# AirborneM2M<sup>™</sup>

APXx-Q5xxx Family User Manual Revision: 1.2

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#### 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

#### 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.



#### 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<sup>™</sup> 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<sup>™</sup> 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<sup>™</sup> 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<sup>™</sup> or AirborneDirect<sup>™</sup> client device server.
- Integrated Airborne Device Server and Wireless Adapter technology.
- The AirborneM2M<sup>™</sup> 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<sup>™</sup> Access Point/Wireless Router/Client. Information on the variations and functionality available in the AirborneDirect<sup>™</sup> 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<sup>™</sup> 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<sup>™</sup>

This AirborneM2M<sup>™</sup> 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<sup>™</sup> 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<sup>™</sup> 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.

$\square$		
	$\left(\begin{array}{ccc} 0 & 0 & 0 & 0 & 0 \\ 1 & 2 & 3 & 4 & 5 \end{array}\right)$	0

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

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Table 1–Serial Port	Pin Definition
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Pin	RS232 (DTE)	RS232 w/Power on pin 9 <sup>2</sup>	RS422/RS485 4-wire	RS485 2-wire
1	No Connect	No Connect	No Connect	No Connect
2	RxD	RxD	RxD+	Connect to pin 3 <sup>3</sup>
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 <sup>3</sup>
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<sup>™</sup>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).





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 $V_{\text{PSE}}$	Positive $V_{\text{PSE}}$	
2	Negative V <sub>PSE</sub>	Positive V <sub>PSE</sub>	
3	Positive $V_{\text{PSE}}$	Negative $V_{\text{PSE}}$	
4			Positive V <sub>PSE</sub>
5			Positive V <sub>PSE</sub>
6	Positive $V_{\text{PSE}}$	Negative $V_{\text{PSE}}$	
7			Negative $V_{\text{PSE}}$
8			Negative $V_{\text{PSE}}$

#### 5.3 Connector Definition

The AirborneM2MTM device has five connectors. Table 4 provides definitions for the connectors.

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

#### Table 4 - Connector Description

#### 5.4 Default Switch (Factory Reset)

The AirborneM2M<sup>™</sup> 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<sup>™</sup> device to the OEM defaults

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.

#### Table 5 - Reset Procedure

6 The device exists the See section

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<sup>™</sup> 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.

LED	Color	Airborne Device State
POWER	0	Adapter is not powered.
	•	(Blue) Adapter is powered.
POST	0	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	0	Adapter is not powered or the Wireless radio is off.
	ightarrow	(Green) Adapter is powered and the Wireless radio is on.
СОММ	0	<ul> <li>If Power LED and COMM LED are both Off the Adapter is not powered.</li> <li>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.</li> </ul>
	•	(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.

#### Table 6 - LED Indicators

## 6.0 Electrical& RF Specification

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		rage ∕mW	Pe dBm		Units	
P <sub>OUTB</sub>	Transmit Power Output 802.11b	11, 5.5, 2, 1		15.0	31.6			dBm	
Poutg	Transmit Power Output 802.11g	6, 9, 12, 18, 24, 36, 48, 54		12.6	18.2			dBm	
P <sub>OUTA</sub>	Transmit Power Output 802.11a	6, 9, 12, 18, 24, 36, 48, 54		17.0	50.1			dBm	
5	Receive	11		-{	36			ID	
P <sub>RSENB</sub>	Sensitivity 802.11b	1		-92				dBm	
		54		-72 -78					
D	Receive Sensitivity 802.11g	36						dDm	
P <sub>RSENG</sub>		18		-84				dBm	
		6		-8	39				
P <sub>rsena</sub>	Receive Sensitivity 802.11a	54		-7	74				
		36		-80			d		
		18		-86				dBm	
		6		-9	90				
F <sub>RANGEBG</sub>	Frequency Range		2412			24	84	MHz	
F <sub>rangea</sub>	Frequency Range 802.11a		4910 5150 5470			53	90 50 25	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 ( $\pm 2dBm$ ).

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
	US/Canada	2.401 - 2.473	11	1 – 11
802.11b <sup>1,2</sup>	Europe	2.401 - 2.483	13	1 – 13
	US/Canada	2.401 - 2.473	11	1 – 11
802.11g <sup>1,2</sup>	Europe	2.401 - 2.483	13	1 – 13
	US/Canada	5.15 - 5.35, 5.725 - 5.825	13	36,40,44,48,52,56,60,64,149,153,157, 161,165
802.11a	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.

Data Rate	Typical Outdoor Distance (Unity gain antenna)	<b>Typical Outdoor Distance</b> (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

Table 11 - Radio Typical Performance Range

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  $50\Omega$  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:

ere: 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:	<b>RP-SMA (Reverse Polarity – SMA)</b> Requires 2.4GHz/5GHz ISM band antenna, 50 input impedance, RP-SMA connector
Serial Connector:	<b>DB-9M (Male)</b> 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<sup>™</sup> Device

Unpack the AirborneM2M<sup>™</sup> 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 <u>www.bb-elec.com</u>.

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<sup>™</sup> 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:           Image: Ima



	and t		
<ul> <li>Airborne Management Center - m</li> <li>File Help</li> </ul>	anut		
Tree View Table View Config View			
Airborne Devices (1) Airborne ABGN DP55x Devices (1) AIrborne ABGN DP55x Devices (1) APMN-Q551 (1)	)		
OPH-CE11 W.44AcCe     Device Configuration Template     OrdgeTemplateIndustrial     OrdgeTemplateEnterprise     OrdgeTemplateEnterprise	Connectivity Tools Configuration Management Template Management Firmware Management Change Management State Clear Status for OEM-Cfg1	Locate OEM-Cfg1 Import Device List Launch Web Browser for OEM-Cfg1 Display Current Module Status for OEM-Cfg1 Blink POST LED for OEM-Cfg1	= ₩Rey13.00
Discover Username= "dpac"			
Authentication Required The server http://10.1.5.141:80 r password. User Name: Password:	equires a username and		
the first time, the web the Configuration tab t Status ע Configuration	browser will default t he top of the page (d רע Certificates אוע	to the Express setup page. To a ark blue bar). twork لا Maintenance	ult to the Module Status page. access the Express Setup Page, nn) You are now ready to confi
Express Setur VLAN Settings VLAN Security Settings Network Settings Serial Port Settings Serial Port 2 Settings Connection Settings Ethernet Settings Port Forwarding Settings			

	If your device is connect	ed and configured corre	ectly you	will see the following LED status.
8	COMM: <b>ORED</b> LINK : <b>OGREEN</b> POST: <b>OGREEN</b> POWER: <b>OBLUE</b>			
	Access Point in Router N (Connected wireless devices are Discovery OEM Device Name = ( Radio Startup Mode = On WLAN Connection Type = Access SSID = (Users option) WLAN Security Type = (Users op Ethernet Role = Router WLAN Channel: = (Users option) Wireless DHCP Server Enabled = WLAN DHCP: (Client) = (Not user Ethernet DHCP(for networks wit WLAN Static IP address = 192.16 WLAN Subnet Mask = 255.255.2	set up on their own network) Users option) Point tion) Enable I) h DHCP servers) = Enabled 8.10.100 (first IP ad dress assign 55.0	ned by WL	AN DHCP server.)
	Express Setup	Current Values		
	Discovery OEM Device Name:	OEM-Cfg1		0
	Radio Startup Mode:	On 💌 😢		
9	WLAN Parameters			
9	WLAN Connection Type:	Access Point 💌 🥝		
	SSID:	AirborneAP		<b>(</b>
	WLAN Security Type:	WEP 128 💌 🕑		
	WEP Key 1:			
	Ethernet Parameters			
	Ethernet Role: Access Point Parameters	Router 🔽 🞯		
	WLAN Channel:	1 🔻 🔞		
	Wireless DHCP Server Enabled:			
	IP Address Parameters			
	WLAN DHCP:	Disabled 💌 🥝		
	Ethernet DHCP:	Enabled 💌 🥝		
	WLAN Static IP Address:	192.168.10.100		
	WLAN Subnet Mask:	255.255.255.0		
	WLAN Gateway Address:	192.168.10.1		
	Commit Cancel Defaults	à		

Access Point in Bridge Mo	nde		
(Connected wireless devices are co		orate network)	
Discovery OEM Device Name = (U: Radio Startup Mode = On WLAN Connection Type = Access F SSID = (Users option) WLAN Security Type = (Users option Ethernet Role = Bridge WLAN Channel: = (Users option) Wireless DHCP Server Enabled = (T WLAN DHCP: (Client) = (Not used) Ethernet DHCP (for networks with WLAN Static IP address = 192.168 WLAN Subnet Mask = 255.255.255	sers option) Point on) Not used) DHCP servers) = .10.100 (Not use 5.0 (Not used in F	(Users option) d in Bridge Mode) Bridge Mode)	
WLAN Gateway Address = 192.168	s.10.1 (Not used	in Bridge Wode)	
Express Setup		urrent Values	
Discovery OEM Device Name:	OEM-Cfg1	unent values	0
Radio Startup Mode:	On 🗸 🕐		-
WLAN Parameters			
WLAN Connection Type:	Access Point	<b>-</b> 0	
SSID:	AirborneAP		?
WLAN Security Type:	WEP 128	• 📀	
WEP Key 1:		_	
Ethernet Parameters			
Ethernet Role:	Bridge 🔻 🕐		
Access Point Parameters			
WLAN Channel:	1 💌 🕜		
Wireless DHCP Server Enabled:	Enable 💌 🥝		
IP Address Parameters			
WLAN DHCP:	Disabled 💌	0	
Ethernet DHCP:	Enabled 💌 🤇	0	
WLAN Static IP Address:	192.168.10.10	0 🕜	
WLAN Subnet Mask:	255.255.255.0		
WLAN Gateway Address:	192.168.10.1		
Port Settings			
Web Server Port:	80		
Telnet Port:	23	0	
Internal FTP Server Listen Port:	21	0	
Secure Shell Server (SSH) Port:	22		
Commit Cancel Defaults			

## **11.0 Using the Web Interface**

AirborneDirect<sup>™</sup> 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".

