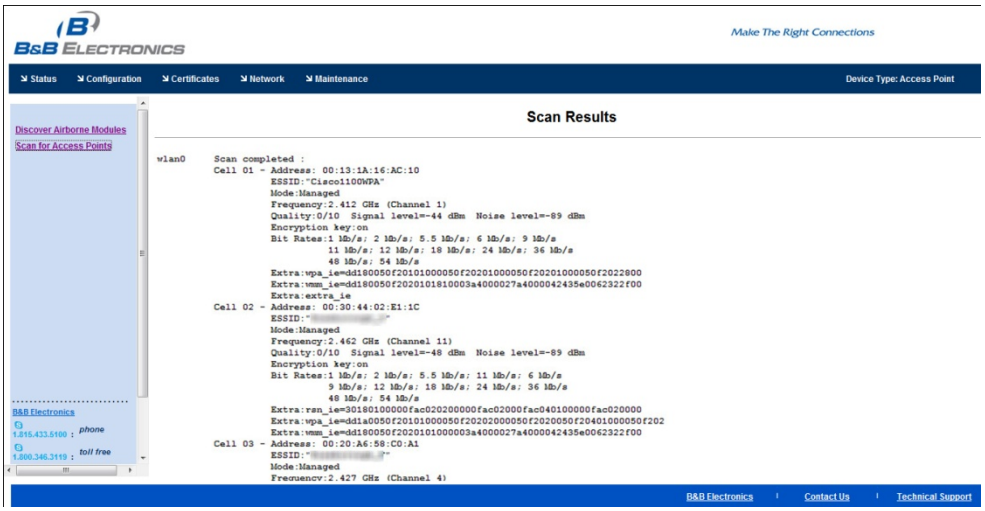
URL	/Network/Discover Airborne Modules
Description	Displays a list of Airborne devices that are visible to the device on the current network, with IP address, device type and wireless or Ethernet MAC address.



Field	CLI Command
Displayed Page	`discover`

Scan for Access Points

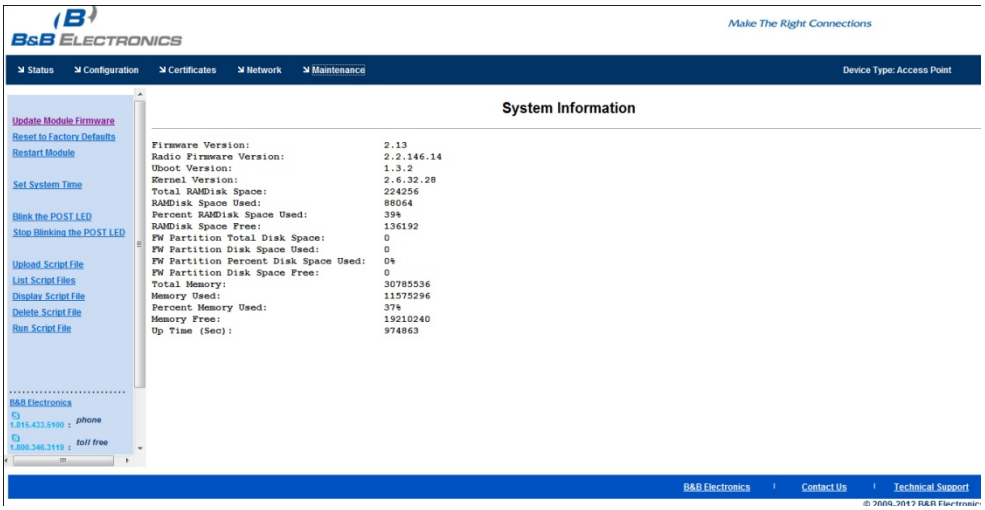
URL	/Network/Scan for Access Points
Description	Displays a list of wireless networks within range of the device



Field	CLI Command
Displayed Page	`wl-scan`

Maintenance (Home Page)

