

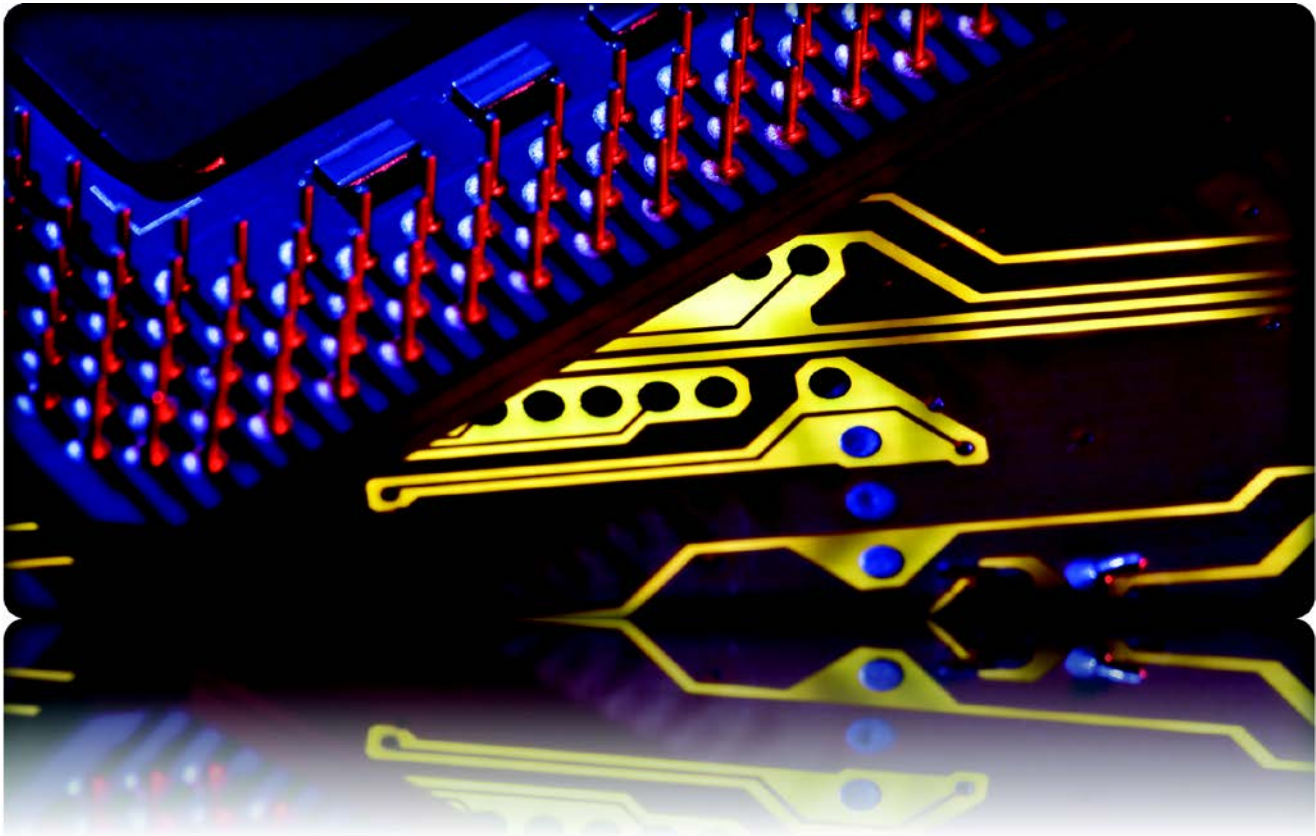


Eurosoft

computer reliability solutions

QATM

Test Descriptions



Assuring Computer Service Reliability

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Eurosoft PC Reliability Solutions

QA Test Descriptions

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Introduction

The purpose of the QA Test Descriptions manual is to provide you with an understanding of the specifics involved in running Test Modules. The test descriptions include information about each of the tests, test settings (parameters), error codes that may be returned and possible causes of failure.

The term "QA+WIN" is used throughout this document as generic coverage for:

- The integrated PC Builder diagnostic program PCB-Client;
- The standalone diagnostic program QA+Win;

These test programs use the same test descriptions: however, they have different user interfaces and functionality.

Not all components maybe supplied with every deliverable.

Document Structure

The first table that follows lists each Test Group, its mnemonic, number and name, and the tests it can provide. Tests requiring Eurosoft test hardware are indicated with an (L) after the test name. Interactive tests (which must be run in interactive mode) are indicated with an (I). Tests which are unavailable under WinPE are listed with the suffix "NPE".

The next table lists general Error Codes that may be returned by the tests.

The test descriptions in the following sections are arranged numerically by group number and conform to a uniform generic structure. Each section starts with a general overview of the group and the devices it contains. Following this is a table that lists all the tests in the group and summarises the main requirements for the test to run. An 'x' in the 'I' column indicates the test must be run in Interactive mode as it requires operator interaction or feedback. An 'x' in the 'E' column indicates that specific Eurosoft hardware (i.e. a loopback plug) is required to run the test. An 'M' indicates a media requirement. The next columns indicate which operating systems the test is available under (an 'x' indicates the test can be run under that operating system).

The next table 'Parameters' lists, for each test that has them, the available parameters, their Default, Min and Max values and any explanatory notes. To avoid unnecessary duplication notes are only given against the first occurrence of the parameter in the table. In some parameters the default or limit may depend on the specific system under test, in these cases the value is given as 'SDP' (System Dependant Parameter).

Following Parameters are the individual test descriptions which generally also include an estimate of how long the test will take to run.

Finally for each group there are two tables giving the group specific error codes that the tests may return and a 'Troubleshooting' table that lists possible causes of the errors.

Test Results

The overall result of each test will be one of five values:

- Passed: the test ran to completion and no error was found.
- Failed: the test ran but an error was found.
- Skipped: the test was skipped by the operator.
- Aborted: the test was aborted by the operator.
- Not Available: the system has determined the test cannot be run; this is neither a pass nor fail.

If 'Failed' or 'Not Available' the error code will give details of the cause of the failure or the reason the test was not available.

Note: Some tests will populate extra information when a test completes. Where the extra information returns a completed proportion of the device, the Decimal System is used when converting between multiples of units i.e. a KB is 1000 Bytes. Only in the case of Memory the Binary System is used i.e. a KB is 1024 Bytes.

Test Group	Group Name	Tests
LPT - 201	LPT	301 - Data Port 302 - External Loopback (L)
MEM - 1001	Memory	301 - Quick 302 - Pseudo Random Data 303 - Walking Bit Left 304 - Walking Bit Right 305 - Inverse Walking Bit Left 306 - Inverse Walking Bit Right 307 - Checkerboard 308 - Bit Stuck High 309 - Bit Stuck Low 310 - Pseudo Random Address 311 - Microtopology
NI2 - 2211	Network	301 - Configuration 302 - IPv4 Connection
HDN - 2601	Hard Drives	301 - Butterfly Seek 302 - Random Read 303 - Linear Read 304 - S.M.A.R.T Status 305 - Imminent Failure 306 - Extended Butterfly 307 - Extended Random Read 308 - Extended Linear Read
MD2 - 2911	Modem	
USB - 3101	USB	301 - Detected Devices (L)
FDN - 3301	Floppy Drives	301 - Butterfly Seek 302 - Linear Read 303 - Read/Write 304 - Media Change (I) 305 - Write Protect (I)
MON - 3501	Monitor	301 - Red Purity (I) 302 - Green Purity (I) 303 - Blue Purity (I) 304 - Mesh (I) 305 - Inverse Mesh (I) 306 - White MEME (I) 307 - Green MEME (I) 308 - Tonality (I) 309 - Grid (I) 310 - LCD Dead Pixel (I)
FRW - 4401	FireWire	301 - IEEE1394 (Firewire)
SER - 4501	Serial Ports	301 - Configuration Registers 302 - Quick Loopback (L) 303 - Baud Rates (L) 304 - Sustained Loopback (L) 305 - Priority Transmit (L)
RMM - 5301	Removable Media	301 - Linear Read 302 - Random Read

Test Group	Group Name	Tests
SY2 - 5411	System	301 - Stress Test 302 - Sleep Test (I) 303 - Hibernate Test (I)
PRC - 5501	Processor	301 - Core Instruction Set 302 - Floating Point Instruction Set 303 - MMX Instruction Set 304 - SSE Instruction Set 305 - SSE2 Instruction Set 306 - SSE3 Instruction Set 307 - SSE 4.1 Instruction Set 308 - SSE 4.2 Instruction Set 309 - SSE 4A Instruction Set
AU3 - 5611	Audio	301 - Soundplay (I) 302 - Audio Connection (L) 303 - Loopback Count (NPE L) 304 - Advanced Quality (NPE L)
VI2 - 5701	Display Adapter	301 - Linear Memory (NPE) 302 - Microtopology Memory (NPE) 303 - Chaotic Addressing Memory (NPE) 304 - Hardware Acceleration (NPE)
CAP - 5901	Video Capture	301 - Capture Driver 302 - Composite Capture Driver (NPE) 303 - S-Video Capture Driver (NPE) 304 - TV Capture Driver (NPE) 305 - RGB Capture Driver (NPE) 306 - Capture (I NPE) 307 - Composite Capture (I NPE) 308 - S-Video Capture (I NPE) 309 - TV Capture (I NPE) 310 - RGB Capture (I NPE)
BAT - 6101	Battery	301 - Charge (I) 302 - Discharge (I) 303 - Voltage 304 - Stress
OPT - 6201	Optical	301 - Linear Read 302 - Random Read 303 - Advanced Movement 304 - Media Erase 305 - Directory Write 306 - ISO Image Write 307 - Media Eject
BIO - 6401	Biometric	301 - Get Passport Properties (I NPE) 302 - Create and Get Data (I NPE)
MO2 - 6701	Motherboard	301 - Northbridge 302 - Southbridge 303 - CMOS Clock 304 - CMOS Checksum 305 - CMOS Battery
OPS - 6801	Operating System	301 - File Details

Test Group	Group Name	Tests
HWM - 6901	Hardware Monitor	301 - System Temperature 302 - CPU Temperature 303 - CPU Core Temperatures 304 - CPU Fan 305 - System Fan 306 - +12 Voltage 307 - -12 Voltage 308 - +5 Voltage 309 - -5 Voltage 310 - +3.3 Voltage 311 - -3.3 Voltage
SSD - 7001	Solid State Drives	301 - Linear Read 302 - Random Read 303 - S.M.A.R.T.
RAI - 7101	RAID	301 - Linear Read
TCH - 7201	Touch Screen	301 - Quick Grid (I) 302 - Advanced Line (I) 303 - Pointing Accuracy (I)
INP - 7301	Input Peripherals	301 - Advanced Keyboard (I) 302 - Keyboard LED (I) 303 - Quick Mouse (I) 304 - Mouse Button (I) 305 - Movement (I) 306 - Quick Keyboard (I)

System Error Codes

Error Code	Name
0x30/3FF	Memory Allocation Error
0x31/3FF	Parameter read error
0x32/3FF	Parameter validation error
0x33/3FF	This test is not available on your OS
0x34/3FF	This test requires interactive mode
0x35/3FF	The specified test was not found
0x36/3FF	Could not get nearest colour
0x37/3FF	No testable devices were detected
0x38/3FF	Attribute read error
0x39/3FF	Test run failure

201 - LPT

Overview

This is a test group for Parallel Ports. Parallel Ports (sometimes called Line Print Terminal or Local Print Terminal ports) are an almost obsolete style of peripheral interface, superseded by USB and FireWire. The tests verify the performance of the parallel ports as they transmit data, handle interrupts, and perform handshaking with external devices.

Loopback plugs are required for certain tests in order to provide a controlled environment.

Ensure that the parallel port is enabled in the system BIOS.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Data Port				x	x	x	x	x	x	x
302	External Loopback		x		x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
302	1	TestErrorLoopbackDataBit	1	1	8	

Descriptions

301 - Data Port

This test verifies that data can be transferred to and from the data port registers. The base address is determined from the global base address parameter. This test tests the internal portions of LPT; it does not test LPT connections.

Test Time: 5 seconds

302 - External Loopback

This test tests the connections to the back of the system case and header pins.

Test Time: 5 seconds

Error Codes

Error Code	Name
0x00/3FF	The port test failed
0x01/010	The loopback test failed

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF 0x01/010	The paralell port test failed. This could be due to a faulty device, incorrect data pin or missing loopbacks.

1001 - Memory

Overview

This is a group that tests physical memory.

100% of the memory cannot be tested due to certain hardware devices and driver pointers that load in the Windows® environment. The memory between 641K and 1024K is not tested, as this is where BIOS and other system resources reside. After any test is executed the system maybe slow to respond as the Windows® OS has been reduced to a minimum amount of memory. Any subsequent tests maybe slow to respond whilst windows recovers the memory therefore it is recommended this test is executed last.

If you are executing 32 bit Windows® diagnostics the maximum amount of tested memory is 2GB. It is recommended all external programs are closed whilst executing this test. Any interface running the test will slow down dramatically in response.