Authentication Requi	red	23
The server http://10 password.	0.1.5.141:80 requires a username and	
User Name: Password:		
	Log In Cance	el

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 -	<b>Default Home Page</b>
------------	--------------------------

Module Status		
	Snatrich	Seatech <sup>1</sup> Ecatacisa

## 11.1 Navigation Bar

#### Figure 6- Website Navigation Bar

> Status	M Configuration	> Certificates	M Network	Maintenance	Device Type: Access Point
		NICS			Male The Right Connections

#### 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

Status M Configuration	S Certificates S Network S Maintenance			Device Type: Access Point
Update Module Firmware Beset to Factory Defaults Restart Module		System In	nformation	
Hell Official Monore Set Sinchem Monore Bener Kone POST LED Bane Since Binking the POST LED Bane Since Binking the POST LED Bane Since Binking the POST LED Bane Since Line Since Line Delate Since Line Delate Since Line Set Since	Insert Version: dio Firmage Version: tion Firmage Version: pai Version to LaMbis Space Lead to LaMbis Space Dead Disk Space Dead Disk Space Dead Partition Disk Space Dead Partition Disk Space Dead Partition Disk Space Tree: Partition State Space Tree: New Yorks New Yorks Time (Sec):	2.13 2.134.14 1.4.20.20 2.4205 #8064 3951 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.		

#### 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
-------------------------	------

N Status N Config	uration	N Certificates	M Network	M Maintenance			Devi	ce Type: Access Point
Indule Status	i				Module Status			
Unernet Statistics Ladio Statistics Unernet Statistics Visolary Associated Cile Virolass DISCP Clants	sta e	Module Firmwa Radio Firmwa Link Status: SSID: MAC Address: DSSID: Transmit Rate Signal Level (IP Address: Unit Level (IP Address: Subnet Kosk: Default Gate Primary DMS Secondary DMS Up Time (Sec)	e Version: (Mb/s): (dBm): dBm): my: ;	2.12A 2.2.144.14 3.2.144.14 3.2.00085 Fb:105 4.1500000300558AF 54 -94 -94 152.166.10.1 1255.055.05.0 0.0.0.0 0.0.0.0 0.0.0.0 8.2.2				
UATECHING, Dan SAL 2000 ; phone Dan SAL 2000 ; boll free								

To select any of the items, move your cursor over the item and press the lefthand 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.



Note that the changes to the parameters will not be applied until a module restart (reboot) has been completed.

#### 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

	lics					M.	ke The R	ight Connectic	ons
⊌ Status Status Sconfiguration	ม Certificates	M Network	Maintenance					Dev	rice Type: Access Point
Vatoad Certificate				Upload a	Certificate to	o the Module			
Delete Certificate	Select a Certifica	ate File to upl	ad and save on the m	odule:					
	Upload Centr	icate C	ancel		Browse				
	Opload Cent	icane C	arre th						
AB Electronica 0 815.433.5160 ; phone									
0 100,345,3119 ; toli free *									

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 <b>Browse</b> 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 <b>Open</b> . This will return you to the Certificate Upload window. The file you have chosen will now be listed next to the <b>Browse</b> 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 <b>Browse</b> 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 <b>Open</b> . This will return you to the Configuration Upload window. The file you have chosen will appear in the field next to the <b>Browse</b> 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.

ISB	<b>B</b> 1 Electron	lics			1	Make The Righ	t Connections
Status	≌ Configuration	Certificates الا	≌ Network	Maintenance لا		De	vice Type: Access Point
				Upload Firm	ware to the Module	1	
	ule Firmware tory Defaults	Current Firmw	are Version	= 3.15			
start Mod	ule	Select the firmwa	are image file t	o load and then click "Load New Fin	nware"		
System 1	Dime		4		Browse		
nk the PO	ST LED a the POST LED	Load New Firm	ware Can	cel			
ange Mod	E Iule Personality						
load Scrip	Contraction of the second s						
at Script Fi							
lete Scrip							
in Script F	ile						
BElectroni							
15.433.5100							
	i: toll free i: sales fax						
1	• •						
					B&B Electronics	Contact Us	I Technical Supp
					and the second constants	100	@ 2009-2013 B&B Elec

Figure 11 - Firmware Update Page

	VICS				M	ake The Right	Conn	ections
ש Status Status ע Configuration	S Certificates	N Network	N Maintenance			Dev	ice Typ	e Access Point
Update Module Firmware Reset to Factory Defaults Restart Medule Set System Time Blink the POST LED Stop Blinking the POST LED Change Module Personality Upload Scrupt File List Scrupt File Display Scrupt File Baselay Scrupt File Baselay Scrupt File Baselay Scrupt File Baselay Scrupt File Baselay Scrupt File	Transferring the File retrieved su This should take <b>Do not tur</b>	ccessfully - Fl approximatel	ashing the module y 90 seconds	Firmware in the Mod	ule			
8.815.433.5100 : phone 8.800.346.319 : toll free 8.816.433.5108 : sales far								
				DAB Electronica		Contect.Us	@ 20	Technical Support 9-2013 B&B Electronic

Figure 13 - Firmware Update Complete

	NICS			M	ake The Right Connections
Status Sconfiguration	N Certificates	S Network	Si Maintenance		Device Type: Access Point
date Module Firmware	Î		Flashing Firm	ware in the Module	
set to Factory Defaults start Module			lashing the module		
L System Time	This should tak				
nk the POST LED to Blinking the POST LED	Do not tu				
ange Module Personality	Restart	ng completed	successfully.		
oad Script File LScript Files					
play Script File ete Script File					
n Script File					
Electronics 5.433.5100 : phone 0.346.3119 : toll free					
5.433.5109 : salos far	-				
				B&B Electronics	Contect Us I Technical Sus

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 Firmwa	re
----------------------------	----

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 <b>Browse</b> 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 <b>Open</b> . 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 <b>Browse</b> 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):

Express Setup	Current Values
Discovery OEM Device Name:	OEM-Cfg1
Radio Startup Mode:	On 💌 🐵
WLAN Parameters	
WLAN Connection Type:	Access Point 💌 🞯
SSID:	AirborneAP
WLAN Security Type:	WEP 128 💌 🞯
WEP Key 1:	Ø
Ethernet Parameters	
Ethernet Role:	Bridge 💌 🕜
Access Point Parameters	
WLAN Channel:	1 💌 🐵
Wireless DHCP Server Enabled:	Enable 💌 🎯
IP Address Parameters	
WLAN DHCP:	Disabled 💌 😨
Ethernet DHCP:	Enabled 💌 🥝
WLAN Static IP Address:	192.168.10.100
WLAN Subnet Mask:	255.255.255.0
WLAN Gateway Address:	192.168.10.1
Port Settings	
Web Server Port:	80
Telnet Port:	23
Internal FTP Server Listen Port:	21
Secure Shell Server (SSH) Port:	22
Commit Cancel Defaults	

Figure	14 -	Express	Setun	Page
riguie	14 -	LAPICSS	Jeiup	i aye

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 <b>On</b> 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 <b>Access Point</b> .
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 <b>Bridge</b> 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 <b>Enabled</b> 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 <b>Client</b> ; 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 <b>Bridge</b> is <b>Router</b> ; This parameter is ignored.

