STORAGEWERKS

SCSI Utility

User Guide

SCSI Utility Development Group, v5.6.8

3/19/2021

SCSI Utility user guide instructions.

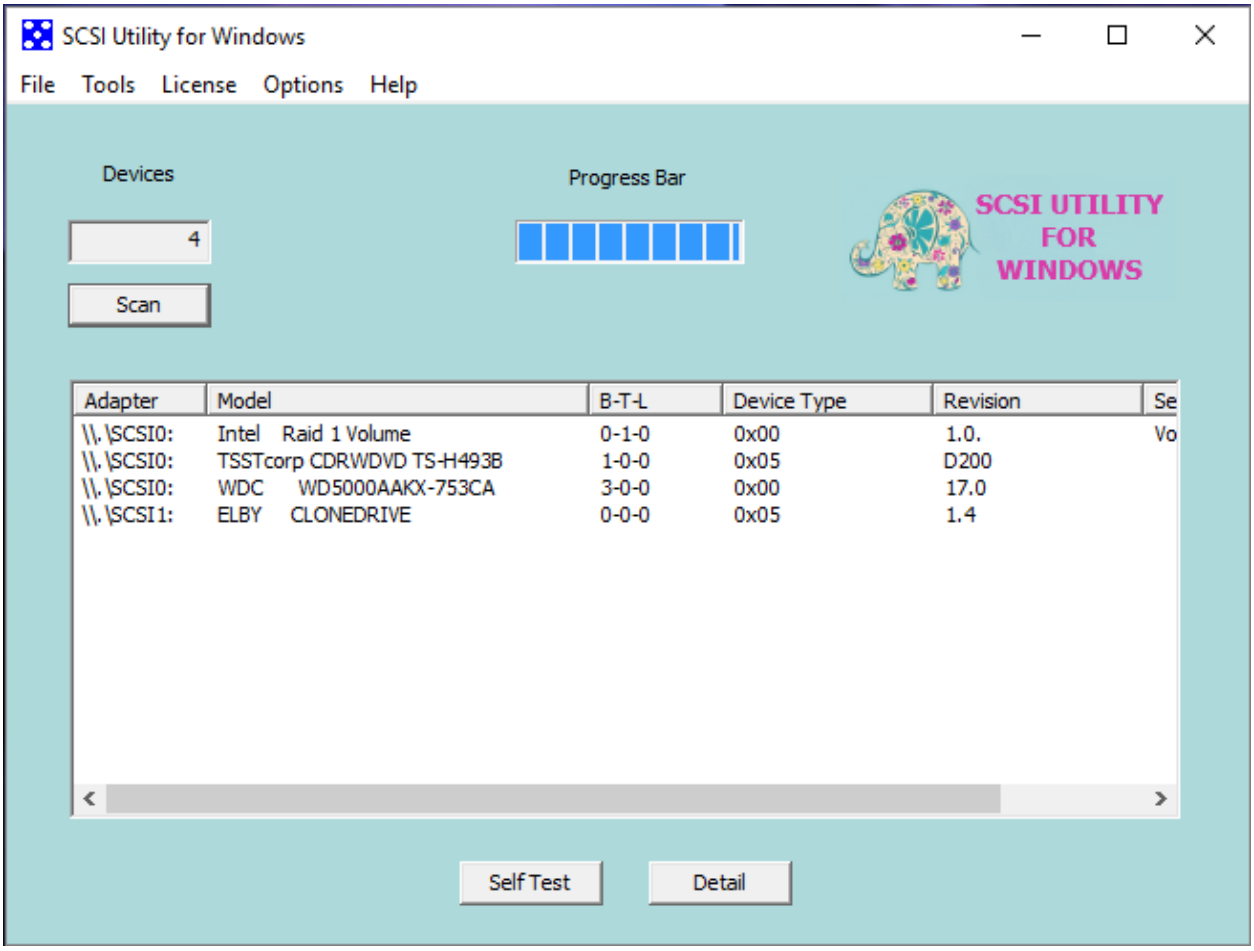
Table of Contents

Introduction

SCSI Utility (SU) is a general-purpose windows graphical user interface (GUI) application that displays all SCSI, SATA and NVMe devices enumerated by the host. SU is available in a 32-bit version only.

Screen Shot

The Main Dialog (MD) is shown below:



Main Dialog Operation

Menu Items

License Import

Locates and opens license file, and registers license enabling SU feature set.

License Register

Renews license lease after it expires (only needed when using license server, not needed when using license key)

License UnRegister
Releases a license release on license server.

Tools Adapters Information
Displays the Adapter Information Dialog (AID)

Tools Commands Primary INQUIRY VPD Supported Page Codes
Displays the Inquiry page codes supported by device.

Tools Commands Primary INQUIRY VPD View Page Code
Displays the 255-byte Inquiry data of entered page code.

Tools Commands Primary SELF TEST FOREGROUND Short
Performs foreground short self-test and displays results.

Tools Commands Primary SELF TEST FOREGROUND Extended
Performs foreground extended self-test and displays results.

Tools Commands Primary RESERVE (6)
Performs legacy SPC-2 style Reserve and displays results.

Tools Commands Primary RELEASE (6)
Performs legacy SPC-2 style Release and displays results.

Tool Commands Primary CUSTOM
Displays Custom Command Dialog (CCD)

Tools Commands Primary TEST UNIT READY
Performs test unit ready and displays results.

Tools Commands Block READ CAPACITY (16)
Displays READ Capacity Dialog (RCD) for selected device.

Tools SCSI Bus Reset
Performs SCSI bus reset on selected device.

Tools Block Devices Change Sector Size
Displays Block Size Modification Dialog (BSMD)

Tools Block Devices Format Drives
Displays Format Device Dialog (FDD)

Tools All Devices Flash Multiple
Displays Flash Multiple Device Dialog (FMDD)

Tools All Devices Parameters
Displays Device Parameters Dialog (DPD)

Tools All Devices Diagnostics
Displays Self-Test Device Dialog (STDD)

Tools Fibre Channel Statistics
Displays Fibre Channel Devices Dialog (FCDD)

Tools Commands NVMe CUSTOM
Displays NVMe Custom Command Dialog (NCCD)

Tools Commands NVMe FIRMWARE COMMIT
Displays NVMe Firmware Commit Dialog (NFCD)

Tools Commands NVMe TELEMETRY HOST INITIATED [NEW]
Performs NVMe Get Log Page, Telemetry Host-Initiated and saves results to file.

Tools Commands NVMe TELEMETRY HOST INITIATED [OLD]
Performs NVMe Get Log Page, Telemetry Host-Initiated with Create Telemetry Host-Initiated Data bit set to 1 and saves results to file.

Tools Commands ATA Custom
Displays ATA Custom Command Dialog (ACCD)

Tools NVMe Parameters
Displays the NVMe Device Parameters Dialog (NDPD)

Tools NVMe Monitor Health
Displays the NVMe SMART and Health Monitor Dialog (NSHMD)

GUI Items

Devices
Displays number of SCSI devices enumerated by the host.

Scan
Initiates scan and display of SCSI devices enumerated by the host.

Main Device Listing
Lists the devices enumerated by the host, displaying the following columns:

- Adapter - The SCSI adapter identifier associated with the device; the number of the adapter is equivalent to the SCSI port number.
- Model - The product and model number of the device from Inquiry data
- B-T-L - Bus, target and LUN identifier of device
- Device Type - Device type as defined by Inquiry peripheral qualifier byte.
- Revision – Firmware revision of device.
- Serial Number – Device serial number.

