# TQ5403

## Hybrid 3-radio 802.11ac Wave 2 Wireless Access Point

The Allied Telesis Enterprise-class TQ5403 Hybrid 3-radio Wireless Access Point features IEEE 802.11ac Wave 2 technology with two spatial streams to deliver a raw capacity of 2.133 Gigabits.

## Overview

The innovative Channel Blanket hybrid mode of the TQ5403 enables optimized wireless networking for all environments. By allowing simultaneous multi-channel and single-channel WLAN connectivity from the same access point, network administrators can combine the performance attributes of the two architectures to best suit their specific deployment requirements.

The TQ5403 has a single 2.4GHz radio and dual 5GHz IEEE 802.11ac radios, and supports Multi-User Multiple Input and Multiple Output (MU-MIMO), allowing multiple clients to send and receive data at the same time, substantially increasing throughput. Combined with a comprehensive feature-set, the APs provide a superior wireless solution for customers from SMBs to large Enterprises.

Smaller businesses can operate the TQ5403 in standalone mode, using its intuitive web-based user interface. For larger installations it can be managed by Allied Telesis Autonomous Wave Control (AWC). With AWC, the wireless network is regularly analyzed, and APs are dynamically updated to reduce interference, minimize coverage gaps, and optimize performance—all with no user intervention. Allied Telesis network management platform, Vista Manager EX, has an AWC wireless management plugin that supports up to 3,000 APs.

Flexible deployment options enable easy installation, with the TQ5403 able to be used on the desktop or mounted on a wall or ceiling. Power may be supplied by Power over Ethernet, for the simplicity of having the Ethernet network connect and power the APs, or by an optional AC power adapter.

# Key Features

## Channel Blanket Hybrid Operation

▶ The TQ5403 supports operation in multi-channel, single-channel (Channel Blanket) and hybrid (multi-channel and Channel Blanket) modes, for the most flexible wireless solution available.

▶ Multi-channel operation provides maximum throughput for high-bandwidth clients, while Channel Blanket operation supports seamless roaming for dynamic environments like warehouses and hospitals, as all APs appear as a single virtual AP.

▶ Hybrid mode combines the best of both architectures, enabling an innovative wireless solution that maximizes performance for a superior user experience.

## IEEE 802.11ac Wave 2

▶ IEEE 802.11ac Wave 2 wireless connectivity delivers Gigabit performance and throughput. In crowded wireless environments, efficient bandwidth distribution is important; IEEE 802.11ac Wave 2 achieves efficiency and robustness, using Multi-user MIMO technology.

▶ Unlike traditional Single-user MIMO networks where devices are served sequentially, Multi-user MIMO simultaneously communicates to multiple clients at once, reducing contention and improving capacity and throughput by up to three times.

▶ Multi-user MIMO uses beamforming, where the AP focuses wireless signal towards connected devices, rather than simply radiating the signal evenly. This improves range and speed for each user, and reduces interference for the best possible connection.

## Tri-radio, with Band Steering

▶ The TQ5403 contains three IEEE 802.11 2ss radios to enable concurrent Wi-Fi communications: one at 2.4GHz band, and two at 5GHz band. This alleviates network congestion and isolates any legacy client devices affecting performance.

▶ Band steering prompts newly connecting devices to use a band with little current congestion to distribute wireless traffic, provide maximum throughput, and the best user experience.

## IEEE 802.11e Wireless Multimedia (WMM)

▶ Quality of Service (QoS) on the wireless network optimizes the performance of voice, video, and data applications, as each has different latency, bandwidth and performance requirements. QoS traffic prioritization ensues the timely delivery of these services.

## IEEE 802.11i (security)

▶ This feature set facilitates strong encryption, authentication and key management strategies, guaranteeing data and system security. In addition to Counter Mode with Cipher Block Chaining Message Authentication Code Protocol (CCMP), IEEE 802.1X key distribution via RADIUS controls access to the network.

## Virtual APs with Multiple SSIDs

▶ The TQ5403 supports Virtual AP (VAP) functionality, with the assignment of different SSIDs and security policies for each VAP on the physical device.

▶ VAPs can be mapped to VLANs for logical network separation and improved throughput. Enable communication by application, function or users.