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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 <b>disabled</b> , this field defines the static IP address for the wireless interface. If the DHCP Server is <b>enabled</b> , this field defines the first IP address leased by the DHCP server. Addresses are incremented as new clients are leased addresses. Default: <b>192.168.10.100</b>
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 <b>disabled</b> , this field defines the subnet mask used by the wireless interface. If the DHCP Server is <b>enabled</b> , this field defines the subnet mask provided by the DHCP server. Default: <b>255.255.255.0</b>
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 <b>disabled</b> , this field defines the gateway IP address used by the wireless interface. If the DHCP Server is <b>enabled</b> , this field defines the gateway IP address provided by the DHCP server. If the DHCP Server is <b>enabled</b> , this field defines the IP address of the WLAN interface of the APXx. Default: <b>192.168.10.1</b>
Select Ethernet Static IP	The function of this field depends upon whether or not the Ethernet Mode setting. If Ethernet Mode is <b>Client</b> , this field defines the IP address to be used if DHCP is not being used or if DHCP fails. If Ethernet Mode is <b>Bridge</b> or <b>Router</b> , this field defines the static IP address to be used by the Ethernet interface. When the Ethernet Mode is <b>Bridge</b> it is recommended that this field be set to an IP address within the same subnet as the WLAN Static IP address. Default: <b>192.168.2.100</b>
Select Ethernet Subnet Mask	This field defines the subnet to be used with the Ethernet Static IP address. Default: <b>255.255.255.0</b>
Select Ethernet Gateway Address	This field defines the Gateway IP address to be used by the Ethernet port. Default: <b>0.0.0.0</b>
(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.

Step	Description
Optional Press <b>Reload</b> [Button]	Reloads the <b>Express Settings</b> page. Select this if you have further configuration options to change.
<i>Optional</i> Press <b>Restart</b> [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<sup>™</sup> 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.

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 <b>WEP64</b> or <b>WEP128</b> 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 <b>Auto</b> 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 <b>WEP64</b> is selected the key length is 10 digits. If <b>WEP128</b> is selected the key length is 26 digits. More than one key field can be completed.
Press Commit [Button]	Saves changes to the device.
<i>Optional</i> Press <b>Reload</b> [Button]	Reloads the <b>WLAN Settings</b> page. Select this if you have further configuration options to change.
<i>Optional</i> Press <b>Restart</b> [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.

Table 18 -	Configuring f	or WEP Security
	ooninganing i	0

#### 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.

Step	Description
<i>Navigation Bar</i> Select <b>Configuration</b>	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 <b>WPA-PSK</b> from the drop down list.
Select WPA Protocol Version	Select <b>Auto</b> 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.
<i>Optional</i> Press <b>Reload</b> [Button]	Reloads the <b>WLAN Settings</b> page. Select this if you have further configuration options to change.
<i>Optional</i> Press <b>Restart</b> [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.

#### Table 19 - Configuring for WPA Security

#### 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.

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.
<i>Optional</i> Press <b>Reload</b> [Button]	Reloads the <b>WLAN Settings</b> page. Select this if you have further configuration options to change.

Step	Description
<i>Optional</i> Press <b>Restart</b> [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.

Step	Description
<i>Navigation Bar</i> Select <b>Configuration</b>	You will see a group of fields under the banner of WLAN Parameters.
<i>Feature Link</i> Select <b>Connection Settings</b>	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 <b>23</b> 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 <b>Connection Settings</b> 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.
<i>Optional</i> Press <b>Reload</b> [Button]	Reloads the <b>Serial Port Settings</b> page. Select this if you have further configuration options to change.

#### Table 21-Configure Data Tunnel on Telnet Port

Step	Description
<i>Optional</i> Press <b>Restart</b> [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.

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	<pre>pass-x Where x can be p1, p2 or any. p1orp2 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.</pre>

#### 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.

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.

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

1/27/2015

Step	Description
Select Tunnel Port	Enter the port to be used for the tunnel. Default is <b>8023.</b> 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 <b>TCP</b> from drop down menu.
Press Commit [Button]	Saves changes to the device.
Press Reload [Button]	Reloads the <b>Connection Settings</b> page.
<i>Feature Link</i> Select <b>Serial Port Settings</b>	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.
<i>Optional</i> Press <b>Reload</b> [Button]	Reloads the <b>Serial Port Settings</b> page. Select this if you have further configuration options to change.
<i>Optional</i> Press <b>Restart</b> [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.

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 <b>8024</b> , 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 <b>Serial Port 2 Settings</b> page. Select this if you have further configuration options to change.
<i>Optional</i> Press <b>Restart</b> [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. 

Step	Description
<i>Navigation Bar</i> Select <b>Configuration</b>	You will see a group of fields under the banner of WLAN Parameters.
<i>Feature Link</i> Select <b>Connection Settings</b>	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 <b>0</b> 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: <b>XXX.XXX.XXX</b> 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.
<i>Feature Link</i> Select <b>Serial Port 1 Settings</b>	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.
<i>Optional</i> Press <b>Reload</b> [Button]	Reloads the <b>Serial Port 1 Settings</b> page. Select this if you wish to change additional configuration options.

#### Table 27 - Configure Serial Port 1 as TCP Client

Step	Description
<i>Optional</i> Press <b>Restart</b> [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.
	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 <b>0</b> 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
<i>Optional</i> Select <b>Secondary TCP Target Server IP</b> Address – Serial Port 2	Enter the IP address of the secondary target server. The address must be in the format: <b>XXX.XXX.XXX</b> 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 <b>Connection Settings</b> 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 <b>Serial Port 2 Settings</b> page. Select this if you wish to change additional configuration options.
<i>Optional</i> Press <b>Restart</b> [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.

		NICS				Mak	e The R	ight Connectio	ons
Status וע	Configuration الا	Certificates لا	Network	Maintenance لا				Dev	ice Type: Access Point
Nodule Statu		Ì			Module Status				
tadio Statist ithernet Stat Nsplay Asso Vireless DH	lics tistics iciated Clients	Module Finmare Radio Pinmare SSID: MAC Address: SSID: MAC Address: SSID: SSID: Noise Level (d IF Address: Subnet Mask: Default Gatews Primary DNS: Secondary DNS: Up Time (Sec);	Version: (Mb/s): dBm): Bm): y:	2.12A 2.2.146.14 Access Foint AitborneAP 00023059AAP 9.6 -96 -96 192.160.10.1 225.255.255.0 0.0.0.0 0.0.0.0 0.0.0.0 832					
UATECH INC. 330.655.9000 300.553.1170	: phone : toll free								
						Quatech	1	Contact us	1 Technical Support
									© 2009-2012 Quatech,
Field				CLI Command					
	ed Page			wl-info					

### **Ethernet Status**

URL	/Status/Ethernet Status		
Description	Provides important information Ethernet interface network cor	n about the device's firmware versio nfiguration.	n, Ethernet connection status and
			Make The Right Connections
	Status کا Configuration کا Certificates کا Network	Maintenance	Device Type: Access Point
	Module Status	Ethernet Status	3
	Elternet Status Refine Status Elternet Status Elternet Status Disaler Associated Clients Wrieless DKCP Clients BARJinstroms Ostatus participation (Secondary Diss) BARJinstroms Ostatus participation (Secondary Diss) BARJinstroms Ostatus participation (Secondary Diss) Disaler Associated Clients Wrieless DKCP Clients BARJinstroms Ostatus participation (Secondary Diss) Dissler Associated Clients Secondary Diss) Dissler Associated Clients Dissler Associated Cl	: 2.13 Commated UOD200597E 1000K/s Full 10.1.2.222 255.255.255.0 0.0.0 0.0.0 970255	
			B&B Electronics I Contact Us I Technical Support
	Field	CLI Command	
	Displayed Page	eth-info	

### **Radio Statistics**

URL	/Status/Radio Statistics		
Description	Provides information about the	packet transmit and receive performan	ce of the wireless interface.
	(B) BSB ELECTRONICS		Make The Right Connections
	Status کا Configuration کا Certificates کا Network	Maintenance لا	Device Type: Access Point
	Module Status	Radio Statistics	
	Ellernet.Slatus Radio Slatusics Elhernet.Slatusics Disalar Associated Cleans Wireless.DHCP.Cleans BALIDExtromesa Official Status : Arror i The Direct Status : Arror i BALIDExtromesa Official Status : Arror i The Direct Status : Arror i T	1648007 42861729 0 10 1237368 4353932 0 0 0	
	< >		B&B Electronics ContactUs Technical Support
			© 2009-2012 B&B Electronic
	Field	CLI Command	
	Displayed Page	stats <blank> or radio</blank>	

### **Ethernet Statistics**

URL	/Status/Ethernet Statistics		
Description	Provides information about the	packet transmit and receive performan	ce of the Ethernet interface.
			Make The Right Connections
	Status ک Configuration ک Certificates ک Network	Maintenance الا	Device Type: Access Point
	Module Status	Ethernet Statistics	
	Emernet Status Radio Statistics Emernet Statistics Emernet Statistics Display Associated Clients Wireless DHCP Clients Radio Electronics Biol Destronics Control Statistics Radio Electronics Radio Electro	13957160 335822314 0 0 5 5 878 3540019 0	
	G 1.00.346.3119 : toll free +		B&B Electronics   Contact Us   Technical Support
			DRO FREFLORMES , FOURIELOS , TECHNICAL SUDION
	Field	CLI Command	
	Displayed Page	statsethernet	