Self-Test

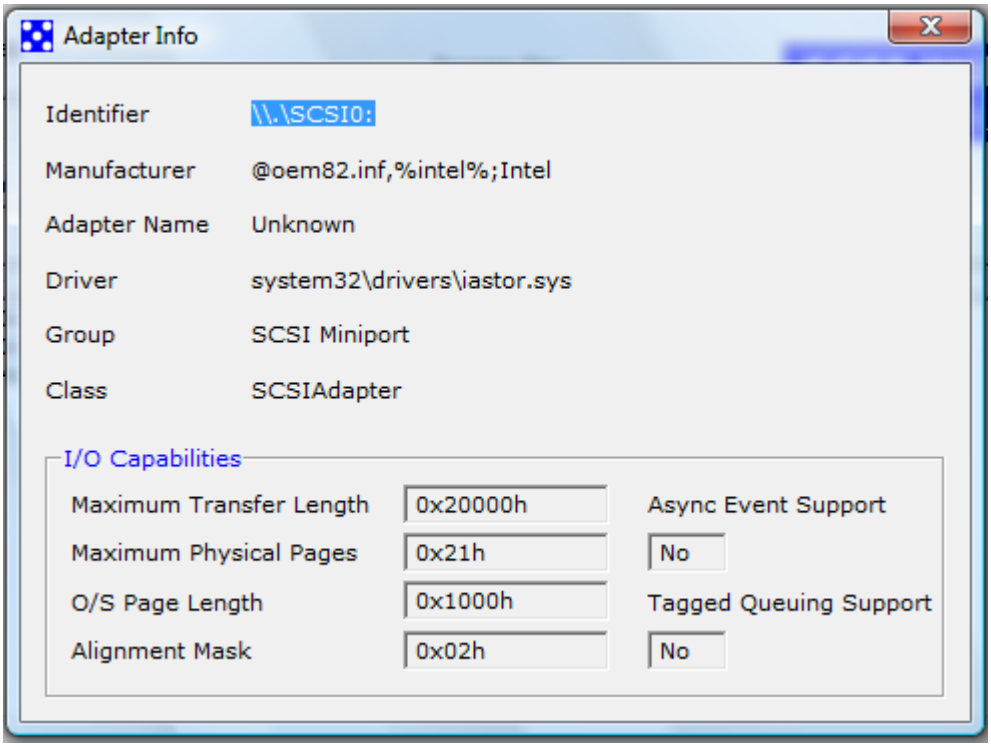
Performs short foreground self-test on selected device.

Detail

Displays SPC-4 style Inquiry data for selected device.

Adapter Information Dialog (AID)

Displays information on SCSI adapter device is associated with.



GUI Items

Identifier

SCSI adapter associated with device.

Manufacturer

SCSI adapter manufacturer

Adapter Name

SCSI adapter name

Driver

Name and location of adapter driver

Group

Adapter driver group classification

Class

Adapter class identification

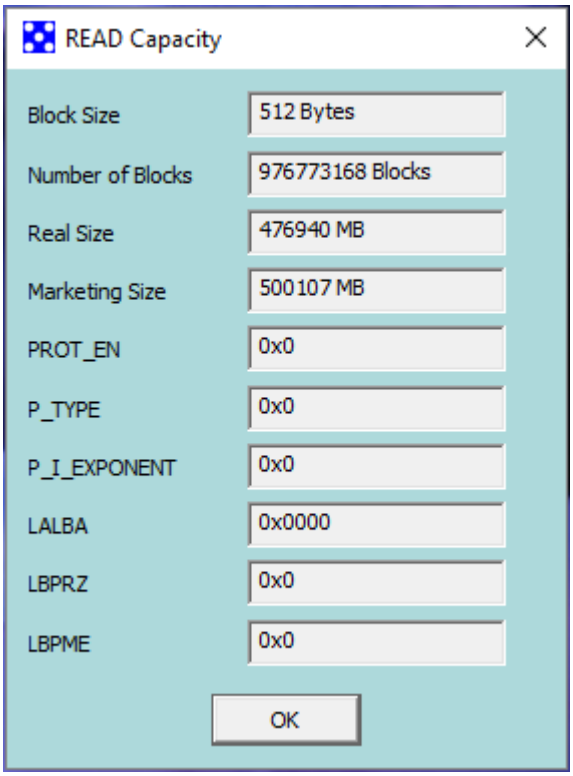
I/O Capabilities

- Maximum Transfer Length - Maximum transfer length supported per single SCSI exchange.
- Maximum Physical Pages - Maximum physical pages supported per single SCSI exchange

- O/S Page Length - Virtual memory manager page length
- Alignment Mask - Adapter address alignment requirements
- Async Event Support - Adapter asynchronous event support
- Tagged Queuing Support - Adapter tagged queuing support.

READ Capacity Dialog (RCD)

Displays information returned in response to READ Capacity Command



GUI Items

Block Size

Size of Logical Block Address (LBA) or block

Number of Blocks

Total number of LBA's or blocks that make up the block device.

Real Size

Size of block device using base2 numbering (1MiB = 1024KB)

Marketing Size

Size of block device using base10 numbering (1MB = 1000KB)

PROT_EN

Protection Information format status (0b = not PI formatted, 1b = PI formatted)

P_TYPE

Indicates the type of PI format used (see SBC-3 for more detail)

P_I_EXPONENT

Indicates the number of protection information intervals placed with each logical block (see SBC-3 for more detail)

LALBA

Lowest aligned logical block address (see SBC-3 for more detail)

LBPRZ

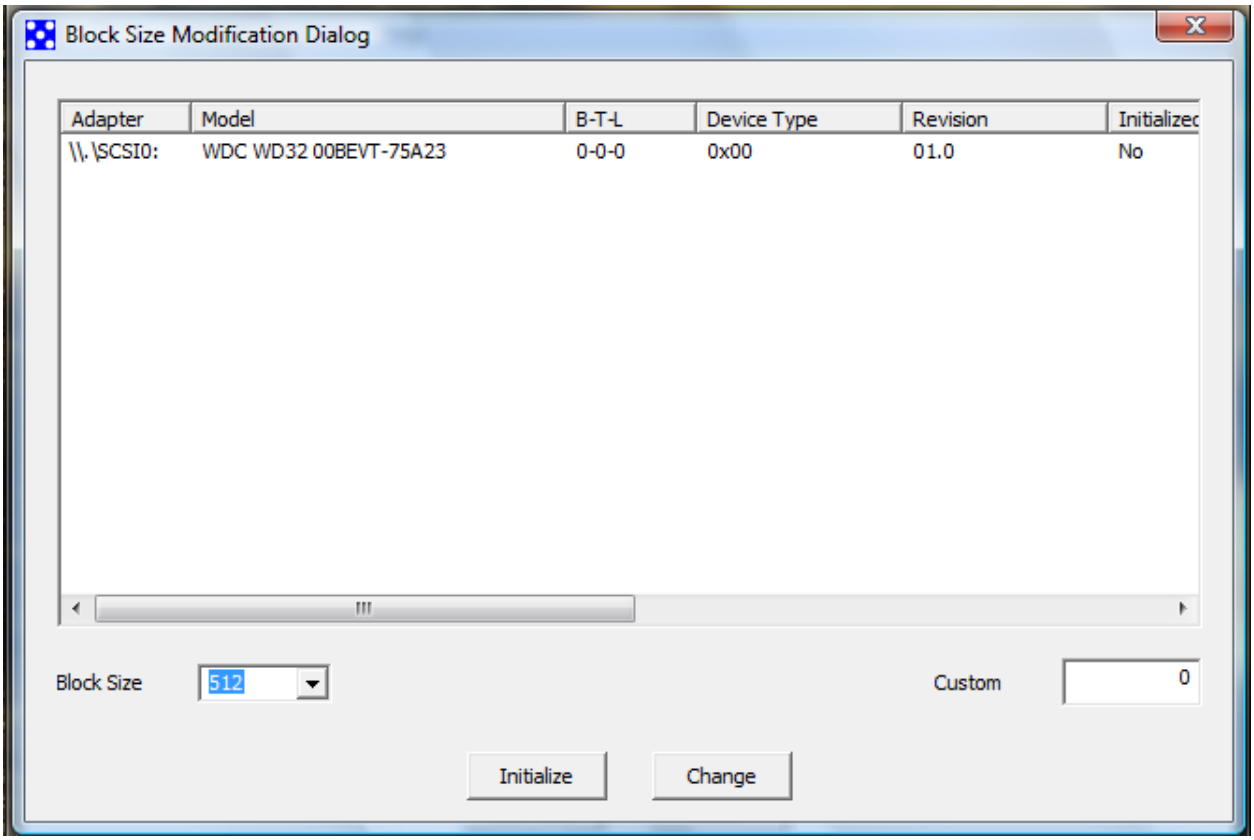
Logical block provisioning read zeros (see SBC-3 for more detail)

LBPME

Logical block provisioning management enabled (see SBC-3 for more detail)

Block Size Modification Dialog (BSMD)

Dialog used to change the block size of multiple block devices simultaneously. To change block size, the user must select the new block size using, highlight the device(s) to be modified, and selects the Initialize button. If Initialization was successful, user highlights the device(s) to be changed and selects the Change button. After block size is changed, devices must be formatted using the FDD.