Note: If the user tries to stop the running of a memory test or the entire group of tests when the system is busy, there may be a delay in the response.

Note: The Pseudo random seed is shown twice in the table with the maximum value depending on platform. Only one will be valid and used.

Note: If testing with a duration, for all tests this should be greater than 59 seconds.

Tests

Test	Name	I	E	M	Windows ® XP	Windows ® Server 03	Windows Vista®	Windows ® Server 2008	Windows ® 7	Windows ® 8	Windows ® PE
301	Quick				x	x	x	x	x	x	x
302	Pseudo Random Data				x	x	x	x	x	x	x
303	Walking Bit Left				x	x	x	x	x	x	x
304	Walking Bit Right				x	x	x	x	x	x	x
305	Inverse Walking Bit Left				x	x	x	x	x	x	x
306	Inverse Walking Bit Right				x	x	x	x	x	x	x
307	Checkerboard				x	x	x	x	x	x	x
308	Bit Stuck High				x	x	x	x	x	x	x
309	Bit Stuck Low				x	x	x	x	x	x	x
310	Pseudo Random Address				x	x	x	x	x	x	x
311	Microtopology				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	60	0	604800	Time to run the test
	2	Coverage	100	1	100	Percentage of maximum testable memory to test
	3	EnableCaching	TRUE	FALSE	TRUE	Specifies whether the cache should be enabled for memory tests
302	1	Duration	60	60	604800	
	3	EnableCaching	TRUE	FALSE	TRUE	
	4	PseudoRandomSeed	0x0	0x0	0xFFFFFFFF FFFFFFFF	32/64 bit maximum value parameter maximum will be set depending on platform
	4	PseudoRandomSeed	0x0	0x0	0xFFFFFFFF	
303	1	Duration	60	0	604800	
	2	Coverage	100	1	100	
	3	EnableCaching	TRUE	FALSE	TRUE	
304	1	Duration	60	0	604800	
	2	Coverage	100	1	100	
	3	EnableCaching	TRUE	FALSE	TRUE	
305	1	Duration	60	0	604800	
	2	Coverage	100	1	100	
	3	EnableCaching	TRUE	FALSE	TRUE	
306	1	Duration	60	0	604800	
	2	Coverage	100	1	100	
	3	EnableCaching	TRUE	FALSE	TRUE	
307	1	Duration	60	0	604800	
	2	Coverage	100	1	100	
	3	EnableCaching	TRUE	FALSE	TRUE	
308	1	Duration	60	0	604800	
	2	Coverage	100	1	100	
	3	EnableCaching	TRUE	FALSE	TRUE	
309	1	Duration	60	0	604800	
	2	Coverage	100	1	100	
	3	EnableCaching	TRUE	FALSE	TRUE	
310	1	Duration	60	60	604800	
	3	EnableCaching	TRUE	FALSE	TRUE	
	4	PseudoRandomSeed	0x0	0x0	0xFFFFFFFF FFFFFFFF	
	4	PseudoRandomSeed	0x0	0x0	0xFFFFFFFF	

Test	Param	Name	Default	Min	Max	Note(s)
311	1	Duration	60	0	604800	
	2	Coverage	100	1	100	
	3	EnableCaching	TRUE	FALSE	TRUE	

Descriptions

301 - Quick

Writes each 32\64 bit data location with 0xA and verifies that it was written correctly.

302 - Pseudo Random Data

This test writes a Pseudo Random pattern into memory and verifies that it was written correctly.

303 - Walking Bit Left

Walks a 1 through a BYTE of 0's from Right to left shifting it 1 bit at a time.

304 - Walking Bit Right

Walks a 1 through a BYTE of 0's from Left to Right shifting it 1 bit at a time.

305 - Inverse Walking Bit Left

Walks a 0 through a BYTE of 1's from Right to Left shifting it 1 bit at a time.

306 - Inverse Walking Bit Right

Walks a 0 through a BYTE of 1's from Left to Right shifting it 1 bit at a time.

307 - Checkerboard

Writes each 32\64 bit data location with 0xA and verifies that it was written correctly.

308 - Bit Stuck High

Writes each 32\64 bit data location with 0 and verifies that it was written correctly.

309 - Bit Stuck Low

Writes each 32\64 bit data location with 0xf and verifies that it was written correctly.

310 - Pseudo Random Address

Writes a randomly selected 32\64 bit data item with the start seed value. When this has been done the number of times equal to the amount of memory, verifies that the data is correct. This is done 3 times, rotating the seed left once each time. The special address line straddle testing is not performed.

311 - Microtopology

This test uses a complex mathematical addressing method designed to stimulate physically adjacent bit cells, effective even where the precise physical arrangement of the device is unknown. Having proved itself in the field as an exceptionally effective test, this test has also proven to be very sensitive to issues of noise and timing in the memory system design as a whole.

Error Codes

Error Code	Name
0x00/3FF	Mismatch of memory
0x01/3FF	Unknown communication failure
0x02/3FF	Memory failed integrity check
0x03/004	Memory error detected by test
0x04/004	Memory write error
0x05/004	Memory read error
0x06/004	Memory Parity check failure
0x07/001	Error attempting to obtain or free memory to test
0x08/3FF	Duration invalid
0x09/001	Failure to create process to execute memory tests
0x0A/3FF	Unknown memory result
0x0B/3FF	Internal error
0x0C/008	Memory failed integrity check
0x0D/3FF	Memory error detected by test
0x0E/3FF	Memory write error
0x0F/3FF	Memory read error
0x10/3FF	Memory Parity check failure

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF 0x02/3FF 0x03/004 0x04/004 0x05/004 0x06/004 0x07/001 0x0C/008 0x0D/3FF 0x0E/3FF 0x0F/3FF 0x10/3FF	The data written and read did not match or information was unable to be read from the memory. The memory appears to be faulty.
0x08/3FF	Parameter error.
0x01/3FF 0x09/001 0x0B/3FF 0x0A/3FF	This error is most likely a Windows® Related Error.

2211 - Network

Overview

This group is designed to test Network Adaptors.

A network adapter (also known as a network interface card, network interface controller, LAN adapter and by similar terms) is a computer hardware component that connects a computer to a computer network. Early network interface controllers were commonly implemented on expansion cards that plugged into a computer bus. The low cost and commonality of the Ethernet standard means that most newer computers have a network interface built into the motherboard.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Configuration				x	x	x	x	x	x	x
302	IPv4 Connection				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
302	1	Target IP	"0.0.0.0"	7	15	The IPv4 address to connect
	2	Target Name	""	0	255	The connection target's name; If set, this takes priority over IP

Descriptions

301 - Configuration

This is a configuration test on the network card to ensure that it can be configured for communication. The test also includes managing the Windows driver.

Test Time: 5s.

302 - IPv4 Connection

The IPv4 Connection test ensures two way communication between an end IPv4 Address or Hostname. This test will check that the Network card memory TCP/IP protocol stack can be loaded and that the network card configuration operates for communication purposes. It also establishes that the socket electrical contacts or WIFI radio are within tolerance.

Note: This is designed to test the network adapter and is not suitable to be used for testing your network or cabling.

Note: Two way communication is required for this test to operate and load the card therefore an efficient route to the target IP address is recommended.

Note: A valid IP address or Host Name parameter should be entered before running this test or the test will return Not Available.

Note: The local loopback (127.0.0.1) address can not be used as this will not test the card.

Test Time: 5s.

Error Codes

Error Code	Name
0x00/001	ARP Table failure
0x01/001	Adaptor IP Address change failure
0x02/3FF	Adaptor Info get failure
0x03/3FF	Internal failure
0x04/3FF	Socket Failure
0x05/3FF	Transfer Failure
0x06/3FF	The IP Address can't be accessed on this device
0x07/3FF	The Device is not connected to a network
0x08/3FF	There was no reply from the ping
0x09/001	Unable to find IP address for name
0x0A/3FF	The IP address parameter has not been set
0x0B/3FF	The IP address used is the local loopback IP

Troubleshooting

Error Code(s)	Potential Reason
0x00/001 0x01/001 0x02/3FF 0x03/3FF 0x04/3FF 0x05/3FF	Potential Windows® driver issues. If the drivers are not installed in the basic version, they may need to be installed. Network card memory fault, control register DMI/IRQ access. Potential issues with motherboard connection for separate card, especially for the PCI bus. If the issue is on the initial connection, the fault may be on the electrical connections on the pins of the card.
0x06/3FF 0x08/3FF 0x07/3FF 0x09/001 0x0A/3FF 0x0B/3FF	Potential Configuration or Test Parameter issue. If trying to ping, check that the target IP is on the same network as the adaptor under test and is configured to respond to pings. <i>Note: The local loopback IP address can't be used for test as it will not test the adaptor.</i>

2601 - Hard Drives

Overview

This is a test group for fixed media disk drive (Hard Disks). Hard Disks consists of one or more rigid (hence "hard") rapidly rotating discs, coated with magnetic material and with magnetic heads arranged to write data to the surfaces and read it from them.

Tests are available to verify the head actuator mechanism, report the SMART status and predict the probability of imminent failure. Extended tests are also available on drives which have either a capacity greater than 2TB or a sector size greater than 512 bytes.

Note: The drive being tested should have data on it to test otherwise the test may stall.

Notes:

1. Only a coverage of 100% will take the same time using a duration or coverage setting.
2. Other parameters may be irrelevant due to hardware access times with this type of test.
3. This is because with a duration setting, each physical read is performed sequentially. Whereas with the coverage parameter, the reading is distributed evenly across the hardware being tested. Therefore there maybe a delay due to moving to the next hardware location.

Tests

Test	Name	I	E	M	Windows ® XP	Windows ® Server 03	Windows Vista®	Windows ® Server 2008	Windows ® 7	Windows ® 8	Windows ® PE
301	Butterfly Seek				x	x	x	x	x	x	x
302	Random Read				x	x	x	x	x	x	x
303	Linear Read				x	x	x	x	x	x	x
304	S.M.A.R.T Status				x	x	x	x	x	x	x
305	Imminent Failure				x	x	x	x	x	x	x
306	Extended Butterfly				x	x	x	x	x	x	x
307	Extended Random Read				x	x	x	x	x	x	x
308	Extended Linear Read				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	300	0	604800	Time to run the test
	2	Coverage	10	1	100	Percentage of hard disk to test
	3	MaximumErrors	1	1	50	Continues to test until the maximum number of errors is reached
302	1	Duration	300	1	604800	
	3	MaximumErrors	1	1	50	
303	1	Duration	300	0	604800	
	2	Coverage	10	1	100	
	3	MaximumErrors	1	1	50	
306	1	Duration	300	0	604800	
	2	Coverage	10	1	100	
	3	MaximumErrors	1	1	50	
307	1	Duration	300	1	604800	
	3	MaximumErrors	1	1	50	
308	1	Duration	300	0	604800	
	2	Coverage	10	1	100	
	3	MaximumErrors	1	1	50	

Descriptions

301 - Butterfly Seek

Each Butterfly Seek test iteration consists of two seeks: one seek is lower than (below) the middle/centre sector and one seek is higher than (above) the middle/centre sector. After each iteration, the lower seek position increases by one sector increment and the higher seek position decreases by the same amount.

Test Time: 8.4 to 12.1 minutes per gigabyte

302 - Random Read

Each Random Seek test iteration is one seek to a pseudo random sector position. The purpose of this test is to test the head actuator mechanism, not the read head mechanism; so the actual sectors that are read, and even the accuracy of the data found, are not necessarily relevant. For this reason, it does not matter if the pseudo-random generator produces the same sector to check each time the test is run.

Test Time: 7.3 to 10.8 minutes per gigabyte

303 - Linear Read

Each Read/Verify test iteration is one seek and verify. Each iteration, the seek position increases by one sector increment.

Test Time: 1.5 to 6 minutes per gigabyte

304 - S.M.A.R.T Status

Self-Monitoring, Analysis, and Reporting Technology, or S.M.A.R.T., is a monitoring system for computer hard disks to detect and report on various indicators of reliability. This test checks the status of the S.M.A.R.T reports, to ensure that the hard disk drive is in a reliable condition.

Test Time: 1 to 5 seconds

305 - Imminent Failure

A "threshold exceeded" value is intended to indicate that there is a relatively high probability that the drive will not be able to honour its specification in the future: that is, it's "about to fail". The predicted failure may be catastrophic, or may be something as subtle as inability to write to certain sectors, or slower performance than the manufacturer's minimum.

Test Time: 1 to 5 seconds

306 - Extended Butterfly

Each Butterfly Seek test iteration consists of two seeks: one seek is lower than (below) the middle/center Megabyte (MB) value and one seek is higher than (above) the middle/center MB value. After each iteration, the lower seek position increases by one MB increment (determined by the range and coverage) and the higher seek position decreases by the same amount.

Note: This test is only available on drives which have either a capacity greater than 2TB or a sector size larger than 512 bytes.

