Agilent E6474A-740 Wireless Application Measurement Software

Data Sheet

Measure the performance of your data services

- Tests include Video, MMS, SMS, http, FTP, email, and WAP
- User experience measurements include; TCP throughput, Server Response Time, Authentication Time, and Data Download Time
- Amalgamate your results with traditional drive-test data for powerful troubleshooting analysis

Agilent Technologies

The Agilent Technologies E6474A Network Optimization Platform is a scalable, integrated, air interface measurement system. This system is used to support integration and maintenance of networks, obtain comprehensive call performance and quantify the end-user's experience for both voice and data.

The Wireless Application Measurement Software (WAMS) option (E6474A-740) enables you to perform service testing on, for example, Video (optional), MMS, SMS, email, WAP, http and FTP application. This real application testing allows you to roll-out your wireless data services with the confidence that all the elements in the delivery chain have been validated. It provides an extremely flexible test sequencer engine and user experience measurements that include TCP throughput, Server Response Time, Authentication Time and Data Download Time.

These measurements enable you to quickly identify data network problem areas and highlight whether they are for example RF, backhaul or internet service provider related. Troubleshooting of the wireless entities is further enhanced through post analysis consolidation of WAMS measurements with traditional drive-test RF, QoS and protocol messaging results.

Wireless Application Measurement Software is independent of technology and can be used to test the performance of Wireless Networks as well as Wireless LAN and LAN.

About this document

This document gives detailed information on the features of the Agilent E6474A-740 Wireless Application Measurement Software (WAMS). It is set out in three parts:

- **Part 1** provides an overview of the system.
- **Part 2** describes a basic test sequence structure.
- **Part 3** provides detailed descriptions of each test and lists your computer requirements.

Part 1: Overview

E6474A System software

The E6474A Wireless Network Optimization Platform software is a user-friendly Windows-based application designed to operate on a laptop PC. It is scalable through selection of licensing options and receiver and phone hardware, for simultaneous data and trace measurements. The application software controls the hardware devices to make and record user-selected measurements and protocol messaging. A GPS receiver is used to obtain positional information. The system can also be configured for use with a pen-tablet computer for indoor measurements. Logged data can be exported to mapping or post processing software for analysis.

Refer to the E6474A Wireless Network Optimization Platform Configuration Guide, literature number 5988-2396EN, for detailed information on available options.

E6474A Wireless Application Measurement Software (WAMS) Overview

- E6474A-740 Wireless Application Measurement Software license

Wireless Application Measurement Software (WAMS) is a software application that measures end-to-end performance of wireless data networks, from the users perspective. It can be used in a drive-test environment, as well as a stationary environment and with commercial or engineering/trace devices. The following are some of the key features in WAMS:

- Application that allows easy creation, scheduling, and running of data tests.
- Multiple wireless networks can be measured simultaneously.
- Allows integration of GPS for accurate time and location stamps.
- Exports measured parameters to TXT or CSV file formats.
- Dedicated post-processing support on Actix Analyzer and Actix DV for Agilent
- Interfaces with QoS Manager DMS report engine, which allows near real time performance monitoring of multiple probes.
- Allows easy creation and integration of custom made and third party tests.

WAMS Architecture

A test sequence in WAMS is a collection of items that are arranged in a hierarchical tree structure. The following tests and nodes constitute the test sequence:

- Service model
- Device node
- Device free node
- Parallel sequence
- Collection of service tests, which include MMS_TEST, HTTP_TEST, FTP_TEST, EMAIL_TEST, WAP_TEST etc.

Each of the nodes and tests has an associated Properties View, which allows a high degree of flexibility in the control of loops, delays, device configurations and settings that are specific to test types.

These elements are further discussed in Part 2 and Part 3 of this document

WAMS Lite

E6474A-745 WAMS Lite provides a low priced entry-point for basic data service testing. The WAMS Lite option supports upgrades to video telephony, streaming and MOS tests. This option is a subset of the complete WAMS option (E6474A-740). WAMS Lite provides the following tests:

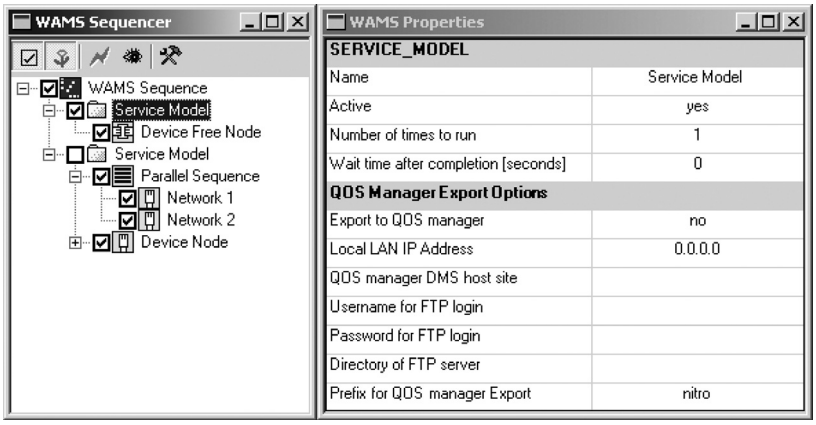
- AT Commands
- DOS Commands
- Voice Test
- Video Connectivity
- FTP Test

Part 2: WAMS Test Sequencing Structure

Service Model

The Service Model is the parent of a test sequence and can schedule multiple Device Node, Device Free Nodes, Parallel Sequences and related Tests.

