Wireless LAN Analyzer
Technical Overview

J6783A NTC Wireless LAN
J7330A Wireless LAN Analyzer Laptop Pro
J7332A Wireless LAN Analyzer Laptop
J7331A Wireless LAN Analyzer Handheld
The demands of your business have made networks more mission critical than ever. Users need better response time, quicker access, and increased mobility. Nowhere has this fact been more evident than with the explosion of Wireless LAN (WLAN) deployments. Hungry for productivity gains and to streamline business processes users are driving service providers to deploy more access more quickly. When the demand is not met, WLAN’s are installed by users themselves, reeking havoc with network security and reliability.

Agilent’s Network Troubleshooting Center (NTC) and family of Network Analyzer products are available to tame these kinds of seemingly uncontrollable issues. Now with the addition of the Agilent Wireless LAN Analyzers, order can be restored from the chaos that so often accompanies WLAN installations.

Proven in the field by hundreds of leading companies, our solutions address the complete life cycle of the network. From planning and deployment, to daily real-time management and troubleshooting, Agilent Wireless LAN Analyzers ensure that 802.11 networks always maintain impeccable levels of security, performance, and reliability.

Whether the situation calls for mobile surveying and troubleshooting, or 24x7 proactive management of multiple WLANs, Agilent provides the answer.

Agilent provides a complete set of solutions for integrated network health and troubleshooting including both centralized and dispatched WLAN network troubleshooting tools. These WLAN products, combined with NTC, provide users a unique centralized solution for WLAN/LAN/WAN network analysis.
Challenges

Agilent Wireless LAN Analyzers respond to the pressing new challenges that WLAN brings. With this set of centralized and portable solutions, Agilent addresses:

- **Site Survey.** A comprehensive and accurate site survey is essential to a successful deployment. Hidden environmental characteristics can degrade and even completely interrupt service undermining promise return on investment.

- **Security.** Network and data security is now more than ever of utmost importance. While delivering new levels of mobility and productivity WLAN technologies also bring with it new threats and vulnerability.

- **Reliability and Performance Management.** Demand on networks has never been greater and the rollout of complex applications such as VoIP requires a perfectly tuned network.

- **Troubleshooting.** WLANs need to be treated differently that typical Wireline technologies, such as Fast Ethernet. With new security issues shifting and changing standards and infrastructures WLAN requires a 'purpose-built' solution.

Product Summary

The Agilent Wireless LAN Analyzer portfolio includes a variety of tools to fit every use case and customer need. The main products are summarized below before being described in more detail.

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J6783A NTC Wireless LAN</td>
<td>Integrated Enterprise wide 24x7 WLAN management and troubleshooting.</td>
</tr>
<tr>
<td>J7330A Wireless LAN Analyzer Laptop Pro</td>
<td>Dispatched WLAN troubleshooting and analysis - for 802.11a/b analysis. Built specifically for Wi-Fi security, reliability, and performance troubleshooting.</td>
</tr>
<tr>
<td>J7331A Wireless LAN Analyzer Handheld</td>
<td>Same great capability as the J7330A/J7332A in an ultra-portable form factor. (Pocket PC based)</td>
</tr>
</tbody>
</table>
Introduction

The Agilent Network Troubleshooting Center is the first and only solution to fully integrate the ability to manage and troubleshoot the entire network from WAN to LAN and now WLAN. This NTC WLAN application can address the integrity of wireless networks - providing 24x7 monitoring of the Security, Performance, and Reliability of any number of WLANs, and delivering actionable information to management staffs and systems anywhere in the world.

NTC Wireless LAN brings complete knowledge of every Wi-Fi device and channel in the environment regardless of band (802.11a, 802.11b, or 802.11g). Management staff can easily monitor the security measures in use on every device to ensure compliance with established policies, while automatically scanning for dozens of wireless network attacks. In addition to security, NTC Wireless LAN proactively addresses the performance and reliability of the network, without which, the WLAN simply could not meet enterprise standards. Dozens of configurable alarms proactively alert managers to developing issues before they lead to problems. A suite of active testing utilities enable managers to test their infrastructure from any location they choose.