Test Time: 25 to 35 seconds per 1000 MB. Actual times will vary depending on several factors including: the device read speed, access times, the interface and medium used.

307 - Extended Random Read

Each Random Seek test iteration is one seek to a pseudo random MB position within the range of Start MB through to the Stop MB. The purpose of this test is to test the head actuator mechanism, not the read head mechanism; so the actual bytes that are read, and even the accuracy of the data found, are not necessarily relevant. For this reason, it does not matter if the pseudo-random generator produces the same MB position to check each time the test is run.

Note: This test is only available on drives which have either a capacity greater than 2TB or a sector size larger than 512 bytes.

Test Time: 25 to 30 seconds per 1000 cycles. Actual times will vary depending on several factors including: the device read speed, access times, the interface and medium used.

308 - Extended Linear Read

Each Read/Verify test iteration is one seek and verify. Each iteration, the seek position increases by one MB increment (determined by the range and coverage). The Read/Verify test is always done with the seek position increasing each iteration.

Note: This test is only available on drives which have either a capacity greater than 2TB or a sector size larger than 512 bytes.

Test Time: 16 to 20 seconds per 1000 MB. Actual times will vary depending on several factors including: the device read speed, access times, the interface and medium used.

Error Codes

Error Code	Name
0x00/3FF	The device failed to open
0x01/3FF	The test thread failed to start
0x02/00A	The drive is too small
0x03/00A	Unable to read drive geometry
0x04/3FF	Unable to set the test thread priority
0x05/3FF	Failed to set file pointer
0x06/3FF	Read failure
0x07/006	Read size mismatch
0x08/3FF	Drive does not support S.M.A.R.T.
0x09/3FF	The drive is an extended drive and does not support this test
0x0A/3FF	Unable to read the drive's capacity
0x0B/013	S.M.A.R.T. Attributes indicate an error
0x0C/001	Unable to communicate with device
0x0D/3FF	The drive is not an extended drive and does not support this test
0x0E/3FF	Failure to obtain memory for testing

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF 0x03/00A 0x05/3FF 0x06/3FF 0x07/006 0x0A/3FF 0x0C/001 0x01/3FF 0x07/006 0x04/3FF	The device may be faulty or another program may be limiting access to the device.
0x02/00A 0x08/3FF 0x09/3FF 0x0B/013 0x0D/3FF 0x0E/3FF	The device does not appear to support this test. Check the test descriptions manual for the test requirements.

2911 - Modem

Overview

A modem (modulator-demodulator) is a device that modulates an analog carrier signal to encode digital information, and also demodulates such a carrier signal to decode the transmitted information. The philosophy is to produce a signal that can be transmitted easily and decoded to reproduce the original digital data.

Generally this device has been superseded by other communication technologies and is only required for historic purposes.

3101 - USB

Overview

This is a group that checks a USB interface, it does not check devices attached to a USB interface. USB (Universal Serial Bus) is a specification for the cables, connectors and communications protocols for a serial connection between PCs and peripherals. This group is only testable if Eurosoft USB hardware is detected when the program initialises: it will not be testable if there are no USB devices or only non-Eurosoft USB devices connected to the USB ports.

Note: Eurosoft USB devices should not be removed or inserted while diagnostics are running.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Detected Devices		x		x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	NumberOfDevices	0	0	127	Number of Eurosoft USB devices expected

Descriptions

301 - Detected Devices

The test counts the number of Eurosoft USB devices (plugs or a Eurosoft mass storage test device) plugged into USB ports. The user specifies how many devices to check for via a 'Number of Devices' parameter, the test passes if it detects a corresponding number of devices, else it fails. If the Number of Devices parameter is set to 0, then at least one Eurosoft USB device is required to pass the test.

Error Codes

Error Code	Name
0x00/3FF	Unable to get control of USB devices
0x01/002	An incorrect number of USB plugs were detected

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF	The test was unable to get control of the USB devices. This may be caused by another program accessing the USB devices.
0x01/002	The number of devices found and specified with the test parameter did not match. This may be caused by an incorrect test parameter or a device failure. If the test parameter is 0, then no devices were found.

3301 - Floppy Drives

Overview

This is a test group for removable media floppy drives. Floppy drives read from, and write to, a removable 'floppy disk' which is a disk of thin and flexible magnetic storage medium, sealed in a rectangular carrier. Though largely obsolete they are still used in legacy and specialist equipment.

Note: Floppy disks can degrade in performance after multiple uses: change the media regularly.

Note: To acquire device information on floppy drive media, the floppy disk must be present in the drive on initialisation.

Note: USB Floppy drives are not supported on Windows Vista® and above and should not be used.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Butterfly Seek			x	x	x	x	x	x	x	x
302	Linear Read			x	x	x	x	x	x	x	x
303	Read/Write			x	x	x	x	x	x	x	x
304	Media Change	x		x	x	x	x	x	x	x	x
305	Write Protect	x		x	x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	60	0	604800	The duration of the test
	2	Coverage	100	5	100	The coverage of the test
302	1	Duration	60	0	604800	
	2	Coverage	100	5	100	
303	1	Duration	60	0	604800	
	2	Coverage	100	5	100	

Descriptions

301 - Butterfly Seek

The Butterfly Seek Test seeks back and forth, lower and higher, to sector positions centred on and around a "middle" sector. Each Butterfly Seek test iteration consists of two seeks: one seek lower than (below) the middle/centre sector plus one seek higher than (above) the middle/center sector. After each iteration, the lower seek position increases by one sector increment and the higher seek position decreases by the same amount.

Test Time: 0.4 to 1.0 minutes (1.44MB floppy); 16.8 minutes (120MB floppy)

302 - Linear Read

The Linear Read Test seeks linearly and sequentially from the start to the end of the disk. Each Linear Seek test iteration is one seek. Each iteration, the seek position increases by one sector increment.

Test Time: 0.3 to 0.5 minutes (1.44MB floppy); 6.2 minutes (120MB floppy)

303 - Read/Write

The Read/Write Test seeks linearly and sequentially between start and stop points. At each seek position, it reads from the disk and then writes what was read back to the disk. Each Read/Write test iteration is one seek. Each iteration, the seek position increases by one sector increment, a read is done from a number of sectors, and a write is done back to the same set of sectors. The Read/Write test is always done with the seek position increasing each iteration.

Test Time: 1.4 to 2.2 minutes (1.44MB floppy); 31.4 minutes (120MB floppy)

304 - Media Change

The Media Change Test verifies that media change is correctly detected.

Test Time: 5 seconds; however, test times can vary considerably depending on user response.

305 - Write Protect

The Write Protect Test verifies that disk write protect is correctly detected.

Test Time: 5 seconds; however, test times can vary considerably depending on user response.

Error Codes

Error Code	Name
0x00/3FF	An error message output of this form indicates a failure (typically an I/O failure) in an FDN internal function
0x01/3FF	Floppy disk seek failure
0x02/3FF	Floppy disk media open failure
0x03/3FF	There is no media in the drive
0x04/3FF	Media eject failure
0x05/3FF	Incorrect media was detected
0x06/3FF	The request timed out
0x07/3FF	No media change detected
0x08/3FF	The data write failed
0x09/3FF	The data read failed

Troubleshooting

Error Code(s)	Potential Reason
0x03/3FF 0x04/3FF 0x05/3FF 0x06/3FF 0x07/3FF	An error has occurred with the floppy disk media. Check to ensure the correct media is inserted when prompted.
0x00/3FF 0x01/3FF 0x02/3FF 0x08/3FF 0x09/3FF	An error has occurred with the floppy disk. This could be because of faulty media or a faulty device.

3501 - Monitor

Overview

This is a test group for Monitors (LCD and CRT). This test group provides testing of the display monitor connected to the primary video adapter. All of the monitor tests use the Windows® API and do not require additional software libraries such as DirectX®.

Each of the monitor tests display a pattern used to check a particular feature of the monitor. All of the tests require the operator to interactively verify proper operation. The tests may be run using all screen resolutions and colour depths. Each test relies on user input, the actual duration is indeterminate. However, it should normally take no longer than 2-5 seconds for a user to determine whether the display is correct or not.

Before each test starts, a dialog box is displayed indicating which test will run. It also contains text indicating how to start the test and how to indicate whether the test ran correctly. This box will be displayed once any key is pressed while the test pattern is shown. Once a key has been pressed a dialog box appears asking whether the test was displayed correctly.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Red Purity	x			x	x	x	x	x	x	x
302	Green Purity	x			x	x	x	x	x	x	x
303	Blue Purity	x			x	x	x	x	x	x	x
304	Mesh	x			x	x	x	x	x	x	x
305	Inverse Mesh	x			x	x	x	x	x	x	x
306	White MEME	x			x	x	x	x	x	x	x
307	Green MEME	x			x	x	x	x	x	x	x
308	Tonality	x			x	x	x	x	x	x	x
309	Grid	x			x	x	x	x	x	x	x
310	LCD Dead Pixel	x			x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	Specifies whether or not to display a test dialog box before the test runs
302	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	
303	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	
304	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	
305	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	
306	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	
307	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	
308	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	
309	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	
310	1	DisplayInitialTestMessage	FALSE	FALSE	TRUE	
	2	ScreenPeriod	5	1	60	How long (in seconds) each pattern must be shown

Descriptions

301 - Red Purity

The display is filled completely red. Any pixels not coloured red indicate a DAC problem, colour gun misalignment, or burned-out LCD panel element. This test is especially valuable for LCD panels.

Test Time: 3 seconds

302 - Green Purity

The display is filled completely green. Any pixels not coloured green indicate a DAC problem, colour gun misalignment, or burned-out LCD panel element. This test is especially valuable for LCD panels.

Test Time: 3 seconds.

303 - Blue Purity

The display is filled completely blue. Any pixels not coloured blue indicate a DAC problem, colour gun misalignment, or burned-out LCD panel element. This test is especially valuable for LCD panels.

Test Time: 3 seconds

304 - Mesh

The display is completely filled with an alternating one-zero mesh pattern. Any 'splotches' of black or white indicate a DAC problem, phosphor bleeding, or LCD panel elements that are stuck off or on.

Test Time: 3 seconds

305 - Inverse Mesh

The inverse mesh display is identical to the mesh display except that the pattern is reversed (i.e. ones become zeros and vice versa). Again, 'splotches' of black or white indicate a DAC problem, phosphor bleeding, or LCD panel elements that are stuck off or on.

Test Time: 3 seconds

306 - White MEME

The display is completely filled with a 'MEME' pattern to allow adjustments to CRT displays.

Test Time: 3 seconds

307 - Green MEME

The display is completely filled with a 'MEME' pattern to allow other adjustments to CRT displays.

Test Time: 3 seconds

308 - Tonality

The tonality display consists of shaded red, green, and blue bars in addition to a variety of vertical and horizontal lines and circles. This test pattern can be used to detect colour granularity problems (i.e. transitions from one colour to the next are not smooth). In addition, it can be used to adjust the 'pincushion' control on CRT displays to attain minimal vertical skewing.

Test Time: 3 seconds.

309 - Grid

The grid display consists of single pixel wide squares, which are 16 across by 12 high with a square white box in the middle. This test pattern is used to check geometry and colour gun alignment.

Test Time: 3 seconds.

310 - LCD Dead Pixel

Testing for dead pixels is performed by displaying a series of coloured screens. The display is filled completely with the colour. Any pixels not coloured indicate a DAC problem, colour gun misalignment, or burned-out LCD panel element. This test is especially valuable for LCD panels.

There are 4 colour steps in order to cover all pixels with all colours:

- Red
- Green
- Blue
- Black

Test Time: depends on parameter.

Error Codes

Error Code	Name
0x00/3FF	The operator has chosen to fail the device based on the appearance of the test

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF	The operator has failed the test. Because this is an interactive only test, the operator should supply additional information to the reasons for the test failure.

4401 - FireWire

Overview

This is a test group for IEEE1394 (FireWire) hardware on the system. FireWire is a serial bus interface standard for high-speed communications and isochronous real-time data transfer.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	IEEE1394 (Firewire)				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	NumberOfBuses	0	0	127	Number of IEEE1394 buses (Controllers) to try to detect

Descriptions

301 - IEEE1394 (Firewire)

The test counts the number of IEEE1394 buses that is required for the test to pass. The user specifies how many devices to check for via a 'Number of Buses' parameter: the test passes if it detects a corresponding number of devices, else it fails. If this parameter is set to 0, then the test will pass if at least one bus is detected.

Test Time: less than 1 second.

Error Codes

Error Code	Name
0x00/3FF	No buses are available to perform the test
0x01/080	Incorrect number of buses detected to perform the test

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF	Firewire cabling if available incorrect. Windows® OS issues detecting device.
0x01/080	Check the test parameters for this test.

4501 - Serial Ports

Overview

This is a group that tests Serial Ports. A serial port (typically designated COM) is a physical interface through which information transfers in or out one bit at a time according to the RS-232 standard. Tests are provided to verify the functionality of the serial ports as they transmit data, handle interrupts, and perform handshaking with external devices.