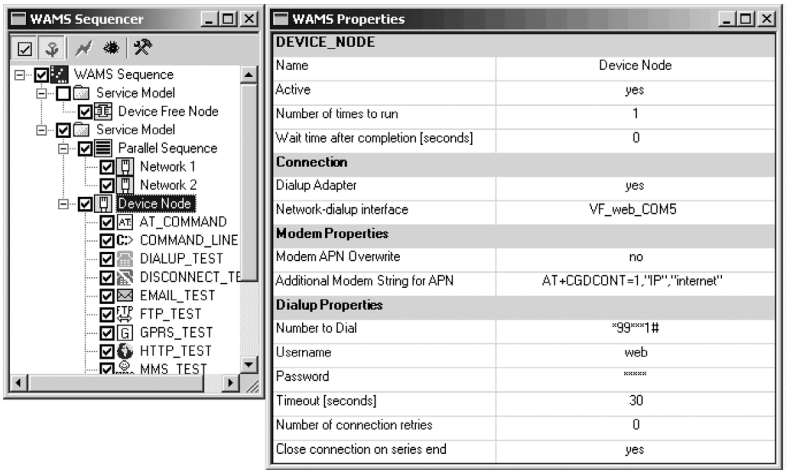
A number of Service Models can be set-up on the sequence but only one can be activated at a time. Properties can be set-up on the Service Model to control scheduling information such as number of times to run a Service Model and the time to wait after it has completed. It is also where the QoS Manager interface is setup, if applicable, enabling test result files to be transferred to your QoS Manager database, which in turn can give regular updates of measurement status via a web interface. For more information on the Agilent QoS Manager, contact your local Agilent Operations Support Systems (OSS) representative.



Device Node

The Device Node serves as a parent to tests that are driven from a device, as specified in the associated properties.

A device can be any data capable entity available on the PCs connections, for example a data enabled phone (accessed via dial-up networking) a LAN interface or a Wireless LAN interface. The Properties of the Device Node enables the selection of LAN or Dial-up Adapter and the related dialup settings, including the ability to overwrite the Modem's APN string, which, for example, controls the switching between WEB and WAP access. It also controls the outer loop and wait time scheduling of the 'child' tests. DIALUP_TEST, HTTP_TEST and FTP_TEST are typical tests that are children of Device Node.



Device Free Node

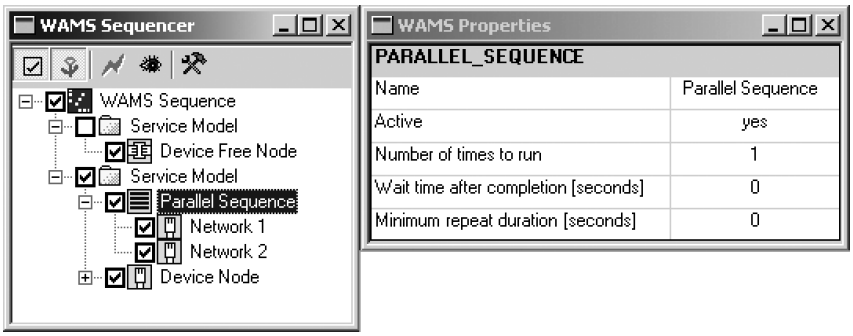
This node is used for containing tests that already include direct dialup and connection control information. For example SMS or MMS tests.

Parallel Sequence

The Parallel Sequence serves as a parent to a collection of devices or tests that need to be run simultaneously.

All the immediate children of Parallel Sequence will be run simultaneously as parallel processes. Typically you can have multiple Device Nodes underneath one Parallel Sequence, in which case the multiple Device Nodes will run simultaneously. This methodology can be used when testing multiple networks simultaneously. Tests can also be sequenced under the Parallel Sequence running from the same Device Node or Device Free Node settings.

The Parallel sequence properties view gives control of number of repeats, delay after sequence and repeat duration timing.



Tests Overview

A number of tests are available, which enable measurements to be made on specific wireless services. Refer to Part 3 for details of what tests are available, their control parameters and what measurements they capture. Tests must all be configured, via their associated Parameter View, before a test sequence is run. Tests generate user traffic in the network and log the performance of the service. Tests are placed as children of Device Nodes, Device Free Nodes or Parallel Sequences.

Status View

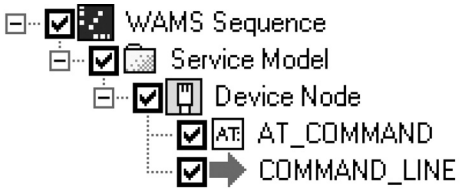
The status of the sequence is available from the WAMS Status View. This indicates which test is currently being run, it's pass/fail status and any fail messages.

Windows standard tools such as copy and paste are available to allow quick creation of comprehensive test sequences. For example a Service Model or a Device Node along with the associated tests and settings can be copied and pasted, then parameters changed to suite your needs.

Test Progress

A section of the WAMS sequencer view displays the test progress as each test is executed.

When a test sequence is run using Live or Logging Mode, the active test in sequence is highlighted with a red arrow.



As each test is run, the current test is highlighted and it’s status is displayed along with the test results.

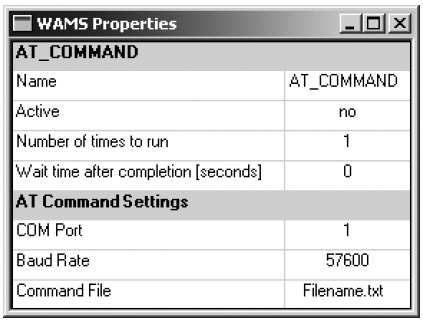
Name	Iteration	Passed	Failed
AT_COMMAND	1 of 1	0	1
COMMAND_LINE	1 of 1	0	0

Part 3: WAMS Tests Detail

The following tests are supplied as standard with the WAMS E6474A-740 option. Each test is configured using the WAMS properties view and when the test sequence is run, a set of measurement results are produced.

Part three lists the properties and generated measurement results for each test.

AT Command Test

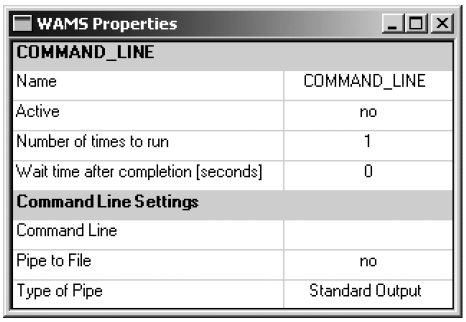


The AT Command test lets you send a text file containing valid AT phone control commands to the attached phone

There are no measurements made using this test. However, depending on the AT commands sent to the phone, other tests and measurements may be effected by this test and the phone configuration.

