

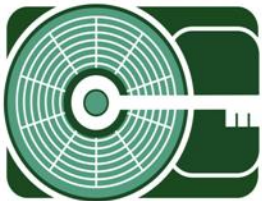
# [MISDE]

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## Functionality Test of the Logicube® Desktop Write-PROtect Adapter

MARSHALL  
INFORMATION SECURITY  
& DIGITAL EVIDENCE



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## TEST PLAN

**Test Number:** WRITEPRO-01

**Test Title:** Functionality Test of the Logicube® Desktop Write-PROtect Adapter

**Test Date:** 3/29/2006

### Purpose and Scope:

To safely acquire and analyze ATA-enabled hard disk data, the MISDE Laboratory possesses the Logicube Desktop Write-PROtect Adapter (see figure 1.1). The Write-PROtect adapter is a hardware-based write blocker that allows ATA-enabled hard disk drives, including disks 137 gigabytes (GB) or greater that implement 48 bit addressing, to be connected to a PC via the IDE (Integrated Drive Electronics) channel or USB (Universal Serial Bus) 2.0 port for the purpose of performing investigative acquisition and/or analysis.

This test plan will test the ability of the Desktop Write-PROtect Adapter to accurately read data from a parallel ATA-enabled hard disk; by means of connection to the IDE channel of the motherboard and USB 2.0 connection. The device should also prevent modification to the hard disk during acquisition and/or examination. This test consists of four scenarios:

### Requirements:

- 1) The Logicube Desktop Write-PROtect adapter should recognize a stand-alone source hard disk while connected to the secondary IDE channel of the motherboard
- 2) The Logicube Desktop Write-PROtect adapter should allow normal write-block operation to occur to the hard disk while attached to the secondary IDE channel of the motherboard.
- 3) The Logicube Desktop Write-PROtect adapter should accurately calculate an MD5 hash algorithm of the laboratory test hard disk while attached to the secondary IDE channel of the motherboard.
- 4) The Logicube Desktop Write-PROtect adapter should recognize a stand-alone source hard disk while connected to the PC through the USB port.
- 5) The Logicube Desktop Write-PROtect adapter should allow normal write-block operation to occur to the hard disk attached to the PC through the USB port.
- 6) The Logicube Desktop Write-PROtect adapter should accurately calculate an MD5 hash algorithm of the laboratory test hard disk. While connected to the PC through the USB port.
- 7) MD5 hash calculations made before and after write attempts to the test hard disk should be consistent.

### Description of Methodology:

The Logicube Desktop Write-PROtect adapter will be attached to the PC via the IDE cable labeled "to host" to the secondary IDE channel located on the motherboard (see figure 1.2). An 18.6 gigabyte ATA-enabled hard disk drive will then be attached to the Write-PROtect adapter using the IDE cable labeled "to hard disk drive." The Write-PROtect adapter will be powered on with the PC with the Write-PROtect device set to "direct" mode (see figure 1.2). After recognition of the attached hard disk in Windows XP, an MD5 hash calculation will be performed using Guidance Software's EnCase® Forensic Edition v.5.05a for Windows. Upon completion of



the hash calculation, a file entitled "Test Document.doc" will attempted to be written to the disk. The Write-PROtect adapter, along with Windows XP, will be powered down and restarted to determine if the write-block operation is persistent. A second MD5 hash calculation will be performed on the attached hard disk using EnCase Forensic Edition v.5.05a for Windows. Upon completion of the hash calculation, the two hash values will be compared to determine if the write-block operation of the Write-PROtect adapter is consistent.

The Write-protect device will then be toggled from "direct" mode to "USB" mode and the device will be connected to the host PC via USB 2.0. The 18.6 GB ATA enabled hard disk will be attached to the Write-PROtect adapter using the IDE cable labeled "to hard disk drive." The write protect adapter will be powered on via the provided external power supply. After recognition of the hard disk in Windows XP, an MD5 hash calculation will be performed using EnCase v.5.05a for Windows. Upon completion of the MD5 hash calculation, a file entitled "Test Document.doc" will attempted to be written to the disk. The write-protect adapter, along with Windows XP, will be powered down, restarted, and viewed in Windows explorer to determine if write-block operation was persistent. A second MD5 hash calculation will be performed on the disk using EnCase Forensic Edition v.5.05a for Windows. Upon completion of the hash calculation, the two hash values will be compared to determine if the write-block operation of the write-PROtect device is consistent.