GUI Items

Device Listing

- Adapter - SCSI adapter associated with device.
- Model - Inquiry product and model strings
- B-T-L - Bus, target and LUN of device
- Device Type - Peripheral qualifier device type byte from Inquiry data
- Revision - Revision string from Inquiry data
- Initialized? - Displays success of initialization step. Yes, means initialization successful, 'No' means initialization has not yet been performed or it was unsuccessful. Default setting is 'No.'
- Formatted Block Size - Reported block size of the device from READ capacity command.
- Number of Blocks - Number of blocks of device from READ capacity command.
- Big Drive? - Did this drive require a 16 byte READ Capacity command? If yes, then this will say 'Yes.' By default, this field will be blank until initialization step is performed.

- Ready for Format? - Displays success or failure of Change step. If change to new block size is successful, this field will say 'Yes.' By default, this field is left blank.
- New Block Size - New block size selected by the user.

Block Size

Dropdown control that allows the user to select the following block sizes: 512B, 520B, 1KiB, 2KiB, 4KiB and Custom.

Custom

If 'Custom' selected in Block Size dropdown control, this text field allows the user to enter the new custom block size

Initialize

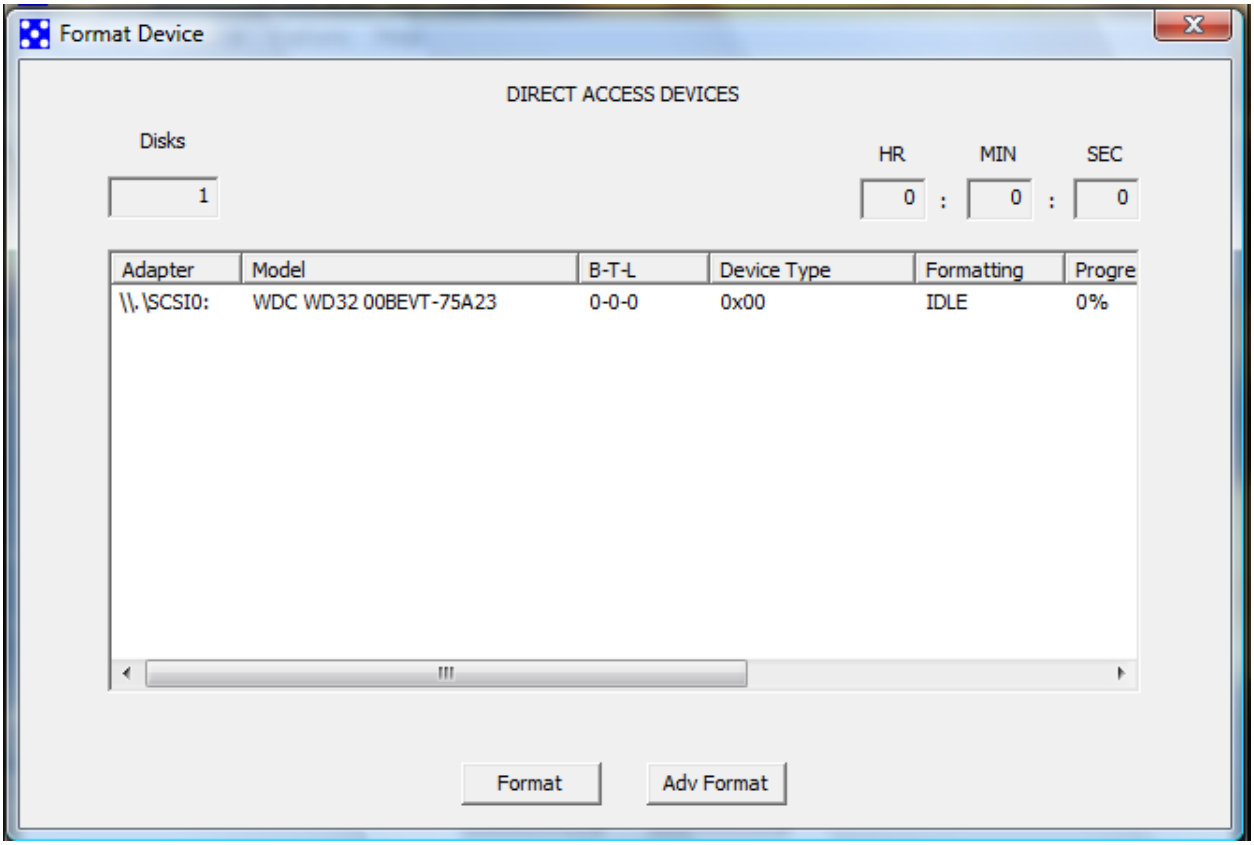
Performs the first step, which is called 'Initialization.'

Change

Perform the second step, which is called 'Change.' Initialization step must be performed first.

Format Device Dialog (FDD)

SU performs basic format and advanced format operations. For advanced format operations, please refer to the T10 SBC specification. For basic format, SU enables the 'IP' bit and uses 0xFFh as the data pattern for initialization.



GUI Items

Disks

The number of block devices displayed in this dialog.

HR: MIN: SEC

Timer that displays the elapsed time since format was started in hours, minutes and seconds.

Device Listing

- Adapter - SCSI adapter associated with device.
- Model - Inquiry product and model strings
- B-T-L - Bus, target and LUN of device
- Device Type - Peripheral qualifier device type byte from Inquiry data
- Formatting - Displays the status of the current format operation. Default setting is 'IDLE.'
- Progress - Percentage completion of current format operation
- Status - Final success of format operation. If fail, see Sense Key and ASC/ASCQ fields

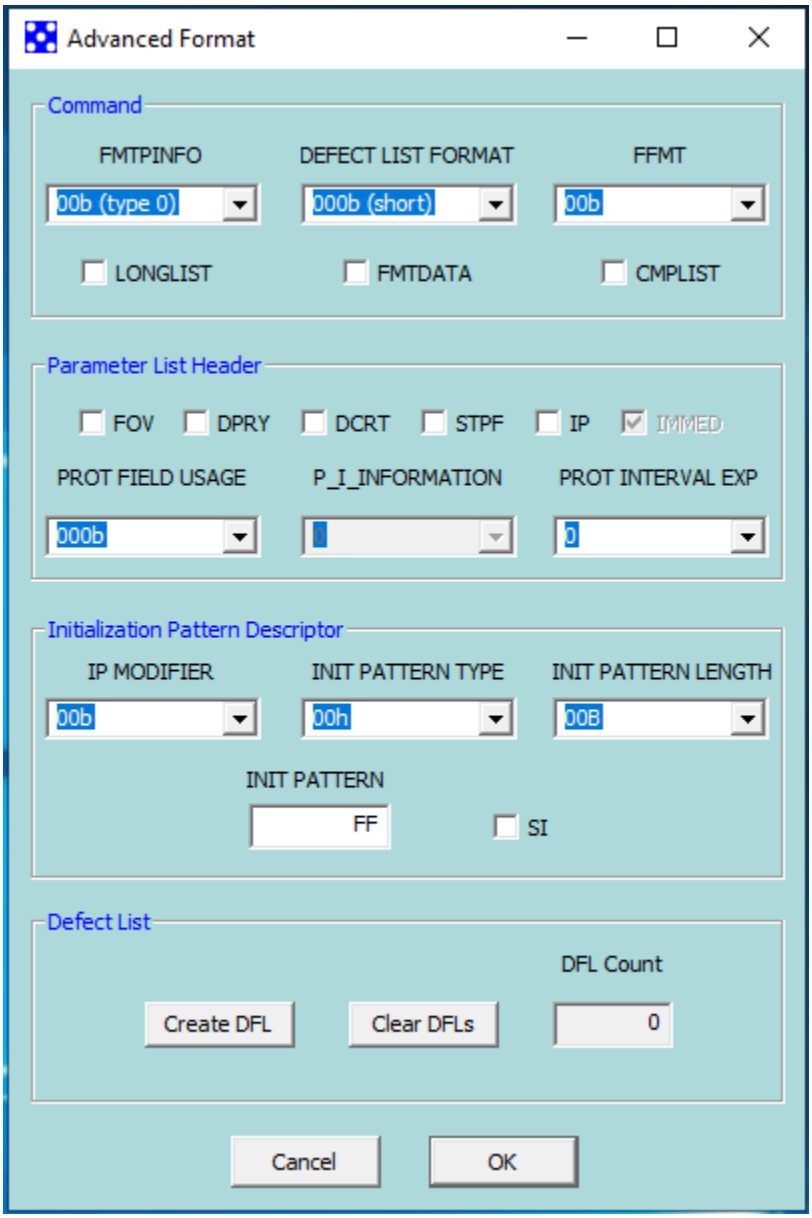
- Sense Key - Sense key for format unit failure
- ASC/ASCQ - Additional sense code and additional sense code qualifier of failed format operation

Format

Begins format operations on highlighted device(s), after format begins, no other devices may be selected, and dialog cannot be exited.