## Link Aggregation

▶ The TQ5403 features two 10/100/1000T Ethernet ports. These can be combined into a single virtual connection using static link aggregation, to double the bandwidth from the AP to the wired network.

## Captive Portal

▶ Manage user access to the Wi-Fi network with captive portal. New users are taken to a login page ensuring they must authenticate before gaining access to the wireless network, and any online resources and applications.

## Dynamic VLANs

▶ Dynamic VLANs simplify management by enabling users to be separated on different VLANs according to rules defined in a centralized user database. When a user connects, their credentials are checked and the VLAN assigned automatically to the AP. An external RADIUS server is supported and a secondary RADIUS server can also be specified for redundancy.

## Graphical User Interface

▶ The web-based user interface is user friendly and intuitive, minimizing training needs, and allowing easy management and monitoring of a single AP. AWC enables management of multiple APs, and automatic wireless network optimization.

## Airtime Fairness

▶ Airtime Fairness equally assigns airtime to each connected client, to ensure fair and predictable sharing of bandwidth. This feature prevents any client from monopolizing the bandwidth when transferring a large amount of data, and ensures consistent performance for all users.

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## Key Features

### Fast Roaming

▶ Fast Roaming with 802.11k, 802.11v, and 802.11r optimizes the process of discovering and selecting the best available AP in a Wi-Fi network, and establishes rapid connectivity for users to seamlessly move between APs.

▶ Users will experience a consistent wireless connection as the APs exchange security keys, so the client device does not need to re-authenticate on the RADIUS server as they roam.

## Specifications

### Physical Specifications

| PRODUCT | WIDTH X DEPTH X HEIGHT | WEIGHT | 10/100/1000T (RJ-45) COPPER PORTS |
|---|---|---|---|
| TQ5403 | 215 x 215 x 48 mm (8.46 x 8.46 x 1.89 in) | 700 g (24.69 oz) | 2 (1 PoE-in port) |

### Power Characteristics

| PRODUCT | POWER SUPPLY | POWER CONSUMPTION | | MAX HEAT DISSIPATION |
|---|---|---|---|---|
| | | AVERAGE | MAXIMUM | |
| TQ5403 | 100-240VAC | 10W | 20W | 67 BTU/h |
| | POE | 10W | 19W | 64 BTU/h |

### Wireless

▶ Multi-channel, single-channel, or hybrid operation
▶ Airtime fairness
▶ Automatic channel selection
▶ Automatic control of transmission power
▶ Band Steering
▶ Fast roaming
▶ RF load balancing
▶ Wireless Distribution System (WDS)
▶ Wi-Fi Multimedia (WMM) for traffic prioritization

### Operational Modes

▶ Centrally managed in multi-channel mode by Vista Manager EX (up to 3,000 APs)
▶ Centrally managed in single-channel or hybrid mode (multi-channel and single-channel) by Vista Manager EX (100 APs per Channel Blanket[1])
▶ Standalone[2]

### Management

▶ Graphical User Interface (HTTP/HTTPS)
▶ Simple Network Management Protocol (SNMPv1, v2c)
▶ Firmware upgrade
▶ Backup/restore settings
▶ Syslog notification
▶ DHCP client
▶ NTP client

### Security

▶ Authentication and accounting
  IEEE 802.1X authentication and accounting
  IEEE 802.1X RADIUS support
  Shared Key Authentication
  WPA (Enterprise, Personal)
  WPA2 (Enterprise, Personal)
  Captive Portal (External RADIUS, Click-Through)

▶ Encryption
  WEP: 64/128 bit (IEEE 802.11a/b/g only)
  WPA/WPA2: CCMP (AES), TKIP
▶ MAC address filtering (Up to 1024 MAC address)
▶ SSID hiding/ignoring
▶ Client isolation
▶ Neighbor AP detection
▶ Kensington lock

### Compliance
Certificates
▶ FCC
▶ CE
▶ RCM
▶ Wi-Fi certified (ID:WFA75927)
▶ IMDA        (For Singapore)
▶ KC          (For South Korea)
▶ MIC         (For Vietnam)
▶ NBTC        (For Thailand)
▶ BSMI/NCC  (For Taiwan)
▶ OFCA         For Hong Kong)
▶ SIRIM       (For Malaysia)
▶ WPC         (For India)
▶ IC          (For Canada)