#### **Expected Results:**

- 1) The Logicube Desktop Write-PROtect adapter will recognize a stand-alone source hard disk while connected to the secondary IDE channel of the motherboard.
- 2) The Logicube Desktop Write-PROtect adapter will allow normal write-block operation to occur to the hard disk while attached to the secondary IDE channel of the motherboard.
- 3) The Logicube Desktop Write-PROtect adapter will accurately calculate an MD5 hash algorithm of the laboratory test hard disk while attached to the secondary IDE channel of the motherboard.
- 4) The Logicube Desktop Write-PROtect adapter will recognize a stand-alone source hard disk while connected to the PC through the USB port.
- 5) The Logicube Desktop Write-PROtect adapter will allow normal write-block operation to occur to the hard disk attached to the PC through the USB port.
- 6) The Logicube Desktop Write-PROtect adapter will accurately calculate an MD5 hash algorithm of the laboratory test hard disk. While connected to the PC through the USB port.
- 7) MD5 hash calculations made before and after write attempts to the test hard disk will be consistent.



**Test Scenarios:**

Test Number	Environment:	Actions:	Assigned Req't's	Expected Results:
01-01	Logicube Desktop Write-PROtect adapter; 18.6 GB ATA hard disk drive	Write-PROtect adapter connected to secondary IDE channel of PC motherboard; hard disk connected to Write-PROtect device	1	ATA enabled HDD will be recognized within Windows (XP) explorer.
01-02	Logicube Desktop Write-PROtect adapter; 18.6 GB ATA hard disk drive; EnCase® Forensic Edition v.5.05a for Windows.	MD5 hash calculation of ATA hard disk attached to Write-PROtect device using EnCase v.5.05a.	3	MD5 Hash calculation will be produced.
01-03	Logicube Desktop Write-PROtect adapter; 18.6 GB ATA hard disk drive	"test document.doc" attempted to be written to hard disk drive in Windows (XP) explorer	2	No modification will be made to protected hard disk drive.
01-04	Logicube Desktop Write-PROtect adapter; 18.6 GB ATA hard disk drive	MD5 hash calculation of ATA hard disk attached to Write-PROtect device using EnCase v.5.05a.	3	Second MD5 Hash calculation will be produced.
01-05	Logicube Desktop Write-PROtect adapter (USB mode); 18.6 ATA hard disk drive	Desktop Write-PROtect device connected to USB 2.0 port of PC	4	ATA enabled HDD will be recognized and USB drivers installed within Windows (XP) explorer.
01-06	Logicube Desktop Write-PROtect adapter (USB mode); 18.6 ATA hard disk drive; EnCase® Forensic Edition v.5.05a for Windows	MD5 hash calculation of ATA hard disk attached to Write-PROtect device (in USB mode) using EnCase v.5.05a.	6	MD5 Hash calculation produced.
01-07	Logicube Desktop Write-PROtect adapter (USB mode); 18.6 ATA hard disk drive	"test document.doc" attempted to be written to hard disk drive in Windows (XP) explorer	5	No modification will be made to protected hard disk drive.
01-08	N/A	Compare MD5 hash calculation values of Write-PROtect (Direct-mode)	7	MD5 calculation will match original MD5 hash calculated on 18.6 GB ATA HDD.



01-09	N/A	Compare MD5 hash calculation values of Write-PROtect (USB-Mode)	7	MD5 calculation will match original MD5 hash calculated on 18.6 GB ATA HDD.
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## Test Data Description:

### Laboratory Test Drive:

Seagate Barracuda ATA III Ultra ATA HDD  
Model: ST320414A  
Serial Number: 7eC0AS9Y  
Part Number: 9R3004-301  
Firmware Number: 3.05  
Capacity: 20.0 GB (18.6 GB viewable disk space)  
Speed: 7200 rpm  
Avg. Seek Time: 8.5 m/s  
Jumper Setting: Single Master  
MD5 hash: 70F8DB74B8DA283AD0210967F12BCCFE