# **Display Associated Clients**



### **Wireless DHCP Clients**

URL	/Status/Wireless E	OHCP Clients				
Description	Displays wireless I	DHCP clients.				
		s			Make The Right Connec	tions
	Status Sconfiguration S	لا Network لا Certificates	Maintenance			Device Type: Access Point
	Module Status	ent Address DBG	IP Address	Bridge DHCP Clients		
				<u>88</u>	B Electronics I Contact Us	I Technical Support     © 2009-2012 B&B Electronics
	lone				Internet   Protected Mode: Off	4 + € 100% +
	Field		CLI Command			
	Displayed Page		eth-dhcp-clients			

Make The Right Connections

Device Type: Access P

### **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.

#### (B) B&B ELECTRONICS Status کا Configu ⊾ Cer Ne Ne וצ Express Setup Current Values Express Setup Discovery OEM Device Name: OEM-Cfg1 0 WLAN Settings WLAN Security Se Network Settings Radio Startup Mode: - 0 On WLAN Parameters WLAN Connection Type: Access Point 🔻 🔞 Serial Port Setting Serial Port 2 Setting Connection Setting Ethernet Settings SSID: Airborne WLAN Security Type: Ethernet Parameters Disabled • 0 Event Settings Advanced Settin Ethernet Role: Bridge 👻 🈡 Access Point Parameters WLAN Channel: 1 • @ Ipload Configuration File List Configuration Files Delete Configuration File Wireless DHCP Server Enabled: Enable 👻 🌚 IP Address Parameters WLAN DHCP: Disabled 👻 🥑 Ethernet DHCP: Disabled • 😡 Active Conf WLAN Static IP Address: 192.168.10.100 WLAN Subnet Mask 255.255.255.0 Factory Configu WLAN Gateway Address: 192.168.10.1 0 WPA Configuration Ethernet Static IP Address: 10.1.2.222 Ethernet Subnet Mask: 255.255.255.0 0

Field **CLI** Command Discovery OEM Device Name name-oem Radio Startup Mode radio-on, radio-off Wireless LAN Connection Type wl-type wl-ssid SSID Wireless LAN Security Type wl-security WEP Key 1 wl-key-1 WPA/WPA2Pre Shared Key (PSK) pw-wpa-psk eth-role Ethernet Role WLAN Channel wl-chan Wireless DHCP Server Enabled wl-dhcp-server WLAN DHCP wl-dhcp Ethernet DHCP eth-dhcp wl-ip WLAN Static IP Address 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.
	(B) BSB ELECTRONICS	Make The Right Connections
	ک Status ک Configuration ک Certificates Network ک Status	Maintenance Device Type: Access Point
	WLAK Setting?         WLAN Connection Type:         Acce           YN AM Security Settings         SSID:         Airbo           Hetwork Settings         SSID:         Airbo           Strait Port Settings         WLAN TX Power (dBm):         15 dd           Serue Port Settings         WLAN TX Power (dBm):         100           Enternet Settings         WLAN TX Power (dBm):         Diad           Advanced Settings         WLAN DTM Interval:         2           Value Control Policy:         Diad         Access Control Policy:         Diad           Valued Control ration:         Weiess DHCP Server Faabled:         Enable	im · i Acd · i Acd · i · i · i · i · i · i · i · i
		BABERectronics / ContactUs / Inschnical Support
	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

WEP Key 1 - 4

WPA/WPA2 Pre Shared Key (PSK)

### **WLAN Security Settings**

RL	/Configuration/WLAN Security Settings	
escription	Configures the security settings for the target net	vork.
	(8)	Make The Right Connections
	Status Sconfiguration Scertificates Science Science	Device Type: Access Poi
	WLAN Security Parameters Current Va	
	Excress Sature VLAN Security Satures NLAN Security Satures NLAN Security Satures NLAN Security Satures NLAN Security Satures NLAN Security Satures NLAN Security NLAN Security NLAN Security NLAN Security NLAN	B&0 Electronica J Contact Us / Technical S
		Make The Right Connections
	SELECTRONICS V Status V Configuration V Certificates V Network V Maintenance	Make The Right Connections Device Type: Access Pol
	B&B ELECTRONICS	Device Type: Access Poi
	Visitans       Visitanias         Visitans       Visitanias         Visitanias       Visitanias         Visitanias       Visitanias         Visitanias       Visitanias         Visitanias       Visitanias         Scinta Port 2 Settinas       Visitanias         Scinta Port 2 Settinas       Visitanias         Scinta Port 2 Settinas       Visitanias         Concection Settinas       Visitanias         Concection Settinas       Visitanias         Concection Settinas       Visitanias         Advanced Settinas       Commit Cancellis         Deleta Configuration       Visitanias         Marce Configuration       Visitanias	Device Type: Access Poi
	Visitans       Visitanias         Visitans       Visitanias         Visitanias       Visitanias         Visitanias       Visitanias         Visitanias       Visitanias         Visitanias       Visitanias         Scinta Port 2 Settinas       Visitanias         Scinta Port 2 Settinas       Visitanias         Scinta Port 2 Settinas       Visitanias         Concection Settinas       Visitanias         Concection Settinas       Visitanias         Concection Settinas       Visitanias         Advanced Settinas       Commit Cancellis         Deleta Configuration       Visitanias         Marce Configuration       Visitanias	
	Variant 2 Certain  <	Device Type: Access Poi
	Field       2 Ordination       2 Ordination       2 Ordination       2 Ordination         View 3 Ordination       2 Ordination       2 Ordination       2 Ordination       2 Ordination         View 3 Ordination       View 3 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination         View 4 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination         View 4 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination         View 4 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination         View 5 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination         View 5 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination         View 6 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination         View 6 Ordination       View 6 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination         View 6 Ordination       View 6 Ordination       View 9 Ordination       View 9 Ordination       View 9 Ordination         View 6 Ordination       View 6 Ord	Device Type: Access Poi

pw-wpa-psk

wl-key-1, wl-key-2, wl-key-3, wl-key-4

### **Network Settings**



# **Serial Port Settings**

	/Configuration/Serial Port Settings					
Description	Configures the serial port settings on the primary serial port.					
		Make The Right Connections				
	ک Configuration الا Certificates الا Network ک	I Maintenance Device Type: Access Point				
	Exarcess_Selse     Serial Port Parameters     Current       VIA.AL Seltines     Serial Port Parameters     Current       Serial Port Seltines     Serial Port Parameters     Genaration Mode:       VIA.AL Sections     Serial Port Parameters     Genaration       Serial Port Seltines     Party:     None +       Connection Seltines     Data Bits:     8 • @       Enternet Seltines     Sone Hour Plant Bics:     1 • @       Advanced Seltines     Party:     None       List Configuration Files     Detect Configuration     Rescape Sing:       Detect Configuration     VirA.Configuration     Rescape Sing:       VirA.Configuration     None     Commit Cancel       VirA.Configuration     None     Second Detectors	<ul> <li>₽</li> <li>₽</li></ul>				
	Field	CLI Command				
	Field Serial CLI Default Mode	<b>CLI Command</b> serial-default, serial-default-pl				
	Serial CLI Default Mode	serial-default, serial-default-pl				
	Serial CLI Default Mode Serial Port Bit Rate	serial-default, serial-default-pl bit-rate, bit-rate-pl				
	Serial CLI Default Mode Serial Port Bit Rate Parity	serial-default, serial-default-pl bit-rate, bit-rate-pl parity, parity-pl				
	Serial CLI Default Mode Serial Port Bit Rate Parity Data Bits	serial-default, serial-default-pl bit-rate, bit-rate-pl parity, parity-pl data-bits, data-bits-pl				
	Serial CLI Default Mode Serial Port Bit Rate Parity Data Bits Stop Bits	serial-default, serial-default-pl bit-rate, bit-rate-pl parity, parity-pl data-bits, data-bits-pl stop-bit, stop-bit-pl				
	Serial CLI Default Mode Serial Port Bit Rate Parity Data Bits Stop Bits Flow Control	<pre>serial-default, serial-default-pl bit-rate, bit-rate-pl parity, parity-pl data-bits, data-bits-pl stop-bit, stop-bit-pl flow, flow-pl</pre>				
	Serial CLI Default Mode Serial Port Bit Rate Parity Data Bits Stop Bits Flow Control Serial Assert	<pre>serial-default, serial-default-pl bit-rate, bit-rate-pl parity, parity-pl data-bits, data-bits-pl stop-bit, stop-bit-pl flow, flow-pl serial-assert, serial-assert-pl</pre>				
	Serial CLI Default Mode Serial Port Bit Rate Parity Data Bits Stop Bits Flow Control Serial Assert Input Buffer Flush Size	<pre>serial-default, serial-default-p1 bit-rate, bit-rate-p1 parity, parity-p1 data-bits, data-bits-p1 stop-bit, stop-bit-p1 flow, flow-p1 serial-assert, serial-assert-p1 input-size, input-size-p1</pre>				
	Serial CLI Default Mode Serial Port Bit Rate Parity Data Bits Stop Bits Flow Control Serial Assert Input Buffer Flush Size Serial Escape Mode	<pre>serial-default, serial-default-p1 bit-rate, bit-rate-p1 parity, parity-p1 data-bits, data-bits-p1 stop-bit, stop-bit-p1 flow, flow-p1 serial-assert, serial-assert-p1 input-size, input-size-p1 esc-mode-serial, esc-mode-serial-p1</pre>				