Command Line Test

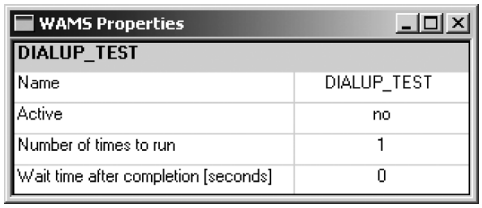
The COMMAND_LINE test operates and performs standard DOS command line commands. For example you may wish to run a 3rd party test program. Using this test you can start and pass control options.



There are no measurements made using this test. However, depending on the commands sent to the DOS prompt, other tests and measurements may be effected by this test.

Dialup Test

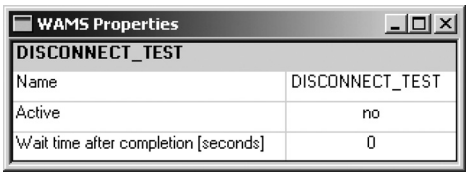
The Dialup test initiates the dialup configuration that is set up in the device node. This test is used to measure how well a dialup action is performed.



Measurement	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
ISP Availability	This measures the availability of the ISP. Availability is reported is 100 if the ISP answered the call. Availability is reported is 0 if the call was not answered.
ISP ConnectTime	The time, in seconds, from the start of the call to the point that the modems synchronized.
ISP AuthenticationTime	The time, in seconds, to send the login and password and receive authentication. LoginTime is reported as NoValue if the login is not successful.
ISP NetworkConnectTime	The time, in seconds, from the start of the network projection phase to the completion of the network connection.
ISP TotalConnectTime	The sum, in seconds, of ConnectTime, AuthenticationTime, and NetworkConnectTime.
IP Address	The IP address of the dialup connection that you have been granted.
ConnectStatus	The connect status code is 100 if successful. Other numbers specify an unsuccessful result.

Disconnect Test

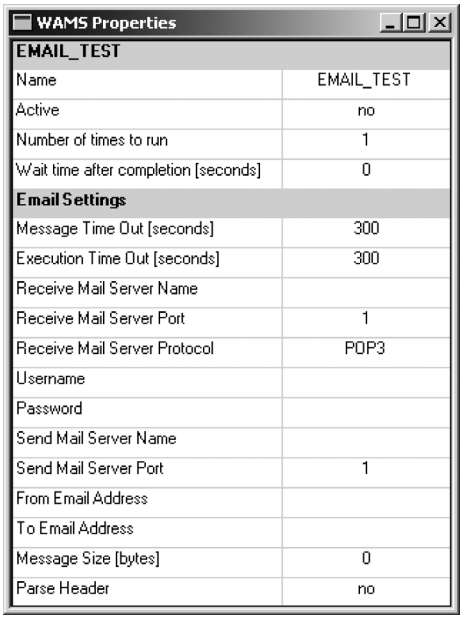
The Disconnect test terminates the dialup configuration that was set up in the device node. This test is used to measure how well a disconnect action is performed.



Measurement	Description
ISP DisconnectTime	The total time taken by the system to disconnect the connection and completely release the hardware.

E-Mail Test

The Email test is a round trip Email test that is designed to measure the performance of Email as it travels through the mail network from a specified mail Sender (for example a SMTP server) to a specified mail Server (for example a POP3 or IMAP server). The round trip time of a message is calculated from the time when it is sent to the time it is received.



Send Measurements	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format.
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
Availability	Indicates whether the SMTP service is available for use by the test. If the SMTP server responds to the connect request with a “250” in its reply message, success is indicated by 100%, else it is 0%.
TotalResponseTime	The summation of the TcpConnectTime, ServerResponseTime, TransmissionTime, and SMTP management time.
DnsTime	The time to complete a name resolution call using the name resolution method specified for the Agent system. This is usually a DNS lookup.
TcpConnectTime	The time to complete a TCP connect call to the

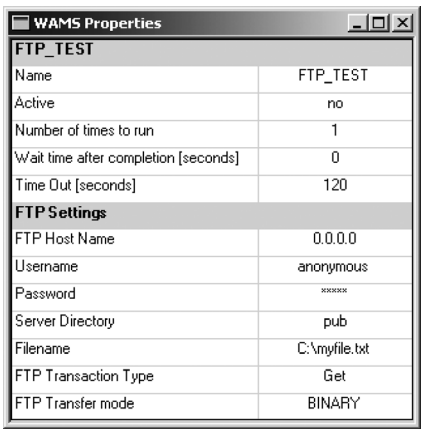
	specified SMTP server.
ServerResponseTime	The time to read the response from the SMTP server to the TCP connect call.
TransmissionTime	The time to transmit the test message to the SMTP server. If the No Send option is set, this will be set to 0.

Receive Measurements	**Description**
Availability	Indicates whether the POP3 or IMAP service is available for use by the test. If the server responds to the connect request with a positive response in its reply message, success is indicated by 100%, otherwise the service is considered unavailable and this is indicated by 0%.
TotalResponseTime	The summation of the DnsTime, TcpConnectTime, ServerResponseTime, AuthenticationTime, MsgRetrievalTime, and MailboxMgmtTime.
DnsTime	The time to do a name resolution on the host name.
TcpConnectTime	The time to complete a TCP connection to the specified SMTP server.
ServerResponseTime	The time after TCP connection call to the response from the server.
AuthenticationTime	The time to authenticate the User and Password at the server.
RetrievalTime	The time to download the mail in the mailbox.
ManagementTime	The time to do management actions such as search, retrieve, and delete, on the mailbox.
MessagesReceived	The number of messages read by the test that are identified as a message sent by this test.
TestCompleted	Indication on the test completed status. 100 means the test passed, 200 indicates the test passed but with warnings.

FTP test

The FTP test is designed to test the availability, response time and transfer rate of an FTP server. Two types of transactions can be performed by this test:

- FTP Get: Performs file download. A file in the server location can be specified.
- FTP Put: Performs file upload.