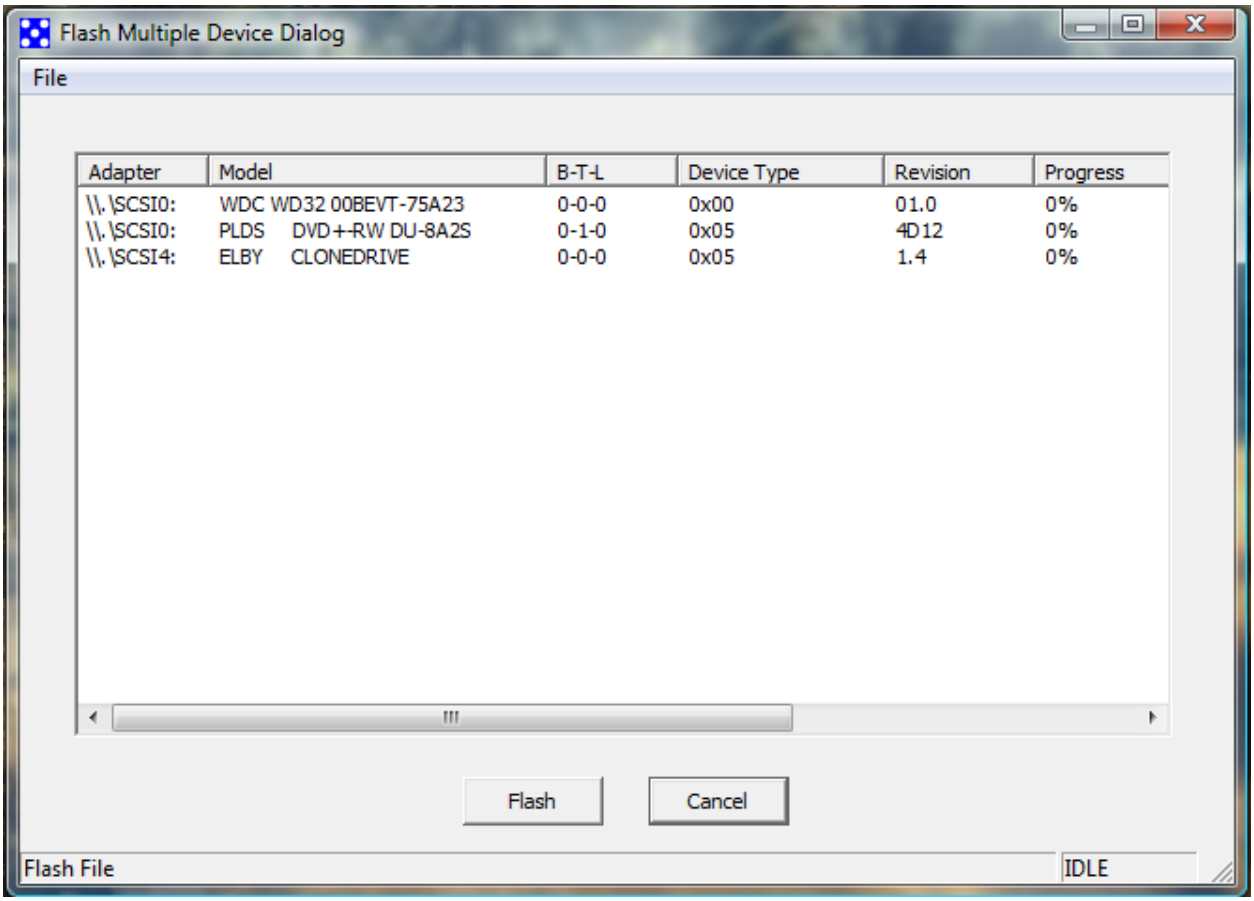
Adv Format

Displays the Advanced Format Dialog (AFD). Please refer to SBC-4 for detailed operation.



Flash Multiple Device Dialog (FMDD)

The FMDD allows a device to be flashed using well-known variations of the WRITE BUFFER command. NVMe devices are also supported (see NVMe Support section for additional details).



Menu Items

File Open

This menu item used to locate and open the flash file.

GUI Items

Device Listing

- Adapter - The SCSI adapter identifier associated with the device.
- Model - The product and model number of the device from Inquiry data
- B-T-L - Bus, target and LUN identifier of device
- Device Type - Device type as defined by Inquiry peripheral qualifier byte.
- Revision - Revision from Inquiry data
- Progress - Displays the progress of the flashing operation.
- Status - Displays the status of flashing operation.
- Sense Key - If flashing operation fails, displays the sense key information.

- ASC/ASCQ - If flashing operation fails, displays the additional sense code and additional sense code qualifier.

Flash

Starts the flashing operation with selected file and highlighted device(s), flash file must be previously selected for flashing to begin. Once flash operations begin, the FMDD cannot be exited.

Cancel

Does not cancel flash operation once they begin, exits FMDD if no flash operations are in progress.

Flash File Name

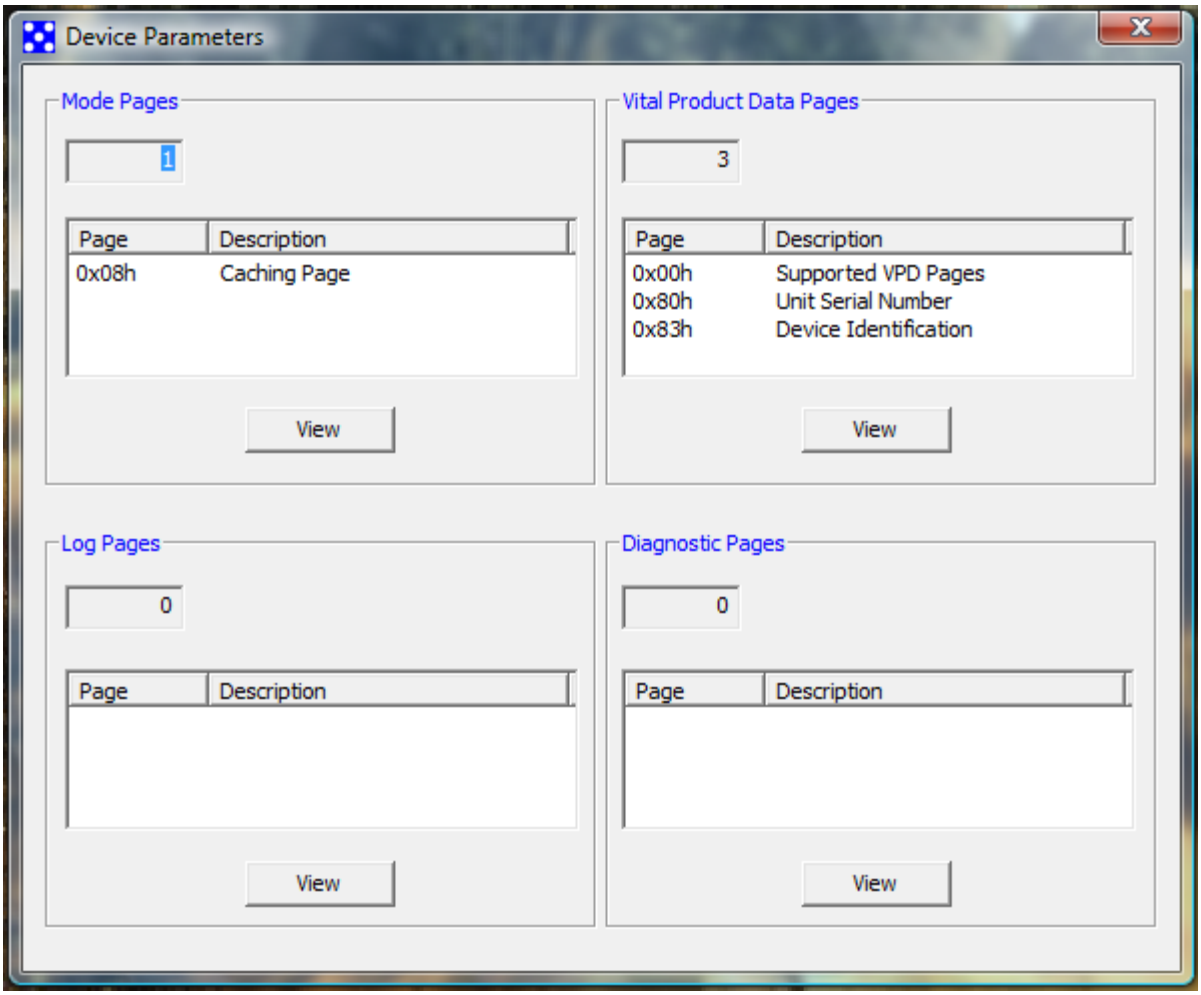
Displays the location and name of flash file selected.