Agilent NTC combines vital network health information from distributed WLAN intelligent sensors, distributed network analyzers, as well as legacy network elements. Each Agilent analyzer is equipped with its own analysis engine purpose-built for the technologies it is managing. In particular the Wi-Fi sensor is able to proactively identify over 60 conditions that can impact the integrity of wireless networks. These sensors bring network intelligence to the edge where it is needed, and provide information and remote troubleshooting to people and systems around the world.

Capabilities

- Intrusion Detection
- Policy Control and Enforcement
- Wireless Performance and Reliability
- One Touch Remote Drill Down
- End-to-End Troubleshooting
- Multi-Mode Coverage 802.11a/b/g
- Infrastructure diagnostic
- Standards based security
- Proactive management
- Local processing ensures enterprise scalability
- Integrated with leading network management consoles
Agilent NTC Wireless LAN is one of the solutions of the Agilent Network Troubleshooting Center. With this new functionality, NTC adds WLAN analysis and troubleshooting to the traditional Wireline testing (Gigabit Ethernet, ATM, etc.). Everything in a single console to quickly pinpoint network problems in either the Wireless or the Wireline side of the network.

The front line of NTC Wireless LAN is manned by strategically placed Intelligent Sensors. These sensors provide around-the-clock coverage of the entire wireless environment including all 802.11a, 802.11b, and 802.11g channels and infrastructure.

Each individual sensor is armed with AirMagnet’s analytical engine, to autonomously monitor the security, performance, and reliability of the network.
Benefits

*Gain Control Over Security Policy*

No issue has defined Wi-Fi more than security. While the past year has welcomed new security protocols that make WLANs as secure as their wired counterparts, ensuring that all users and stations comply with these security measures has been another issue entirely. NTC Wireless LAN Sensors address this gap by auditing and validating the security of every Wi-Fi device in the network, providing managers with an easy process to ensure all users employ the appropriate level of security.

Supported protocols include:

<table>
<thead>
<tr>
<th>WEP</th>
<th>LEAP</th>
<th>PPTP VPN</th>
<th>802.1x</th>
</tr>
</thead>
<tbody>
<tr>
<td>WPA (802.1x)</td>
<td>LEAP</td>
<td>L2TP VPN</td>
<td></td>
</tr>
<tr>
<td>TTLS</td>
<td>TKIP</td>
<td>SSH VPN</td>
<td></td>
</tr>
<tr>
<td>TLS</td>
<td>MIC</td>
<td>IPSEC VPN</td>
<td></td>
</tr>
</tbody>
</table>

*Detect Wireless Intruders and Attacks*

Maintaining internal defenses is only half the security battle. As Wi-Fi has grown, so too have the number and sophistication of wireless attacks. WLAN Sensors have been engineered specifically to counter these threats - scanning the environment for Rogue APs and War-Drivers, Spoofed MAC Addresses, and a host of Denial of Service Attacks unique to Wi-Fi. Sensors send encrypted real-time alarms in response to an attack, allowing staff to respond before the network is impacted.

*Ensure Network Reliability*

In addition to predictable performance, WLANs must be highly reliable before being considered business grade. NTC Wireless LAN addresses this need with a suite of alarms and diagnostics that detect network faults and misconfigurations that can lead to outages in the network. These diagnostics are complemented by active utilities to pin down the sources of connectivity problems in the network.
Scalable Management

**Controlled Centralized System Management**
NTC Wireless LAN aggregates expert information from all WLAN sensors and correlates this data with information from other technologies or applications being managed. As with all NTC applications, this information can be seamlessly integrated into large OSS\NMS systems with its built-in policy-based management capabilities.

**Configuration and User Management**
Maintains configurations for every sensor in the system, allowing IT personnel to tune sensor thresholds appropriately for each location.