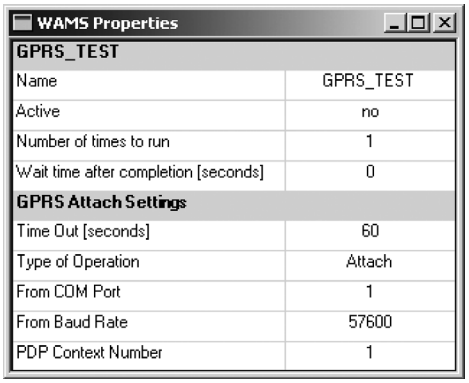


Measurement	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format.
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
Availability	Indicates that the test was able to successfully establish a connection to the server and receive an acknowledgement.
TotalTestTime	Time to get or put the file including the log-in time and authentication time.
DNS_Time	Time taken to establish the DNS connection.
ConnectTime	The time to establish a TCP socket connection to the FTP server.
ResponseTime	The time to receive the initial acknowledgement from the FTP server, indicating that the server is ready to accept FTP requests.
AuthenticationTime	The time to authenticate the user with the FTP server (send the username and password, and get

	an acknowledgement from the server).
PutTime	Time to send the file to the server.
GetTime	Time to retrieve the file from the server.
PutRate [kbps]	Data transfer rate for the upload to the server.
GetRate [kbps]	Data transfer for the download from the server.
TestCompleted	Indicates whether all steps of the test completed as would be expected for a correctly running FTP server.

GPRS Attach Test

The GPRS Attach tests the GPRS connection. Tests include the GPRS attach, GPRS detach, PDP context activate, and PDP context deactivate.



Measurement	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format.
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
CommandExecutionTime	The time from sending the AT command until the network provides an OK response.
TotalTestTime	Total test time measured from the beginning of the test to the end of the test, including any processing time.
TestCompleted	Indicates either that the test completed without any errors (100 percent), or that the test encountered one or more errors and could not complete successfully (0 percent).

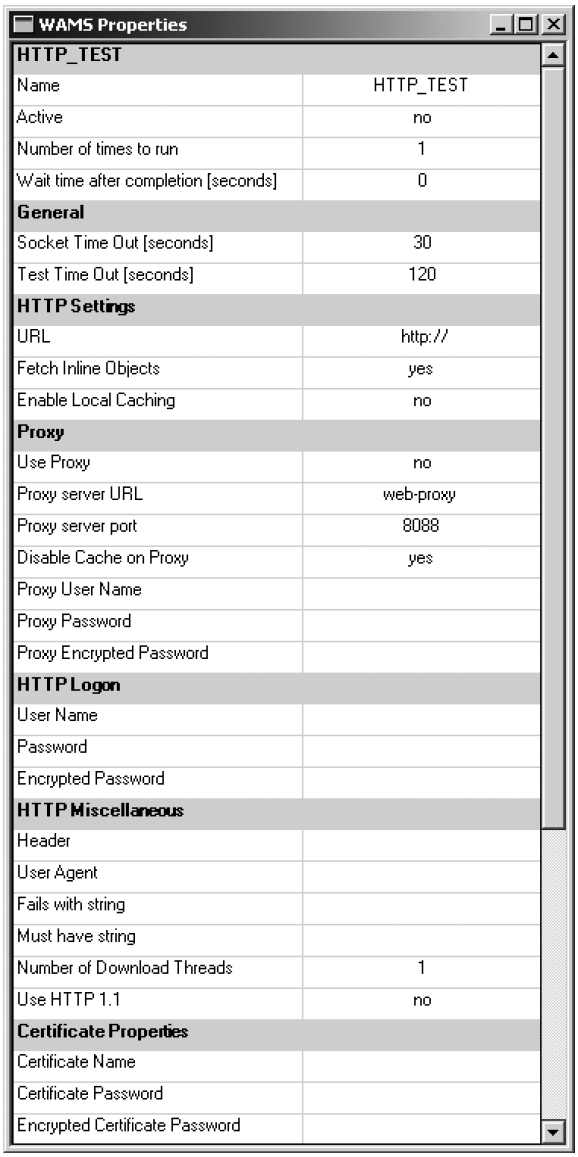
HTTP Test

The HTTP test downloads a Web page from a server in a manner similar to a Web browser. However, the HTTP test differs from a browser primarily because the test then takes measurements that are indicators of the QoS provided by the HTTP service.

The HTTP test issues an HTTP GET request to the chosen web server for the desired page. It then reads the HTTP response from the server. If the response to the GET is redirected, then the test follows that redirection, sending a GET for the new page. The test maintains and manages its own list of HTTP Cookies that are sent as part of the HTTP requests.

The HTTP test can be used for both normal (HTTP) and secure (HTTPS) web pages. HTTP 1.1 is supported; persistent connections and pipe-lined requests are used when connecting to HTTP/1.1 servers.

When connecting to HTTP/1.0 servers, multiple parallel threads are used, each with its own socket. Java script is not parsed by the test. Therefore, embedded objects defined in javascript will not be loaded. The test adheres more closely to the HTTP and HTML specifications than most web browsers. This feature can help identify problems that may be hidden by certain Web browsers.



Measurement	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
Message 1 and 2	Messages retrurned from the HTTP test.
StatusCode	Lists the status code of the HTTP test. For example 100 means the test is OK, 200 means there are warning messages, 400 means there are RAS errors.
DataSize	Lists the size in bytes of data that has been measured by the HTTP test.
DataRate	The rate at Kbits/sec which data from the Web page is returned.
Availability	Indicates that the Web is available to service HTTP requests. For example, if the server responds with a valid status code that is less than or equal to 499, then the Availability will be 100 percent. If the server responds with unknown responses, failure to connect, or status codes that are greater than or equal to 500, then the Availability will be 0 percent.
TotalResponseTime	Sum of DnsTime, TcpConnectTime, AdditionalTcpConnectTime (when threads equals one), and DataTransferTime. ServerResponseTime is not explicitly added into TotalResponseTime because it is a component of DataTransferTime.
DnsTime	Time of DNS name lookup. Seconds
TcpConnectTime	Time to establish the initial TCP connection with the service.
RedirectTime	Time to read the initial response from first server and open a socket to the new URL when the initial page is redirected.
ServerResponseTime	Time from when the request is sent until the first byte of the response is read. Seconds
DataTransferTime	The time to load the Web page and all the embedded objects.
OtherTCPConnectTime	Sum of the connect time for multiple downloads of objects.