Status

Status of the ongoing flash operations, default is 'IDLE.'

Device Parameters Dialog (DPD)

Displays the mode pages, log pages, diagnostic pages and vital product data pages supported by the device, if SU supports reporting of page, user may select to view page contents.



GUI Items

Mode Pages

Displays the number of pages supported and a listing showing page code and description of page supported, user may highlight a listing in window and select View to view page details.

Log Pages

Displays the number of pages supported and a listing showing page code and description of page supported, user may highlight a listing in window and select View to view page details.

Diagnostic Pages

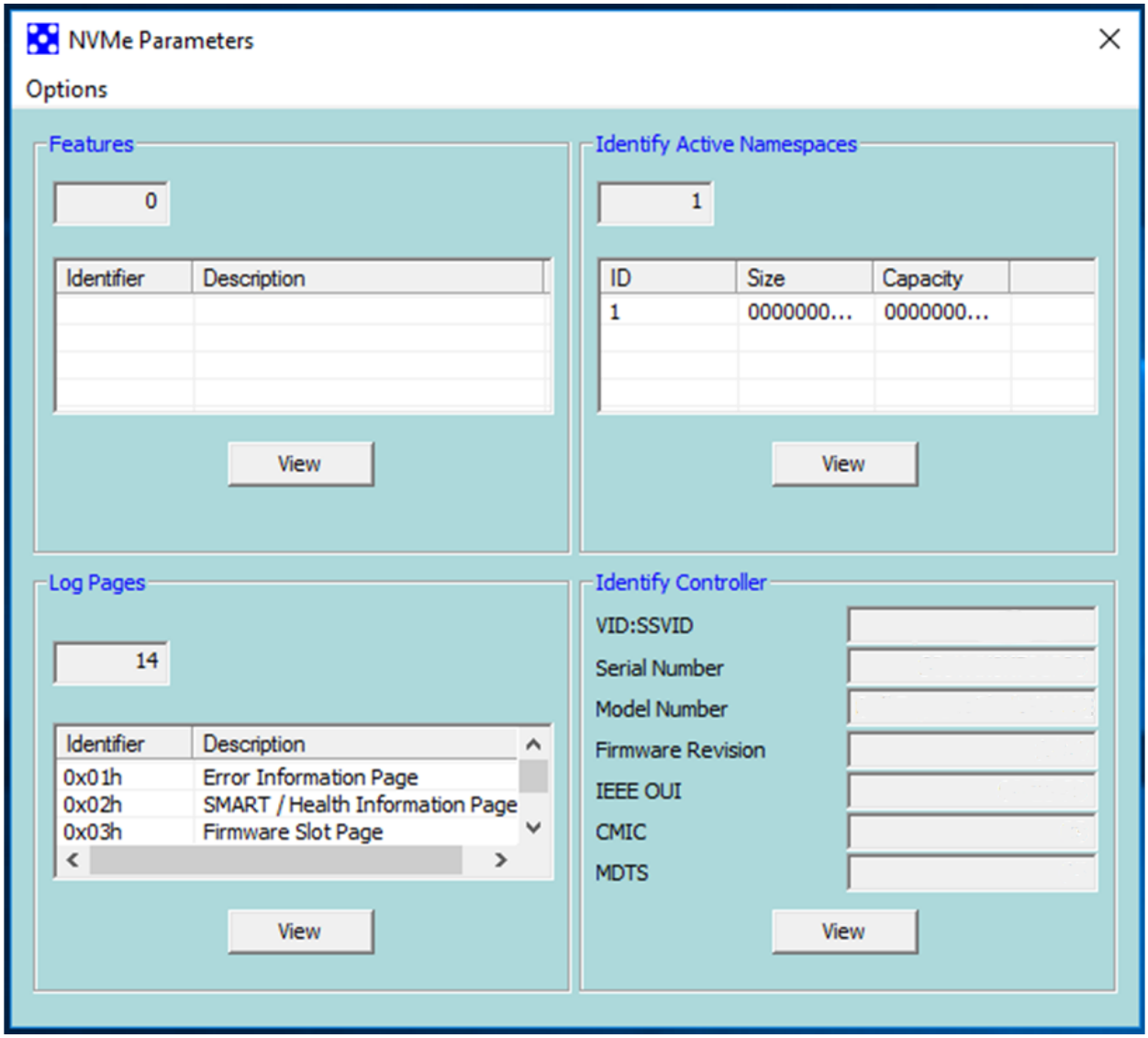
Displays the number of pages supported and a listing showing page code and description of page supported, user may highlight a listing in window and select View to view page details.

Vital Product Data Pages

Displays the number of pages supported and a listing showing page code and description of page supported, user may highlight a listing in window and select View to view page details.

NVME Device Parameters Dialog (NDPD)

Displays NVME log pages, features, namespaces, and Controller Identify supported by the device.



GUI Items

Features

Displays the NVMe features supported by the device, user may highlight a listing in window and select View to display feature details.

Identify Active Namespaces

Displays the number of active namespaces configured on the device, user may highlight a listing in window and select View to display namespace details.

Log Pages

Displays the NVMe log pages supported by the device, user may highlight a listing in window and select View to display log page details.

Identify Controller

Displays some of the major fields associated with the NVMe Identify Controller data, user may highlight a listing in window and select View to display identify controller details.

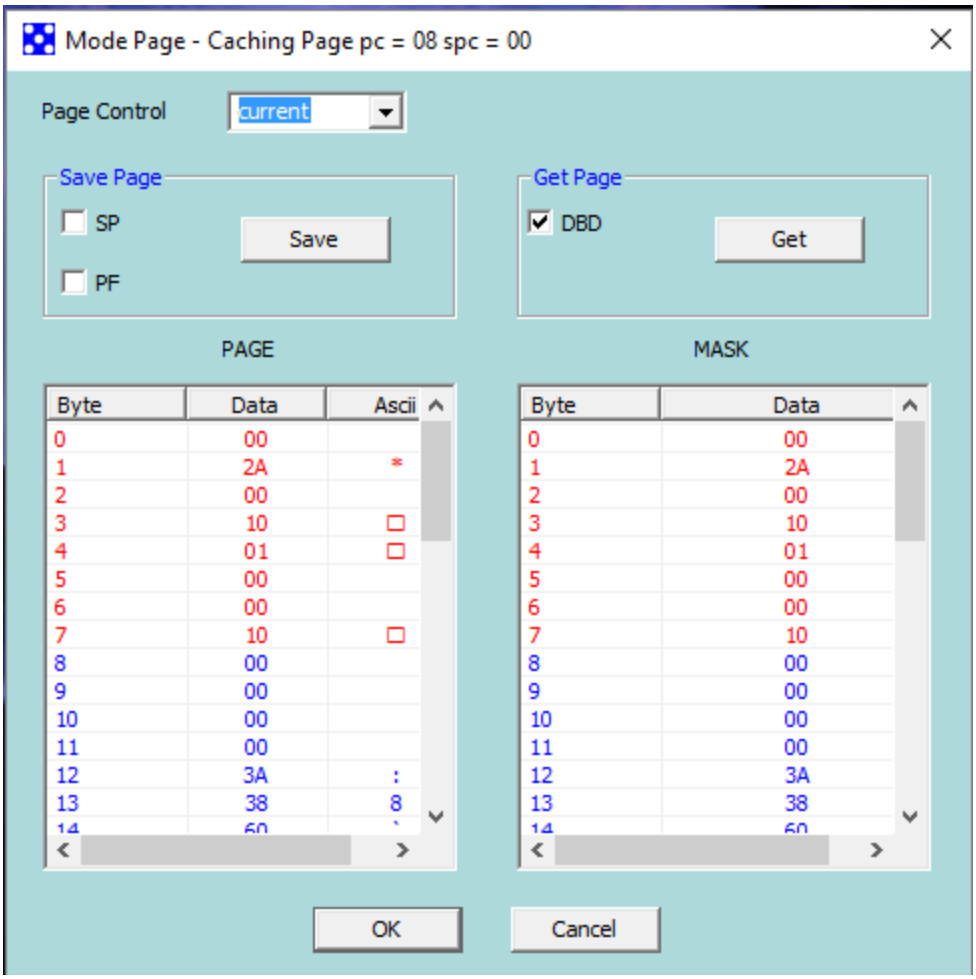
Menu Items

Options -> Generate Report

User will be prompted to select a file location for the report. All NVMe features, log pages, namespaces and identify controller are included in the report.