Note: Serial cards that have multiple serial ports must have the correct Windows® drivers loaded in order to be tested correctly.

Tests

Test	Name	I	E	M	Windows ® XP	Windows ® Server 03	Windows Vista®	Windows ® Server 2008	Windows ® 7	Windows ® 8	Windows ® PE
301	Configuration Registers				x	x	x	x	x	x	x
302	Quick Loopback		x		x	x	x	x	x	x	x
303	Baud Rates		x		x	x	x	x	x	x	x
304	Sustained Loopback		x		x	x	x	x	x	x	x
305	Priority Transmit		x		x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
303	2	MinimumBaudRate	300	300	921600	Minimum baud rate to test. If the entered value is not a preferred baud rate, the value is rounded down to the nearest preferred baud rate
	3	MaximumBaudRate	115200	300	921600	Maximum baud rate to test. If the entered value is not a preferred baud rate, the value is rounded down to the nearest preferred baud rate
304	1	TestDuration	10	1	604800	Time to run the test for, seconds, max 1 week
	4	BaudRate	115200	300	921600	Baud rate to test. If the entered value is not a preferred baud rate, the value is rounded down to the nearest preferred baud rate

Descriptions

301 - Configuration Registers

Tests the Configuration Settings of the serial port.

Test Time: 2 seconds

302 - Quick Loopback

This test performs an abbreviated loopback test at a single baud rate, to test the port's ability to transmit and receive a short message.

Test Time: 3 seconds

303 - Baud Rates

This test performs an abbreviated loopback test at a variety of baud rates, specified by Min and Max values, to test the port's ability to transmit and receive a short message.

Test Time: up to 12 seconds

304 - Sustained Loopback

Tests the ability to withstand a transmission of sustained duration at a specified baud rate.

Test Time: as specified.

305 - Priority Transmit

Tests serial port driver's priority transmit capability.

Test Time: 25 seconds

Error Codes

Error Code	Name
0x00/3FF	The minimum and maximum baud rates are not valid
0x01/3FF	Unable to write the port config
0x02/3FF	The serial port is a modem and cannot be tested
0x03/3FF	Unable to transmit all the data
0x04/3FF	Unable to receive all the data
0x05/3FF	The transmitted and received data does not match
0x06/3FF	Unable to read the port config
0x07/3FF	The set and read configs do not match
0x08/3FF	Unable to transmit the Priority character
0x09/3FF	Unable to receive the Priority character
0x0A/3FF	Unable to find a serial port

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF	The Minimum and Maximum baud rates may be the wrong way round. The Minimum and Maximum baud rates may be the same.
0x01/3FF 0x02/3FF 0x03/3FF 0x04/3FF 0x05/3FF 0x06/3FF 0x07/3FF 0x08/3FF 0x09/3FF 0x0A/3FF	The following are possible causes of errors: Faulty/wrong loopback plug. Port to I/O interface (serial connector or interface chip) failure. Port does not support (all) status/flow control lines. Faulty port/device/serial chip (UART or chipset). Improper IRQ configuration. Test data rates exceed device capability.
0x08/3FF 0x09/3FF	The Priority Transmit mechanism may be inoperative.

5301 - Removable Media

Overview

This is a test group for disk drives with "removable media". This includes devices which plug directly into a port, such as USB flash memory "drives", as well as those that have media which are inserted into purpose-built peripheral devices.

Notes:

1. Removable media **MUST** be present in the appropriate devices **BEFORE** running the test.
2. When testing PCMCIA slots, a Removable "media" PCMCIA card with suitable "media" is a good way to test this hardware.
3. When testing removable "media" using Windows® Preinstallation Environment, both card bus driver and device drivers may need to be added to the image.
4. Only a coverage of 100% will take the same time using a duration or coverage setting. Other parameters may be irrelevant due to hardware access times with this type of test. This is because with a duration setting, each physical read is performed sequentially. Whereas with the coverage parameter, the reading is distributed evenly across the hardware being tested. Therefore there maybe a delay due to moving to the next hardware location.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Linear Read			x	x	x	x	x	x	x	x
302	Random Read			x	x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	60	0	604800	Time to run the test for, seconds, max 1 week
	2	Coverage	100	1	100	The percentage of the "media" to test
302	1	Duration	60	1	604800	

Descriptions

301 - Linear Read

Exercises a drive's read capability using linear (incrementally increasing) read addresses. Success or failure of each read is monitored.

302 - Random Read

Exercises a drive's read capability using pseudo-random read addresses. Success or failure of each read is monitored.

Error Codes

Error Code	Name
0x00/006	The buffer size read of the media does not match the buffer set to be read
0x01/005	Failed to set the position to read the media
0x02/005	General Failure to read the media
0x03/00A	The media is too small or does not exist
0x04/3FF	Unable to read the size of the media

Troubleshooting

Error Code(s)	Potential Reason
0x00/006 0x01/005 0x02/005 0x04/3FF	Potential media issues. Possible Windows OS issues.
0x03/00A	The size of the media is too small to be read. If the media is genuine this could be Media or Windows OS related.

5411 - System

Overview

This group is used for testing the system as a whole. Stress testing refers to tests that determine the robustness of the system by testing up to the limits of normal operation. The Stress test puts a greater emphasis on robustness, availability, and error handling under a heavy load, than on what would be considered correct behavior under normal circumstances.

This groups also contains information on SCSI controllers available within the system.

Note: Multiple components are tested with the stress test therefore Information on the error is always be the last component to fail.

Note: Any failures during initialisation are considered catastrophic and irrespective of maximum failures testing will cease.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Stress Test			x	x	x	x	x	x	x	x
302	Sleep Test	x			x	x	x	x	x	x	x
303	Hibernate Test	x			x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	300	60	604800	Time to run the test
	2	IncludeMemory	TRUE	FALSE	TRUE	Include the memory in the Stress Test
	3	IncludeOptical	FALSE	FALSE	TRUE	Include any optical drives in the test
	4	IncludeProcessor	TRUE	FALSE	TRUE	Include any processors in the test
	5	IncludeFixedDrives	TRUE	FALSE	TRUE	Include Fixed Drives for testing i.e RAID, SSD and Hard Drive
	6	IncludeVideoGraphicsTest	TRUE	FALSE	TRUE	Include Video Graphics test
	7	OpticalMediaResistance	2	1	1000	Optical Error allowance
	8	MaximumFailures	1	1	100000	Maximum number of non-catastrophic test failures before exiting
	9	MinimumFrameRate	10	1	100000	Minimum Frame rate
	10	MaximumVideoCardTemperature	80	1	100000	Minimum Frame rate
	11	PseudoRandomSeed	0x0	0x0	0xFFFFFFFF	Seed used for seeding random data and locations to use during test
	11	PseudoRandomSeed	0x0	0x0	0xFFFFFFFFFFFFFFFF	
302	12	ForceSleep	FALSE	FALSE	TRUE	Force the sleep test to execute
303	12	ForceSleep	FALSE	FALSE	TRUE	

Descriptions

301 - Stress Test

Main stress test. The pseudo random seed ensures test repeatability.

Test Time: Dependent on user input.

302 - Sleep Test

S3 Sleep test.

Test Time: User dependant.

303 - Hibernate Test

S4 Sleep test.

Test Time: User dependant.

Error Codes

Error Code	Name
0x00/00C	Exceeded the maximum size of stress capabilities
0x01/008	General Error executing the test
0x02/091	General Error executing the test for the memory
0x03/090	Fatal Error executing the test for the Processor
0x04/091	Error executing the test for the Processor
0x05/001	Failed to open a device
0x06/090	General Error Executing Optical Tests
0x07/091	Failed to Read the optical Device
0x08/091	The transfer data amount is incorrect
0x09/092	Failed to Read the optical or hard drive Device
0x0A/092	The transfer data amount is incorrect
0x0B/092	Error with Video Graphics stress component
0x0C/090	Error Initialing video graphics with dependencies
0x0D/091	Failed to Set the location of media position
0x0D/091	The media to be tested is too small
0x0E/091	The optical media is invalid
0x0F/091	Exceeded the maximum temperature set for the video graphics
0x10/091	Under the minimum frame rate of video graphics
0x11/001	Failed to set sleep state
0x12/3FF	User failed to set sleep state
0x13/3FF	Sleep parameters not being set to force the test
0x14/090	General Error executing the test for the memory
0x15/090	Fatal Error executing the test for the video memory
0x16/3FF	A dependency on the sleep test is not available
0x17/091	Error with Video Graphics stress component

Troubleshooting

Error Code(s)	Potential Reason
0x00/00C 0x01/008 0x05/001 0x0F/091 0x10/091 0x03/090 0x15/090 0x14/090 0x17/091	General Error executing stress tests.
0x02/091	Memory component of stress has failed.

Error Code(s)	Potential Reason
0x04/091	CPU component of stress has failed.
0x06/090 0x07/091 0x08/091 0x0D/091 0x0D/091 0x0E/091	Optical component of stress has failed. Check the media quality and size.
0x09/092 0x0A/092 0x0D/091 0x0D/091	Main fixed drive component of stress has failed.
0x0B/092 0x0C/090	Video graphics component failed. Check video graphics drivers and card if available. If the error is based on the dependencies make sure you either have directx available
0x13/3FF	The sleep tests must be explicitly enabled through the force sleep parameter
0x11/001 0x12/3FF 0x16/3FF	Most likely to be a Windows OS related issue.

5501 - Processor

Overview

This group is a processor test group that consists of nine tests that can be run on various instruction sets supported by the logical processors (i.e. hardware-implemented threads) of the computer system: Core Instruction Set Test, Floating Point Instruction Set, MMX Instruction Set and SSE Instruction Sets.

Each device identified by this group represents a physical processor package.

Note: Each set of tests when selected are executed on every processor core.

Tests

Test	Name	I	E	M	Windows ® XP	Windows ® Server 03	Windows Vista®	Windows ® Server 2008	Windows ® 7	Windows ® 8	Windows ® PE
301	Core Instruction Set				x	x	x	x	x	x	x
302	Floating Point Instruction Set				x	x	x	x	x	x	x
303	MMX Instruction Set				x	x	x	x	x	x	x
304	SSE Instruction Set				x	x	x	x	x	x	x
305	SSE2 Instruction Set				x	x	x	x	x	x	x
306	SSE3 Instruction Set				x	x	x	x	x	x	x
307	SSE 4.1 Instruction Set				x	x	x	x	x	x	x
308	SSE 4.2 Instruction Set				x	x	x	x	x	x	x
309	SSE 4A Instruction Set				x	x	x	x	x	x	x

301 - Core Instruction Set

This test performs certain CPU operations and checks the results against expected results. The CPU Test is made up of the following categories:

General:

Loads registers with patterns, performs operations that affect certain flags, and then checks to see that everything is operating correctly.

Arithmetic:

Performs various addition, subtraction, multiplication, and division operations and verifies against expected results.

Logic:

Tests shift and rotate instructions.

Test Time: Approximately 4 seconds

302 - Floating Point Instruction Set

The first seven sub-tests apply math operations to the Numeric Coprocessor to see if it is functioning properly. The operation is compared to the expected result. A failure indicates a variance to the expected result.

Test Time: Approximately 4 seconds

303 - MMX Instruction Set

The MMX Basic Functionality test verifies basic MMX instructions on processors that support the MMX instruction set.

Test Time: Approximately 4 seconds.

304 - SSE Instruction Set

Finds faults with SSE instructions, including:

Data conversion instructions

Integer arithmetic instructions

Integer comparison instructions

Integer logic instructions

Floating point arithmetic instructions (including square root approximation)

Floating point comparison instructions

Floating point logic instructions

Test Time: Approximately 4 seconds.

305 - SSE2 Instruction Set

The SSE2 Instruction Set Test finds faults with SSE2 instructions, including:

Data conversion instructions

Integer arithmetic instructions

Integer comparison instructions

Integer logic instructions

Floating point arithmetic instructions (including square root approximation)

Floating point comparison instructions

Floating point logic instructions

Test Time: Approximately 4 seconds.

306 - SSE3 Instruction Set

The SSE3 Instruction Set Test finds faults with SSE3 instructions, including:

Add-Subtract-Packed-Double

Add-Subtract-Packed-Single

Horizontal-Add-Packed-Double

Horizontal-Add-Packed-Single

Horizontal-Subtract-Packed-Double

Horizontal-Subtract-Packed-Single

Misaligned integer vector load

Move Double precision floating point numbers to XMM

Pop floating point Register Stack

Test Time: Approximately 4 seconds.

307 - SSE 4.1 Instruction Set

This Test finds faults with SSE4 instructions.

Test Time: Approximately 4 seconds.

308 - SSE 4.2 Instruction Set

Detection and status test of instruction set for Processor.

Test Time: Approximately 4 seconds.

309 - SSE 4A Instruction Set

Detection and status test of instruction set for Processor.

Test Time: Approximately 4 seconds.

