MTTplus-900
WiFi Air Expert Module

MTTplus
Modular Test Platform

The MTTplus WiFi Air Expert Module is the most complete and compact tool for WiFi networks discovery, survey, optimization, performance testing and troubleshooting.

With countless deployments including residential, private and public Hotspots, managed SMBs and hospitality services, WiFi is both a source of great opportunities and challenges for carriers. Customer expectations are high but they have very limited knowledge of the technologies' environmental limitations or best practices, leading to numerous service calls.

VeEX's WiFi Air Expert provides the tools for reliable, repeatable install procedures that go beyond RF layer analysis. It provides complete performance testing that measures end user's experience under traffic load.

The Air Expert Module for the MTTplus platform is equipped with 802.11ac Wave 1 3x3:3 WiFi capabilities to discover the network's Access Points, Clients and Channels. It surveys coverage problems with signal, noise levels and utilization tracking. A dedicated spectrum analyzer assists in the troubleshooting of WiFi and non-WiFi interference affecting performance and the V-Perf function provides traffic Download/ Upload test to a wired Ethernet responder to evaluate the WiFi network's capacity under load.

Module Highlights

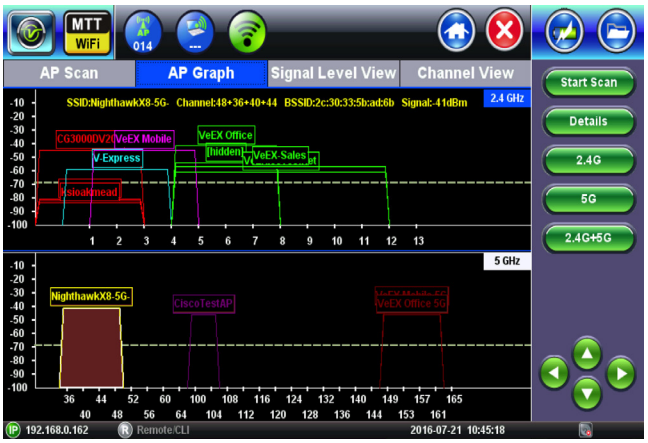
- Supports detection and connection to 802.11a/b/g/n/ac devices
- Discovers networks and lists Access Points, Clients and Channels in table and graphical format
- AP detailed capabilities discovery including SSID, BSSID, channels, security, supported data rates, signal and noise levels, co-channel and adjacent APs and associated clients
- Survey coverage problems with signal and noise levels tracking
- Analyze Channel usage by utilization and number of APs
- Discover associated and non-associated WiFi Clients present in the network
- One button Auto-Test evaluates the health of the WiFi network with analysis of security, coverage, interference, top talkers and connectivity with configurable AP list
- Connectivity testing with DHCP connection to APs, Ping, Trace Route and ARPWiz
- Verify network performance with dual ended V-Perf Upload/ Download throughput testing
- Optional Ethernet 10/100/1000-T and 1000-X ports to verify end-to-end throughput performance
- Directional antenna to locate and track a specific AP or client
- Optional dual band 2.4 GHz and 5 GHz spectrum analyzer to easily discover and identify WiFi and non-WiFi interference
- Optional built-in GPS on the MTTplus mainframe to record the location of the test being performed
- Optional built-in Camera on the MTTplus mainframe with automatic bar/QR code to record tested environment and network devices for future reference

Key Features

Discover your Network

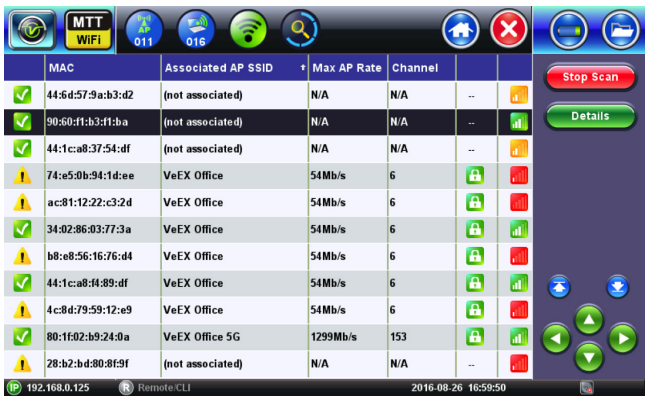
The Air Expert automatically scans the WiFi network for 802.11 a/b/g/n/ac APs and Clients. Results are provided in table and graphical format.