Mode Page Dialog (MPD)

This dialog page is displayed when a device is selected in the Mode Page section of DPD.



GUI Items

Page Control
Dropdown that allows user to select current, changeable, default and saved values.

Save Page – SP
SP bit in Mode Select Command

Save Page – PF
PF bit in Mode Select Command

Save Page – Save
Performs a Mode Select based on page control, save page settings and contents of PAGE buffer.

Get Page – DBD
Device Block Descriptor bit in Mode Sense Command

Get Page – Get
Performs a Mode Sense based on get page and page control settings and displays results in PAGE buffer.

PAGE
Mode Page results of Mode Sense Command (default on dialog open is current mode page results with DBD bit set to one). Red text is mode page header, blue text is device block descriptor and black text is mode page data. All data fields are editable. To edit, user must double click on data cell to be modified.

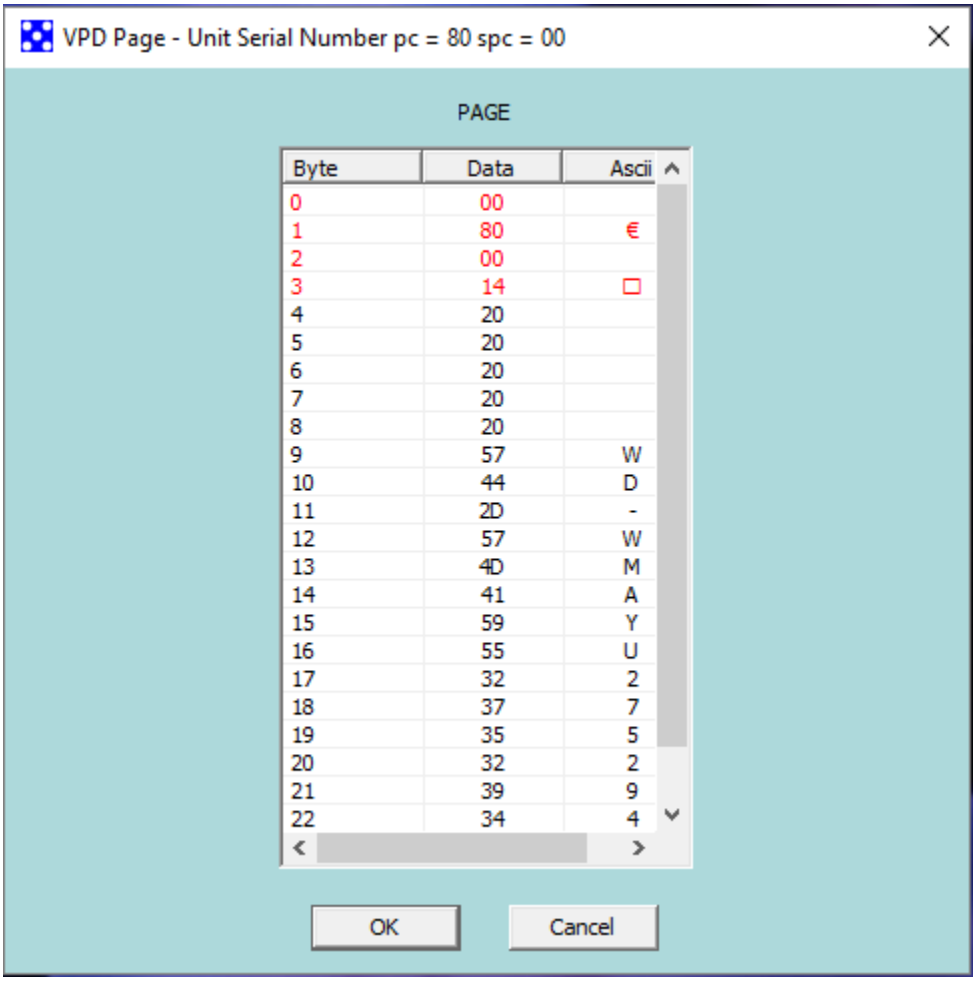
MASK
This buffer displays the changeable bit mask associated with give page code and sub-page code. Red text is mode page header, blue text is device block descriptor and black text is mode page data. This buffer is not editable.

OK
Closes dialog.

Cancel
Close dialog

VPD Page Dialog (VPDD)

This dialog page is displayed when a device is selected in the Vital Product Data Pages section of DPD.



GUI Items

PAGE

Vital Product Data Page results of Inquiry command with EVPD bit set to one. Red text is VPD page header, and black text is VPD page data.

OK

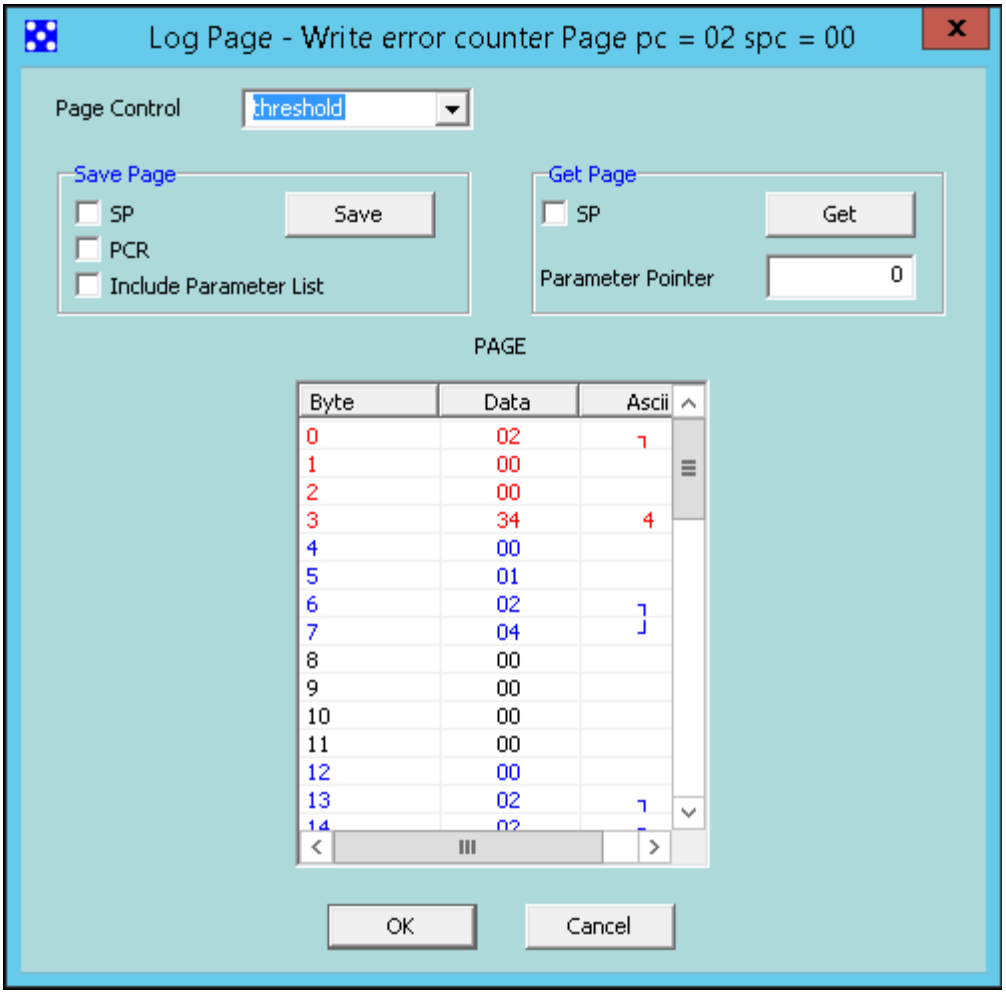
Closes Dialog.

Cancel

Closes Dialog.

Log Page Dialog (LPD)

This dialog page is displayed when a device is selected in the Log Page section of DPD.



