# Secure, Rugged Dual Band Module – Access Point / Client / Router

## Model APMN-Q551

B+B SmartWorx
Powered by ADVANTECH
www.advantech-bb.com

### PRODUCT FEATURES

- Quick time to market and reduced integration costs
- 802.11a/b/g/n Wi-Fi radio (2.4 GHz, 5 GHz)
- AirborneM2M Power Save firmware reduces power consumption and extends battery life in mobile devices
- Extended operating temperature range (-40 to +85°C) and environmental specifications
- AirborneM2M Speed Link roaming provides enhanced connection reliability
- AirborneM2M PortFlex capability enables any combination of communication ports (UART, SPI, GPIO, Ethernet and 802.11 interfaces)
- FCC Part 15 Class B Sub C Modular Approval minimizes regulatory requirements
- Backwards compatible with previous generations of AirborneM2M embedded modules

## AirborneM2M Embedded 802.11a/b/g/n Dual Band (2.4 GHz, 5 GHz) Access Point Module or Client

The AirborneM2M line of highly-integrated 802.11 wireless access point modules allow OEMs to Wi-Fi enable devices used in an array of machine-to-machine (M2M) applications. B+B SmartWorx delivers all the necessary RF technology networking stacks and advanced security features in a compact, single-board package, reducing integration costs for OEMs and providing for a quick time to market.

**Big Performance in Small and Ruggedized Package**
The AirborneM2M series delivers the industry's most rugged, highly integrated, embedded wireless access point Wi-Fi module solution. AirborneM2M modules meet extended operating temperature and shock vibration specifications of the most demanding M2M applications.

Utilizing a 32-bit ARM9 processor and the high-performance Atheros AR6203 802.11 radio, the module delivers increased transmit power and receive sensitivity, contributing to superior range performance.

**SpeedLink™ Roaming**
The AirborneM2M Speed Link roaming feature provides enhanced connection reliability, enabling OEM devices to roam freely within a wireless network without loss of data or connection.

**Flexible and Easy to Integrate**
AirborneM2M incorporates support for both wireless access point and serial to Wi-Fi communications. Utilizing AirborneM2M Port Flex capability, OEMs may configure via software any combination of UART, SPI, Ethernet, GPIO and 802.11 interfaces. Each individual port can be independently configured. A development kit is also available to aid developers (sold separately).

**Future-proof**
These AirborneM2M modules are footprint and pin-compatible with their predecessors. B+B SmartWorx' commitment to maintaining hardware and software compatibility assures OEMs of a simple, future-proof migration path even as wireless technology evolves.

**Enterprise Class Security**
Security protocols are important to mission critical wireless M2M applications. AirborneM2M™ Access Point multi-layer security addresses the requirements of Enterprise-class networks and corporate IT departments. These advanced security features include wireless security (802.11i/ WAP2 enterprise), authentication security using WPA2 (AES-CCMP) and device security (multi-layered encryption). The AirborneM2M™ Access Point includes a fully functional DHCP server to provide unique addresses for each authenticated client. Up to 10 clients can be supported on the local Wi-Fi network.

### ORDERING INFORMATION

| MODEL NUMBER | DESCRIPTION |
|---|---|
| **APMN-Q551** | 802.11a/b/g/n, 10/100 Industrial Wireless Access Point/Router/ Client Module: UART, SPI and RS-232/422/485 wired interfaces |
| **WLNN-EK-DP551** | Design and Development Kit |

### ACCESSORIES

**ACH2-DBAT-DP002** - 2dBi portable (rubber duck), 2.4/5GHz antenna

**ACH2-DBAT-DP003** - 3.8/5.5dBi portable (rubber duck), 2.4/5GHz antenna




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# Secure, Rugged Dual Band Module – Access Point / Client / Router

## Model APMN-Q551

### SPECIFICATIONS

| TECHNOLOGY | | |
|---|---|---|
| Technology | IEEE 802.11a/b/g/n, Wi-Fi compliant | |
| Frequency | 2.4 ~ 2.4835 GHz (US/Canada/Europe)<br>5.150 ~ 5.350 GHz<br>5.725 ~ 5.825 GHz | |
| Modulation Technology | DSSS, CCK, OFDM | |
| Modulation Type | DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM | |
| Network Access Modes | Access Point, Infrastructure (Client), Ad Hoc | |
| Channels | | |
| | US/Canada: | 11 Channels 802.11b/g |
| | | 13 Channels 802.11a |
| | Europe: | 13 Channels 802.11b/g |
| | | 19 Channels 802.11a |
| | France: | 4 Channels 802.11b/g |
| | Japan: | 14 Channels 802.11b |
| | | 13 Channels 802.11g |
| | | 23 Channels 802.11a |
| Wireless Data Rate | 802.11b: 11, 5.5, 2, 1 Mbps<br>802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps<br>802.11n: 65, 58.5, 42, 39, 26, 19.5, 13, 6.5 Mbps | |
| MAC | CSMA/CA with ACK, RTS, CTS | |
| Network Protocols | TCP/IP, ARP, ICMP, DHCP, DHS, UDAP, TFTP, UDP, PING | |
| Receive Sensitivity 802.11 b/g | 54 Mb/s = -72 dBm<br>36 Mb/s = -78 dBm<br>18 Mb/s = -84 dBm<br>6 Mb/s = -89 dBm<br>11 Mb/s = -86 dBm<br>1 Mb/s = -92 dBm | |
| Receive Sensitivity 802.11 a | 54 Mb/s = -74 dBm<br>36 Mb/s = -80 dBm<br>18 Mb/s = -86 dBm<br>6 Mb/s = -90 dBm | |