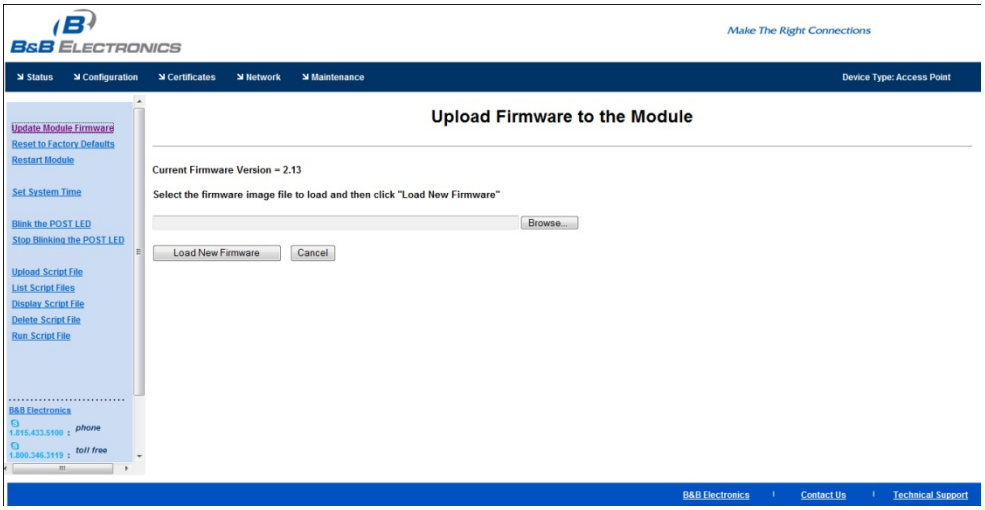
URL	/Maintenance
Description	Home page for the maintenance-related pages.



Field	CLI Command
Displayed Page	`sys-info`

Update Module Firmware

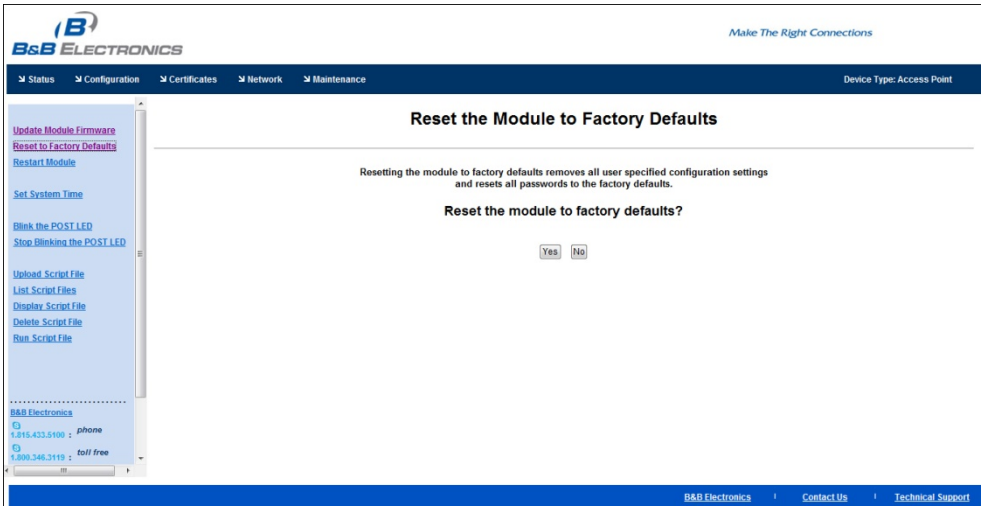
URL	/Maintenance/Update Module Firmware
Description	Enables you to update module firmware.



