EVEREST NETWORKS

DATA SHEET

EVEREST AP1004WRe

Quad-Radio 802.11ac Wave 2 4x4:4 UHD Outdoor Accesss Point

Everest Networks provides the industry's leading Wi-Fi solutions addressing today's most pressing ultra-high density (UHD) challenges, such as high user engagement, high network capacity, fast throughput, and low total cost of ownership (TCO). Our solutions leverage the Everest Wi-Fi platform, designed and built specifically for UHD venues such as stadiums, arenas, convention centers, shopping malls, transport hubs, auditoriums, campuses, and smart cities.

AN INDUSTRY FIRST

A foundational component of the Everest platform is the AP1004WRe, a ruggedized IP-67, high performance access point (AP) for short- to mid-range coverage. It is a first-of-its-kind, next-generation, multi-gigabit 802.11ac AP featuring the industry's most advanced and unique RF capabilities including quad 802.11ac Wave 2 radios, patented antenna technology enabling multi-radio beam-forming and shaping, and 4x4:4 MIMO and MU-MIMO capabilities.

BUILT FROM THE GROUND UP

At its core, the AP1004WRe employs, for an industry's first, four radios, including three in the 5-GHz band, which can operate simultaneously at full bandwidth without any RF coverage compromises. In addition, the AP1004WRe employs a patented multi-antenna system incorporating strategically-placed, directional, down-tilted and optimized antennas, providing proprietary reconfigurable beam-forming and beam-shaping capabilities. This enables a variety of coverage patterns from 140°-wide directional to 90°-wide directional, thus achieving an advantageous versatility for RF coverage and interference mitigation. Compared with omni-directional APs, these features, along with polarization and pattern diversity, provide improved spatial reuse mechanisms for an enhanced 4-stream MIMO and MU-MIMO functionalities. Consequently, the AP1004WRe's attains an industry-leading highest user engagements and capacity per AP combined with an unsurpassed level of deployment flexibility and installation simplicity, speed, and low TCO.

The AP1004WRe also provides additional capabilities such as advanced radio resource management, active multi-radio client load balancing, and assisted roaming, which are fully supported and managed by Everest's WLAN controller wireless management system. Through Everest's WLAN controller's simple and clear user interface, the AP1004WRe can be easily and quickly configured, managed, monitored, and assessed with minimal user interaction, providing operational efficiency and system scalability (up to 1,000 APs) without compromise.

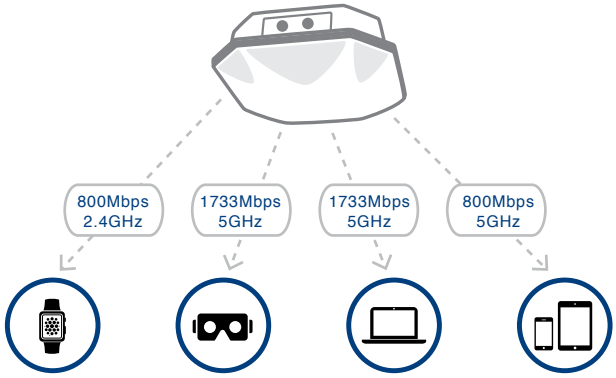
UNIQUE BENEFITS

- Concurrent **quad-radio** 802.11ac Wave 2 4x4:4 → PHY data rate up to **5 Gbps**
- Up to **1,000** associated devices per AP
- Up to **199+** active devices per AP
- **5 Gbps** backhaul provided by 2 x 2.5G PoE+ Ethernet ports
- Patented antenna beam-forming and shaping technology:
  - 2.4 GHz: fixed pattern → 90° x 90°
  - 5 GHz: software-reconfigurable patterns → 90° x 90° to 140° x 140°
- Simultaneous polarization and pattern diversity for efficient MIMO and MU-MIMO
- 2.4/5 GHz → 4x4:4SS per radio for:
  - 4x4 SU-MIMO devices per radio
  - Up to 3 concurrent MU-MIMO devices per 5 GHz radio
  - 16 parallel streams per AP
- IP67 rated for outdoor and industrial indoor environments