# **Serial Port 2 Settings**

	/Configuration/Serial Port 2 Settings				
Description	Configures the serial port settings	s on the secondary serial port.			
	(B)	Make The Right Connections			
	Status Sconfiguration Scertificates Stetwork	enance Device Type: Access			
	Serial Port Parameters Current	Values			
	Express Setup         Serial CLI Default Mode:         CLI           WLAN Settings         Serial Port Bit Rate:         9600				
	WLAN Security Settings         Parity:         None •           Network Settings         Data Bits:         8 • Ø	0			
	Serial Port 2 Settings Stop Bits: 1 • @	• 0			
	Ethernet Settings Input Buffer Flush Size: 1460 Event Settings Serial Escare Mode: On	0			
	Advanced Settings Network CLI Escape Mode: On -				
	Upload Configuration File         Escape String:         7E7E7E64           List Configuration Files         Serial Interface Type:         RS-232 •           Delete Configuration File         Serial Interface Type:         RS-232 •				
	Commit Cancel Defaults				
	User Configuration OEM Configuration OEM Configuration				
	Factory Configuration WPA Configuration				
	B&B Electronics				
		B&B Electronica I Contact Us I Technical So			
	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			
	Serial Assert Input Buffer Flush Size	serial-assert-p2 input-size-p2			
	Input Buffer Flush Size Serial Escape Mode	input-size-p2 esc-mode-serial-p2			
	Input Buffer Flush Size Serial Escape Mode Wireless LAN CLI Escape Mode	input-size-p2 esc-mode-serial-p2 esc-mode-lan-p2			
	Input Buffer Flush Size Serial Escape Mode	input-size-p2 esc-mode-serial-p2			

### **Connection Settings**

(B)					Make The R	ight Connections
Status V Configuration	NICS Vertificates کا Network کا Mainte	nance				Device Type: Access Poin
•	Connection Parameters	Curre	ent Values	_		
Express Setup	Serial Port 1 Connection Settings					
WLAN Settings	Outbound Transmit Type:	TCP 🗸 🔞				
WLAN Security Settings Network Settings	Primary TCP Target Server IP Address:	0.0.0.0	0			
Serial Port Settings	Secondary TCP Target Server IP Address:	0.0.0.0	•			
Serial Port 2 Settings	TCP Port.	2571 😧				
Connection Settings	TCP Timeout:	0				
Ethernet Settings Event Settings	TCP Retry Time:	60 🕑				
Advanced Settings	Tunnel Enabled:	Disabled 👻 🔞				
	Serial Port 2 Connection Settings	700				
Upload Configuration File	Outbound Transmit Type - Serial Port 2:	TCP - 🔞				
List Configuration Files	Primary TCP Target Server IP - Serial Port 2:	0.0.0.0				
Delete Configuration File	Secondary TCP Target Server IP - Serial Port 2:					
Connection Settings	TCP Retry Time - Serial Port 2:	60				
Ethernet Settings Event Settings	Tunnel Enabled - Serial Port 2:	Disabled 👻 😡		_		
Advanced Settings	Port Settings HTTP Port Accessible via Wireless:	Enabled 🔹 😡				
	Web Server Port	80 0				
Upload Configuration File	Default Web Page:	index.html		0		
List Configuration Files Delete Configuration File	Teinet Port Accessible via Wireless:	Enabled • @				
Menter Communication File	Telnet Port	23				
Active Configuration	Telnet Timeout:	0				
User Configuration	Internal FTP Server Enabled:	Enabled • @				
OEM Configuration Factory Configuration	Internal FTP Server Listen Port:	21 0				
WPA.Configuration =	SSH Port Accessible via Wireless:	Enabled v 😡				
	Secure Shell Server Port	22				
B&B Electronics 0. 1.815.433.5100 : phone	Common Settings					
	Connect LED Mode:	TCP 🔹 🥹				
0 1.800.346.3119 : toll free	TCP Max Retries:	15 🔞				
() 1.815.433.5109 : sales fax	Wireless UDAP Discovery Enabled:	Enabled - 🧐				
	Ethernet UDAP Discovery Enabled:	Enabled 👻 😡				

Field	CLI Command
Outbound Transmit Type	wl-xmit-type, wl-xmit-type-pl
Primary TCP Target Server IP Address	wl-tcp-ip, wl-tcp-ip-pl
Secondary TCP Target Server IP Address	wl-tcp-ip2, wl-tcp-ip2-pl
TCP Port	wl-tcp-port, wl-tcp-port-pl
TCP Timeout	wl-tcp-timeout, wl-tcp-timeout-pl
TCP Retry Time	wl-retry-time, wl-retry-time-pl
Tunnel Enabled	wl-tunnel, wl-tunnel-pl
UDP Target Server IP Address	wl-udp-ip, wl-udp-ip-pl
UDP Port	wl-udp-port, wl-udp-port-pl
UDP Receive Port	wl-udp-rxport, wl-udp-rxport-pl
UDP Transmit Mode	wl-udp-xmit, wl-udp-xmit-pl
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></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.				
			Make The Right Connections		
	۲ Status کا Configuration کا Certificates کا Network کا Network کا	Aaintenance	Device Type: Access Point		
	Connection Settings Ethernet Settings Advanced Settings Advanced Settings Upload Configuration File Last Configuration File Deter Configuration File Active Configuration Deter Configuration Commit Cancel Defaults Made Settomes Deter Configuration Commit Cancel Defaults				
			B&B Electronics <sup> </sup> Contact Us <sup> </sup> Technical Support		
	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**

L	/Configuration/	Event Settings		
scription	Event Settings			
	B			Make The Right Connections
	B&B ELECTRO	INICS		male the tight contractory
	Status V Configuration	Maint لا Certificates الا Maint	enance	Device Type: Access Point
		Event Parameters	Current Values	
	Express Setup	At Device Startup, Run Script:	[Disable] - @	
	WLAN Settings WLAN Security Settings	When a Configuration is Applied, Run Script:	[Disable] -	
	Network Settings	When the Radio Link Goes Down, Run Script		
	Serial Port Settings	When the Radio Link Comes Up, Run Script		
	Serial Port 2 Settings	When the Ethernet Link Goes Down, Run Scri When the Ethernet Link Comes Up, Run Scrip		
	Connection Settings Ethernet Settings	When the Ethernet Link Comes Up, Run Scrip Timer 1		
	Event Settings	Timer 1 Initial Delay:	0	
	Advanced Settings	Timer 1 Period:	0	
	Upload Configuration File	When Timer 1 Triggers, Run Script	[Disable] -	
	List Configuration Files	Timer 1 Enable:	[Clear] 🔻 😨	
	Delete Configuration File	Timer 2		
	Active Configuration	Timer 2 Initial Delay:	0	
	User Configuration	Timer 2 Period: When Timer 2 Triggers, Run Script.	0 😡 [Disable] 👻	
	OEM Configuration	Timer 2 Enable:	[Disable] - W	
	Factory Configuration	Timer 3	[Clear]	
	WPA Configuration B&B Electronics	Timer 3 Initial Delay:	0	
		Timer 3 Period:	0	
	() 1.815.433.5100 : phone	When Timer 3 Triggers, Run Script:	[Disable] -	
	() 1.800.346.3119 : toll free	Timer 3 Enable:	[Clear] 👻 🔞	
	1.815.433.5109 : sales fax	Timer 4		
		Timer 4 Initial Delay:	0 0	
		When Timer 4 Triggers, Run Script	[Disable] - Ø	
		Timer 4 Enable:	[Clisable] - 0	
		Timer 5	[Ciear]	
		Timer 5 Initial Delay:	0	
		Timer 5 Period:	0	
		When Timer 5 Triggers, Run Script	[Disable] - 😡	
		Timer 5 Enable:	[Clear] 👻 🥑	
		Timer 6 Timer 6 Initial Delay:	0	
		Timer 6 Period:	0 0	
		When Timer 6 Triggers, Run Script	[Disable] -	
		Timer 6 Enable:	[Clear] - @	
		Timer 7	() W	
		Timer 7 Initial Delay:	0	
		Timer 7 Period:	0	
		When Timer 7 Triggers, Run Script	[Disable] - @	
		Timer 7 Enable:	[Clear] -	
		Timer 8 Timer 8 Initial Delay:	0	
		Timer 8 Period:	0 0	
		When Timer 8 Triggers, Run Script	[Disable] -	
		Timer 8 Enable:	[Clear] - @	
		Commit Cancel Defaults	Second Second	
	e >			
				B&B.Electronics <sup> </sup> Contact.Us <sup> </sup> Technical Sup
	Field	c	CLI Command	
	TBD			
	IDU			