Field	CLI Command
Load New Firmware [Button]	`update`

Reset Factory Defaults

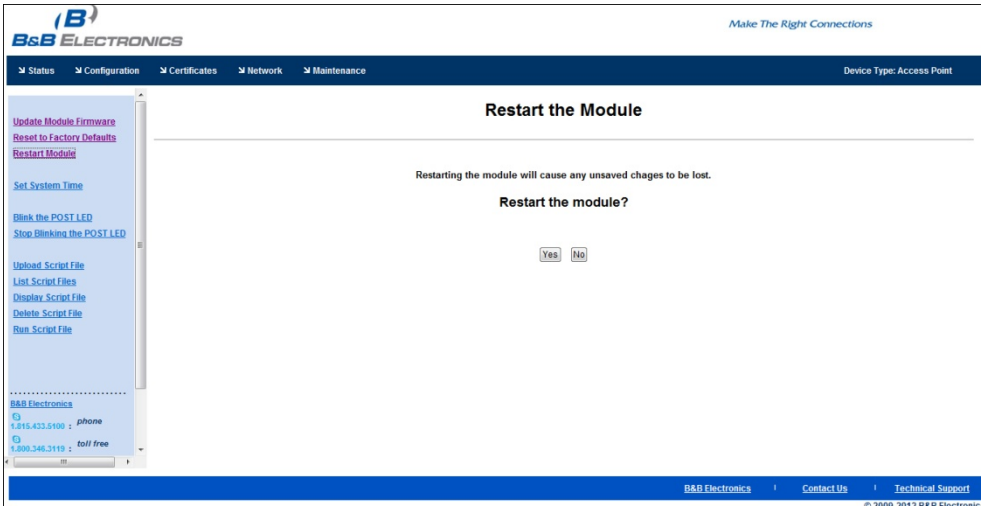
URL	/Maintenance/Reset Factory Defaults
Description	Returns device to factory defaults. If oem_config.txt is present this will take precedence over the factory configuration.



Field	CLI Command
Yes [Button]	`reset`

Restart Module

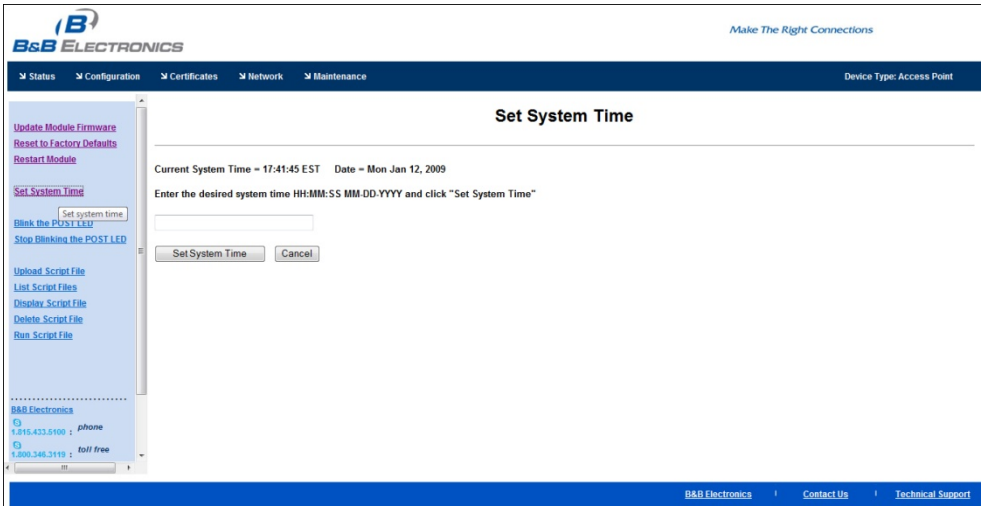
URL	/Maintenance/Restart Module
Description	Restarts device.