Error Codes

Error Code	Name
0x00/3FF	The test for this processor cannot be executed because it is not supported
0x01/009	Failed to set the core for this test
0x02/3FF	Failed to initialise external library in order to perform testing
0x03/3FF	Failed SSE 4.1 instructions test
0x04/3FF	Failed SSE 3 instructions test
0x05/3FF	Failed SSE 4.1 instructions test
0x06/3FF	Failed MMX instructions test
0x07/3FF	Failed Floating point instructions test
0x08/3FF	Failed Core instructions test
0x09/3FF	Failed SSE 4.2 instructions test
0x0A/3FF	Failed SSE instructions test
0x0B/3FF	Failed SSE 2 instructions test
0x0C/3FF	Failed Core sign bit test
0x0D/3FF	Failed Core carry bit test
0x0E/3FF	Failed Core zero bit test
0x0F/3FF	Failed Core parity bit test
0x10/3FF	Failed Core RCX register test
0x11/3FF	Failed Core RDX register test
0x12/3FF	Failed Core R8 register test
0x13/3FF	Failed Core R9 register test
0x14/3FF	Failed Core shift left test
0x15/3FF	Failed Core shift right test
0x16/3FF	Failed Core addition test
0x17/3FF	Failed Core subtraction test
0x18/3FF	Failed Core multiplication test
0x19/3FF	Failed Core division test
0x1A/3FF	This instruction set has been deprecated for 64 bit platforms

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF	The processor does not have the capabilities to perform the test.

Error Code(s)	Potential Reason
0x01/009 0x03/3FF 0x04/3FF 0x05/3FF 0x06/3FF 0x07/3FF 0x08/3FF 0x09/3FF 0x0A/3FF 0x0B/3FF 0x0C/3FF 0x0D/3FF 0x0E/3FF 0x0F/3FF 0x10/3FF 0x11/3FF 0x12/3FF 0x13/3FF 0x14/3FF 0x15/3FF 0x16/3FF 0x17/3FF 0x18/3FF 0x19/3FF	<p>Potential processor silicon failure. Unlikely Windows® OS issue.</p>
0x02/3FF	Ensure all files are available for testing.
0x1A/3FF	These instruction sets are no longer supported natively on your processor. Newer instruction sets are now available

5611 - Audio

Overview

This test group is designed to test the PC audio subsystem. The electrical characteristics of audio subsystems vary from manufacturer to manufacturer.

In the majority of cases the Soundplay test and Audio Connection test will be sufficient to test the core functionality of your audio devices.

In most cases the other audio tests require that a loopback cable be connected between the LINE OUT jack and the LINE IN and/or MIC IN jacks. Consequently, the actual speakers will not be connected during most of these tests.

As listed below, each item describes the particular setup needed to conduct the test.

The test group automatically selects the highest sample rate and sample size for a test as supported by the audio hardware during the testing process.

The allocation of audio ports to specific functions (e.g. line input, line output) is software configurable under Windows®, which can override the audio hardware's defaults.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Soundplay	x			x	x	x	x	x	x	x
302	Audio Connection		x				x	x	x	x	x
303	Loopback Count		x		x	x	x	x	x	x	
304	Advanced Quality		x		x	x	x	x	x	x	

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	2	Duration	4	1	100	Duration of test
302	3	TestConnectionCount	0	0	100	Count of jacks expected
303	1	Tolerance Percentage	10	1	100	The tolerance for recieved signals
	4	Test Loopback Count	1	0	10	Count of loopback connections expected
304	1	Tolerance Percentage	30	0	100	

Descriptions

301 - Soundplay

The soundplay test is designed to test the functionality of the speakers or audio ports on the system. When the test is run, a sound file is played and the operator is prompted to confirm the sound was heard.

Note: The sound playing is controlled by windows and will play on all audio devices present. It is recommended to run the test more than once to check each of your devices in turn.

Note: It is recommended to remove all loopbacks connected to the system to ensure speakers connected are used. The Windows® volume should also be set to a reasonable level.

Test Time: Dependent on user input.

302 - Audio Connection

The Audio connection test checks the system as a whole to confirm Jack sense functionality. To configure this test, initialise the group with no jacks plugged in and check the device information. The count of jacks given is the number of internal jacks connected.

If you wish to run interactively, set the parameter of 0 run the test and follow the instructions.

To run automated, insert the count of jacks you wish to test and set the jack count parameter to equal the internal and additional jacks combined.

If the count of jacks detected does not equal the count of jacks expected, this test will fail.

Note: Not all sound devices support jack detection.

Test Time: 1s.

303 - Loopback Count

The loopback test checks the functionality of playback and recording on the system for ports with loopbacks connected. Once a loopback is confirmed, it is recorded for use by the Advanced Quality test

Test Time: 10-60s.

304 - Advanced Quality

Each loopback found by test 303 that supports 2 channels on the device is tested, to confirm the overall quality of the audio input and output.

Note: Test 303 must pass before this test is run.

Test Time: 10-60s.

Error Codes

Error Code	Name
0x00/00E	Unable to output sound
0x01/00E	Unable to record sound
0x02/00E	Unable to open mixer
0x03/00E	Received wave was outside tolerance
0x04/00E	The Input and Output device cannot be tested
0x05/00F	Unable to render sound
0x06/00F	Unable to capture sound
0x07/00F	The left channel signal was too small to test
0x08/00F	The right channel signal was too small to test
0x09/00F	The left channel signal was not within tolerances
0x0A/00F	The right channel signal was not within tolerances
0x0B/3FF	No Audio Jacks were detected
0x0C/002	An incorrect count of jacks were detected
0x0D/3FF	The operator chose to fail the test
0x0E/3FF	The sound could not be played
0x0F/3FF	The count of jacks was not set
0x10/014	The count of jacks did not change
0x11/002	The number of detected loopbacks did not match the Test Loopback Count setting
0x12/3FF	The Loopback Count Test must pass before this test is run
0x13/3FF	No stereo loopbacks were enumerated
0x14/00F	Received wave was outside tolerance
0x15/3FF	The tolerance parameter has not been set to a valid value.

Troubleshooting

Error Code(s)	Potential Reason
0x00/00E 0x01/00E 0x02/00E 0x04/00E 0x0D/3FF 0x0E/3FF 0x09/00F 0x0A/00F 0x05/00F 0x06/00F 0x14/00F	Potential hardware issue. Check if drivers are installed and up to date for the sound card.

Error Code(s)	Potential Reason
0x03/00E 0x04/00E 0x00/00E 0x01/00E 0x0B/3FF 0x0C/002 0x11/002 0x09/00F 0x0A/00F 0x13/3FF 0x07/00F 0x08/00F 0x05/00F 0x06/00F 0x14/00F	Potential hardware issue. Check that loopback plugs are inserted and that the correct port is being tested.
0x0F/3FF 0x12/3FF 0x11/002 0x0C/002 0x14/00F 0x03/00E 0x15/3FF	The test parameters are invalid for this device.
0x10/014	Check that jack detect is supported. A result of NOT AVAILABLE can be caused by the operator failing to remove the Audio Jack or a genuine fault.

5701 - Display Adapter

Overview

This is a group that tests graphics hardware (the 'graphics card' not the monitor). It incorporates two of our most successful memory test algorithms to test the on-board graphics memory and a new 3D render test to verify the GPU is functioning correctly. A linear memory test has also been included to provide memory testing capabilities when Microsoft Windows® DirectX9 is unavailable.

Notes:

1. Only a coverage of 100% will take the same time using a duration or coverage setting.
2. Other parameters may be irrelevant due to hardware access times with this type of test.
3. This is because with a duration setting, each physical read is performed sequentially. Whereas with the coverage parameter, the reading is distributed evenly across the hardware being tested. Therefore there maybe a delay due to moving to the next hardware location.
4. If you using Windows® Preinstallation Environment then other diagnostic groups should be considered for testing video memory.

Tests

Test	Name	I	E	M	Windows ® XP	Windows ® Server 03	Windows Vista®	Windows ® Server 2008	Windows ® 7	Windows ® 8	Windows ® PE
301	Linear Memory				x	x	x	x	x	x	
302	Microtopology Memory				x	x	x	x	x	x	
303	Chaotic Addressing Memory				x	x	x	x	x	x	
304	Hardware Acceleration				x	x	x	x	x	x	

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
302	1	Duration	60	1	604800	Maximum Testing time in seconds, this can be up to 7 days.
303	1	Duration	60	1	604800	
304	1	Duration	60	1	604800	

Descriptions

301 - Linear Memory

The Linear Memory Test performs a basic memory test on all accessible video memory. The test works by filling the screen with a colour, then individually checking that each pixel is displaying this colour.

Note: This test cannot detect 'dead pixels' in an LCD display; only defective video memory.

Note: User interaction during the Linear Memory test should be avoided; as such interaction may cause the Operating System to update the screen and may result in erroneous results for this test.

302 - Microtopology Memory

This test uses a complex mathematical addressing method designed to stimulate physically adjacent bit cells, effective even where the precise physical arrangement of the device is unknown. This test is also very sensitive to issues of noise and timing in the memory system design as a whole.

Test Time: Dependant on the duration test setting.

303 - Chaotic Addressing Memory

Memory is addressed in non-repeating pseudo-random sequences that are designed not to resolve to the same cells twice. The addressing and test data sequences are subsequently regenerated to ensure that data was not misdirected due to an addressing error or subject to a coupled fault.

Test Time: Dependant on the duration test setting.

304 - Hardware Acceleration

The Hardware Acceleration Test renders randomly generated 3-dimensional scenes with a video card's hardware acceleration and compares the resulting image with an emulated software rendering. If the difference between the hardware and software rendered frames exceeds a reasonable threshold (i.e. more than a variation in antialiasing algorithms), the test fails.

Error Codes

Error Code	Name
0x00/001	Unable to create window class
0x01/001	Unable to create window
0x02/001	Unable to set window parameters
0x03/3FF	Unable to update window
0x04/001	Unable to get control of window
0x05/3FF	Unable to set draw mode
0x06/001	Unable to set window size
0x07/007	Incorrect pixel detected
0x08/3FF	DirectX9 is not supported
0x09/3FF	Could not find Ship.x
0x0A/001	Failed to initialise Z-Buffer
0x0B/3FF	Failed to initialise graphics
0x0C/3FF	Failed to initialise lights
0x0D/3FF	Failed to initialise font
0x0E/3FF	Failed to validate device
0x0F/3FF	Dx9 software rendering unavailable
0x10/3FF	The software and hardware rendered frames do not match
0x11/3FF	Unable to allocate texture memory
0x12/008	General Error allocating texture memory
0x13/3FF	The memory set and compared did not match
0x14/008	General error testing memory
0x15/001	Could not lock the texture memory
0x16/001	Could not unlock the texture memory
0x17/3FF	Error while rendering
0x18/3FF	Unknown format of DX9

Troubleshooting

Error Code(s)	Potential Reason
0x00/001 0x01/001 0x02/001 0x03/3FF 0x04/001 0x05/3FF 0x06/001 0x18/3FF	The test is unable to run because of a window failure. This could be caused by missing or incorrect display drivers or another application taking control of the window.

Error Code(s)	Potential Reason
0x08/3FF 0x0A/001 0x0B/3FF 0x0C/3FF 0x0D/3FF 0x0E/3FF 0x0F/3FF 0x15/001 0x16/001 0x12/008 0x14/008 0x18/3FF	<p>The test has failed due to a DX9 error. This could be caused by a missing or unsupported DX9 installation or a genuine fault with your device.</p>
0x07/007 0x13/3FF 0x09/3FF 0x11/3FF 0x10/3FF 0x17/3FF 0x18/3FF	<p>A failure has been detected with your device. This could be a genuine fault with your device or missing or incorrect device drivers.</p> <p><i>Note: For video cards with less than 32MB video memory the test may fail.</i></p>

5901 - Video Capture

Overview

CAP is a test group for capture devices. Capture devices receive data from items such as video cameras, DVD players or television antennae. The group consists of ten tests that can be run on a device. Included with the group are five tests that check basic functionality, the Capture Driver tests.

If a device is found, it is scanned for the different types of input it offers. If the inputs detected are of an unrecognized type then the Capture Driver Test can then be run to ensure basic functionality.

If the device only offers one video input, only the Capture Test is made available. If the device offers different inputs, the Group offers a test for each of the available inputs.

Generally, capture devices need some timeout to initialize before starting to transfer data. A test parameter is available for the user to control this.

These tests facilitate performing a high-quality check of the device and its configuration by interactively checking the actual data received.