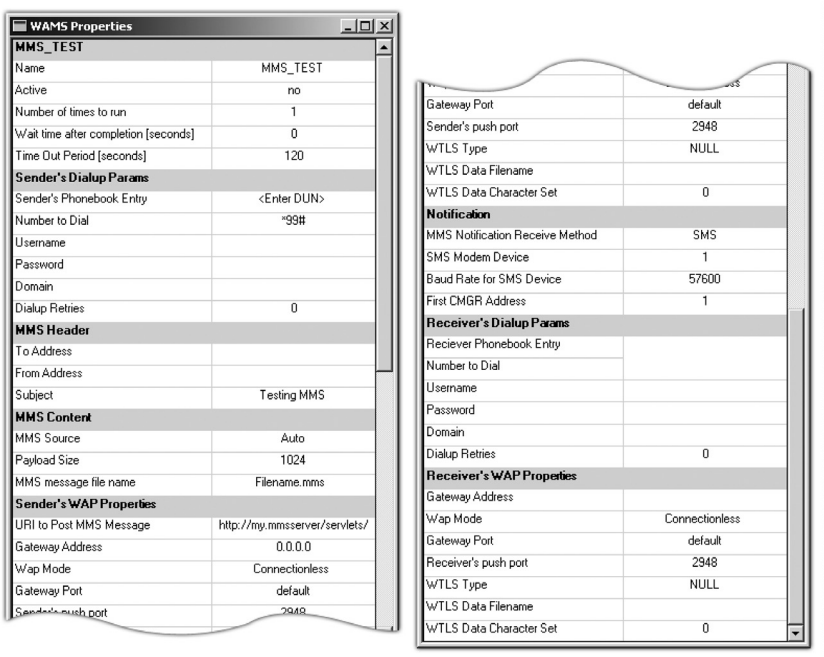
TestCompleted	Indicates either that the test completed without any errors (100 percent), or that the test encountered one or more errors and could not complete successfully (0 percent). This measurement applies to the initial Web page only, not to embedded objects.
InitialDownLoadTime	Time to download the initial Web page.
ObjectDownLoadTime	Time to download embedded objects (frames and images).
ObjectErrors	The number of embedded objects that had download errors.
Redirections	TCP and redirected web pages.
Frames	A count of the embedded HTTP frames.
Images	A count of the images used on the page.
ImagesDownload	A count of the images downloaded during the test.

MMS Test

The MMS test is used to measure the availability and performance of a MMS service. The test currently supports MMS transactions over the WAP 1.2.1 and 2.0 protocol. MMS tests must meet the following criteria.

- Phone SIMs should be MMS capable.
- Phones need to be data enabled.
- The receiving phone must:
    - Support SMS PDU Mode
    - Not be MMS enabled (preventing automatic data download to the phone).

Currently MMS tests are not supported on CDMA networks.

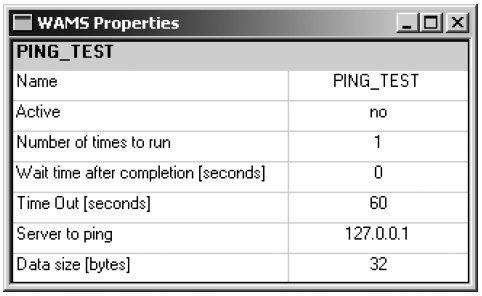


Measurement	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format.
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.

TxDialupConnectTime	Time to connect to senders IP.
TxDialupIpAddress	IP address of transmitting mobile connection.
TxDialupDisconnectTime	Time for transmitting mobile to disconnect from ISP.
TxRedirectTime	URL redirection time for transmitting mobile, if URL redirection occurs.
TxGatewayConnectTime	WAP gateway connection time for transmitting mobile if WAP mode is connection oriented.
TxMmsPostStatus	Status of POST operation. Details of the codes given here can be found in the Open Mobile Alliance (http://www.openmobilealliance.org).
TxUploadSize	Size of transmitted MMS message.
TxUploadTime	Time to transmit MMS message. This is measured as the time transmission starts until a WAP response is received.
TxUploadRate	MMS message upload rate
PushNotifyTime	Time elapsed from: Receipt of WAP response on senders phone. to Receipt of PUSH notification on the receiver phone.
RxDialupConnectTime	Time to connect to receiver IP.
RxDialupIpAddress	IP address of receiving mobile connection.
RxDialupDisconnectTime	Time for receiving mobile to disconnect from ISP.
RxRedirectTime	URL redirection time for receiving mobile, if URL redirection occurs.
RxGatewayConnectTime	WAP gateway connection time for receiving mobile if WAP mode is connection oriented.
RxMmsGetStatus	Status of GET operation. Details of the codes given here can be found in the Open Mobile Alliance (http://www.openmobilealliance.org).
RxDownloadSize	Size of received MMS message. This is usually slightly different from the sent MMS message.
RxDownloadTime	Time to download the MMS message.
RxDownloadRate	Data rate on the receiver phone.
MmsAcknowledgeIndSendTime	Time to send M-Acknowledge.Ind message for the receiving MMS message.
TotalTestTime	Total test time measured from the beginning of the test to the end of the test, including any processing time.
TestCompleted	Indicates whether the test completed successfully or not. 100 indicates that the test completed successfully, 200 means there were warning messages.

PING Test

The PING test lets you perform a standard ping to a known IP address. This test lets you change the data size to be sent as part of the PING test.



Measurements	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
Availability	This measures the availability of the PING'd IP address. 100 if the address was available 0 if the address was not available.
RoundTripTime	Time to Live. This is a variable included with a sent packet and marks how long that packet should live within the network before the network is allowed to discard it. Normally the variable is decremented with each network hop and/or every second, whichever comes first. When the variable reaches 0 the packet is discarded. Variable range 1-127, default 27.
TestCompleted	Lists the status of the completed test. 100 means the test completed with no problems, 200 means the test completed but there were warning messages, 0 means the test failed to complete.