Field	CLI Command
Yes [Button]	`restart`

Set System Time

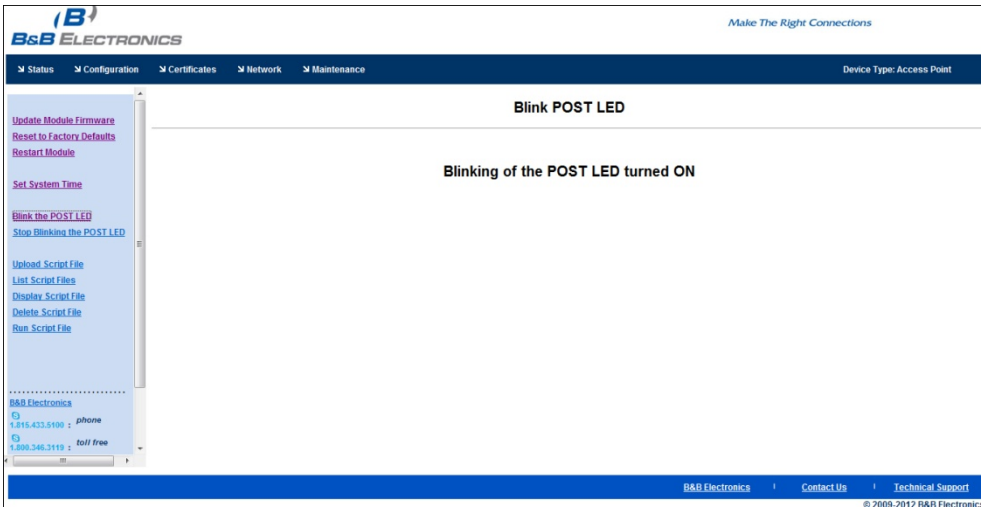
URL	/Maintenance/Set System Time
Description	Sets system time.



Field	CLI Command
Set System Time	`sys-time`

Blink the POST LED

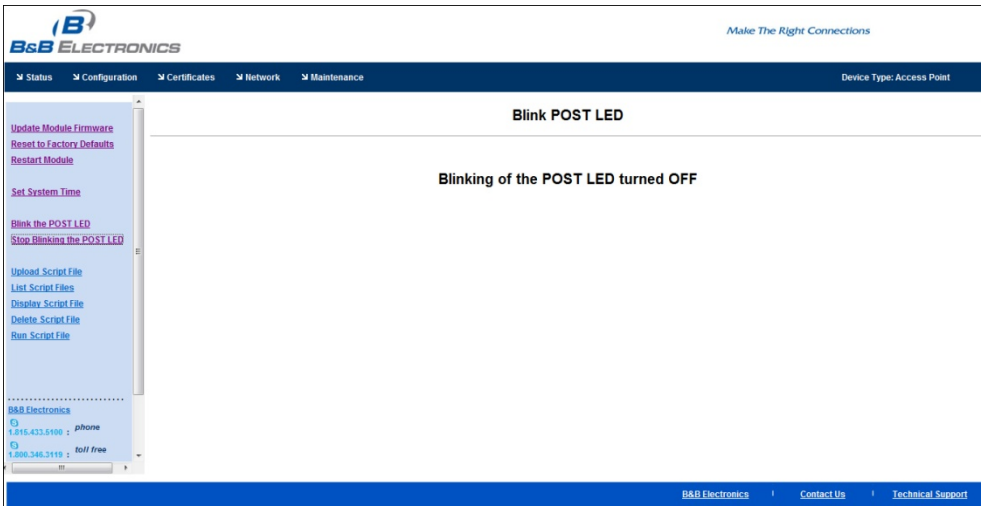
URL	/Maintenance/Blink the POST LED
Description	Makes the POST LED blink. This lets you identify the specific device with which you are communicating.