Tests

Test	Name	I	E	M	Windows ® XP	Windows ® Server 03	Windows Vista®	Windows ® Server 2008	Windows ® 7	Windows ® 8	Windows ® PE
301	Capture Driver				x	x	x	x	x	x	x
302	Composite Capture Driver				x	x	x	x	x	x	
303	S-Video Capture Driver				x	x	x	x	x	x	
304	TV Capture Driver				x	x	x	x	x	x	
305	RGB Capture Driver				x	x	x	x	x	x	
306	Capture	x			x	x	x	x	x	x	
307	Composite Capture	x			x	x	x	x	x	x	
308	S-Video Capture	x			x	x	x	x	x	x	
309	TV Capture	x			x	x	x	x	x	x	
310	RGB Capture	x			x	x	x	x	x	x	

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Use the preview pin	0	0	1	Whether the capture pin (default) or preview pin should be used
302	1	Use the preview pin	0	0	1	
303	1	Use the preview pin	0	0	1	
304	1	Use the preview pin	0	0	1	
305	1	Use the preview pin	0	0	1	
306	1	Use the preview pin	0	0	1	
	2	Attempts limit	5	1	50	Limit of attempts to invoke system functions before reporting about an error
	3	Capture timeout	5000	0	100000	Capture timeout, i.e. duration of capturing (in milliseconds)
	4	Number of times to perform	1	0	10	Number of times to perform capturing
	5	Timeout between captures	1000	0	100000	Timeout before a capture (in milliseconds)
307	1	Use the preview pin	0	0	1	
	2	Attempts limit	5	1	50	
	3	Capture timeout	5000	0	100000	
	4	Number of times to perform	1	0	10	
	5	Timeout between captures	1000	0	100000	
308	1	Use the preview pin	0	0	1	
	2	Attempts limit	5	1	50	
	3	Capture timeout	5000	0	100000	
	4	Number of times to perform	1	0	10	
	5	Timeout between captures	1000	0	100000	
309	1	Use the preview pin	0	0	1	
	2	Attempts limit	5	1	50	
	3	Capture timeout	5000	0	100000	
	4	Number of times to perform	1	0	10	
	5	Timeout between captures	1000	0	100000	
310	1	Use the preview pin	0	0	1	
	2	Attempts limit	5	1	50	
	3	Capture timeout	5000	0	100000	
	4	Number of times to perform	1	0	10	
	5	Timeout between captures	1000	0	100000	

Descriptions

301 - Capture Driver

This test will check that the device has basic functionality.

302 - Composite Capture Driver

This test will check that the device has basic functionality.

303 - S-Video Capture Driver

This test will check that the device has basic functionality.

304 - TV Capture Driver

This test will check that the device has basic functionality.

305 - RGB Capture Driver

This test will check that the device has basic functionality.

306 - Capture

This digital test will try to connect an output pin on a source filter to a sink filter, and set the appropriate input port.

The user will be prompted to verify if the video quality displayed through the port is satisfactory.

Note: If the port being tested does not have a signal attached, the display is likely to be a pure blue screen. Input signals can be delivered to the port under test by devices such as video cameras, DVD players or television antennae.

Note: For this test to be available, suitable device drivers need to be loaded on the system under test.

307 - Composite Capture

This analogue test will try to connect an output pin on a source filter to a sink filter, and set the appropriate input port.

The user will be prompted to verify if the video quality displayed through the port is satisfactory.

Note: If the port being tested does not have a signal attached, the display is likely to be a pure blue screen. Input signals can be delivered to the port under test by devices such as video cameras, DVD players or television antennae.

Note: For this test to be available, suitable device drivers need to be loaded on the system under test.

308 - S-Video Capture

This analogue test will try to connect an output pin on a source filter to a sink filter, and set the appropriate input port.

The user will be prompted to verify if the video quality displayed through the port is satisfactory.

Note: If the port being tested does not have a signal attached, the display is likely to be a pure blue screen. Input signals can be delivered to the port under test by devices such as video cameras, DVD players or television antennae.

Note: For this test to be available, suitable device drivers need to be loaded on the system under test.

309 - TV Capture

This analogue test will try to connect an output pin on a source filter to a sink filter, and set the appropriate input port.

The user will be prompted to verify if the video quality displayed through the port is satisfactory.

Note: If the port being tested does not have a signal attached, the display is likely to be a pure blue screen. Input signals can be delivered to the port under test by devices such as video cameras, DVD players or television antennae.

Note: For this test to be available, suitable device drivers need to be loaded on the system under test.

310 - RGB Capture

This analogue test will try to connect an output pin on a source filter to a sink filter, and set the appropriate input port.

The user will be prompted to verify if the video quality displayed through the port is satisfactory.

Note: If the port being tested does not have a signal attached, the display is likely to be a pure blue screen. Input signals can be delivered to the port under test by devices such as video cameras, DVD players or television antennae.

Note: For this test to be available, suitable device drivers need to be loaded on the system under test.

Error Codes

Error Code	Name
0x00/001	Failed to pause the captured video test
0x01/001	Failed to run the captured video test
0x02/001	Failed to stop the captured video test
0x03/3FF	User chose to fail the test
0x04/001	Internal Error Control capture window
0x05/001	Failed to set window style
0x06/001	Failed to show the window
0x07/001	Internal Error
0x08/001	Failed to initialise the graph builder
0x09/001	Failed to create device enumeration
0x0A/3FF	The device available does not match the test to be executed

Troubleshooting

Error Code(s)	Potential Reason
0x00/001 0x01/001 0x02/001 0x03/3FF 0x04/001 0x05/001 0x06/001 0x07/001 0x08/001 0x09/001	Windows driver issues. Capture card issues.
0x0A/3FF	The device does not have the required capabilities for the test.

6101 - Battery

Overview

BAT is a test group for batteries. The battery group of tests has been designed to test the charging circuit and battery device attached to the system. There are four tests within this group covering Charge, Discharge, Voltage and Stress.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Charge	x			x	x	x	x	x	x	x
302	Discharge	x			x	x	x	x	x	x	x
303	Voltage				x	x	x	x	x	x	x
304	Stress				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	60	1	604800	Time to run the test, in seconds, max 1 week
302	1	Duration	60	1	604800	
303	2	MinimumVoltage	10	1	50	Minimum Volage
	3	MaximumVoltage	20	1	50	Maximum Voltage
304	1	Duration	60	1	604800	

Descriptions

301 - Charge

The Battery should be between 10 and 95% charged. Requests the user plug any AC power source and maximizes the charge rate of the battery for the duration specified by the user. If the charge rate is outside the expected measured, the test will fail. Since not all charging systems are the same, the expected rate should be set in accordance with the hardware specifications of the charging system and battery under test.

Test Time: Dependent on the duration test setting

302 - Discharge

The Battery should be between 10 and 95% charged. Requests the user remove any AC power source and maximizes the discharge rate of the battery for the duration specified by the user. If the discharge rate is outside the maximum expected rate the test will fail. Since not all charging systems are the same, the expected rate should be set in accordance with the hardware specifications of the charging system and battery under test.

Test Time: Dependent on the duration test setting

303 - Voltage

The Battery should be between 10 and 95% charged. Measures the voltage rating for the battery in the system. If the voltage value supported by the system lies between Minimum Voltage and Maximum Voltage the test will pass.

Test Time: Approximately 4 Seconds

304 - Stress

The Battery should be between 10 and 95% charged. Requests the user plug or unplug any AC power source and maximizes the charge/discharge rate of the battery for the duration specified by the user. If the charge/discharge rate is outside the expected rate, and or the expected measured rate, the test will fail. A graphical display of the charge/discharge will be displayed.

Test Time: Dependent on the duration test setting

Error Codes

Error Code	Name
0x00/003	Battery charge is over 95%
0x01/003	Battery charge is under 10%
0x02/3FF	Battery charge has failed to discharge during the test
0x03/3FF	Battery voltage is outside the range of test settings
0x04/3FF	Unable to find a battery to test
0x05/3FF	Battery charge/discharge state detected as incorrect
0x06/3FF	Battery is not detected as rechargeable
0x07/3FF	Timed out detecting removal\insertion of ac adapter
0x08/3FF	Unable to retrieve the battery charge rate

Troubleshooting

Error Code(s)	Potential Reason
0x00/003 0x01/003	The battery in it's current charge state is not suitable for testing as it is required to be between 10 and 95%. The battery should be charged or discharged as required prior to test execution.
0x02/3FF 0x03/3FF 0x04/3FF 0x05/3FF 0x06/3FF 0x08/3FF	Potential general battery failure. It is advisable to review your test settings as newer systems require longer discharge times.
0x07/3FF	Timed out awaiting a response from the user. This could mean that the system does not support detection of the AC Adapter.
0x08/3FF	On older systems there is potential that the charge\discharge reading is invalid or not supported.

6201 - Optical

Overview

OPT is a group that tests optical hardware: CDR, CDRW, DVDR and DVDRW. There are a number of tests within this group covering reading, writing and Mechanical stress. Write tests are also available for both ISO images and simple directory transfer.

Supported Media

Assuming the media is supported by the device under test, the following media are supported:-

CD-ROM, CD-R, CD-RW

DVD-ROM, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-DL

The following media are not supported:-

CD-Audio (All types), VCD, SVCD

DVD-Audio (All types), DVD-Video (All types), DVD-RAM

The tests does not currently support Blue Ray or HD DVD devices.

When testing on a DVD drive the test requires there to be DVD media in the drive with sufficient data for the test to be run. If the media is a CD then the tests will not be available, this also happens if the DVD does not have enough data for a good sample.

If there is no media in the drive and the user setting is interactive the media will be requested if no media is inserted a test failure will result. In non-interactive mode this will result in the test not being available.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Linear Read			x	x	x	x	x	x	x	x
302	Random Read			x	x	x	x	x	x	x	x
303	Advanced Movement			x	x	x	x	x	x	x	x
304	Media Erase			x	x	x	x	x	x	x	x
305	Directory Write			x	x	x	x	x	x	x	x
306	ISO Image Write			x	x	x	x	x	x	x	x
307	Media Eject				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	60	0	604800	Time to run the test for, seconds, max 1 week
	2	Coverage	10	1	100	Percentage of media to check
	7	Minimum Transfer Rate	70	0	1000	The minimum transfer speed the drive is allowed to reach before failing the test. This is in KB/S
302	1	Duration	60	1	604800	
	7	Minimum Transfer Rate	70	0	1000	
303	1	Duration	60	1	604800	
304	3	Eject/Reload Disc	TRUE	FALSE	TRUE	Eject/Reload disc after test.
305	3	Eject/Reload Disc	TRUE	FALSE	TRUE	
	4	Directory	". "	1	MAX_PATH	Path to an existing directory to be written to the disc. Files in this directory will be written to the root of the disc. When left blank, the test will write default test files to the root of the disc.
	5	Recursive	FALSE	FALSE	TRUE	True sets the test to include the writing of sub directories present in the specified directory of the Directory parameter. False sets the test to ignore sub directories present in the specified directory of the Directory parameter.
306	3	Eject/Reload Disc	TRUE	FALSE	TRUE	
	6	Filename	". "	1	MAX_PATH	Put in the path and filename to the file to write.

Descriptions

301 - Linear Read

Performs read testing of the chosen media in the device using a basic reading algorithm. Test medium must have at least 50MB of data, more is recommended. The higher the data content of the media the better the test.

Test Time: Dependent on the duration or coverage test setting.

302 - Random Read

Performs read testing of the chosen media in the device using a complex reading algorithm. Test medium must have at least 50MB of data, more is recommended. The higher the data content of the media the better the test.

Test Time: Dependent on the duration test setting.

303 - Advanced Movement

Applies the maximum amount of stress to the laser positioning actuator for the duration of the test. Test medium must have at least 50MB of data, more is recommended. The higher the data content of the media the better the test.

The Advanced movement test includes a Laser Refocusing test, used for checking that the laser can refocus accurately. This test is dependent on the type of media inserted. If a Multi layer disc is inserted then the refocusing across the layers is also tested.

Test Time: Dependent on the duration test setting.

304 - Media Erase

Tests the devices ability to erase an erasable disc. A device or medium fault will cause this test to fail. Test medium must be erasable and supported by the device.

Test Time: Dependent on the amount of data on the media.

305 - Directory Write

Tests the devices ability to write a directory structure. The test will write files from a specified directory source to the root of the disc. If no directory is specified then default test files are used. The test can also be set to include or exclude sub directories. Test medium must be writeable and supported by the device.

Note: Directory structures written to disc must not exceed 100MB.

Note: The default "." means that the current working directory will be written to the medium. If medium is blank default parameter values execute without error.

Test Time: Dependent on the size of the directory being written.

306 - ISO Image Write

Tests the devices ability to write an ISO image. Test medium must be writable and supported by the device. Correct media type must be present.

Note: Images used must not exceed 100MB and be of type ISO only.

Note: The default value must be set with a valid ISO image or the test will not be available.

Test Time: Dependent on the size of the ISO file being written.

307 - Media Eject

Tests the devices ability to eject the media.