SMS Test

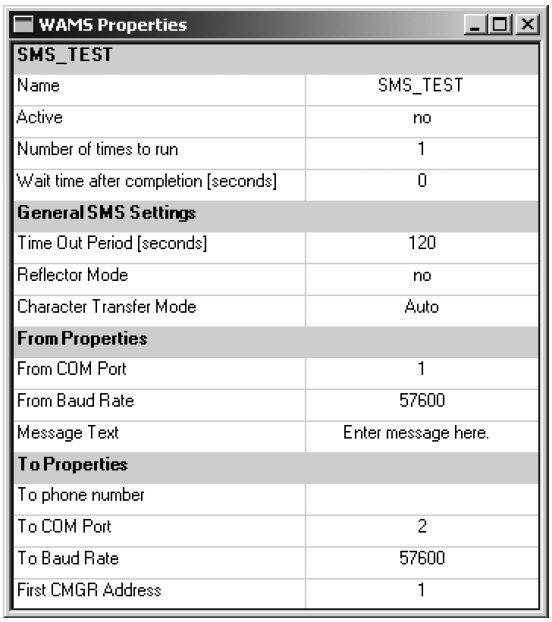
SMS test is used to measure the availability and performance of the SMS service. In order for this test function properly, the phone must strictly support the GSM 7.05 and GSM 7.07 standards. Currently SMS tests are not supported on CDMA networks.

The test supports both the Text mode.

The test supports three types of configurations:

- One phone sends SMS to itself.
- One phone sends SMS to another phone connected to the same PC.
- The source phone sends SMS to a reflector phone connected to a different PC at a different location, which will reply back to the source phone.

For the third configuration (reflector mode), there can be a reflector mobile connected to a different computer (possibly at a different location). This requires a second PC running the E6474A software running the SMS_REFLECTOR module. This module listens to any incoming SMS message, and once received, it replies back to the sender with the received time stamp attached to the message. The sender then receives that message and calculates the round trip time.



Measurements	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.

Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
SendTime	Time taken to send the message to the network.
ReceiveTime	Time taken to receive the message from the network, once the message was sent.
RedirectTime	Time taken for the reflector phone to send the message back to the original phone (only for reflector mode).
TotalTime	This is the time for the SMS message plus any compatibility checking.
Accuracy	Accuracy of the received message (between 0 and 100).
TestCompleted	Lists the status of the completed test. 100 means the test completed with no problems, 200 means the test completed but there were warning messages, 0 means the test failed to complete.

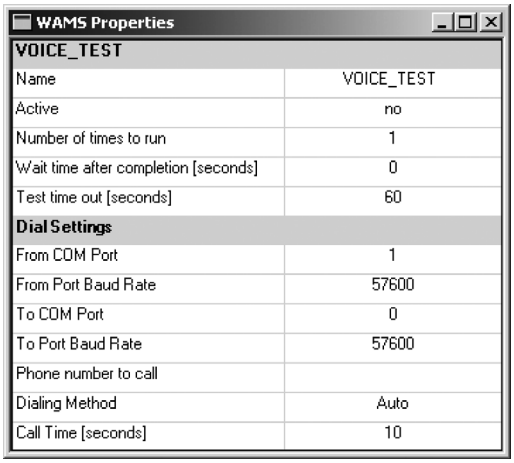
Voice Test

Voice test is a test for measuring the availability of voice service. It does not measure and analyze the voice quality. It does measure service availability, blocked and dropped calls, and call holding time.

There are two test configurations:

- Two phones, one calling the other.
- One phone calling an auto-answer number.

Phones used in this test must support the ITU-T V.25ter dial commands as specified in the ETSI GSM 7.07 standard.



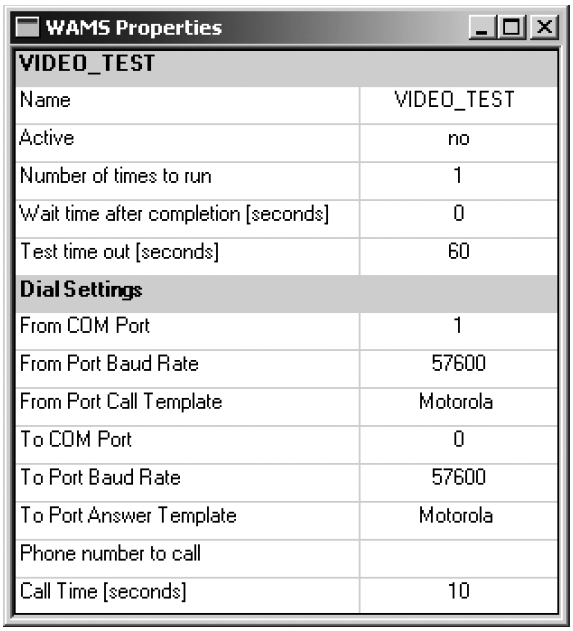
Measurements	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
CallSetupTime	Time taken to initiate the call.
CallHoldingTime	Time period over which the call was held.
BlockedCall	100 if the call could not be initiated. Otherwise 0.
DroppedCall	100 if the call was dropped during the call period. Otherwise 0.
TestCompleted	100 if the test was completed before timing out. Otherwise 0.

Video Connectivity Test

This test allows you to verify the ability to establish a video call between two phones connected to your drive-test PC.

The test currently supports the Motorola A835 phone. Phones are controlled over their modem ports.

This test operates in the same way as the existing voice connectivity test.



Measurements	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
Call Setup Time	The time, in seconds, from the first simulated key-press until the TO phone answers the call.
Call Holding Time	Time period in seconds over which the call was held.
Blocked Call	If the call is blocked, 100 if the call cannot be set-up, otherwise 0.
Dropped Call	If the call is dropped, 100 if the test was completed before timing out. Otherwise 0.