Field	CLI Command
Displayed Page	`blink-post-led on`

Stop Blinking the POST LED

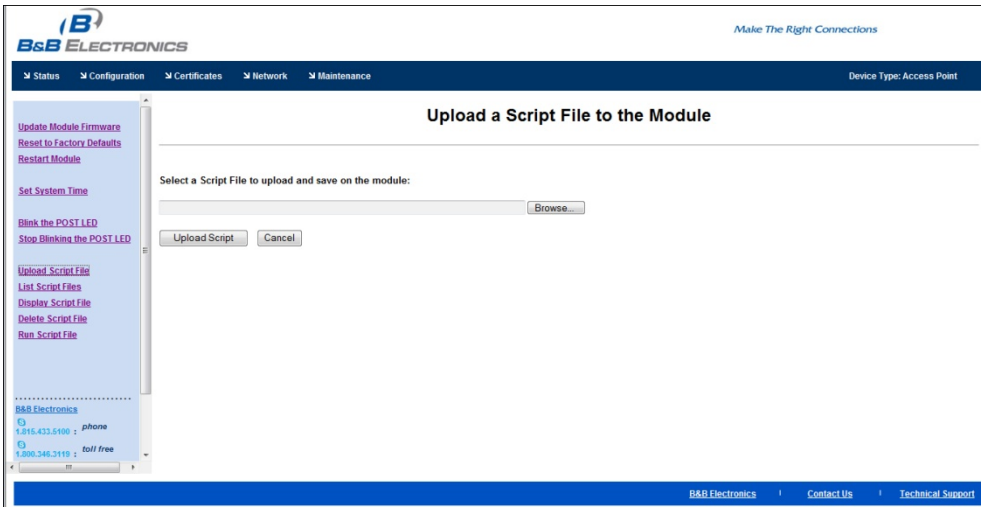
URL	/Maintenance/Stop Blinking the POST LED
Description	Stops the POST LED blinking.



Field	CLI Command
Displayed Page	`blink-post-led off`

Upload Script Files

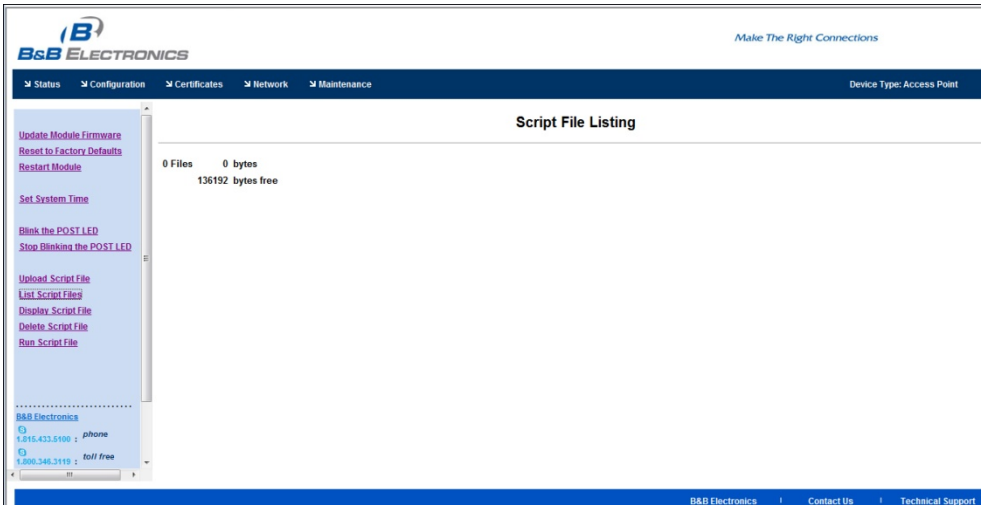
URL	/Maintenance/Upload Script Files
Description	Upload Script Files.