AP Discovery



Scan results include AP detailed capabilities: SSID, BSSID, channels, security, supported data rates, signal and noise levels, SNR, co-channel and adjacent channels AP, BSS load, associated clients. Warning signs alert technicians about AP configuration issues as well as if any measurements go beyond user configurable thresholds. The table view can be sorted by any field in order to help in troubleshooting, while the graphical view provides an easy to understand picture of co-channel and adjacent channel interferers.

Clients Discovery

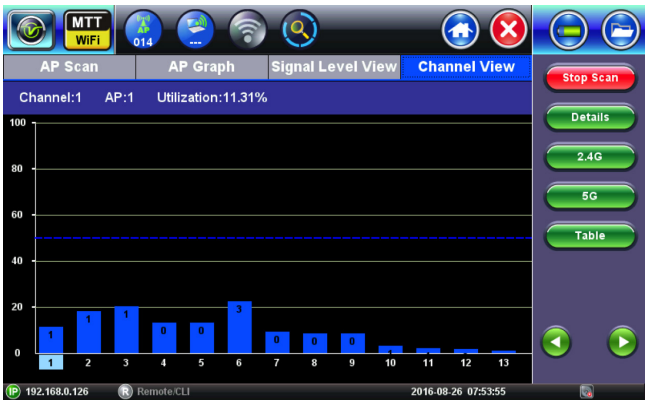


The Air Expert Client scan function monitors all WiFi channels to detect WiFi clients with the SSID they are associated to, as well as non-associated clients (clients not connected to an AP). Network administrators can ensure that the devices are authorized on the network by checking against their MAC address and manufacturer information as well as monitor the client's activity.

Channel Utilization Discovery

With WiFi as a shared medium, all devices on the same channel share air time. An AP located on a channel with active co-channel APs or adjacent channel APs will lead to lower performance as they are competing for the same available air time.

The Air Expert Channel scan function provides a view of channel utilization in graphical and table format to quickly identify channels with high utilization.

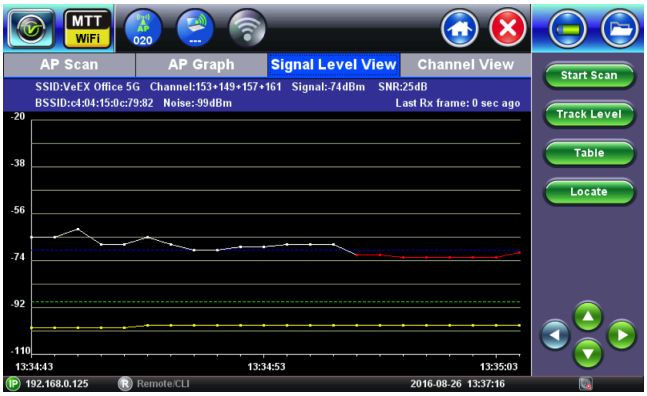


Detailed channel measurements can be sorted by any field including utilization %, number of APs, number of co-channel APs and strongest signal. This information is crucial as technicians need to identify if performance issues are linked to high channel utilization and must quickly decide if reconfiguring the AP to a new channel is advisable.

Survey Your Network

Level Tracking

A required step for any installation is to survey the facility for proper coverage with a site walk through. The Air Expert Level tracking function facilitates this step by providing Signal and Noise levels tracking in graphical and table format.



With user configurable thresholds, it is easy to pinpoint where the Signal or Noise levels fall below acceptable quality and ensure site readiness. With a set of pre-configured and configurable location labels, add location information to your measurements to create a full record of the facility walk through.

Connectivity Testing

To ensure that network connectivity is available, the Air Expert emulates a client and connects to an AP with customer credentials. The interface allows the technician to review association and authentication status, and provides detailed information about network parameters: assigned IP address, Gateway, DHCP server and DNS server addresses.

Network troubleshooting tools Ping and Traceroute verify connectivity to the internet while the ARPWiz application discovers the local network.