| | |
|---|---|
| Transmit Power | 802.11b = 15 dBm (31.6 mW)<br>802.11g = 12.6 dBm (18.12 mW)<br>802.11a = 17 dBm (50.1 mW) |
| Security Protocols (AP and AdHoc modes) | Disabled, WEP 64 & 128-bit, WPA-PSK(TKIP), WPA2-PSK(AES) |
| Security Protocols (Client mode) | Disabled, WEP 64 & 128-bit, WPA-PSK(TKIP), WPA2-PSK(AES), WPA & WPA2 Enterprise (EAP-TLS, EAP-TTLS, EAP-PEAP, EAP-FAST, LEAP) and a suite of migration modes (WPA-LEAP64, WPA-LEAP128, WPA-PSK64, WPA-PSK128, WPA-PSK128-TKIP, WPA2-PSK-TKIP)<br>Supports Certificates and Private Key Upload and Storage (multiple) |
| Antenna | Two (2) U.FL Coaxial Connectors, 50 Ohms<br>Maximum Gain @ 5 GHz = 5.5 dBi<br>Maximum Gain @ 2.4 GHz = 4.1 dBi |
| Supply | 3.3VDC +/-5%, 650 mA (maximum) |
| Supply In-rush Current | 1500 mA (maximum) for 400us |
| DC Characteristics | Operating Current (Tx, 802.11g) = 370 mA (typical)<br>Operating Current (Rx, 802.11g) = 200 mA (typical) |
| Environmental | Operating Temperature: -40 to +85 °C<br>Storage Temperature: -40 to +85 °C<br>Relative Humidity: 5 to 95% (non-condensing) |
| Interfaces | Dual UART (960Kbaud, RS232/ 422/ 485, SPI (1-bit/8 MHz), 10/100 Ethernet, PortFlex |
| Digital I/O | 8 GPIO |
| LED Indicators | 4 Indicator LED Signals (RF_ACT, POST, CONNECT, RF_LINK), Signal Strength |
| Connector | 36-pin High Density SMT Connector from Hirose (DF12-36DS-0.5V), 4mm Height |
| **MEANTIME BEFORE FAILURE (MTBF)** | |
| MTBF | 522001 hours (# APMN-Q551)<br>524380 hours (# WLNN-EK-DP551) |
| **APPROVALS, DIRECTIVES & STANDARDS** | |
| North America | FCC Title 47 Part 15 Class B Sub C Intentional Radiator, IOC RSS210 |
| CE - Directives (Europe) | 2014/35/EU - Low Voltage Directive<br>2014/53/EU - Radio Equipment Directive (RED)<br>Hereby, Advantech B+B SmartWorx declares that the radio equipment type Wi-Fi access point (module) is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: *www.advantech-bb.com*<br>2011/65/EU - Reduction of Hazardous Substances (RoHS) Directive<br>2012/19/EU - Waste Electrical & Electronic Equipment (WEEE) Directive |
| CE - Standards (Europe) | **EMC:**<br>ETSI EN 300 328 v2.1.1 - EMC & Radio Spectrum Matters (ERM) Wideband Transmission Systems - 2.4 GHz ISM Band<br>ETSI EN 301 893 v1.8.5 - EMC & Radio Spectrum Matters (ERM) Wideband Transmission Systems - 5 GHz ISM Band<br>ETSI EN 301 489-1 v2.1.1 - Applied in accordance with the specific requirements of:<br>ETSI EN 301 489-17 v3.1.1 - EMC & Radio Spectrum Matters (ERM) Broadband Data Systems<br>EN 55032+AC, Class A - Information Technology Equipment (ITE) - RF Emissions<br>EN 55024 - Information Technology Equipment (ITE) - Immunity Characteristics - Limits and Methods of Measurement<br>**Safety:**<br>**EN 60950-1 + A1 + A11 + A12 + A2 -** Information Technology Equipment (ITE) - Safety - Part 1 - General Requirements<br>**RF Exposure:**<br>EN 62311 - Assessment of electronic and electrical equipment related to human exposure restrictions for EM fields (0 Hz to 300 GHz) |