**Anywhere, Anytime Integrity Management**
NTC Wireless LAN provides a view of alarms and WLAN health by individual sensor. NTC Console can be run securely whether in a Network Operations Center (NOC), or remotely on a laptop - keeping network engineers connected to the information they need regardless of their location.

**Advanced LAN \ WAN \ WLAN Troubleshooting**
With expert information and the troubleshooting capability of Agilent’s Network and WLAN Analyzers, the most elusive network problems can be quickly isolated and then quickly resolved.

**Remote Drill-Down and Troubleshooting**
One of the most powerful features of the NTC is the ability to drill down directly into an analyzer to solve a network issue. The WLAN sensor operates as any network analyzer and is available for remote troubleshooting with a single click. This allows users to securely connect to a particular sensor from any location, and view detailed information in real-time. Users can view low level data on every channel and device in the area, see alarms, real-time local statistics, and even review packet decodes.

**Remote Troubleshooting and Active Tools**
Using the Remote user interface to WLAN sensors, users can leverage a host of active troubleshooting tools to pinpoint problems in the network. These tools allow the user to remotely test throughput on a particular AP, diagnose connection problems, and perform Layer 3 debugging and end-to-end provisioning. Such remote capability greatly reduces the need to dispatch resources when troubleshooting the WLAN.

**Efficient Use of Network Resources**
NTC and its associated Network Analyzers have been designed with ultimate efficiency in mind. After all, a troubleshooting system that adds a burden to the system is counter-productive. Unlike many systems on the market today that simply capture and forward data to a central server for processing, Agilent Network Analyzers have the analysis system built right in. Agilent's WLAN sensors where created using this paradigm and therefore process locally, sending real-time alarms only when thresholds are reached. Trending data is saved on the sensor, and securely transferred at regular intervals to the NTC, minimizing operational load on the network and servers.
Specifications

**General**

- Supported 802.11 Standards: A, B, G
- Radio Frequency: 2.4 GHz, 5 GHz Bands Concurrently
- Supported Security Standards: 802.1x, LEAP, TKIP, MIC, PEAP, WPA, VPNs
- SNMP Traps: Yes
- Reporter Option: Yes
- Secure Communication: SSL, TLS
- Real-Time Decode: Yes

**Security Management**

**Policy Enforcement**

- AP with WEP Disabled
- Client Station with WEP Disabled
- WEP IV Reused
- Device Using Open Authentication
- AP Unconfigured
- Rogue AP
- Rogue Client Station
- Crackable WEP IV In Use
- Device Unprotected by VPN
- Device Unprotected by 802.1x
- AP Broadcasting SSID
- Ad-hoc Station Detected
- Long EAPRekey Timeout
- Device Using Shared Key Authentication
- Unassociated Station Detected

**Intrusion Detection**

- Spoofed MAC Address Detected
- Device Probing With NULL SSID
- Dictionary Attack in EAP Methods
- Abnormal Authentication Failures
- Denial of Service Attacks
- Association Flood
- Authentication Flood
- EAPOL logoff
- EAPOL start
- EAPOL ID Flood
- EAPOL Spoofed Success
- Deauthentication Broadcast
- Deauthentication Flood
- Dis-association Broadcast
- Dis-association Flood
- RF Jamming

**Performance Management**

- AP With Weak Signal Strength
- Low Transmission Speed
- High Packet Fragmentation Rate
- High Bandwidth Usage
- Missed AP Beacons
- High Speed Transmission Not Supported
- Channel Overloaded by APs
- 802.11 Performance Options Not Supported
- APs With Mutual Interference
- High Mgmt and Control Frame Overhead
- AP Overloaded with Clients
- AP Overloaded by Bandwidth Consumption

**Reliability Management**

- WLAN Hidden Node Problem
- AP System of Firmware Reset
- Station Excessively Switching Between APs
- Packet Error Rate Exceeded
- AP Association Capacity Full
- Channel with Overloaded APs
- DCF and PCF Controls Active at Same Time
- Conflicting AP Configuration
- Channel with High Noise Levels
- High Multicast/Broadcast Traffic
- Ad-hoc Station Using AP SSID
- Station Constantly Probing for Connection