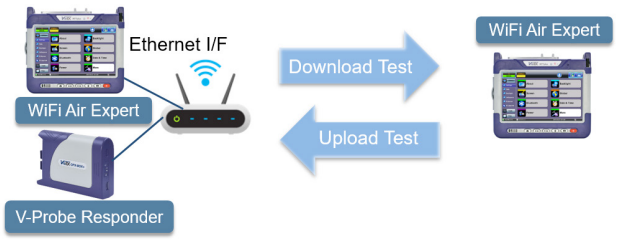
Optimize your Network

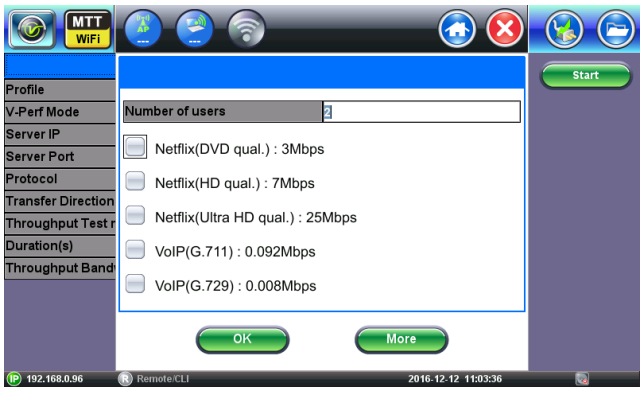
V-Perf Throughput Testing

Surveying the RF environment is a good first step for any installation to determine network performance in terms of coverage and connectivity. But real time and bandwidth-hungry applications like video and audio streaming, place a traffic load strain on the network that cannot be properly assessed with RF metrics alone. The customer's true Quality of Experience (QoE) can only be measured with traffic loads simulating an end user's application data traffic. The Air Expert V-Perf dual-ended upload and download traffic test evaluates the network's performance under load and measures QoE parameters from an end user's point of view.

Technicians can quickly establish whether the achieved upload and download rates meet SLA requirements and readiness for high bandwidth traffic like audio and video streaming, with pre-configured profiles for common applications (Netflix, YouTube, Skype, VoIP....).

V-Perf dual-ended test is compatible with iPerf3 servers, MTTplus Air Expert or companion VeEX Ethernet responders, connected directly on the back of the AP to perform WiFi to Ethernet data throughput tests. The test can also be performed to a cloud-based server, qualifying WiFi and Broadband access bandwidth in one step.





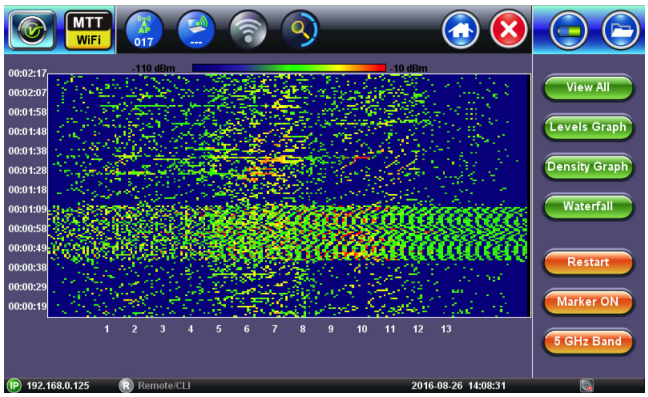
Service calls and end user frustration can often be traced to the common complaint of a "slow network." The Air Expert's V-Perf test can help to unequivocally prove the WiFi network's capacity. With configurable data transmission rate and Pass/Fail threshold, technicians can quickly establish whether the achieved upload and download rates meet SLA requirements and readiness for high bandwidth traffic like audio and video streaming.

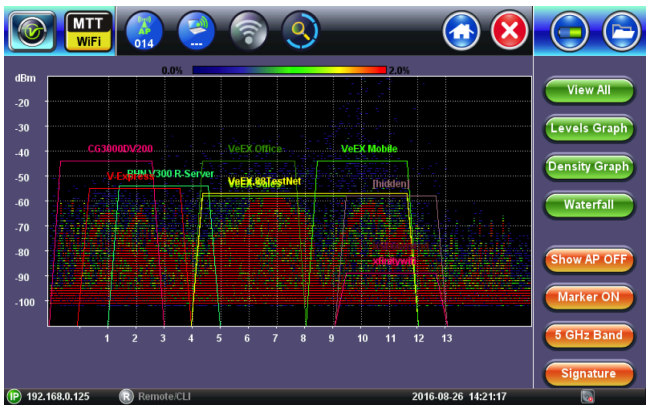
Troubleshoot your Network

WiFi Spectrum Analyzer

With the 2.4 GHz and 5 GHz RF frequency bands open for unlicensed use, WiFi's frequency bands are available for anyone to use. The 2.4 GHz frequency band is especially popular and crowded. It is used by many common RF emitting devices including cordless phones, Bluetooth, Zigbee, baby monitors, wireless audio or security systems. All of these devices constitute sources of non-WiFi interference. They emit frequencies either on a single narrow frequency range like Zigbee, or frequency hopping across the entire spectrum, like Bluetooth, or continuously emitting across the entire spectrum, like a microwave oven. These interferers do not follow WiFi protocol rules, so interference can start while WiFi devices are in the middle of a transmission and last for an unknown duration. In some cases, WiFi will attempt to continue operation in the presence of RF interference by automatically switching to a lower data rate, which slows the use of wireless applications. In the worst case, if the interference source is strong and constant, the WiFi devices will hold communications until the interfering signal goes away completely.