### Drive Parameters (non-DOS / Windows translation)

Cylinders: 16383  
Heads: 16  
Sectors: 63  
Total Addressable Sectors: 39,102,336

### Drive Parameters (DOS translation)

Cylinders: 1023  
Heads: 256  
Sectors: 63  
Total Addressable Sectors: 39,102,336

### Installed Software:

Microsoft Windows XP Professional 32 Bit O/S w/ Service pack 2  
Microsoft Office 2003 Professional  
Dell Optiplex GX270 Drivers and Utilities Disk

### Examination PC used:

Gateway E5200 Desktop  
600 MHz Intel Pentium III  
Microsoft® Windows XP Professional w/ Service Pack 2  
256 MB RAM  
30 GB parallel ATA Hard Disk Drive



## SUMMARY REPORT

**Test Number:** WRITEPRO-01

**Test Title:** Functionality Test of the Logicube® Desktop Write-PROtect Adapter

**Test Date:** 3/27/2006

### Test Description:

This test documents the results of the functionality of the Logicube Desktop Write-PROtect adapter when attached to the secondary IDE channel of a PC motherboard or USB 2.0 port.

### Forensic Tool:

**Title:** Desktop Write-PROtect  
**Manufacturer:** Logicube®  
**Model Number:** F-ADP-WP  
**Serial Number:** N/A

### Test Results:

Test Number	Environment:	Actions:	Assigned Req't's	Expected Results:	Results:
01-01	Logicube Desktop Write-PROtect adapter; 18.6 GB ATA hard disk drive	Write-PROtect adapter connected to secondary IDE channel of PC; hard disk connected to Write-PROtect device	1	ATA enabled HDD will be recognized within Windows (XP) explorer	Pass
01-02	Logicube Desktop Write-PROtect adapter; 18.6 GB ATA hard disk drive; EnCase® Forensic Edition v.5.05a for Windows.	MD5 hash calculation of ATA hard disk attached to Write-PROtect device using EnCase v.5.05a.	3	MD5 Hash calculation will be produced.	Pass
01-03	Logicube Desktop Write-PROtect adapter; 18.6 GB ATA hard disk drive	"test document.doc" attempted to be written to hard disk drive in Windows (XP) explorer	2	No modification will be made to protected hard disk drive	Pass
01-04	Logicube Desktop Write-PROtect adapter; 18.6 GB ATA hard disk drive	MD5 hash calculation of ATA hard disk attached to Write-PROtect device using EnCase v.5.05a.	3	Second MD5 Hash calculation will be produced.	Pass
01-05	Logicube Desktop Write-PROtect adapter	Desktop Write-PROtect device	4	ATA enabled HDD will be	Pass





	(USB mode); 18.6 ATA hard disk drive	connected to USB 2.0 port of PC		recognized and USB drivers installed within Windows (XP) explorer	
01-06	Logicube Desktop Write-PROtect adapter (USB mode); 18.6 ATA hard disk drive; EnCase® Forensic Edition v.5.05a for Windows	MD5 hash calculation of ATA hard disk attached to Write-PROtect device (in USB mode) using EnCase v.5.05a.	6	MD5 Hash calculation produced.	Pass
01-07	Logicube Desktop Write-PROtect adapter (USB mode); 18.6 ATA hard disk drive	"test document.doc" attempted to be written to hard disk drive in Windows (XP) explorer	5	No modification will be made to protected hard disk drive	Pass
01-08	N/A	Compare MD5 hash calculation values of Write-PROtect (Direct-mode)	7	MD5 calculation will match original MD5 hash calculated on 18.6 GB ATA HDD.	Pass
01-09	N/A	Compare MD5 hash calculation values of Write-PROtect (USB-Mode)	7	MD5 calculation will match original MD5 hash calculated on 18.6 GB ATA HDD	Pass



### Requirements:

- 1) The Logicube Desktop Write-PROtect adapter should recognize a stand-alone source hard disk while connected to the secondary IDE channel of the motherboard
- 2) The Logicube Desktop Write-PROtect adapter should allow normal write-block operation to occur to the hard disk while attached to the secondary IDE channel of the motherboard.
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- 6) The Logicube Desktop Write-PROtect adapter should accurately calculate an MD5 hash algorithm of the laboratory test hard disk. While connected to the PC through the USB port.
- 7) MD5 hash calculations made before and after write attempts to the test hard disk should be consistent.