Safety
▶ EN 60950-1
▶ EN 62368-1
▶ UL 60950-1
▶ UL 62368-1

ElectroMagnetic Compatibility
▶ AS/NZS 2772.2
▶ EN 301 489-1
▶ EN 301 489-17
▶ EN 55024

▶ EN 55032, Class B
▶ EN 61000-3-2, Class A
▶ EN 61000-3-3
▶ EN 61000-4-2
▶ EN 61000-4-3
▶ EN 61000-4-4
▶ EN 61000-4-5
▶ EN 61000-4-6
▶ EN 61000-4-8
▶ EN 61000-4-11
▶ FCC 47 CFR Part 15, Subpart B
▶ VCCI, class B

Radio equipment
▶ AS/NZS 4268
▶ EN 300 328
▶ EN 301 893
▶ FCC 47 CFR Part 15, Subpart C
▶ FCC 47 CFR Part 15, Subpart E[3]
▶ FCC part 2

### Environmental Specifications

▶ Operating temperature range:
  PoE: 0°C to 50°C (32°F to 122°F)
  AC adapter: 0°C to 45°C (32°F to 113°F)
▶ Storage temperature range:
  -25°C to 70°C (-13°F to 158°F)
▶ Operating relative humidity range:
  90% non-condensing
▶ Storage relative humidity range:
  95% non-condensing

### Embedded Antennas
Omni-directional
▶ Frequency band: 2.4 GHz
▶ Max. peak gain: 3.95dBi
▶ Supports Channel Blanket

Omni-directional
▶ Frequency band: 5GHz (5.2-5.3GHz)
▶ Max. peak gain: 4.20dBi
▶ Supports Channel Blanket

Omni-directional
▶ Frequency band: 5GHz (5.6-5.8GHz)
▶ Max. peak gain: 4.83dBi

### Radio Characteristics
Supported frequencies:
▶ 2.400 ~ 2.4835 GHz
▶ 5.150 ~ 5.250 GHz
▶ 5.250 ~ 5.350 GHz
▶ 5.470 ~ 5.725 GHz
▶ 5.725 ~ 5.850 GHz

Modulation Technique
▶ 802.11a/g/n/ac: OFDM
▶ 802.11b: DSSS, CCK, DQPSK, DBPSK
▶ 802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM
▶ 802.11a/g/n: BPSK, QPSK, 16QAM, 64QAM, 256QAM

[1] Supports 4 Channel Blankets per TQ5403
   500 clients maximum per Channel Blanket
[2] 200 clients maximum per AP in standalone mode
[3] Supported frequencies: 5.150 ~ 5.250 GHz
                           5.725 ~ 5.850 GHz

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## Data Rate
▶ 802.11a/g:
  54/48/36/24/18/12/9/6Mbps
▶ 802.11b: 11/5.5/2/1Mbps
▶ 802.11n: 6.5 - 400Mbps[4] (MCS 0 - 15)
▶ 802.11n: 6.5 - 300Mbps (MCS 0 - 15)
▶ 802.11ac: 6.5 – 866.7Mbps (MCS 0 - 9, NSS 1 - 2)

## Media Access
▶ CSMA/CA + Ack with RTS/CTS

## Diversity
▶ Spatial diversity

[4] Using 256 Quadrature Amplitude Modulation

## Standards

### Ethernet
IEEE 802.1AX-2008 Link Aggregation (static)
IEEE 802.3 10BASE-T
IEEE 802.3u 100BASE-TX
IEEE 802.3ab 1000BASE-T
IEEE 802.3x Flow Control
IEEE 802.3at Power over Ethernet+
IEEE 802.1Q VLAN Tagging

### Wireless
IEEE 802.11 a/b/g/n/ac (Wave 2) 2x2:2ss MU-MIMO
IEEE 802.11k Radio Resource Measurement of Wireless LANs
IEEE 802.11v Basic Service Set Transition Management Frames
IEEE 802.11r Fast Basic Service Set Transition
IEEE 802.11e WMM for Quality of Service
IEEE 802.11i WPA/WPA2/802.1x for Security