# **Port Forwarding Settings**

URL	/Configuration/Port For	warding Settings				
Description	Configures port forwarding.					
		25	Make The Right Connections			
	의 Status 의 Configuration :	Certificates الا Network الا Maintenance	Device Type: Access Point			
	WLAN Setungs	Port Forwarding Parameters Curr Parameters Forwarding efault Forwarding	ent Values			
	Serial Port Settings	ort Forwarding Rule: Protocot: ALL  Port Action: FORWARD Add rule Commit Cancel Defaults	V Dest IP: Port			
	Upload Configuration File List Configuration Files Delete Configuration File					
		B&B Electronics	I <u>Contact Us</u> I <u>Technical Support</u>			
	Field	CLI Command				
	Port Forwarding Default	wl-route-default				
	Port Forwarding Rule	wl-route				

# **IP Filtering Settings**

JRL	/Configuration/IP Filte	ring Settings				
Description	Configures IP filtering.					
		NICS		Make The Right	Connections	
	Configuration لا Status ک	Certificates الا Network الا Maintenance		Device	Type: Access Point	
	Express Setup     WLAN Settings     WLAN Security Settings     Network Settings     Serial Port 2 Settings     Connection Settings     Ethernet Settings     Port Forwarding Settings     Event Settings     Advanced Settings     Upload Configuration File     List Configuration File	IP Filtering Parameters IP Filtering Default: ACCEPT © @ IP Filtering Rule: Protocol: ALL V IP: Add rule Commit Cancel Defaults	Port	Action: ACCEPT 💙	Remove:	
			B&B Electronics	Contact Us	Technical Support	
	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.

	NICS		Make The Right Connections
x Status کا Configuration	ک Certificates کا Network کا Maintenance		Device Type: Access Point
press Setup	Advanced Parameters	Curr	ent Values
LAN Settings	Version / User Management CEM Defined Version String:	oemverstr	0
LAN Security Settings Hwork Settings	Discovery Manufacturer Device Name:	DPAC-Airborne-AccessPoint	
erial Port Settings	Discovery OEM Device Name:	OEM-Cfg1	
erial Port 2 Settings	Discovery Device Name:	Device	
needion Settings	Administrator Password.		
ort Forwarding Settings	Manufacturing User Name	doac	0
Filtering Settings	Manufacturing Password:		
ent Settings	OEM User Name:	0em	
tvanced Settings	OEM Password		
Noad Configuration File	CFG User Name:	cig	
st Configuration Files	CFG Password		
elete Configuration File	Regular User Name.	user	
tive Configuration	Regular User Password:		
er Configuration EM Configuration	Encrypt Wireless Keys:	Disabled 💌 😢	
ctory Configuration	Protect the OEM Configuration:	Disabled - 👽	
PA Configuration	Authorization Level Settings Minimum Authorization Level for Reset To Factory Defaults:	CERT LANDING TO B	
B.Electronica	Minimum Authorization Level for Radio Off.	CFG Level User 💌 😻	
15.433.5100 : p/tone 00.346.3119 : tol/ free	Minimum Authorization Level for Radio On:	CFG Level User .	
15.433.5109 : sales for	SSH Settings		
	SSH Default User Name		
	SSH Default Password		
	SSH Keysize (evenly divisible by 8):	1024	
	Power Save Settings Module Power Save Mode	Active 💌 😻	
	Module Power Save Mode Senal Port 1 inactivity Timer	Active	
	Serial Port 1 inactivity timer	0 0	
	Radio Startup Node	On 💌 🕶	
	FTP Settings	Low-Log -	
	FTP Server IP Address or Name:		0
	FTP User Name:		0
	FTP Password	[	
	FTP Server Path		
	FTP File Name.		0
	System Time Settings Timecone Name	EST	-
	Timezone Officet	-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 • •	
	WLAN Specific Settings	0	
	Antenna Mode:	Antenna 2 Only 💌 😵	
	Speedlink Roaming:	Enabled 💽 🤨	
	Beacons Missed Before Roaming:	6	
	Association Retry Count	3	
	Association Backoff Time (msec):	10000	
	ARP Staleout Time	120	
	ARP Reschable 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	100	
	WLAN DHCP Vendor Class ID String:		
	Ethernet DHCP Vendor Class ID String	[	
	LED / GPKO Settings I/O Port F Bit Direction:	0xFF 🔍	
	VO Port F Bit Direction:	0xFF Ø	
	VO Port F Internal Pullup Resistor	0xFF V	
		Tener 1	
	I/O Port G Internal Pullup Resistor Enable LED Signal Strength Meter	0xFF Ø	
	Enable LED Signal Strength Meter: Enable POST LED:	Enabled • •	
	Enable RF_LINK LED:	Enabled	
	Enable WLN_CFG LED	Enabled	
	Enable CONVLED:	Enabled 💌 🖬	
	Other Advanced Settings		
	Enable Echo for Teinet Sessions	Enabled .	
	UDP Server Ping	Disabled 💌 😰	
	Education Constant Constants		
	Commit Cancel Defaults		
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 Configurat	ion File
Description	Allows user, OEM or encrypted co	onfiguration files to be uploaded to the device.
	(B) B&B ELECTRONICS	Make The Right Connections
	لا Status کا Configuration کا Certificates کا Network ک	Maintenance Device Type: Access Point
	Express Setup WLAN Settings	Upload a Configuration File to the Module
	WIAN Society Settings       National Setting Part Settings       Serial Part Settings       Connection Settings       Connection Settings       Ethernet Settings       Ethernet Settings       Ethernet Settings       Ethernet Settings       Ethernet Settings       Ethernet Settings       Upload Configuration File       Usit Configuration File       Delete Configuration File       Delete Configuration       Carbor Configuration       Carbor Configuration       Configuration	ad and save on the module: Browse
	< >	B&B Electronics <sup>1</sup> Contact Us <sup>1</sup> Technical Support
		© 2009-2012 B&B Electronici
	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.

		Certificates	Network	¥ Maintenance						Devi	ce Type: Access Poin
	Ê				Config	uration File	Listing				
Express Setup WLAN Settings											
WLAN Security Settings	ti	mezone.sh	42 bytes								
Network Settings	y	ser_config.txt	381 bytes								
Serial Port Settings		2 Files	423 bytes								
Serial Port 2 Settings			137216 bytes	free							
Connection Settings											
Ethernet Settings											
Event Settings											
Advanced Settings											
Upload Configuration File List Configuration Files											
Delete Configuration File											
Delete Comparation File											
Active Configuration											
User Configuration											
OEM Configuration											
Factory Configuration											
WPA Configuration											
B&B Electronics	-										
III F											
								B&B Electronics	i.	Contact Us	I Technical Sug
								Dab Electronics		<u>contact us</u>	recnnical su

Field	CLI Command
Displayed Page	list-cfg

# **Delete Configuration File**

URL /Configuration/Delete Configuration File

**Description** Lets you delete previously saved configuration files.

Encress Sense         VALA Setuants         VALA Setuants         VALA Setuants         VALA Setuants         Scala Pol Setuants         Scala Pol Setuants         Consection Setuants         Restruct Setuants         Res	Status Status Configurati	ion צו	Certificates	Network K	Maintenance						Dev	ice Type	Access Poir
With All Sections     Koose a Configuration File to Delete:       Strail Port Sections     Choose a Configuration File.       Strail Port Sections     Delete File       Concortion Sections     Delete File       Konnex Sections     Delete Fi		Î				Delete	a Configura	tion File Fi	rom Flash				
MPA Configuration S8 Dectronics	VLAIL Security Settings letwork Settings erial Port Settings erial Port 2 Settings innection Settings vant Settings vant Settings vant Settings reload Configuration File list Configuration File selete Configuration Setting Configuration												
	VPA Configuration SB Electronics	Ŧ							<u>B&amp;B Electron</u>	<u>cs</u> 1	<u>Contact Us</u>	1	Technical Su

# **Active Configuration**

 URL
 /Configuration/Active Configuration

 Description
 Displays the current configuration settings.