### Observations:

Although this test plan implemented the secondary IDE channel of the motherboard to test write-blocking capability of the Desktop Write-PROtect with an attached hard disk, it is possible to use the primary IDE channel to view the native operating system (e.g. Windows 98, XP, Linux, etc.) disk drive of the PC without altering or destroying data contained within the disk.

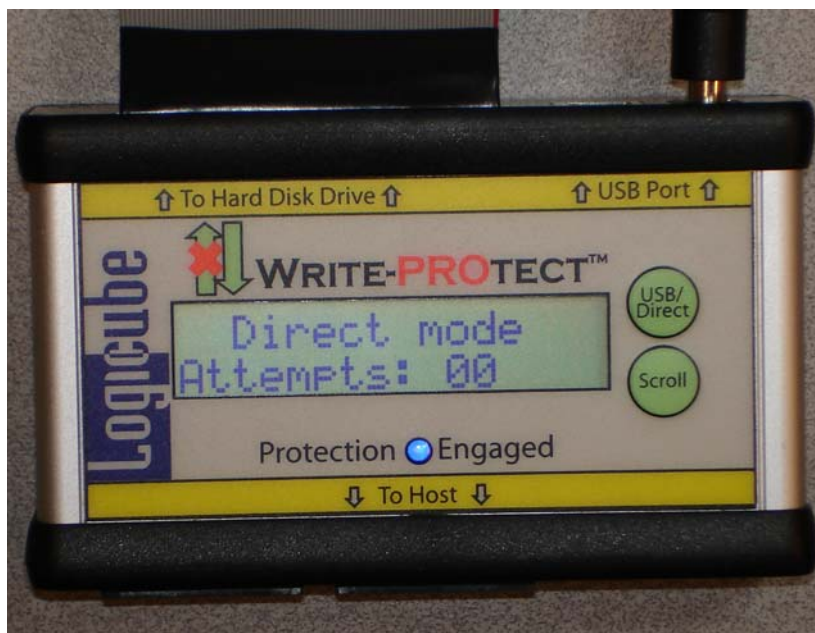
### Limitations:

N/A

### Recommendations:

N/A

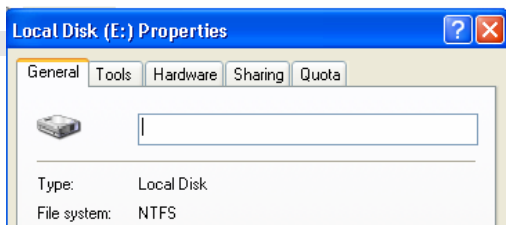
**Figure 1.1-** Shown is the Logicube Desktop WritePROtect in Direct ATA mode