## Ordering Information

### AT-TQ5403-xx
Enterprise-Class 802.11ac Wave 2 Wireless Access Point with 3 radios and embedded antenna

Where xx =  [none] Regulatory Domain: Worldwide (except United States)
01 Regulatory Domain: United States Reserved

## Related Products

### AT-MWS0091
AC adapter

## Wireless Management Licenses

Wireless management of the TQ5403 is available from the Vista Manager EX network management platform, and from the Vista Manager Mini running on our SwitchBlade x908 GEN2 switch or x950 Series or AR-Series firewalls and routers.

| PLATFORM | LICENSE NAME | DESCRIPTION |
|---|---|---|
| Vista Manager EX | AT-FL-VISTA-BASE-1/5YR | Vista Manager EX network monitoring and management software license |
| Vista Manager EX | AT-FL-VISTA-AWC10-1/5YR[5] | Autonomous Wave Controller (AWC) plug-in license for Vista Manager |
| Vista Manager EX | AT-FL-VISTA-CB10-1/5YR[6] | Channel Blanket Hybrid (multi-channel and single-channel) license for AWC plug-in |
| SwitchBlade x908 GEN2 | AT-FL-GEN2-AWC40-1/5YR[7] | Autonomous Wave Controller (AWC) plug-in license for SBx908 GEN2 (Up to 40 nodes) |
| SwitchBlade x908 GEN2 | AT-FL-GEN2-AWC80-1/5YR[7] | Autonomous Wave Controller (AWC) plug-in license for SBx908 GEN2 (Up to 80 nodes) |
| SwitchBlade x908 GEN2 | AT-FL-GEN2-AWC120-1/5YR[7] | Autonomous Wave Controller (AWC) plug-in license for SBx908 GEN2 (Up to 120 nodes) |
| SwitchBlade x908 GEN2 | AT-FL-GEN2-AWC250-1/5YR[7] | Autonomous Wave Controller (AWC) plug-in license for SBx908 GEN2 (Up to 250 nodes) |
| SwitchBlade x908 GEN2 | AT-FL-GEN2-CB40-1/5YR[8] | AWC-Channel Blanket license for SBx908 GEN2 (Up to 40 access points) |
| SwitchBlade x908 GEN2 | AT-FL-GEN2-CB80-1/5YR[8] | AWC-Channel Blanket license for SBx908 GEN2 (Up to 80 access points) |
| SwitchBlade x908 GEN2 | AT-FL-GEN2-CB120-1/5YR[8] | AWC-Channel Blanket license for SBx908 GEN2 (Up to 120 access points) |
| SwitchBlade x908 GEN2 | AT-FL-GEN2-CB250-1/5YR[8] | AWC-Channel Blanket license for SBx908 GEN2 (Up to 250 access points) |
| x950 Series | AT-FL-x950-AWC40-1/5YR[7] | Autonomous Wave Controller (AWC) plug-in license for x950 (Up to 40 nodes) |
| x950 Series | AT-FL-x950-AWC80-1/5YR[7] | Autonomous Wave Controller (AWC) plug-in license for x950 (Up to 80 nodes) |
| x950 Series | AT-FL-x950-AWC120-1/5YR[7] | Autonomous Wave Controller (AWC) plug-in license for x950 (Up to 120 nodes) |
| x950 Series | AT-FL-x950-CB40-1/5YR[8] | AWC-Channel Blanket license for x950 (Up to 40 access points) |
| x950 Series | AT-FL-x950-CB80-1/5YR[8] | AWC-Channel Blanket license for x950 (Up to 80 access points) |
| x950 Series | AT-FL-x950-CB120-1/5YR[8] | AWC-Channel Blanket license for x950 (Up to 120 access points) |
| AR4050S UTM Firewall | AT-FL-AR4-AWC20-1/5YR[7] | Autonomous Wave Controller (AWC) plug-in license for AR4050S (Up to 20 nodes) |

[5] The AWC license also requires the Vista Manager EX license to operate
[6] The Channel Blanket license requires both the AWC and Vista Manager EX licenses to operate
[7] 5 APs can be managed for free. Additional APs can be managed by purchasing AWC licenses
[8] Channel Blanket is not available as a free service. Both an AWC-CB license and an AWC license are required for Channel Blanket to operate