GUI Items

Page Control

Page Control (PC) field used in Log Sense and Log Select Commands (see SPC-4 for more detail)

Save Page – SP

SP bit used in Log Select Command (see SPC-4 for more detail)

Save Page – PCR

PCR bit used in Log Select Command (see SPC-4 for more detail)

Save Page – Include Parameter List

Contents of PAGE buffer will be sent with Log Select Command (see SPC-4 for more detail)

Save Page – Save

Sends Log Select Command

Get Page – SP

SP bit used in Log Sense Command (see SPC-4 for more detail)

Get Page – Get

Sends Log Sense Command

Get Page – Parameter Pointer

Page Parameter field used in Log Sense Command (in HEX) (see SPC-4 for more detail)

PAGE

Log Page results of Log Sense Command (default on dialog open is threshold log page results). Red text is log page header, and black text is mode page data. All data fields are editable. To edit, user must double click on data cell to be modified.

OK

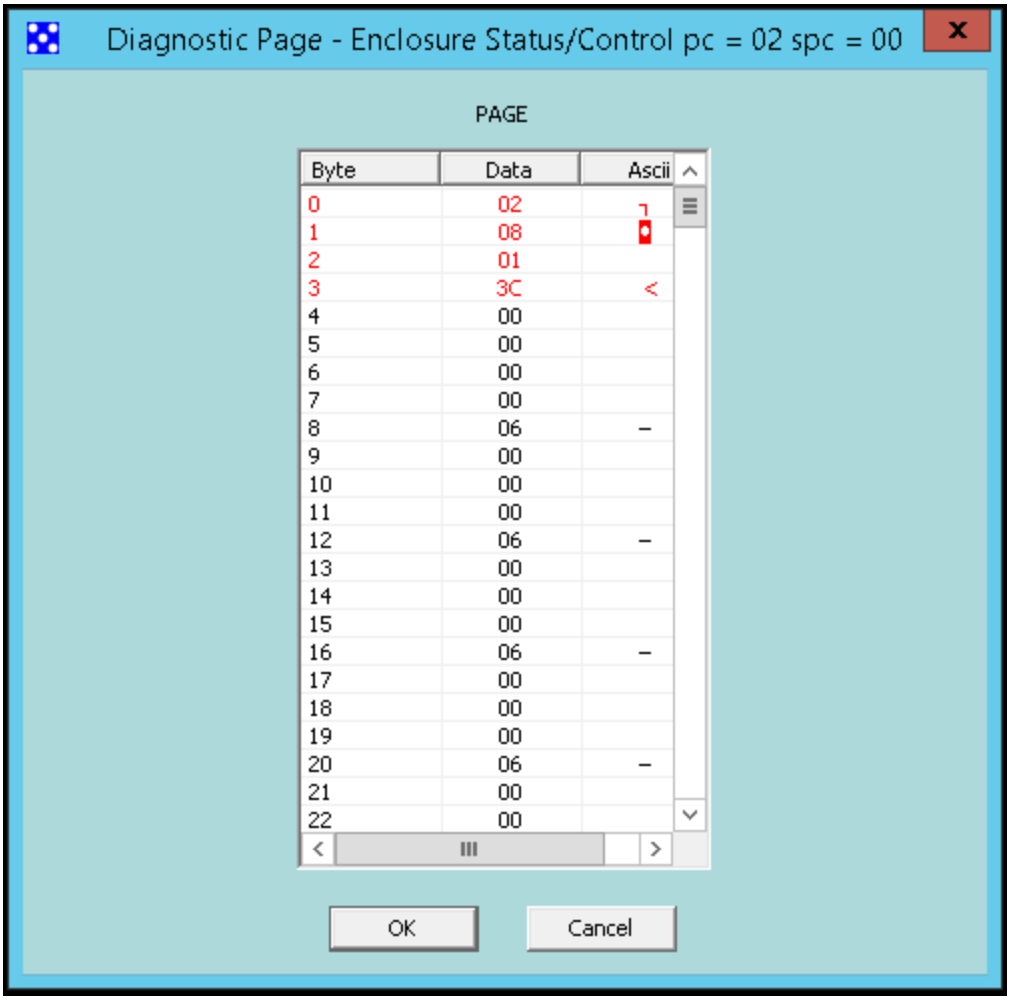
Closes dialog.

Cancel

Closes dialog.

Diagnostic Page Dialog (DiagPD)

This dialog page is displayed when a device is selected in the Diagnostic Page section of DPD.



GUI Items

PAGE

Diagnostic Page results returned by Receive Diagnostics Command. Red text is diagnostic page header, and black text is parameter data.

OK

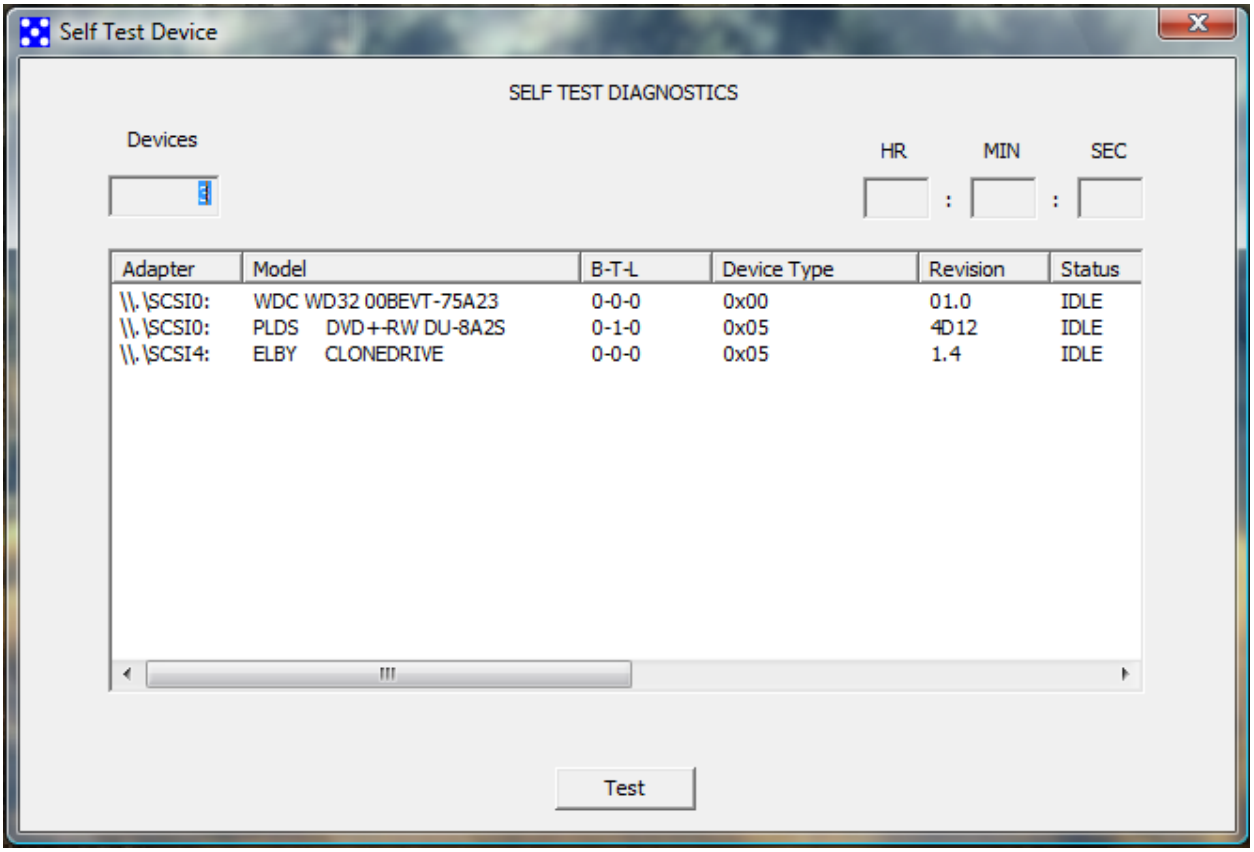
Closes dialog.

Cancel

Closes dialog.

Self-Test Device Dialog (STDD)

This dialog performs the short and extended built-in self-test (BIST) of the one or multiple devices.



GUI Items

Devices

The number of block devices displayed in this dialog.

HR: MIN:SEC

Timer that displays the elapsed time since format was started in hours, minutes and seconds

Device Listing

- Adapter - SCSI adapter associated with device.
- Model - Inquiry product and model strings
- B-T-L - Bus, target and LUN of device
- Device Type - Peripheral qualifier device type byte from Inquiry data
- Revision - Revision from Inquiry data
- Status - Displays the status of the self-test operation.
- Progress - Displays the progress of the self-test operation.
- What Failed? - If the BIST fails, this field displays what stage of BIST failed.
- Sense Key - If self-test operation fails, displays the sense key information.