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**Reporter Option:** Yes
**Secure Communication:** SSL, TLS
**Real-Time Decode:** Yes
End-to-End Connectivity
- Mismatched SSID
- Client with Match All SSID
- Mismatched RF Channel
- Mismatched Privacy Setting
- Authentication Failure
- Reassociation Failure
- Possible Equipment Failure
- AP Signal Out of Range
- Mismatched Capability Settings
- Device With Bad WEP Key
- Higher Layer Protocol Problem
- 802.1x Authentication Failure

Tools
- Perform
- DHCP
- Ping
- TraceRoute
- Whois

System Requirements

<table>
<thead>
<tr>
<th>NTC Wireless LAN</th>
<th>Wireless LAN HW Sensor</th>
<th>Wireless LAN SW Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Memory</td>
<td>Operating System</td>
</tr>
<tr>
<td>Windows 2000, XP</td>
<td>64 MB</td>
<td>Windows 2000, XP - PC not included</td>
</tr>
<tr>
<td>Memory</td>
<td>Antenna</td>
<td>Memory</td>
</tr>
<tr>
<td>256 MB Minimum</td>
<td>Omni-directional, 2.4 GHz: 3.0 dbi, 5.25 GHz: 5.5 dbi, 5.75 GHz: 5.0 dbi</td>
<td>128 MB Minimum</td>
</tr>
<tr>
<td>CPU</td>
<td>802.11 Radio Card</td>
<td>Disk Storage</td>
</tr>
<tr>
<td>800 MHz Minimum</td>
<td>Atheros based a/b/g Multi-mode card</td>
<td>20 MB Free Space Minimum</td>
</tr>
<tr>
<td>Disk Storage</td>
<td>10/100 Ethernet Port</td>
<td>Supported 802.11 PC or PCI cards-</td>
</tr>
<tr>
<td>4 GB Free Space</td>
<td>2 with Power Over Ethernet option</td>
<td>Cisco PCM352- Cisco LMC352- Cisco PCI1352- NetGear WAB501</td>
</tr>
</tbody>
</table>
The Agilent Wireless LAN Analyzer Laptop Pro, Laptop, and Handheld are the portable products of the WLAN family. These products, combined with NTC Wireless LAN, offer a complete network troubleshooting and analysis solution for any WLAN environment.

Introduction

Built specifically for Wi-Fi, the Agilent Wireless LAN Analyzer Laptop Pro (802.11a and 802.11b), the Wireless LAN Analyzer Laptop (802.11b), and the Wireless LAN Analyzer Handheld (802.11b) scan security threats and performance faults. Users can view the entire Wi-Fi environment in a single integrated view in real-time.

With the ability to automatically detect and alert on over 50 wireless security and performance conditions, the Wireless LAN Analyzers keep operators on top of potential threats as they develop. Channel, infrastructure, and packet data are delivered through an intuitive user interface - allowing users to spend their time solving problems instead of interpreting cumbersome packet decodes. Additionally, with built-in tools for site-surveying, connection troubleshooting, support for GPS, and all 14 channels used worldwide, the Wireless LAN Analyzers offer the most complete solution for any environment. An easy-to-use interface adapts to the needs of the user. The end result is the industry’s best wireless management tool with a unique combination of superior functionality and usability.
Intelligent Analytical Engine

The Wireless LAN Analyzer Laptops and Wireless LAN Analyzer Handheld are powered by AirMagnet’s™ intelligent analytical engine that helps network professionals stay on top of changes in the network before they lead to problems. This expert system runs continuously in the background automatically collecting network performance statistics, identifying and tracking wireless devices and their distinguishing characteristics, monitoring and analyzing the health of a WLAN, pinpointing WLAN problems, and suggesting potential solutions to network problems.

The most comprehensive view of the network

- Security Management
- Performance Management
- Installation Surveying
- Connection Troubleshooting
- Wireless Administration
WLANs have considerably altered how security is managed in the enterprise. The entire wireless environment must be monitored to ensure each station complies with established security policies. More than 30 wireless threat conditions can be detected.