**Figure 1.2 -** Configuration of test disk drive with attached WritePROtect to the secondary IDE channel of PC

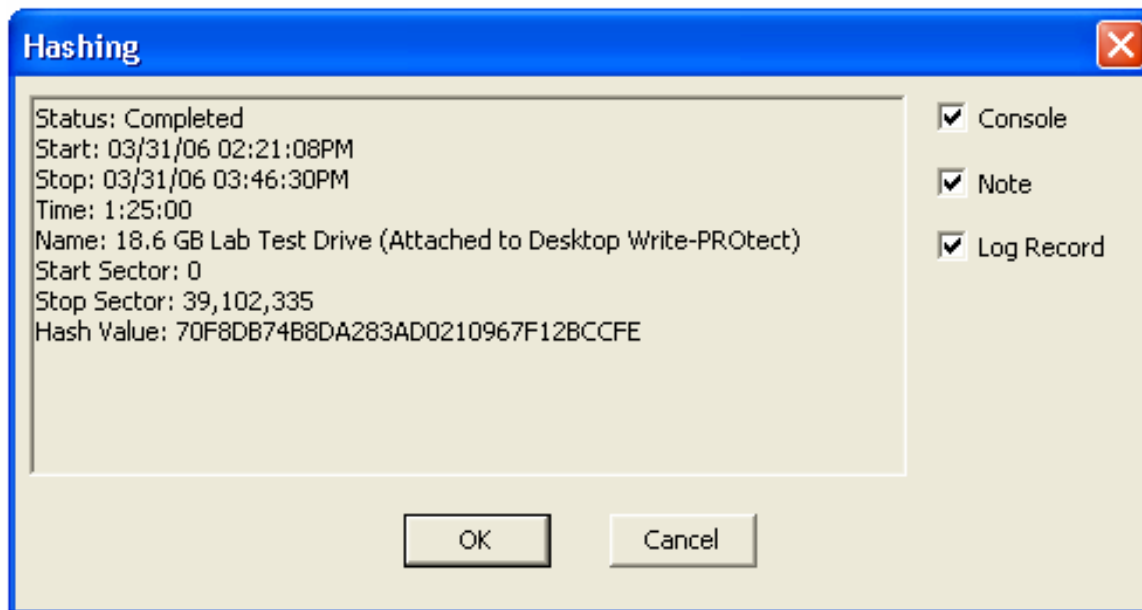


**Figure 1.3-** Properties of 18.6 GB test hard disk drive

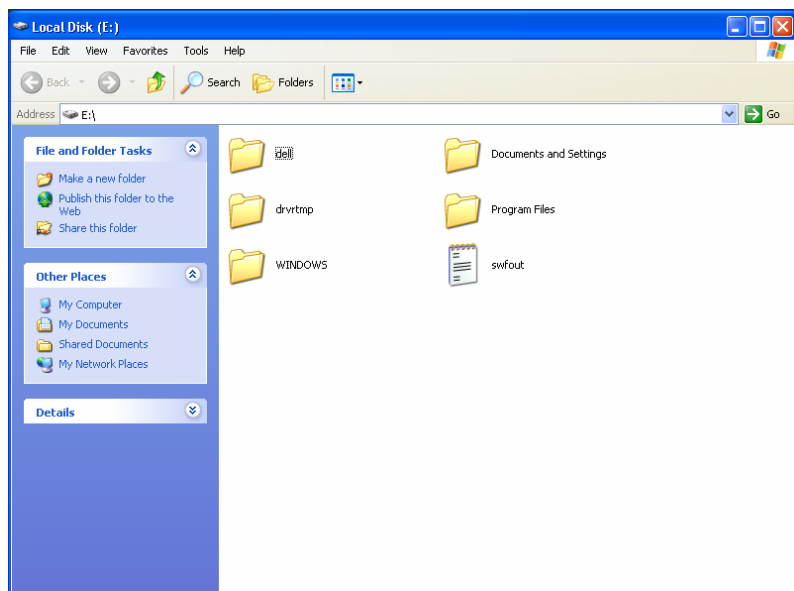




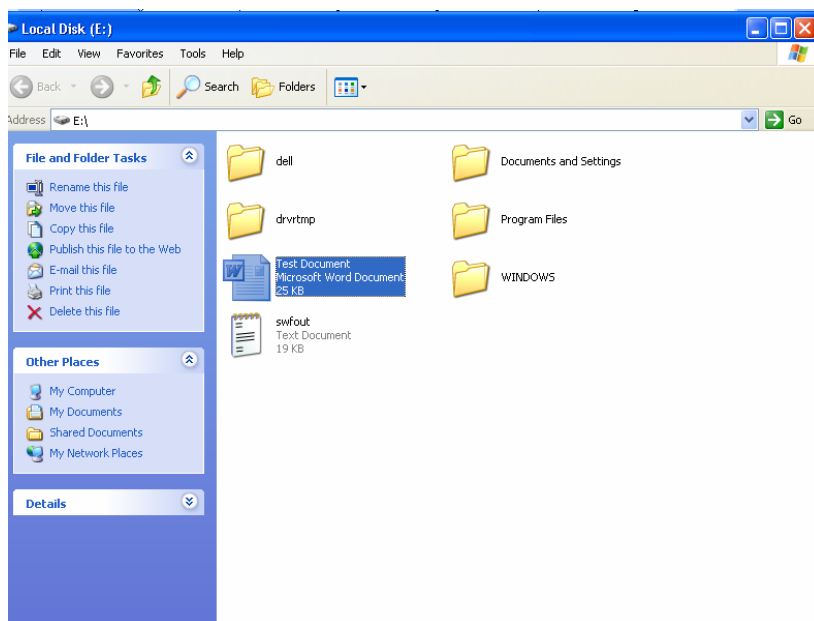
**Figure 2.1-** MD5 hash statistics of test hard disk drive attached to Desktop WritePROtect in Direct Mode