Field	CLI Command

List Script Files

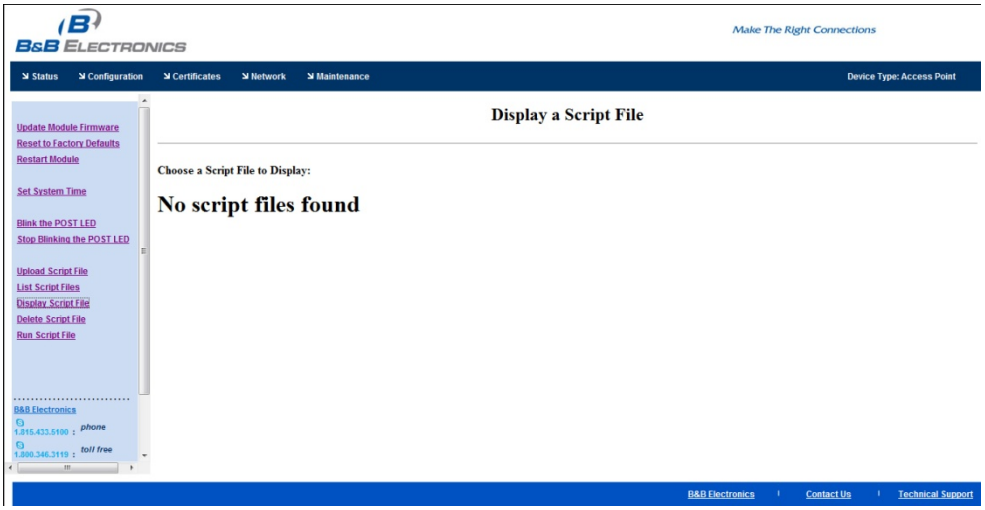
URL	/Maintenance/List Script Files
Description	Lists script files.



Field	CLI Command
TBD	

Display Script Files

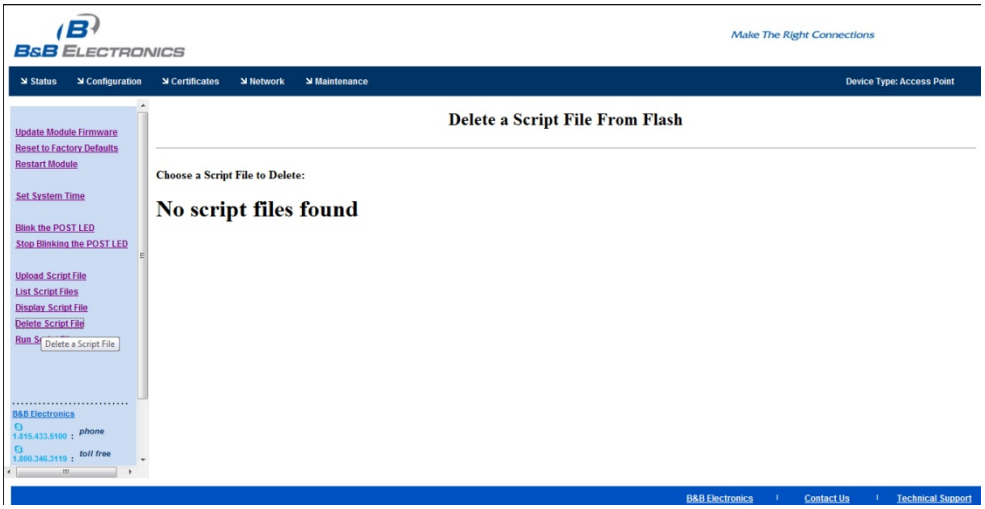
URL	/Maintenance/Display Script Files
Description	Displays script files.



Field	CLI Command
TBD	

Delete Script File

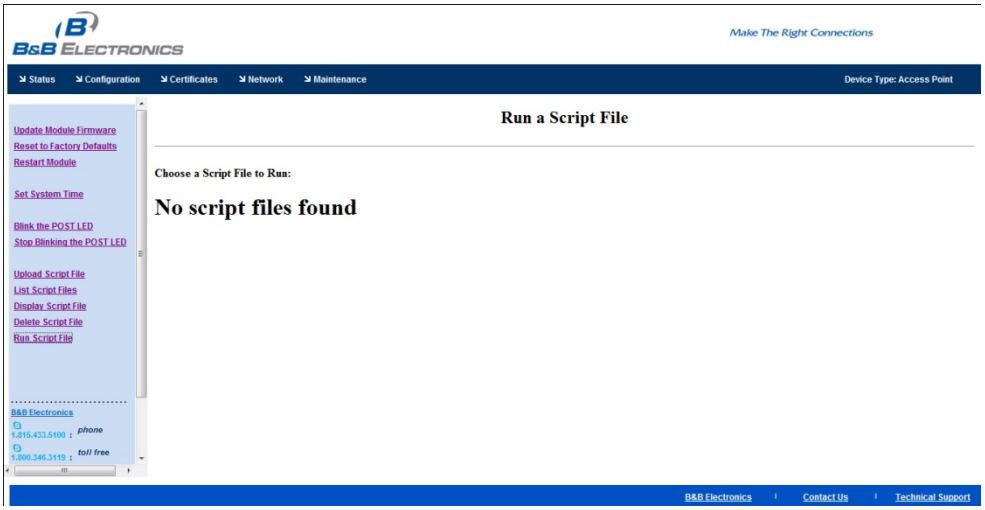
URL	/Maintenance/Delete Script File
Description	Deletes a script file.