Rogue AP and Client Detection
Know if an unauthorized 802.11a or 802.11b device is being installed on the network. Wireless LAN Analyzers also include a Find Tool to track down the location of rogue devices after they are identified.

Wireless Denial of Service Detection
Know when intruders attempt to deny network access, by saturating WLAN channels or flooding AP Association Tables. Multiple alarms designed to counter emerging strategies such as 802.1x DoS attacks, RF Jamming, and Association and Authentication DoS attacks.

AP Impersonation Detection
Indicates an intruder attempting to invade the network by emulating (or spoofing) a registered MAC address 802.1x/LEAP/TKIP/MIC security validation. WLANs can be made far more secure by leveraging new security protocols. These protocols are supported allowing users to discover wireless devices that are unprotected.

Unconfigured Access Point
Indicates that an access point on the network is configured with a default SSID, a potential security threat.

WEP Alarms
Discover stations operating with WEP disabled, using crackable WEP IV keys, and others.
Performance Management

Effective WLAN administration requires complete control over every access point operating in the environment—including how each is configured. The addition of unauthorized nodes, misconfigured devices, as well as the movement of nodes to alternate locations, can have a significant impact on network performance and reliability.

Agilent Wireless LAN Analyzer Laptop Pro, Laptop, and Handheld products help network professionals stay on top of the performance curve, with an Expert Performance Analysis Tool that monitors both 802.11a and 802.11b networks and identifies the potential source of performance problems as they are happening.

Network Summary View
Provides a simultaneous view of all 14 802.11b channels and all 8 802.11a channels, with the ability to drill down into detail on any node in the network.

Performance Alarms
Monitoring the WLAN environment for more than 20 wireless conditions that can cause performance problems, alerting the user when such conditions are detected. Users are immediately aware of high packet error rates, hidden node problems, AP interference, low transmission rates, and many others.

Channel Bandwidth Monitor
Tracking of channel interference, multicast/broadcast storms, poor RF signals, bridge loops, and low transmission rates. RF signals can be displayed in dBm or %.

Channel Interference and Noise Monitor
Monitoring of channel throughput and alerts when a channel is overloaded with Access Points or Stations. It also provides an alert if a channel is experiencing interference from an unidentified source.
When a WLAN is not designed and installed properly, the consequences can be chronic user complaints about dead spots and low transmission rates as well as connectivity issues and increased network latency. The Agilent Wireless LAN Analyzers give network professionals the necessary tools to plan and install their 802.11a and 802.11b infrastructure.

Comprehensive Drilldown Functions
Allows the detailed investigation of a single Access Point or Station, to evaluate signal quality and various configuration options with the flexibility to drill down to the level of information required by the task.

Channel Signal Strength/Quality Tools
Helps identify and isolate co-channel interference from unknown access points and other potential sources, which helps prevent potential conflicts or performance issues.
Auto Discovery Tools
Catalogues all SSIDs, access points, and stations on a network—both authorized and unauthorized—to give installers an accurate picture of the WLAN infrastructure.

Network Site Survey Tool
Eases the collection of RF signals and performance data, so network nodes can be placed for maximum functionality.

Export Function
Allows survey data to be exported for management reporting.

Antenna Signal Alignment Meter
Provides fast response time signal tracking to achieve the optimal signal reception in line-of-sight bridge-to-bridge alignment.

Connection Wizard
Without intelligent tools, the process of troubleshooting a problem connection can be an incredible drain on time and resources. To help expedite the resolution of these issues, the Wireless LAN Analyzers incorporate an integrated Intelligent Connection Diagnostics Utility.

Connection Mismatch Tool
Identifies any mismatch of SSIDs, WEP keys, transmission rates, or RF channels—a major source of connection problems.

Failure Analysis Tool
Helps isolate the source of a transmission failure including authentication, re-association, speed mismatch, and hardware failures.