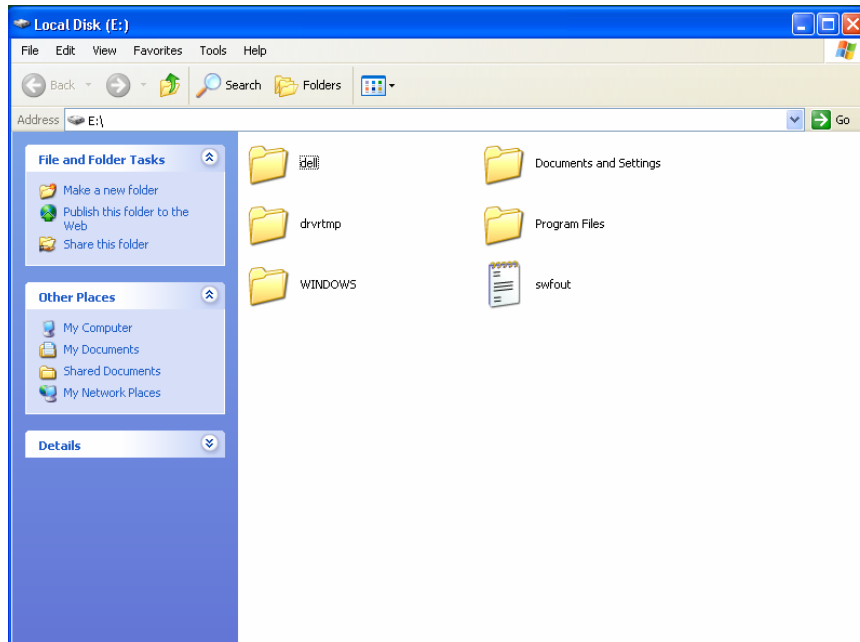
**Figure 2.2-** Contents of test hard disk drive attached to WritePROtect in Direct Mode.



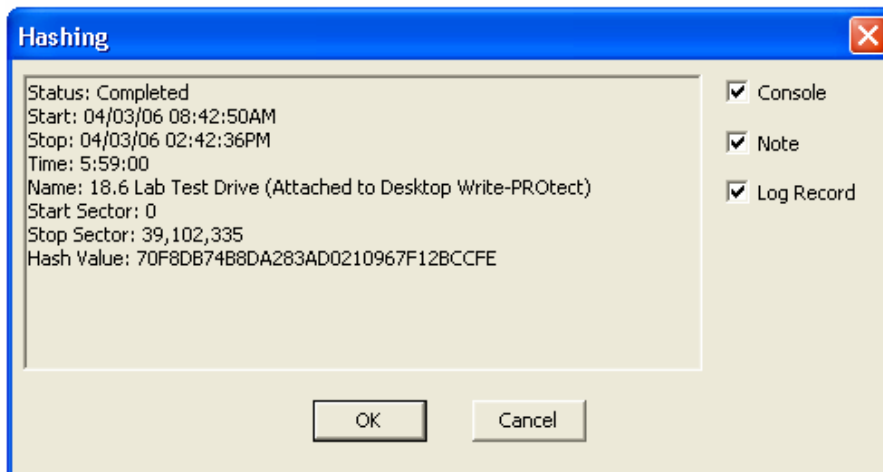
**Figure 2.3-** "Test Document.doc" added to test disk drive attached to Desktop WritePROtect



**Figure 2.4-** Test Drive attached to Desktop WritePROtect in Direct Mode viewed in Windows Explorer after rebooting of system