Field	CLI Command
Displayed Page	TBD

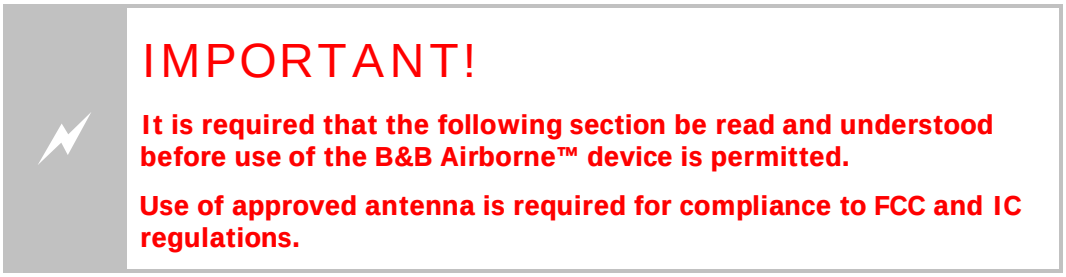
Run Script File

URL	/Maintenance/Run Script File
Description	Runs a script file.



Field	CLI Command
Displayed Page	TBD

17.0 Certification & Regulatory Approvals



The unit complies with the following agency approvals:

Table 29 - Regulatory Approvals

Country	Standard	Status
North America (US & Canada)	FCC Part 15 Sec. 15.107, 15.109, 15.207, 15.209, 15.247 Modular Approval	Complete
Europe	CISPR 16-1 :1993 ETSI EN 300 328 v1.8.1 2015 ETSI EN 301 893 v1.7.1 2015	Complete

17.1 FCC Statement

This equipment has been tested and found to comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

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 to an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for assistance.

Operations in the 5.15-5.25GHz and channel 5260MHz are restricted to indoor usage only.

- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

17.2 FCC RF Exposure Statement

To comply with FCC/IC RF exposure compliance requirements, this device and its antenna must operate with a separation distance of a least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

17.3 Information for Canadian Users (IC Notice)

This device has been designed to operate with an antenna having a maximum gain of 5.5dBi in the 5GHz band and 4.1 in the 2.4GHz band. An antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50Ω. Only approved antenna may be used with this equipment.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the Equivalent Isotropically Radiated Power (EIRP) is not more than required for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This radio transmitter (3913A-WLNN551) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device. Operations in the 5.15-5.25GHz and channel 5260MHz are restricted to indoor usage only.

Cet émetteur radio (3913A-WLNN551) a été approuvé par Industrie Canada pour fonctionner avec les types d'antennes énumérés ci-dessous avec le gain maximal admissible et l'impédance d'antenne requise pour chaque type d'antenne indiqué. Types d'antennes ne figurent pas dans cette liste, ayant un gain supérieur au gain maximum indiqué pour ce type, sont strictement interdites pour une utilisation avec cet appareil. Les opérations dans l'5,15 à 5,25 GHz et 5260MHz canaux sont limités à une utilisation en intérieur uniquement.

The following is a list of the Antenna's approved to work with this transmitter, please contact your B&B representative if you have any questions.