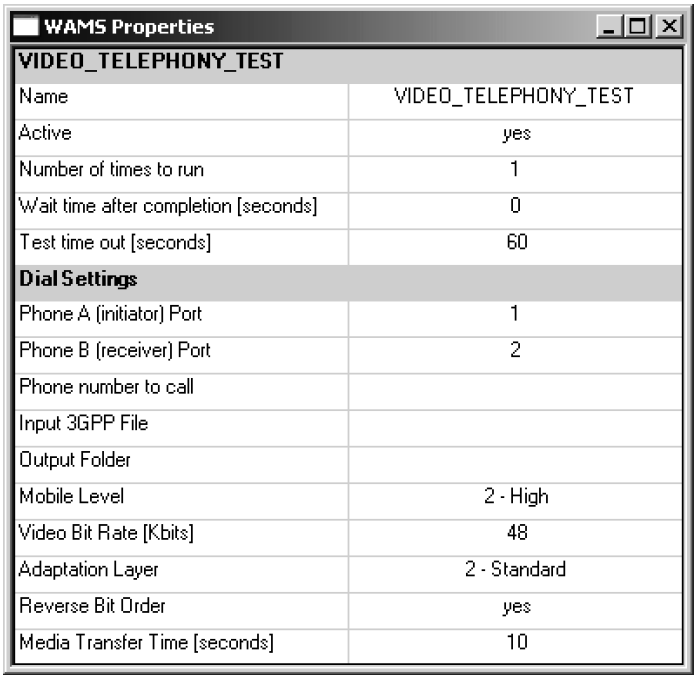
TestCompleted	Lists the status of the completed test. 100 means the test completed with no problems, 200 means the test completed but there were warning messages, 0 means the test failed to complete.

Video Telephony Test (optional)

This test allows you to verify the connection and transmission of video and audio data between two mobiles.

To perform video telephony testing, two compliant mobile devices are connected to your PC. The two mobiles establish a 64K circuit switched call before pre-defined video and audio streams are sent between the mobiles. The PC makes measurements during the transfer and reports at the end of the test. Received files can be saved for review on completion of all tests.

Note: Only one video telephony test can be performed at a time. Video telephony tests can not be configured into a parallel sequence.

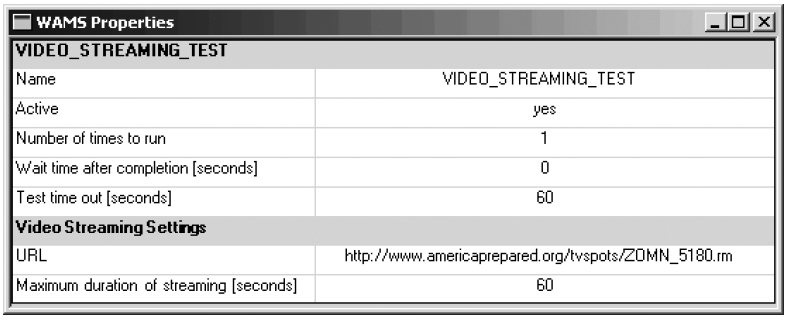


Measurements	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Device	
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
Call Setup Time	The time, in seconds, to establish the multimedia Circuit Switched data call.

Media Transfer Time	Time period in seconds over which the call was held and media was transferred.
Total Response Time	The time in seconds from the start of call establishment to the end of the call.Call Setup Time + Stream Setup Time + Transfer Time
Stream Setup Time	Time in seconds after the CS call is established to the point when the audio/video data can be sent over the connection. Includes master and slave negotiation time and mux setup.
Round Trip Delay	Average round trip delay time over the time data was transfered (seconds).
Average Audio Bit Rate	Average kbps for audio data transfer.
Maximum Audio Bit Rate	Highest kbps for audio data transfer.
Minimum Audio Bit Rate	Lowest kbps for audio data transfer.
Average Video Bit Rate	Average kbps for video data transfer.
Maximum Video Bit Rate	Highest kbps for video data transfer.
Minimum Video Bit Rate	Lowest kbps for video data transfer.
ML Parity Error Rx	Total count of mobile parity errors detected on A-side (basic error detection).
ML Parity Warning Rx	Total count of mobile parity warnings detected on A-side.
Control CRC Error Rate	% of CRC errors during H.324M control channel protocol transfers.
Lost Audio Packets	Number of audio SDUs lost during transmission from B-side to A-side.
Audio CRC Error Rate	% of CRC errors during H.324M audio channel protocol transfers.
Lost Video Packets	Number of video SDUs lost during transmission from B-side to A-side.
Video CRC Error Rate	% of CRC errors during H.324M video channel protocol transfers.
Total Audio Rx	Total Audio bits received
Total Video Rx	Total Video bits received.
Blocked Calls	Indicates whether the call was blocked. 100 means the call was blocked. 0 means the call was not blocked.
Dropped Call	Indicates whether the call was dropped. 100 means the call was dropped. 0 means the call was not dropped.
Test Completed	Lists the status of the completed test. 100 means the test completed with no problems. 200 means the test completed but there were warning messages. 0 means the test failed to complete.

Video Streaming Test

This test provides timing, data rates and error measurements on a video streaming file downloading from a specified URL. The video and audio output are available from a pop-up window on the laptop during the test (this feature is not available during playback). Real Player® must be installed and configured to enable this viewing feature.

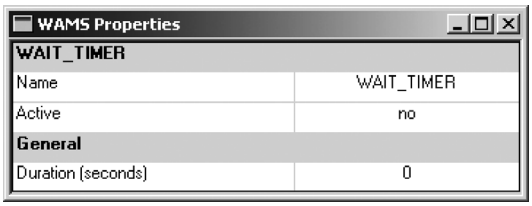


Measurements	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
NetworkConnectionTime	Time to setup the network connection. The counter starts when the test starts and ends once the network connection established. (milliseconds)
Error Code	Displays a unique error code. This code can be used to highlightz reasons for the streaming test failure.
TotalPacketReceived	Number of packets received during the test. This is a measurement of network transmission quality and network transmission rate.
TotalPacketLost	Number of packets received during the test. This is a measurement of network transmission quality.
BufferTime (ms)	Time to fill up the buffer before the stream starts playing. The counter starts when first data packet is received. (milliseconds). The default buffer size is 256KB.
MaximumBitRate	Maximum transmission rate in bps throughout the test. This is a measurement of network transmission rate.