Test Time: 1 Second

Error Codes

Error Code	Name
0x00/00A	The medium inserted is too small to give meaningful results
0x01/00A	The amount of data is incorrect for this test
0x02/3FF	The media is not suitable for this test
0x03/001	Failed to read the media
0x04/00B	The transfer speed is too slow
0x05/3FF	Failed to write to the media
0x06/3FF	Cannot retrieve windows operating system handle for the device
0x07/3FF	The drive is not ready
0x08/001	The Media is not ready

Troubleshooting

Error Code(s)	Potential Reason
0x00/00A	The media is too small to perform this test.
0x01/00A 0x02/3FF 0x06/3FF	Check the parameters, data and media to perform the test.
0x06/3FF 0x05/3FF 0x04/00B 0x03/001 0x07/3FF 0x08/001	Possible media or device failure.

6401 - Biometric

Overview

BIO is a test group for biometric devices. Biometric devices provide access control using a fingerprint reader linked to a 'passport' database to determine if access can be granted. The biometric group of tests has been designed to support the latest generation of biometric hardware.

There are two tests within this group covering Passport Properties and Data testing of the device.

This group can be configured using the diagnostic configuration file. For more information please see Appendix B.

Tests will only run on machines under a full operating system with the device drivers installed. The biometric device should be fully configured and the configuration (fingerprint) of the user must be present during testing as both tests are interactive.

Tests

Test	Name	I	E	M	Windows ® XP	Windows ® Server 03	Windows Vista®	Windows ® Server 2008	Windows ® 7	Windows ® 8	Windows ® PE
301	Get Passport Properties	x			x	x	x	x	x	x	
302	Create and Get Data	x			x	x	x	x	x	x	

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
302	1	Name Of Private Object	"TestData"	1	10	
	2	Name Of Attribute	"1"	1	10	
	3	Source Value Of Attribute	"111"	1	10	

Descriptions

301 - Get Passport Properties

This test will ask the user for fingerprint.

Then it will check if the users fingerprint matches the biometric information already in the system and if so make an attempt to get passport properties of the owner of the passport.

302 - Create and Get Data

Firstly this test will ask the user for fingerprint. Then it will check if fingerprint matches the biometric information already in the system and if so make an attempt to create a new private data object and set its attribute.

Secondly it will similarly authenticate the user by asking for fingerprint again, try to open the private data object and compare the value of the attribute to the source value.

Finally, the private data object will be deleted.

Error Codes

Error Code	Name
0x00/001	General Error Executing tests
0x01/3FF	Unable to read passport
0x02/3FF	General Error Executing tests

Troubleshooting

Error Code(s)	Potential Reason
0x00/001 0x01/3FF 0x02/3FF	Windows Driver for device not available. Device not working as required. If the users fingerprint does not match the data stored in the device. If the device is not configured with any data. The Biometric Chipset is not supported.

6701 - Motherboard

Overview

MO2 is a group that tests the Motherboard. It consists of the following three tests: Northbridge Test Set, Southbridge Test Set and CMOS Tests. One or more sub-tests may not be available or compatible with all operating systems.

Tests may not run (or may not run all sub-tests) if drivers and libraries are missing, hardware is unsupported or errors are encountered.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Northbridge				x	x	x	x	x	x	x
302	Southbridge				x	x	x	x	x	x	x
303	CMOS Clock				x	x	x	x	x	x	x
304	CMOS Checksum				x	x	x	x	x	x	x
305	CMOS Battery				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	30	1	604800	Time in seconds individually allocated to the Graphics bus sub-test
	2	FSBSpeed	SDP	0	50000	Target frequency - the expected value. A value of 0 means that the front side bus speed is not tested.
	6	FSBTolerance	30	1	100	Tolerance percentage for FSB Speed.
305	4	MinimumBatteryVoltage	180	0	10000	Minimum acceptable battery voltage in centi-volts. For example 180 = 1.8 volts
	5	MaximumBatteryVoltage	350	0	10000	Maximum acceptable battery voltage in centi-volts. For example 180 = 1.8 volts

Descriptions

301 - Northbridge

Sub-tests:

1/ FSB Speed - the FSB (HT link / QPI) speed is read and checked to see if it is within the tolerance of the target speed, as defined by the outlined parameters below.

2/ Graphics bus - performs a basic memory test on all accessible video memory. The test works by filling the screen with a random colour, then individually checking that each pixel is displaying this colour.

3/ Memory bus - performs a basic test on the memory configuration.

Note: If the whole test passes the extra information will contain a tested percentage of the graphics component of the Northbridge.

302 - Southbridge

Sub-tests:

1/ I/O port - performs a basic test on the first detected serial port.

2/ Ethernet - performs a basic local host ping test.

If any sub-test fails, the whole test is considered a fail.

Test Time: Approximately 5 seconds

303 - CMOS Clock

Real-time clock - the CMOS real-time clock date and time are compared to the system date and time. A maximum difference of 5 seconds is permitted, to allow for small timing delays.

304 - CMOS Checksum

Checksum - the CMOS checksum is calculated and compared to the checksum stored in CMOS.

305 - CMOS Battery

Battery Voltage - the CMOS battery voltage is read and checked to see if it falls between the minimum and maximum defined by the parameters below.

Error Codes

Error Code	Name
0x00/3FF	Unable to load dlls required for test
0x01/017	The CMOS Realtime clock is incorrect
0x02/3FF	The CMOS Checksum is incorrect
0x03/3FF	The CMOS Battery voltage is outside tolerances
0x04/3FF	The CMOS Battery voltage is unable to be read
0x05/016	The FSB speed is outside tolerances
0x06/3FF	Unable to create window class
0x07/3FF	Unable to create window
0x08/3FF	Unable to update window
0x09/3FF	Unable to get control of window
0x0A/3FF	Unable to set draw mode
0x0B/3FF	Unable to set window size
0x0C/080	Incorrect pixel detected
0x0D/3FF	Unable to find a serial port to test
0x0E/3FF	Unable to open a serial port to test
0x0F/3FF	Unable to create an ICMP file
0x10/3FF	General Pingtest error
0x11/3FF	Pingtest timed out
0x12/3FF	Pingtest reply buffer too small
0x13/3FF	Unable to write the port config
0x14/3FF	Unable to read the port config
0x15/3FF	The set and read configs do not match
0x16/3FF	The battery voltage is unavailable to read
0x17/3FF	Memory controller check failed
0x18/3FF	The FSB speed parameter has not been set

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF	A required DLL failed to load. Ensure that the Xtra directory is present and contains all required files.
0x01/017 0x02/3FF 0x03/3FF 0x04/3FF	The CMOS test has failed. This could be because of faulty CMOS or CMOS battery. Try replacing the battery.
0x17/3FF	The memory subtest has failed. Ensure there is enough memory available on the system to test.

Error Code(s)	Potential Reason
0x06/3FF 0x07/3FF 0x08/3FF 0x09/3FF 0x0A/3FF 0x0B/3FF 0x0C/080	The graphics subtest has failed. This can occur if user interaction is detected during the test as the OS may access video memory to update cursor locations.
0x13/3FF 0x14/3FF 0x15/3FF 0x0D/3FF 0x0E/3FF	The serial subtest has failed.
0x0F/3FF 0x10/3FF 0x11/3FF 0x12/3FF	The network ping subtest has failed.
0x05/016 0x18/3FF	The FSB subtest has failed. Ensure the correct tolerance was entered for the test parameter.
0x16/3FF	Unable to read battery voltage to perform the test.

6801 - Operating System

Overview

OPS is a software test group that reports the operating system version and installed programs. It provides one test that checks that the operating system can gather information on specified files.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	File Details				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	FileListName	NULL	5	MAX_PATH	Name of input file containing list of files to report against

Descriptions

301 - File Details

The File Version test checks that the operating system can gather file size, version, CRC, and creation and 'last modified' time and date. To use this group, an input file must be created. The test will look for all files listed in the input file and if it can read all the parameters for those files the test passes.

Note: The parameters gathered are not displayed or logged.

The input file - Example: If the user wanted to check files 'file1.txt' and 'file2.txt' located in the root of the c: drive, then the lines in the input file would contain:

C:\file1.txt

C:\file2.txt

Wildcards cannot be used to specify a group of files.

Important: The input file must be a .txt file extension and must be saved in an ANSI format (rather than UTF-8 etc) for it to be correctly read by the OPS test. i.e. The file can be created using Microsoft Windows® Notepad. This

is a case-sensitive extension due to the diagnostic framework supporting multiple languages.

Important: Each line specifying a file path must be shorter than 260 characters, otherwise the input file will be rejected and your test will not run fully.

Test Time: 4 seconds per input file entry.

Error Codes

Error Code	Name
0x00/3FF	A line in the 'input file' is too long
0x01/3FF	'Input file' not specified
0x02/3FF	'Input file' name not valid
0x03/3FF	Failed to get details on one of the files specified in 'input file'

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF	Maximum length for line in 'input file' should be 260 characters.
0x01/3FF	Enter name for 'input file' on parameters menu.
0x02/3FF	'Input file' name should be at least 1 character with the '.txt' at the end.
0x03/3FF	Either one of the files specified in 'input file' does not exist or the operating system has failed to get a parameter.

6901 - Hardware Monitor

Overview

HWM is a group that provides the ability to test Hardware Monitor sensors. The types of sensor available are: temperature, fan speed and voltage.

All tests within this group have the same structure as follows:

The test checks the metric (temperature, speed or voltage) is within the percentage tolerance of the target. The user specifies the target value, tolerance and sensor identifier: the test passes if it the sensor value is within plus or minus the tolerance of the target, else it fails.

Test Tolerance

This is the percentage tolerance the sensor value must be within the target to pass the test. For example, if this is set to 10 and the target is 40C, then the sensor reading must be within 10% of 40C (36C to 44C).

Test Identifier

Each test has a parameter enabling the user to define the text identifier to match the particular sensor. This is because sensors may have different names on different systems and in different locales. For example, the default sensor name for test 301 is 'Mainboard'. The match can be partial, e.g. if the sensor name were 'Case Fan 1' and the identifier was 'Fan' then the sensor would be treated as a match. Only the last matching sensor value is tested and the identifier is case-insensitive.

Test Time: less than 1 second per test.

Tests

Test	Name	I	E	M	Windows ® XP	Windows ® Server 03	Windows Vista®	Windows ® Server 2008	Windows ® 7	Windows ® 8	Windows ® PE
301	System Temperature				x	x	x	x	x	x	x
302	CPU Temperature				x	x	x	x	x	x	x
303	CPU Core Temperatures				x	x	x	x	x	x	x
304	CPU Fan				x	x	x	x	x	x	x
305	System Fan				x	x	x	x	x	x	x
306	+12 Voltage				x	x	x	x	x	x	x
307	-12 Voltage				x	x	x	x	x	x	x
308	+5 Voltage				x	x	x	x	x	x	x
309	-5 Voltage				x	x	x	x	x	x	x
310	+3.3 Voltage				x	x	x	x	x	x	x
311	-3.3 Voltage				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Target Temperature	SDP	0	254	Target temperature (C) - the expected value.
	4	Tolerance Percentage	10	0	100	Tolerance - allowable deviation either side of the target.
	5	Test Identifier	"Mainboard"	0	MAX_PATH	Sensor name (partial match allowed, not case-sensitive).
302	1	Target Temperature	SDP	0	254	
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	"Cpu"	0	MAX_PATH	
303	1	Target Temperature	SDP	0	254	
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	"Core #%i"	0	MAX_PATH	
304	2	Target Speed	SDP	0	10000	Target fan speed (RPM) - the expected value.
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	"cPU"	0	MAX_PATH	
305	2	Target Speed	SDP	0	10000	
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	"FANIN"	0	MAX_PATH	
306	3	Target Voltage	SDP	0	2500	Target voltage (centivolts) - the expected value.
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	" +12"	0	MAX_PATH	
307	3	Target Voltage	SDP	0	2500	
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	" -12"	0	MAX_PATH	
308	3	Target Voltage	SDP	0	2500	
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	" +5"	0	MAX_PATH	
309	3	Target Voltage	SDP	0	2500	
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	" -5"	0	MAX_PATH	
310	3	Target Voltage	SDP	0	2500	
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	" +3"	0	MAX_PATH	

Test	Param	Name	Default	Min	Max	Note(s)
311	3	Target Voltage	SDP	0	2500	
	4	Tolerance Percentage	10	0	100	
	5	Test Identifier	"-3"	0	MAX_PATH	

Descriptions

301 - System Temperature

System Temperature test.

302 - CPU Temperature

CPU Temperature test.

303 - CPU Core Temperatures

CPU Core Temperature test. The %i is used as a number wildcard for the number of available cores.

304 - CPU Fan

CPU Fan speed test.

305 - System Fan

System Fan speed test.

306 - +12 Voltage

+12 voltage test.

307 - -12 Voltage

-12 voltage test.

308 - +5 Voltage

+5 voltage test.

309 - -5 Voltage

-5 voltage test.

310 - +3.3 Voltage

+3 voltage test.

311 - -3.3 Voltage

-3 voltage test.

Error Codes

Error Code	Name
0x00/3FF	The sensor name parameter was not found
0x01/3FF	The result was outside the tolerance
0x02/3FF	Unable to find sensor

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF 0x01/3FF 0x02/3FF	Check the system information for your system to ensure the correct parameter values are being used.