MFG	P/N	Max. Gain 2.4G (dBi)	Max. Gain 5G (dBi)	Impedance (Ω)
Laird	CAF 94505	2.0	4.0	50

Nearson	T131AH-2.4/4.9/5.X-S	2.0	2.0	50
Taoglas	GW.71.5153	3.8	5.5	50
Taoglas	PC.11.07.0100A	3.0	4.5	50
Taoglas	WS.01.B.305151	4.1	4.7	50
Taoglas	FXP.810.07.0100C	2.4	5.1	50
Taoglas	FXP.830.07.0100C	2.6	5.0	50

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website www.hc-sc.gc.ca.

This Device complies with Industry Canada license-exempt RSS standard(s).Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

17.4 FCC/IC Modular Approval

This document describes the Airborne WLN FCC modular approval and the guidelines for use as outlined in FCC Public Notice (DA-00-1407A1).

The APXx-Q5xxx is covered by the following modular grants:

Table 30 - Modular Approval Grant Numbers

Country	Standard	Grant
North America (US)	FCC Part 15 Sec. 15.107, 15.109, 15.207, 15.209, 15.247 Modular Approval	F4AWLNN551
Canada	RSS 210 Modular Approval	3913A-WLNN551

By providing FCC modular approval on the Airborne WLN modules, the customers are relieved of any need to perform FCC part15 subpart C Intentional Radiator testing and certification, except where they wish to use an antenna that is not already certified.

B&B Electronics supports a group of pre-approved antenna; use of one of these antennas eliminates the need to do any further subpart C testing or certification. If an antenna is not on the list, it is a simple process to add it to the pre-approved list without having to complete a full set of emissions testing. Please contact B&B Electronics Technical support for details of our qualification processes.

Please note that as part of the FCC requirements for the use of the modular approval, the installation of any antenna must require a professional installer.

This is to prevent any non-authorized antenna being used with the radio. There are ways to support this requirement but the most popular is to utilize a non-standard antenna connector, this designation includes the reverse polarity versions of the most popular RF antenna types (SMA, TNC, etc.). For more details please contact B&B Electronics.

The following documents are associated with this applications note:

- FCC Part 15 – Radio Frequency Devices
- FCC Public Notice – DA-00-1407A1 (June 26th, 2000)

B&B Electronics recommends that during the integration of the radio, into the customers system, that any design guidelines be followed. Please contact B&B Electronics Technical Support if you have any concerns regarding the hardware integration.

Contact B&B Electronics Technical support for a copy of the FCC and IC grant certificates, the test reports and updated approved antenna list.

17.5 Regulatory Test Mode Support

The Airborne Device Server includes support for all FCC, IC and ETSI test modes required to perform regulatory compliance testing on the module, please contact B&B Electronics Technical Support for details on enabling and using these modes.

18.0 Physical & Environmental Approvals

The device has passed the following primary physical and environmental tests. The test methods referenced are defined in SAE J1455 Aug1994.

Table 31 - Mechanical Approvals

Test	Reference	Conditions
Temperature Range (Operational)	Table 1B, Type 2b	-40°C to +85°C
Temperature Range (Non-Operational)		-40°C to +85°C
Humidity	Sect 4.2.3	0-95%RH @ 38°C condensing Fig 4a – 8 hours active humidity cycle
Altitude	Sect 4.8	Operational: 0-12,000ft (62 KPa absolute pressure) Non-operational: 0-40,000ft (18.6 KPa absolute pressure)
Vibration	Sect 4.9	Operational: 2.4 Grms, 10-1K Hz, 1hr per axis Non-operational: 5.2 Grms, 10-1K Hz, 1hr per axis
Shock	Sect 4.10	Operational: 20Gs MAX, 11ms half-sine pulse
Product Drop	Sect 4.10.3.1	1m onto concrete, any face or corner, 1 drop
Packaging Drop	Sect 4.10.2.1	32 inches onto concrete on each face and corner. Packaged in 'for transit' configuration.

Test reports are available from B&B Electronics Technical Support, please contact directly for the latest documentation.