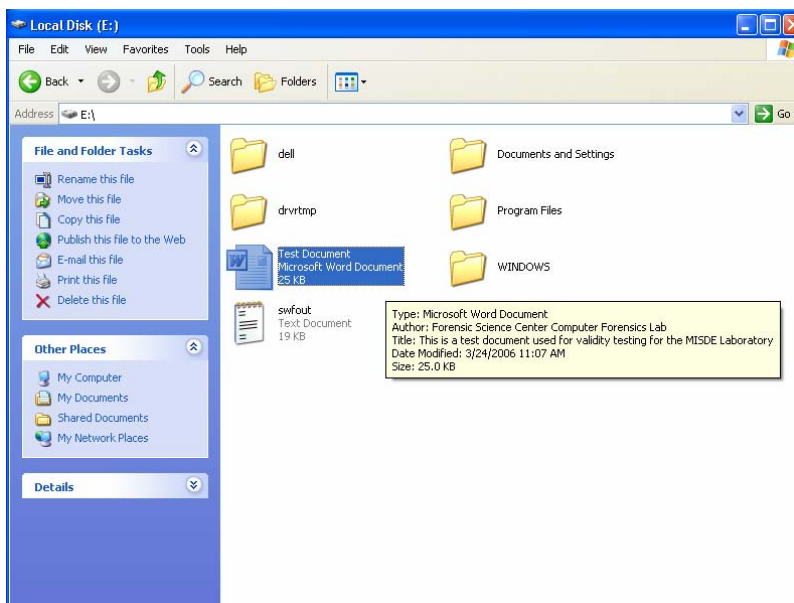


**Figure 3.2 -** MD5 hash statistics of 18.6 test disk drive attached to Desktop WritePROtect in USB mode

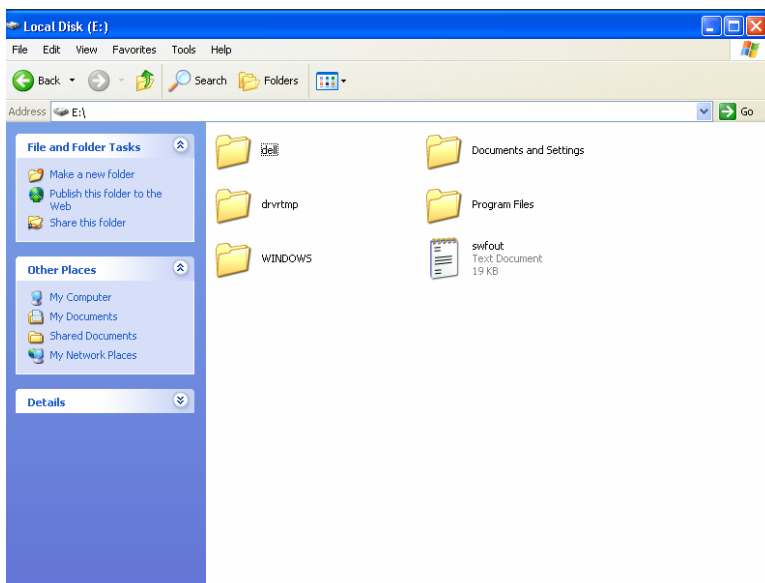




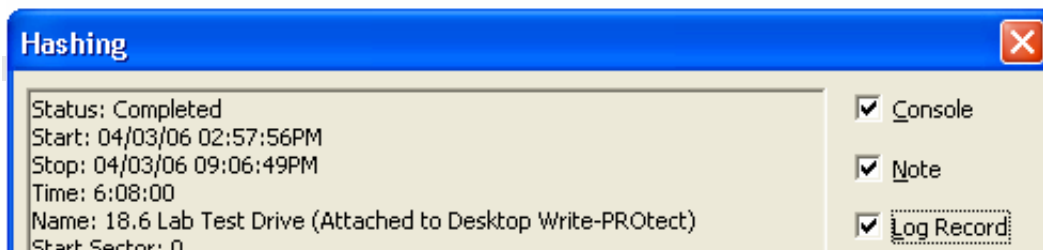
**Figure 3.3-** Test Document.doc added to 18.6 GB test disk drive attached to Desktop WritePROtect in USB mode.



**Figure 3.4-** Test Drive attached to Desktop WritePROtect in USB Mode viewed in Windows Explorer after rebooting of system



**Figure 3.5 -** MD5 hash statistics of 18.6 test disk drive attached to Desktop WritePROtect in USB mode after restarting of system.





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