7001 - Solid State Drives

Overview

SSD is a test group for solid-state drives. A solid-state drive is a data storage device that uses solid-state memory to store persistent data in the same manner of a traditional block I/O hard disk drive. SSDs are distinguished from traditional magnetic disks such as hard disk drives or floppy disk, which are electromechanical devices containing spinning disks and movable read/write heads. In contrast, SSDs use microchips that retain data in non-volatile memory chips and contain no moving parts. Compared to electromechanical HDDs, SSDs are typically less susceptible to physical shock, are silent, have lower access time and latency. SSDs use the same interface as hard disk drives.

Notes:

1. Only a coverage of 100% will take the same time using a duration or coverage setting.
2. Other parameters may be irrelevant due to hardware access times with this type of test.
3. This is because with a duration setting, each physical read is performed sequentially. Whereas with the coverage parameter, the reading is distributed evenly across the hardware being tested. Therefore there maybe a delay due to moving to the next hardware location.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Linear Read				x	x	x	x	x	x	x
302	Random Read				x	x	x	x	x	x	x
303	S.M.A.R.T.				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	60	0	604800	Time to run the test for, seconds, max 1 week
	2	Coverage	100	1	100	Percentage coverage
302	1	Duration	60	1	604800	

Descriptions

301 - Linear Read

Exercises a drive's read capability using linear (incrementally increasing) read addresses. Success or failure of each read is monitored.

302 - Random Read

Exercises a drive's read capability using pseudo-random read addresses (these are randomly generated using a fixed computational process). A quick benchmark is performed on the device to display a read rate. Success or failure of each read is monitored.

303 - S.M.A.R.T.

Self-Monitoring, Analysis, and Reporting Technology, or S.M.A.R.T., is a monitoring system for solid-state drives to detect and report on various indicators of reliability. This test checks the status of the S.M.A.R.T reports (namely, Program Fail Count, Erase Fail Count, Wear Levelling Count, Unexpected Power Loss), to ensure that the solid state drive is in a reliable condition. If at least one S.M.A.R.T. report is below the threshold, the test fails.

Test Time: 1 to 5 seconds

Error Codes

Error Code	Name
0x00/001	Unable to read drive information
0x01/005	Unable to read from drive
0x02/006	Input buffer overflow
0x03/005	Unable to set drive position pointer
0x04/3FF	Unable to open drive
0x05/3FF	Unable to get drive S.M.A.R.T. Attributes
0x06/013	One or more S.M.A.R.T. Attributes are outside of their tolerances

Troubleshooting

Error Code(s)	Potential Reason
0x05/3FF 0x06/013	The S.M.A.R.T. Attributes being read are either not supported on the drive and interface or the drive is faulty.
0x00/001 0x01/005 0x03/005 0x02/006 0x04/3FF	The drive may be faulty.

7101 - RAID

Overview

RAI is a group that checks RAID devices. RAID (Redundant Array of Independent/Inexpensive Disks) is a storage technology that combines multiple disk drive components into a single logical unit. This can give advantaged in terms of speed, reliability and cost.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Linear Read				x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Duration	60	0	604800	Time to run the test
	2	Coverage	100	1	100	Percentage of RAID disk to test
	3	MaximumErrors	1	1	50	Continues to test until the maximum number of errors is reached

Descriptions

301 - Linear Read

Each Read/Verify test iteration is one seek and verify. Each iteration, the seek position increases by one MB increment (determined by the range and coverage). The Read/Verify test is always done with the seek position increasing each iteration.

Note: This test is only available on drives which have either a capacity greater than 2TB or a sector size greater than 512 bytes.

Test Time: 16 to 20 seconds per 1000 MB. Actual times will vary depending on several factors including: the device read speed, access times, the interface and medium used.

Error Codes

Error Code	Name
0x00/001	The device failed to open
0x01/001	Failed to set RAID hardware Address
0x02/001	Read failure

Troubleshooting

Error Code(s)	Potential Reason
0x00/001 0x02/001 0x01/001	The device may be faulty or another program may be limiting access to the device.

7201 - Touch Screen

Overview

This group is for testing Touchscreens.

A touchscreen is an electronic visual display that can detect the presence and location of a touch within the display area. The term generally refers to touching the display of the device with a finger or hand. Touchscreens can also sense other passive objects, such as a stylus.

All the tests within the Touchscreen group are interactive as user interaction is required.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Quick Grid	x			x	x	x	x	x	x	x
302	Advanced Line	x			x	x	x	x	x	x	x
303	Pointing Accuracy	x			x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Timeout	15	1	60	Timeout for input
	4	Grid Size	6	3	20	The number of grids in both the X and Y axis
302	1	Timeout	15	1	60	
	2	Max Failed Pixels	3	0	100	Max number of failed pixels allowed after test completion
303	1	Timeout	15	1	60	
	3	Tolerance	15	5	100	How close in pixels the touch must be to the target

Descriptions

301 - Quick Grid

The Quick grid test fills the screen with a grid of sectors to test. Each sector needs to be touched to pass the test.

Test Time: Dependent on user input.

302 - Advanced Line

This test will test the whole of the screen. By tracing a line diagonally accross the screen, every pixel on the X and Y axis will be tested.

Test Time: Dependent on user input.

303 - Pointing Accuracy

The Pointing Accuracy test is designed to test the accuracy and calibration of the touch device. A series of targets will be shown that should be touched. If the touch detected is outside the tolerance then the test will fail.

Test Time: Dependent on user input.

Error Codes

Error Code	Name
0x00/001	Failed to create window
0x01/3FF	The Operator chose to fail the test
0x02/012	The touch was outside the tolerance area

Troubleshooting

Error Code(s)	Potential Reason
0x00/001	The test failed to start. This is most likely caused by a hardware or OS fault.
0x01/3FF 0x02/012	The test has failed. This could be due to an operator error, uncalabrated or faulty touch device.

7301 - Input Peripherals

Overview

This groups covers system information and testing on the input peripherals. It focuses on tests for the keyboard and mouse.

A peripheral is a device that is connected to a host computer, but not part of it. It expands the host's capabilities but does not form part of the core computer architecture.

The Keyboard Test and Quick Keyboard Test offer different methods for testing the Keyboard peripherals connected to your system.
It is not necessary to run both tests for full coverage and it is recommended to only run the test configured in the way you find most comfortable.

Tests

Test	Name	I	E	M	Windows® XP	Windows® Server 03	Windows Vista®	Windows® Server 2008	Windows® 7	Windows® 8	Windows® PE
301	Advanced Keyboard	x			x	x	x	x	x	x	x
302	Keyboard LED	x			x	x	x	x	x	x	x
303	Quick Mouse	x			x	x	x	x	x	x	x
304	Mouse Button	x			x	x	x	x	x	x	x
305	Movement	x			x	x	x	x	x	x	x
306	Quick Keyboard	x			x	x	x	x	x	x	x

Parameters

Test	Param	Name	Default	Min	Max	Note(s)
301	1	Test Configuration	"I97Diag\\xtra\\ \\7300\\English _8Keys.txt"	5	MAX_PATH	The internal config file to use for the test. This file is created using the Advanced Window if the keycount parameter is not set. If the keycount is set then this parameter should be set to one of the Autofill identifiers listed on the Advanced Window.
	2	Debounce	250	0	2000	The debounce time in Ms between each key check. A value greater than 0 will run the test in Ordered mode and a value of 0 will run in Unordered mode.
	3	Timeout	10	0	60	The timeout between key presses before the test will fail. If set to 0 then a fail button will be shown.
302	4	Timeout	15	1	60	The timeout for waiting for a response from the operator.
303	4	Timeout	15	1	60	
304	4	Timeout	15	1	60	
305	4	Timeout	15	1	60	
306	2	Debounce	100	0	2000	
	6	Keyboard Config	SDP	5	MAX_PATH	The keyboard configuration to use.

Descriptions

301 - Advanced Keyboard

The keyboard test has two modes of use to cover the ways a keyboard can be tested.

The keyboard can be tested in Ordered mode where key presses are expected in the order defined in the configuration file used. The keys pressed are also checked for debounce. This mode of operation is best suited for checking key zones on laptop keyboards.

The other mode of operation is Unordered mode where keys can be pressed in any order. Each keypress is checked against the list of keys in the configuration, with each key match removing the key from the list. Any mismatched keys are ignored and no debounce checking is done. Once all the keys have been pressed the test passes. This mode of operation is best suited for mechanical keyboards for checking an entire keyboard to ensure each key works and does not get stuck.

The Advanced window of this group can be used to create configuration files for use by this test. Clicking a row in the table in the Advanced window will highlight it. Once highlighted, clicking the left cell will allow editing and allow the name of the key to be entered. This is the name that will be shown within the test. Clicking the right cell will change to a key entry mode. The scancode of the next keyboard key pressed will then be entered into the cell. This is the physical key that will need to be pressed during the test. The Clear button can be used to clear a row and remove the key name and code. If Autofill is enabled, each key entered in the scancode column will automatically have its name filled in the name column. The Load and Save buttons can be used to load and save the configuration files. The created files can then be entered as test parameters in the test.

Test Time: Dependent on user input.

302 - Keyboard LED

The LED test will activate and deactivate the Num lock, Scroll lock and Caps lock LEDs on the keyboards connected to the system

303 - Quick Mouse

The quick mouse test will display a box that must be clicked to pass the test.

304 - Mouse Button

The button test will prompt for mouse buttons to be pressed. This will test each of the requested buttons for correct functionality.

305 - Movement

The movement test will display a ring for the mouse to to be moved around to test mouse tracking functionality.

306 - Quick Keyboard

The Quick Keyboard Test is a streamlined version for the Keyboard Test. A visual representation of the selected keyboard configuration is shown in the Interactive test window if available and the keys are coloured when they are pressed. A debounce time is also configured. If any key is detected within the debounce time of the previous key the test will fail.

Test Time: Dependent on user input.

Error Codes

Error Code	Name
0x00/3FF	Unable to load any keys to test
0x01/3FF	Unable to load the test configuration file
0x02/001	Unable to get the keyboard
0x03/001	Unable to create test window
0x04/3FF	The Operator chose to fail the test
0x05/011	The wrong key press was detected
0x06/011	Another key was detected during the debounce time
0x07/3FF	The test timed out
0x08/001	Unable to get the mouse
0x09/3FF	The cursor moved outside the test ring
0x0A/3FF	The cursor moved back into a tested area
0x0B/3FF	The keyboard config is invalid.

Troubleshooting

Error Code(s)	Potential Reason
0x00/3FF 0x01/3FF	The specified Key configuration file was not successfully loaded. Check that the file is present and contains keys to be tested.
0x02/001 0x03/001 0x08/001 0x0B/3FF	The test failed to start. This is most likely caused by a hardware or OS fault.
0x04/3FF 0x05/011 0x06/011 0x07/3FF 0x09/3FF 0x0A/3FF	The test failed due to a possible fault with the hardware or due to operator error.

APPENDIX A - XML Configuration Scripts

The following section defines the field values and types for the entities of the XML configuration script.

Entities

Eurosoft

Main entity of the configuration scripts, which is used as a wrapper for all groups and has no attributes.

Eurosoft_<group ID> (e.g. Eurosoft_7100)

Main entity of the group, which is used as a wrapper and has no attributes.

Eurosoft_7100

Main entity of the RAI group, which is used as a wrapper and has no attributes.

Section

The entity, which is used to describe a particular method of handling RAID information and has the following attributes:

Attribute	Mandatory	Type	Range
Name	Yes	String	512 characters
Method	No	String	512 characters

Device

The entity, which is used to describe a device within a section and has the following attributes:

Attribute	Mandatory	Type	Range
UniqueID	Yes	Integer	1-2147483647
VendorID	Yes	Hexadecimal integer	4 hexadecimal digits
DeviceID	Yes	Hexadecimal integer	4 hexadecimal digits
Name	No	String	512 characters

Eurosoft_6400

Main entity of the BIO group, which is used as a wrapper and has no attributes.

Device

This entity is used to specify an additional device for BIO and has the following attributes:

Attribute	Mandatory	Type	Range
PNPContains	Yes	String	512 characters
Manufacturer	Yes	String	512 characters

Note: The PNPContains attribute should contain a string that should be found in valid PNPDeviceID for the device. This usually contains the Vender and Device ID

Typical example of configuration script:

```
<Eurosoft>
  <Eurosoft_7100>
    <Section Name="hyperraid" Method="Method1 (Hyperwin.exe)">
      <Device UniqueID="1" VendorID="8086" DeviceID="25b0"
        Name="6300ESB SATA RAID Controller"></Device>
      <Device UniqueID="2" VendorID="8086" DeviceID="24df"
        Name="82801ER (ICH5R) SATA Controller"></Device>
    </Section>
  </Section>
</Eurosoft_7100>
```


<Eurosoft_6400>

<Device PNPContains="USB\VID_1307&PID_1171"
Manufacturer="Generic"></Device>

</Eurosoft_6400>

</Eurosoft>

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