( <b>B</b> ) BSB ELECTRO	NICS						Make	The Ri	ght Connectic	ns	
ע Status Configuration	Certificates لا	Network لا	Maintenance لا						Dev	ice Type: Access	s Point
seress-Setup CAN Settinas CAN Settinas ALAY Security Settinas ertal Port Settinas ertal Port Settinas ental Port Settinas ental Configuration files Configuration File Setto Configuration File Setto Configuration File Chica Configuration File Configuration File Configuration File Configuration	#//bin/qtsh # /var/tmp/active, # # ver vp 2.13 # ver vp 2.14 # bwc, capp 0.0054 # bwc, capp 0.0054 # bwc, capp 0.0054 # bwc, capp 0.0054 # work of the second of the second # therment MAC 000 # Ethernent MAC 000 # therment	CESS_POINT_ XG-05420" 30117 x000300117 2801 28059A7D 00B28059A7D 00B28059A7E C-Airborne-Ac ction_E-V_Pro ice	cessPoint		Active Config	uration					
							B&B Electronics	1	Contact Us	I <u>Technic</u>	al Suppo
Field			CLI Com	mand							
Displayed Page			cfg-dum	mp active							

#### **User Configuration**

URL /Configuration/User Configuration Description Displays the contents of the user\_config.txt configuration file. Make The Right Connections א Status א Cor Main لا Certificates الا Main Device Type: Access Point Express Selup WLAH Settings WLAH Security Settings Serial Port Settings Serial Port Settings Connection Settings Event Settings Event Settings Advanced Settings User Configuration #/bin/qtsh #/var/etc/config/user\_config.txt # ver.fw 2.13 dev.tppe 23 (ACCESS POINT\_11bg\_AR6k) dev.tppe 24 (ACCESS POINT\_11bg\_AR6k) hvc\_caps 06/A2017 # bvc\_caps 06/A2017 # bvc\_caps 06/A2017 # bvc\_caps 06/A2017 # VLAN MAC 000628093A70 E thernere MAC 000628093A7E # Thernere MAC 000628093A7E # dev.tppe 12222 radio startup on eth-clob tridge Upload Configuration File List Configuration Files Delete Configuration File Active Configurat User Configuration OEM Configuration Factory Configuration WPA Configuration B&B Electronics | Contact Us | Technical Se 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.

							Device Type: Acces
15 🛆				OEM Configurat	tion		
	Error Oxf809:	File not f	ound.				
e							
2							
Ξ							
modified co	nfiguration						
				B&B Electronics	l.	Contact Us	I <u>Technical</u>
	€ modified co	e modified configuration	e modified configuration)	e modified configuration	Error Oxf809: File not found.	Error Oxf809: File not found.	Error Öxf809: File not found.

# **Factory Configuration**

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

Factory Co	nfiguration	
#//bin/qtsh # /etc/factory_config_ie.txt ver cenverstr user-cen oen user-cen oen user-teg dg user user user-leap dpac name-amo DEM.Cfg1 name-dem DEM.Cfg1 name-dewice Device pm-mode active esc-art FTE/FE473 esc-mode-serial on esc-mode-serial on esc-mode-serial on esc-mode-serial on serial-default cli Intf-type rs252 bit-rate 9600 data-bits 8 perify n flow n porty n flow n bit-rate 9600 data-bits 8 perify n flow n		
Field	CLI Command	
Displayed Page	cfg-dump factory	

# **WPA Configuration**

Description		security configuration settings being	Make The Right Connections
	Itebrook.settinas         #           Senar Dord. Settinas         ctrl _init           Senar Dord. Settinas         capol.           Connection Settinas         ap.eca           Ethernel.Settinas         assoc.           Librenel.Settinas         assoc.           Librenel.Settinas         assoc.           Librenel.Settinas         assoc.           Librenel.Settinas         assoc.           Librenel.Settinas         assoc.           Librenel.Settinas         assoc.	np/wpa_supplicant.conf rface=/var/run/wpa_supplicant ersion=1 rfm=1 rfm=1 sctoff=0 ref isco1100WFPA" id=1 met-WPA.P.SK IPA =FKIP	PA Configuration
			R&B Electronics / Contact Us / Technical Su
	Field	CLI Command	
	Displayed Page	cfg-dump wpa	

### **List Certificates**

URL	/Certificates/List Certificates		
Description	Displays a list of the certificat	es saved to the device. This is the hon	ne page for the Certificates link.
			Make The Right Connections
	Status ک Configuration ک Certificates ک Network	k لا Maintenance	Device Type: Access Point
	Upload Certificate	Certificate File Listin	g
	List Certificates Defets Certificate TrustedCA perm 1280 by 1 Files 1280 by 124928 by Mag Restorms 0 1850 Restorms 0 1850 Statutes 0 1850 Statutes 0 1850 Statutes 1850 Statu	tes	
			B&B Electronics <sup> </sup> <u>Contact Us</u> <sup> </sup> <u>Technical Support</u>
	Field	CLI Command	
	Displayed Page	list-cert	

# **Upload Certificate**

URL	/Certificates/Upload Certificate	
Description	Lets you upload certificates and private keys to the device.	
	(B) BSB ELECTRONICS	Make The Right Connections
	ع Status ک Configuration ک Certificates الا Network ک Maintenance	Device Type: Access Point
	Upload a Certificate to the Module	
	Delete Certificate Select a Certificate File to upload and save on the module: Upload Certificate Upload Certificate Cancel	
	NBAD Decisionsa Visi A332490 ; phone Suo 345311 ; foll fine	
	Bab E	ectronics Contact Us Technical Support

Field	CLI Command
Upload Certificate [Button]	put-cert

### **Delete Certificate**

URL	/Certificates/Delete Certificate	'Certificates/Delete Certificate										
Description	Allows you to delete certificates s	stored on the device.										
	BSB ELECTRONICS		Make The Right Connections									
	Status کا Configuration کا Certificates کا Network کا	Maintenance	Device Type: Access Point									
	Upload Certificate List Certificate	Delete a Certificate File From Flash										
	Deletic Conflicate Choose a Centificate File to Delete Choose a Centificate File.	s: elete File										
		<u>B&amp;B Ek</u>	ectronics I Contact Us I Technical Support									
	Field	CLI Command										
	Delete Certificate [Button]	del-cert										

# **Network (Home Page)**

RL	/Network		
escription	Home page for the network-rela	ated pages.	
	BSB ELECTRONICS		Make The Right Connections
	Status الا Configuration الا Status الا Metwork	Maintenance لا	Device Type: Access Point
	Discover Airborne Modules	Module Sta	itus
	Scan for Access Points Hoddle F Irmmere Version: Link Status: SSID: Mac Address: BSSID: Transmit Link (Bb); Mac Address: BSSID: Transmit Link (Bb); IF Address: Subnet Mask: Default Oateway: Frianzy DSS: to Default Oateway: Primary DSS: to Defaul	2.13 2.2.146.14 Access Point MG-Daso2 000D20059A7D 34 -6 -6 10.1.2.222 255.552.255.0 0.0.0.0 0.0.0.0 0.0.0.0 974564	
			B&BElectronics <sup>1</sup> ContactUs <sup>1</sup> Technical Su
	Field	CLI Command	
	Displayed Page	wl-info	

#### **Discover Airborne Modules**

URL	/Network/Discover	Airborne Mo	dules					
Description	Displays a list of Ai address, device typ				e on the curre	ent netw	vork, w	ith IP
		3				Make The	Right Conne	ections
	Status کا Configuration کا Ce	ertificates 🛛 Network	Maintenance لا					Device Type: Access Point
	Discover Airborne Modules			Discover I	Results			
	Scan for Access Points		Device Name	IP Address	MAC Address Devi	се Туре	FW Ver	
	BAD Strattonsa 1316/322000 : Shore 1316/322100 : Shore 1400 342319 : Bolf free		OoldenEnro3 SystemTest13 OBH-Cfg1 SystemTestVeyron7 OBH-Cfg1	10.1.3.107 10.1.0.209 10.1.2.217 10.1.2.202 10.1.2.402 10.1.3.190	0001200508F DIRE 00086879C243 DIRE 00082805667 DIRE 00028205667 DIRE 00028205661 DIRE	CT-SERIAL CT-ETHERNET CT-ETHERNET	2.13 2.13A 1.62	
	< >				B&B	Electronics I	Contact I	Is I Technical Supp
	Field		CLI Command					
	Displayed Page		discover					

## **Scan for Access Points**

		Make The Right Connections
	tificates א Network א Maintenance	Device Type: Access Poi
Discover Airborne Modules	Scan Results	
Scan for Access Pointy via BBR Instrumes 0, 55,133,500 phone Case Jack 20, 100 free case Ja	<pre>Scan completed : Cell 01 - Address: 00:13:1A:16:AC:10 ESED: ~CleocilONFA- Mode Managed Tolker Managed Tolker Managed Tolker Managed Tolker Managed Tolker Managed Tolker Managed Tolker Managed Extra: managed Tolker Managed Extra: Managed Transperson, 14:00 Managed Tolker Managed Tolker Managed Tolker Managed Tolker Managed Tolker Managed Transperson, 2:46 CdH (Channel 1) Dolker Managed Tolker Managed Tol</pre>	2
		B&B Electronics Contact Us Technical St

## Maintenance (Home Page)

RL	/Maintenance					
escription	Home page for the r	maintenance-relat	ed pages.			
	(B) B&B ELECTRONICS				Make The	Right Connections
	Status کا Configuration کا Certi	ficates א Network א Maintena	nce			Device Type: Access Point
	Update Module Firmware			System Information		
	Restart Illocitie         Radio           Set System Time         Total           Bink the POST LED         Reformed           Stop Binking the POST LED         RADio           Upload Scrub Life         PV Par           Upload Scrub Life         PV Par           Digsby Scrub File         Total           Digsby Scrub File         Total           Digsby Scrub File         Percent           Benetic Scrub File         Percent	Used: t Memory Used:	2.13 2.2.146.14 1.3.2 2.6.32.29 244256 68426 694 99 99 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			
					B&B Electronics	Contact Us I Technical Supp
						@ 2009.2012 R&R Flee
	Field	CL	I Command			
	Displayed Page	sy	s-info			

## **Update Module Firmware**

 URL
 /Maintenance/Update Module Firmware

 Description
 Enables you to update module firmware.