MinimumBitRate	Minimum transmission rate in bps throughout the test. This is a measurement of network transmission rate.
AverageBitRate	Average transmission rate in bps throughout the test. This is a measurement of network transmission rate.
StreamSetupTime (ms)	Time to establish a stream with the server. The counter starts right after network connection established and ends when the stream is established. (milliseconds)
RebufferCount	Number of re-buffer's that occur throughout the test. The counter counts whenever there is buffering congestion.
TotalStreamDuration (ms)	Total duration of video streaming. The counters starts when first packet is received and ends when the video streaming test is stopped or finished. (milliseconds)
MaximumJitter (ms)	Maximum inter-arrival time of packets throughout the test. This is a measurement of the network transmission rate. (milliseconds)
MinimumJitter (ms)	Minimum inter-arrival time of packets throughout the test. This is a measurement of the network transmission rate. (milliseconds)
AverageJitter (ms)	Average inter-arrival time of packets throughout the test. This is a measurement of the network transmission rate. (milliseconds)
1st Streaming Rate (bps)	Highest percentage of packets is transmitted using this streaming rate.
2nd Streaming Rate (bps)	2nd highest percentage of packets is transmitted using this streaming rate.
3rd Streaming Rate (bps)	3rd highest percentage of packets is transmitted using this streaming rate.
4th Streaming Rate (bps)	4th highest percentage of packets is transmitted using this streaming rate.
5th Streaming Rate (bps)	5th highest percentage of packets is transmitted using this streaming rate.

Wait Test

Use this 'test' to set a delay period in the test sequence. This is useful if you have external programs running and you wish to wait for them to complete.



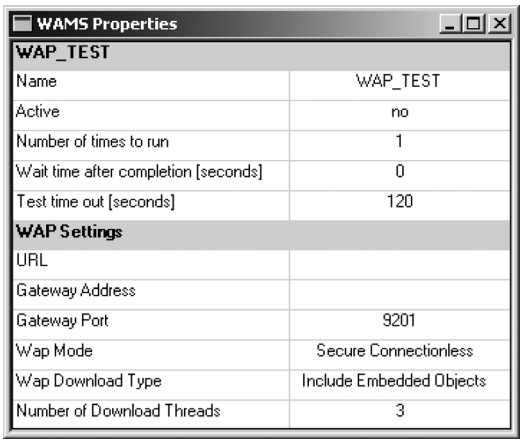
There are no measurements reported for this test action.

WAP Test

WAP test is an important test in the mobile environment due to the widespread use of WAP-based technology. The WAP test downloads a web page from a server in a manner similar to a WAP browser. However, the WAP test differs from a browser because the test takes measurements that are indicators of the QoS provided by the WAP service.

The WAP test connects to the specified WAP Gateway (proxy), and issues a WAP GET request to the chosen web server for the desired web page. It then reads the response from the server. If the response to the GET is redirected, then the test follows that redirection, sending a GET for the new page.

The WAP test supports WAP Version 1.2.1 and WAP 2.0.



Measurements	Description
Test Type	The type of test being made.
Version	Indicates the version of the test program being run.
Name	Indicates the name of the test. If no changes have been made in the sequence tree, the name defaults to the test type label.
Date	The date of when the test was run. MM/DD/YYYY.
Time	The time of when the test was run. 24 hour format
Latitude	The latitude that the test was run at.
Longitude	The longitude that the test was run at.
Success ID	A numerical value of showing the test success state. 0 means the test passed. 2 means the test passed but with warnings.
Availability	100% if the Gateway and the URL responds to connect and GET actions, otherwise it is 0%.
TestCompleted	100% if the GET operation succeeds. Otherwise, it is 0%.
TotalResponseTime	Sum of GatewayConnectTime, DataTransferTime, and Disconnect Time.
GatewayConnectTime	Time the test takes to establish connection with the WAP Gateway.

DataTransferTime	Time taken to download the Web page.
DataTransferRateEncoded	Transfer rate calculated with the encoded data size.
DataTransferRateDecoded	Transfer rate calculated for the decoded data.
ValidPageContent	This reports whether the page content was valid, 100 means the page content was OK, 200 means the page content had warning messages.
EncodedSize	Size of the encoded data.
DecodedSize	Size of the decoded data.
GatewayDisconnectTime	Time taken to disconnect from the WAP Gateway.
DiagnosticStatus	Status returned by the WAP Web page.
InitialDownloadTime	Time taken to download the main WML page.
ObjectDownloadTime	Time taken to download objects embedded in the main page.
EmbeddedObjectErrors	Number of errors occurred in attempting to download embedded object.
GatewayRedirectionTime	Time taken for redirection of the Gateway, if any.
URLRedirectionTime	Time taken for redirection of the URL.
EmbeddedObjectCount	Number of embedded objects downloaded.

Computer hardware requirements

The Agilent E6474A system requires a PC. The PC requirements differ depending on the hardware configuration and on which parameters are being selected.

Recommended PC Specifications:

- Windows® 2000 or XP Pro SP2(inc XP for Tablet PC)
- 1GHz PIII, 512MB RAM
- Two USB Ports
- 20GB hard disk
- CD-ROM drive recommended for installation
- 1024 x 768 display resolution minimum

www.agilent.com/find/contactus

For more product information
Visit our website at:
www.agilent.com/find/E6474A

Additional literature
For further information refer to:-

Indoor Wireless Measurement System PO (5988-8691E)

Agilent E6474A Wireless Network Optimization Platform Configuration Guide	(5988-2396EN)
Indoor Wireless Measurement System Product Overview	(5988-8691E)
E6473B Direct Connect Hub Product Overview	(5988-8177EN)
Agilent Wireless Data Measurement Product Overview	(5980-2310E)
E6474A GSM/GPRS Data Sheet	(5988-5904EN)
E6474A cdma2000 Data Sheet	(5988-6195EN)
E6474A W-CDMA/UMTS Data Sheet	(5988-3027EN)
Agilent Data Service Assurance (DSA Product Overview	(5989-0469EN)
SASE Product Overview	(5989-0347EN)

Product information subject to change without notice.

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