FEATURES & BENEFITS

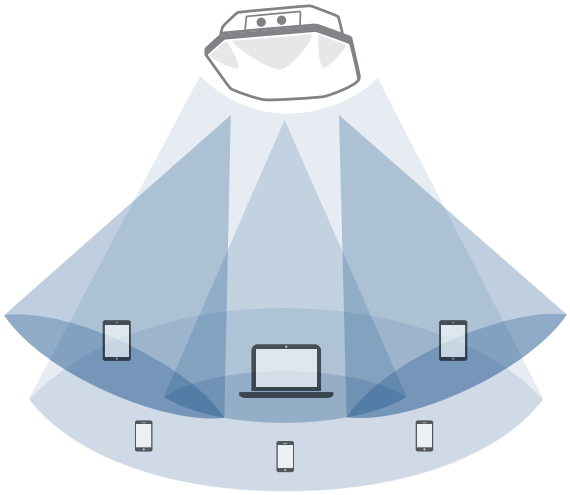
CONCURRENT QUAD-RADIO FOR UP TO 5 GBPS

The AP1004WRe leverages the combined power of four radios, one 2.4 GHz and three 5 GHz radios with four spatial streams per radio, for a total of 16 parallel streams per AP. In addition, dual 2.5 Gbps Ethernet ports provide up to 5 Gbps of wired backhaul. The AP1004WRe features a patented design and system architecture enabling concurrent quad-radio operation without impacting the radio's performance for best-in-class aggregate PHY throughput of 5 Gbps. In addition, the patented design does not compromise on RF performance and radio coverage, making the AP1004WRe amenable to various deployment venues.



PATENTED ANTENNA TECHNOLOGY

The AP1004WRe has a patented, fully-integrated, software-adjustable antenna system with the following characteristics: band-optimized, tightly-controlled radiation patterns, polarization and pattern diversity, as well as beam angle and shape reconfigurability. Band-optimized antennas enable optimal radiation in the entire frequency spectrum; polarization and pattern diversity provide enhanced MIMO and MU-MIMO operation; beam angle and shape reconfigurability enable directing energy to various spatial sectors for radio coverage zone control and interference management. These unique features provide system designers and integrators unparalleled flexibility in various deployment venues, maximizing network capacity with fewer APs and faster install times.



ACTIVE CLIENT ROAMING & LOAD BALANCING

Our patent-pending load balancing algorithms performs traffic management to optimize client associations, throughput, and roaming. Based on 802.11k and 802.11v protocols, the algorithm dynamically balances users between intra- and inter-AP radios to maximize radio, client, network performance and capacity.

AUTO DISCOVERY

Upon power-up, the AP1004WRe is auto-discovered by Everest's WLAN controller which performs AP verification and authorization before commencing data transfer. Once authorized, updated firmware and AP configuration are downloaded in a secured and controlled tunnel for an efficient and fast bring-up and operation.

RUGGED INDUSTRIAL DESIGN

The AP1004WRe is IP67-rated, designed and tested for salt spray, vibration, extreme thermal conditions, shock, and dust. This allows the AP1004WRe to operate in the toughest environments. A compliment of mounting brackets and accessories ensures that these APs are not only aesthetically pleasing, but also quick to deploy.

SPECIFICATIONS

Performance and Capacity

Associated Devices

Up to 1,000

Active Devices

Up to 199+

Peak PHY Rates

5 GHz: 4.266 Gbps (aggregate)

2.4 GHz: 800 Mbps

Total: 5.066 Gbps

Backhaul

5 Gbps (2x 2.5 Gbps Ethernet ports)

Advanced Radio Technology

Radios Per AP

5 GHz: 3x 802.11ac Wave 2

2.4 GHz: 1x 802.11n

MIMO

4x4 (SU-MIMO and MU-MIMO)

MIMO Streams (per radio)

SU-MIMO (2.4/5 GHz):
- 4 streams for 4x4 devices
- Max.: 433.3 Mbps per stream
- Max.: 1,733 Mbps (5 GHz)

MU-MIMO (5 GHz):
- 3 streams for 3 concurrent devices

Features

TPC, DFS, TxBF, SGI

MRC, MLD, CDD, STBC, LDPC

Max Tx Power (varies by country code, band, MCS)

2.4 GHz: 24 dBm

5 GHz: 24 dBm

Rx Sensitivity

802.11n (MCS0, HT20): -93 dBm

802.11ac (MCS0, VHT20): -93 dBm

Antenna Characteristics

Antenna Characteristics

Band-optimized, reconfigurable

Internal and integrated

Directional and down-tilted

Pattern, polarization, spatial

Antenna Patterns

2.4 GHz: 90˚ x 90˚

5 GHz: 90˚ x 90˚ to 140˚ x 140˚

Max Physical Antenna Gain

2.4 GHz: 6 dBi

5 GHz: 5 dBi

WiFi Specifications

Supported Standards

IEEE 802.11a/b/g/n/ac

Supported Rates

802.11b: 1 - 11 Mbps

802.11a/g: 1 - 54 Mbps

802.11n: 6.5 - 600 Mbps (MCS0-31, 1 - 4 SS)