Many highly disruptive and intermittent WiFi performance issues can be traced to non-WiFi interferers. But unless technicians are armed with a specialized spectrum analyzer, they will be powerless in detecting these interference sources since traditional WiFi network scanning tools can only discover 802.11 WiFi devices.



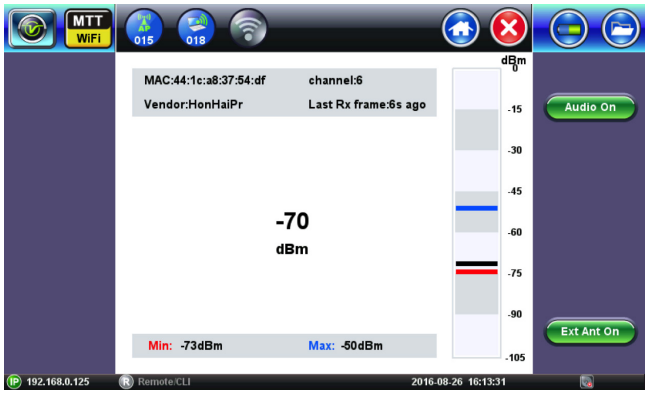


The Air Expert offers a dedicated spectrum analyzer that displays all RF activity – WiFi and non-WiFi interferers – in the 2.4 GHz and 5 GHz bands. The Spectrum Analyzer view allows technicians to visualize interference sources overlapping with the AP under test. The WiFi interference library can also be used to identify interference signatures against a list of known interferers (Cordless phones, Zigbee, Bluetooth, etc.)

Secure your Network

WiFi Locate Function

If suspected rogue APs or Clients are present on the network, the Air Expert locate function can be used to track the physical location of the device. With an external directional antenna, the function monitors the strength of the signal, and reports progress.



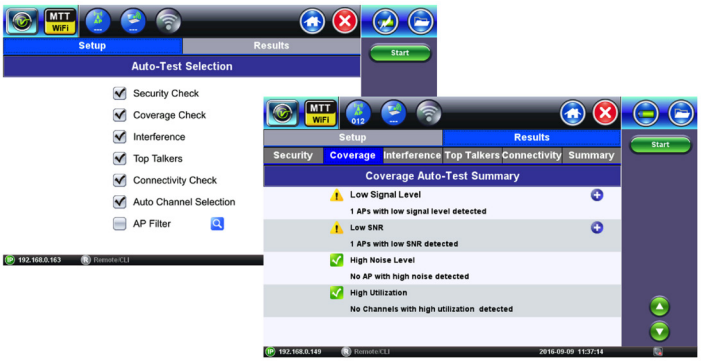
Automate Testing

Auto Test Function

WiFi performance is highly dependent on environmental factors. RF signals can be attenuated or blocked by physical obstacles like large metallic objects or concrete walls, neighboring APs with high traffic load can reduce performance, and non-WiFi interference sources, like cordless phones, video cameras or baby monitors, can disrupt WiFi transmission.

Since environmental factors will vary from location to location, no two installs will face the same challenges. Yet it is important to follow a repeatable install procedure to ensure consistency in the service level provided to the end user.

The Air Expert Auto Test function provides an automated, reliable and repeatable installation routine. With configurable test profiles for consistency, and test results clearly marked with Pass, Fail or Warning status, technicians are provided with an easy-to-use and comprehensive site assessment routine.



Test your Wired Network

Test Interfaces

The Air Expert is optionally fitted with an RJ45 10/100/1000BaseT Ethernet interface and an SFP 1000Base-X interface. This allows technicians to verify or troubleshoot the wired access network and broadband access.

IP Tools

Provides Ethernet and Internet connectivity verification and troubleshooting tools, supports: IPv4 (Static, DHCP) and VLAN. Network troubleshooting tools Ping and Traceroute verify connectivity to the internet while the ARPWiz application discovers the local network.

PoE Test

The Power over Ethernet test function supports emulation of Powered Device and allows technicians to identify the pairs used. This function also measures PoE voltage.