Real-Time Packet Capture and Decode Function
Captures and decodes data packets and displays them in real time. Additionally, the Agilent Wireless Analyzer allows users to capture up to 64MB of data and up to 2MB for the Wireless LAN Analyzer Handheld for later evaluation.

Trace File Playback
Replays previously captured network packets, device information, and alarms in a time-stamped, sequenced trace file—allowing network administrators to identify and pinpoint transient or intermittent network problems.

Basic LAN Troubleshooting Tools
Helps isolate connectivity problems selectively to and from a specific access point; including DHCP Renew, Ping, TraceRoute, Whois, and DNS Lookup.
**Wireless Administration**

The Agilent Wireless LAN Analyzers are organized the way that security and network administrators work, vastly simplifying routine Wi-Fi administration tasks. The Analyzers organize information in a logical hierarchical structure, to give users the information that is most useful, with the control and flexibility to access more detailed information on demand.

*Real-Time Network Status*

Available through a series of performance alarms that makes it easy to stay on top of the changes that can pose performance problems or lead to service disruptions.

*Network Profile Tools*

These tools help administrators keep track of multiple WLAN environments through Configuration Profiles and Address Books for logical name mapping.

*Smart Size*

The Analyzers automatically adjust to make the best use of available screen space - alternately condensing or exposing information in response to screen size while minimizing distracting scrollbars.

*Simultaneous Graphs*

Allow users to easily select and view up to 6 real time graphs to see key relationships in network statistics.
<table>
<thead>
<tr>
<th>System Requirements</th>
<th>J7330A Wireless LAN Analyzer Laptop Pro</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>• Windows XP or Windows 2000</td>
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<tr>
<td></td>
<td>• 128 MB of RAM (256 recommended)</td>
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<tr>
<td></td>
<td>• 20 MB of free disk space for installation</td>
</tr>
<tr>
<td></td>
<td>• Available CardBus PC Card Type II slot for 802.11 a/b dual support</td>
</tr>
<tr>
<td></td>
<td>• Supported NICs: Netgear WAB501, Proxim Orinoco 8460</td>
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<thead>
<tr>
<th></th>
<th>J7332A Wireless LAN Analyzer Laptop</th>
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<tbody>
<tr>
<td></td>
<td>• Windows XP or Windows 2000</td>
</tr>
<tr>
<td></td>
<td>• 28 MB of RAM (256 recommended)</td>
</tr>
<tr>
<td></td>
<td>• 20 MB of free disk space for installation</td>
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<td>• Available CardBus PC Card Type II slot for 802.11 a/b dual support</td>
</tr>
<tr>
<td></td>
<td>• Supported NIC: Cisco 350 Series PCMCIA</td>
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<tr>
<th></th>
<th>J7331A Wireless LAN Analyzer Handheld</th>
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<tbody>
<tr>
<td></td>
<td>• Pocket PC 2000 or 2002 Operating System (2002 recommended)</td>
</tr>
<tr>
<td></td>
<td>• Strong ARM or Xscale processor based system</td>
</tr>
<tr>
<td></td>
<td>• 32MB of RAM (64 MB recommended)</td>
</tr>
<tr>
<td></td>
<td>• 2 MB of free disk space for installation</td>
</tr>
<tr>
<td></td>
<td>• 8 MB of free memory space</td>
</tr>
<tr>
<td></td>
<td>• Available PCMCIA card slot</td>
</tr>
<tr>
<td></td>
<td>• Supported NIC: Cisco 350 Series PCMCIA</td>
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</tbody>
</table>
Warranty
90-day media replacement warranty

Ordering Information
J6783A  NTC Wireless LAN
J7333A  Wireless LAN SW Sensor (for NTC Wireless LAN use)
J7334A  Wireless LAN HW Sensor (for NTC Wireless LAN use)
J7330A  Wireless LAN Analyzer Laptop Pro (802.11 a/b)
J7332A  Wireless LAN Analyzer Laptop (802.11b)
J7331A  Wireless LAN Analyzer Handheld 802.11b

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