	NICS					Make	The R	ght Connectic	ons	
Configuration لا Status	Certificates لا	Network S	Maintenance					Dev	ice Typ	e: Access Point
Update Module Firmware Reset to Factory Defaults Restart Module	Current Firmwar	- Version - 2.42	Upload Fi	rmware	to the Moo	lule				
Set System Time			load and then click "Load New Firmware"							
Blink the POST LED Stop Blinking the POST LED	Load New Fi	rmware C	ancel	Browse						
Upload Script File List Script Files Display Script File										
Delete Script File Run Script File										
BSB Electronics 5 1.815.433.5100 : phone 5 1.800.346.3119 : toll free										
						B&B Electronics	- î	Contact Us	- î	Technical Support
Field			CLI Command							
Load New Firmwa	re [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.



### **Restart Module**

URL	/Maintenance/Restart Module
Description	Restarts device.

	<b>B</b> ) Electron	NICS						Make	The R	ght Connecti	ons	
ש Status	Configuration لا	Certificates لا	Network	Maintenance الا						De	vice Type: Access Point	
Update Mode Reset to Fac						Restart th	ne Module					
Restart Mod					Restarting the		e any unsaved chage	s to be lost.				
Blink the PO	<u>ST LED</u>					Restart th	e module?					
Stop Blinking	a the POST LED					Yes	No					
List Script Fi Display Scrip	les											
Delete Script Fi	t File											
B&B Electroni () 1.815.433.5100	: phone											
0 1.800.346.3119												
								B&B Electronics	1	Contact Us	1 Technical Sup	
											@ 3000 3043 DED EIA4	troni
Field				CLI Co	ommand							
Yes [Bi	utton]			resta	rt							

### Set System Time

 URL
 /Maintenance/Set System Time

 Description
 Sets system time.

	NICS					Make	The R	ght Connectic	ns	
Status کا Configuration	Certificates د	Network الا	Maintenance لا					Dev	ice Typ	e: Access Point
Udate Hodak Firmware Reset to Factory Defaults Restart Module Set System Time Bank the PDSTLED Unload Script File Unload Script File Unload Script File Delete Script File Delete Script File Run Script File Status Script File Run Script Fi	Enter the desired	d system time F	EST Date – Mon Jan 12, 2009 H:MM:SS MM.DD.YYYY and click "Set !	Set System	Time					
						B&B Electronics	1	Contact Us	0	Technical Suppo
Field			CLI Command							
Set System Time			sys-time							

### Blink the POST LED

scription	/Maintenance/Blink the POST LED           Makes the POST LED blink. This lets you identify the specific device with which you are communicating.				
	(B) B&B ELECTRONICS	Make The Right Connections			
	ک Status کا Configuration کا Certificates کا Network ک	I Maintenance Device Type: Access Point			
	Update Module Firmware       Reset D Factory Defaults       Restart Module       Set System Time       Bink the POST LED       Stop Blinking the POST LED       Ubload Script File       List Script File       Delete Script File       Delete Script File       MAL Restrontics       Value Script File       MAL Restrontics       Value Script File       Status Script File	Blink POST LED turned ON			
	« <u> </u>	B&B Electronics ContactUs Technical Sur			
		@ 2009.2017 RAR Flar			
	Field	CLI Command			
	Displayed Page	blink-post-led on			

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### **Stop Blinking the POST LED**

URL	/Maintenance/Stop Blinking the Po	OST LED
Description	Stops the POST LED blinking.	
	BSB ELECTRONICS	Make The Right Connections
	۲ Status کا Configuration کا Certificates کا Network کا N	Naintenance Device Type: Access Point
	Update Module Firmware Reset to Factory Defaults	Blink POST LED
	Restart Module Set System Time	Blinking of the POST LED turned OFF
	Blink the POST LED Stop Blinking the POST LED Upload Script File	
	Disatav Script File Delete Script File Ren Script File	
	B&B.Electronics 0,514,613,5100 ; phone 1,504,61319; c0// free , m ,	
		B&B Electronics Contact Us Technical Support
	Field	CLI Command
	Displayed Page	blink-post-led off

# **Upload Script Files**

URL	/Maintenance/Upload Script Files
Description	Upload Script Files.
	Make The Right Connections  Make The Right Connections  Status V Configuration V Certificates V Network V Maintenance  Device Type: Access Point
	Upload a Script File to the Module  Best to Factory Defaults Restart Module  Set System Time Blink the POST LED Stop Binking the POST LED Upload Script Cancel Upload Script File
	List Script File Disday Script File Run Script
	BAB Electronics   Contact.Us   Technical Surport
	Field CLI Command

# **List Script Files**

URL	/Maintenance/List Script Files						
Description	Lists script files.						
					Make The R	ight Connections	
	Status کا Configuration کا Certifi	cates 🛛 Network 🗠	Maintenance			Device Ty	ype: Access Point
	Vpdate Module Firmware Reset to Factory Defaults			Script File Listing			
	Restart Module 0 Files	0 bytes 36192 bytes free					
	Blink the POST LED Stop Blinking the POST LED						
	Uzload Script File List Script File Dissisty: Script File Delete Script File Run Script File						
	B88 Electronics O 1516-032.5100 ; phone O 1500-346.3119 ; foll free						
					B&B Electronics 1	Contact Us	Technical Support
	Field		CLI Command				
	TBD						

# **Display Script Files**

URL	/Maintenance/Display Script File	es	
Description	Displays script files.		
			Make The Right Connections
	의 Status 의 Configuration 의 Certificates 의 Network	ک Maintenance	Device Type: Access Point
	Lipdate Module Firmware Rest10 Factory Defaults Restart Hodule Set System Time Blink the POSTLED Stop Blinking the POSTLED Upband Script File Distative Script File Distative Files Distative Script File Distative Files Distative Script File Distative Files Distative File		
			B&B Electronics   Contact Us   Technical Support
	Field	CLI Command	
	TBD		

# **Delete Script File**

URL	/Maintenance/Delete Script File				
Description	Deletes a script file.				
	BEB ELECTRONICS		Make The Right Connections		
	ע Status א Configuration ע Certificates א Network	Maintenance	Device Type: Access Point		
	Update Module Firmware Reset to Factory Defaults Restart Module	Delete a Script File From Flash			
	Set System Time Set System Time Blink the POST LED Stop Blinking the POST LED				
	Uolead Script File List Script File Debits Script File Debits Script File Run & Debits Script File				
	D&B.Electronica 0 1515.433.5400; Phone 1200.346.519; foll free 1200.346.519; foll free 1				
		BSB	Electronics I Contact Us I Technical Support		
	Field	CLI Command			
	Displayed Page	TBD			

# **Run Script File**

URL	/Maintenance/Run Script File						
Description	Runs a script file	9.					
		lics			Make The	Right Connections	
	Status ک Configuration ک Certificates ک Network ک Maintenance					Device 1	ype: Access Point
	Update Module Firmware Reset to Factory Defaults			Run a Script File			
	Restart Module Set System Time Blink the POST LED Stop Blinking the POST LED Upload Script File List Script File Delete Script File Bun Script	Choose a Script File to Run: No script files fo	und				
	() 1.815.433.5100 ; <i>Dhone</i> () 1.800.346.3119 ; <i>toll free</i> () () () () () () () () () ()				B&B Electronics	Contact Us	Technical Support
	Field		CLI Command				
	Displayed Page		TBD				

#### **17.0 Certification & Regulatory Approvals**

#### **IMPORTANT!**

It is required that the following section be read and understood before use of the B&B Airborne™ device is permitted.

Use of approved antenna is required for compliance to FCC and IC regulations.

The unit complies with the following agency 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  $50\Omega$ . 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	
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 26<sup>th</sup>, 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.

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.	

Table 31 - Mechanical Approvals

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