V-Perf Throughput Testing

V-Perf dual ended test is compatible with iPerf3 servers, or an MTTplus Air Expert connected on the WiFi interface to run Ethernet to WiFi data throughput test. The test can also be performed to a cloud-based server, to qualify WiFi and Broadband access bandwidth in one step.

With configurable data transmission rate and Pass/Fail threshold, technicians can quickly establish whether the achieved upload and download rates meet SLA requirements and readiness for high bandwidth traffic like audio and video streaming.

Document your Network

Remote Access

The MTTplus platform offers multiple ways for Remote Control or access to the information remotely (i.e. test results, test profiles, etc.).

The test set can be reached via:

- ReVeal PC software
- Web browser (Web Remote Control)
- VNC® Client
- Management Port Connectivity: 10/100Base-T, Wi-Fi 802.11 a/b/g/n/ac*

Report generation

Test results generation in PDF format

Export test results and profiles via USB memory, Bluetooth, web browser, Data Card or ReVeal companion PC software

GPS Option

With optional built-in GPS on the MTTplus mainframe, Geolocation coordinate can be added to record the location of the test being performed

Advanced Management

This option allow users to append work order information to test results (i.e. Job ID, account, location, comments)

- Compatible with R300 Productivity Server (R-Server)
- Authorized test sets can register with specific VeSion R300 Server
- Test results can be uploaded via LAN, WiFi or cellular data connection

**Requires optional WiFi USB adapter*

Specifications

General

Wireless Standards
- 802.11 a, b, g, n, ac

WiFi data rates
- 802.11 a: up to 54 Mbps
- 802.11 b: up to 11 Mbps
- 802.11 g: up to 54 Mbps
- 802.11 n: up to 450 Mbps
  -BPSK, QPSK,16-QAM, 64-QAM
  -MCS 0-7
  -HT20/40
- 802.11 ac: up to 1.3 Gbps
  -BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM
  -MCS 0-9
  -VHT20/40/80

Operating frequencies
- ISM: 2.400 GHz to 2.4835 GHz
- UNII: 5.170 GHz to 5.825 GHz

MIMO channels
- 3x3:3

WiFi security standards
- WEP
- WPA/WPA2 Personal
- WPA/WPA2 Enterprise

Output Power
- 802.11a: 15dBm@54 Mbps
- 802.11b: 18dBm@11 Mbps
- 802.11g: 15dBm@54 Mbps
- 802.11gn HT20: 13dBm@MCS7
- 802.11gn HT40: 13dBm@MCS7
- 802.11an HT20: 13dBm@MCS7
- 802.11an HT40: 12dBm@MCS7
- 802.11ac VHT80: 10dBm@MCS9

Receiver Sensitivity
- 802.11a: ≤-65dBm@54 Mbps
- 802.11b: ≤-76dBm@11 Mbps
- 802.11g: ≤-65dBm@54 Mbps
- 802.11gn HT20: ≤-64dBm@MCS7
- 802.11gn HT40: ≤-61dBm@MCS7
- 802.11an HT20: ≤-64dBm@MCS7
- 802.11an HT40: ≤-61dBm@MCS7
- 802.11ac VHT80: ≤-51dBm@MCS9

Wi-Fi Antennas
- Internal antennas (3)
  -Frequency range: 2.4 to 2.49 GHz, 4.9 to 5.9 GHz
  -Peak Gain: 3.3 dBi @2.44 GHz,3.8 dBi at 5.2 GHz,5.4 dBi at 5.8 GHz
- External directional antenna (used for locate function only)
  -Frequency range: 2.4 to 2.5 GHz, 5.1 to 5.9 GHz
  -Peak Gain: 5 dBi
  -Polarization: vertical
  -Connector: SMA (female) 50 Ohms

WiFi Spectrum Analyzer (Optional)
- Frequency Range: 2.400 to 2.495 GHz and 5.150 to 5.850 GHz
- Amplitude Range: -100 to -6.5 dBm
- SMA (female) 50 Ohms

802.3 Ethernet test ports (Optional)
- RJ45 10/100/1000Base-T
- SFP 1000Base-X

PoE Testing
- Emulation of Powered Device
- Detect pairs used
- PoE voltage measurement

VeEX
The Verification Experts

VeEX Inc.
2827 Lakeview Court
Fremont, CA 94538 USA
Tel: +1.510.651.0500
Fax: +1.510.651.0505
www.veexinc.com
customercare@veexinc.com

D05-00-122P C00 2016/12