802.11ac Wave 2: 6.5 to 1.733 Gbps (MCS0-9, 1 - 4SS)

802.11n-2.4 GHz: 6.5 - 800 Mbps (MCS0-9, 1 - 4SS)

802.11 HT: HT20/40

802.11 VHT: VHT20/40/80

Supported Channels (availability based on country code)

2.4 to 2.472 GHz: 1 - 13 (FCC/IC)

2.4 to 2.4835 GHz: 1 - 14 (ETSI)

5.15 - 5.25 GHz: 36 - 48 (FCC: U-NII-1/IC/ETSI)

5.25 - 5.35 GHz: 52 - 64 (FCC: U-NII-2A/IC/ETSI)

5.47 - 5.725 GHz: 100 - 140 (FCC: U-NII-2C/IC/ETSI)

5.725 - 5.850 GHz: 149 - 165 (FCC: U-NII-3/IC)

Channelization

20/40/80 MHz

Security

Wi-Fi Protected Access (WPA)

IEEE 802.11i (WPA2, RSN)

Transport Layer Security (TLS)

Datagram Transport Layer Security

IEEE 802.1X

Encryption: AES, CBC, CCM CCMP128,256

Power

Max Input Power (per port)

POE: 12.95 W @ 37 - 56 VDC

POE+: 25.5 W @ 42.5 - 56 VDC

4PPoE+: 30 W @ 42.5 - 56 VDC

SPECIFICATIONS

Max Power Consumption

45 W (~2.58 BTUs/min)

Physical Interfaces

Ethernet

2x 100/1000/2500 Mbps

Auto-sensing

802.3u 100 Base-Tx

802.3ab 1000 Base-T

802.3bz 2.5G Base-T

PoE 802.3at (Type I) [802.3af]

PoE+ 802.3at (Type II) [802.3at]

4P PoE 802.3bt (draft)

LLDP

Physical Characteristics

Dimensions

261 mm x 261 mm x 97 mm

10.3 in x 10.3 in x 3.9 in

Weight

3.4 Kg (7.5 lbs)

Environmental

Operating temperature: -40˚C to 55°C (-40°F to 131°F)

Storage temperature: -40°C to 70°C (-40°F to 158°F).Below -20°C: up to 20 min. for minimum internal operating temperature of -20°C

Operating humidity: 5% to 95% non-condensing

Operating altitude: 3000 m

Shock and vibrations: ETSI 300-19-2-4 spec T41.E 4M3

Surge immunity: 1 kV

Lightning protection: - 4 kV (with optional external primary protection)

Air vent valve for balancing humidity and pressure

UV resistant

Ice pellets: up to 25 mm (radial)

Corrosion: 10 - year protection

IP67 rated (water, dust, smoke)

Management

Wireless and Traffic: Standards

802.11e QoS

802.11k RRM

802.11r Fast BSS transition (FT)

802.11v Wireless Network Management

802.11ae Prioritization of Management Frames

Wireless and Traffic: Features

Airtime fairness

Client load balancing

Dynamic radio management based on per: client, radio, and AP metrics

Interfaces

Everest's WLAN controller: WMS and AC

Certification and Compliance

Wi-Fi Alliance

Wi-Fi Certified n, ac

Wi-Fi Protected Access (WPA2)

Protected Management Frames

Voice-Enterprise

WMM® (Wi-Fi Multimedia™)

Regulatory and Safety

Emissions (EMI/EMC):
- FCC Part 15, Class B
- ICES-003 issue 6, Class B
- VCCI (CISPER 32)

Radio:
- FCC Part 15c, part 15e (US)
- RSS-247 (Canada)
- ARIB STD-T66, ARBI STD-77 (Japan)

Surge: IEC 61000-4-5 Edition 2.0 2014, EN61000-4-5:2014

Safety:
- UL60950-1/ IEC60950-1
- UL60950-22/ IEC60950-22

Shock and vibrations:
- IEC 68-2-27
- IEC 68-2-06

Reliability

MTBF

171,292 hours (calculated)

MTTR

30 minutes