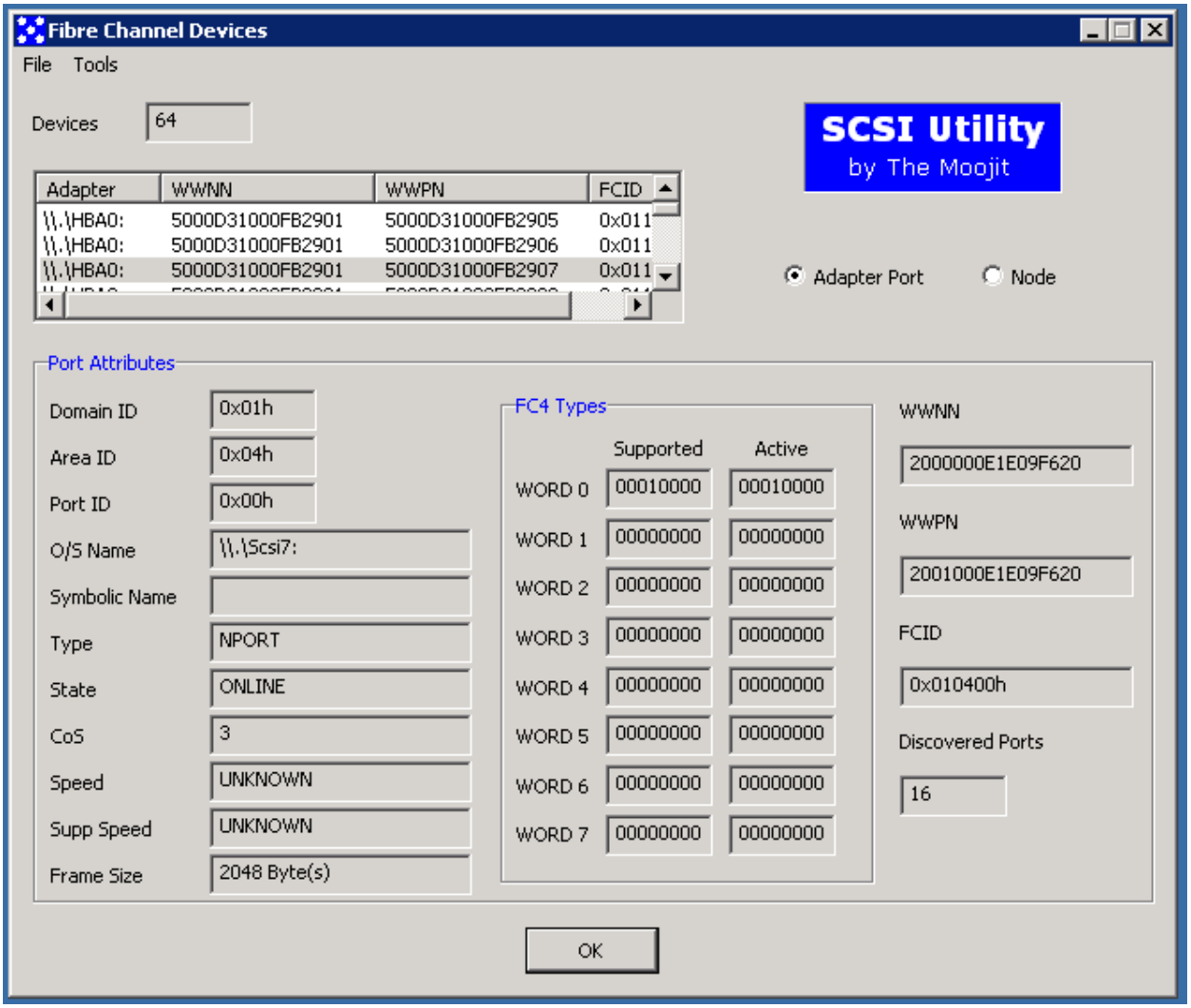
- ASC/ASCQ - If self-test operation fails, displays the additional sense code and additional sense code qualifier.
- Self-Test Error - If the BIST fails, this field displays the error code.
- Stage - Current BIST stage in progress

Test

After highlighting device(s), this button starts the BIST operations.

Fibre Channel Devices Dialog (FCDD)

This dialog displays information pertaining to fibre channel HBA's installed in the system and devices enumerated by the HBA's.



Menu Items

File Exit
Exits FCDD.

Tools Adapters Information
Displays the HBA Statistics and Information Dialog (HSID) when a device is highlighted in the FCDD device listing.

Tools Adapters List All
Displays the SNIA Adapters Dialog (SAD) when a device in the FCDD device listing is highlighted.

GUI Items

Devices
Number of fibre channel nodes enumerated by host.

Device
- Adapter - The HBA that discovered FC node.
- WWNN - World Wide Node Name of FC node
- WWPN - World Wide Port Name of FC node
- FCID - FC address of node (24 bits)

Adapter Port
Selecting this radio button switches FCDD to display information about the FC HBA (adapter)

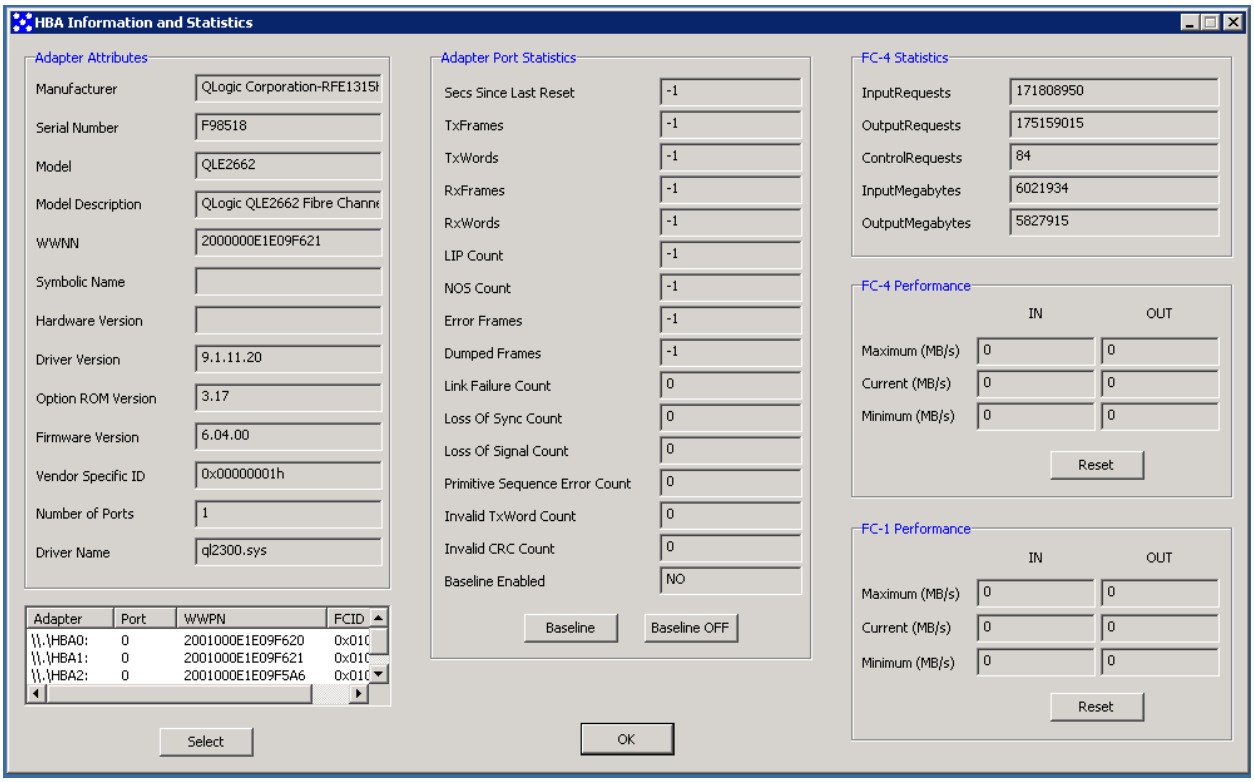
Node
Selecting this radio button switch FCDD to display information about the FC node enumerated by FC HBA

Port Attributes
Please refer to T11 specification for more detail on these parameters

FC4 Types
Please refer to T11 specification for more detail on these parameters

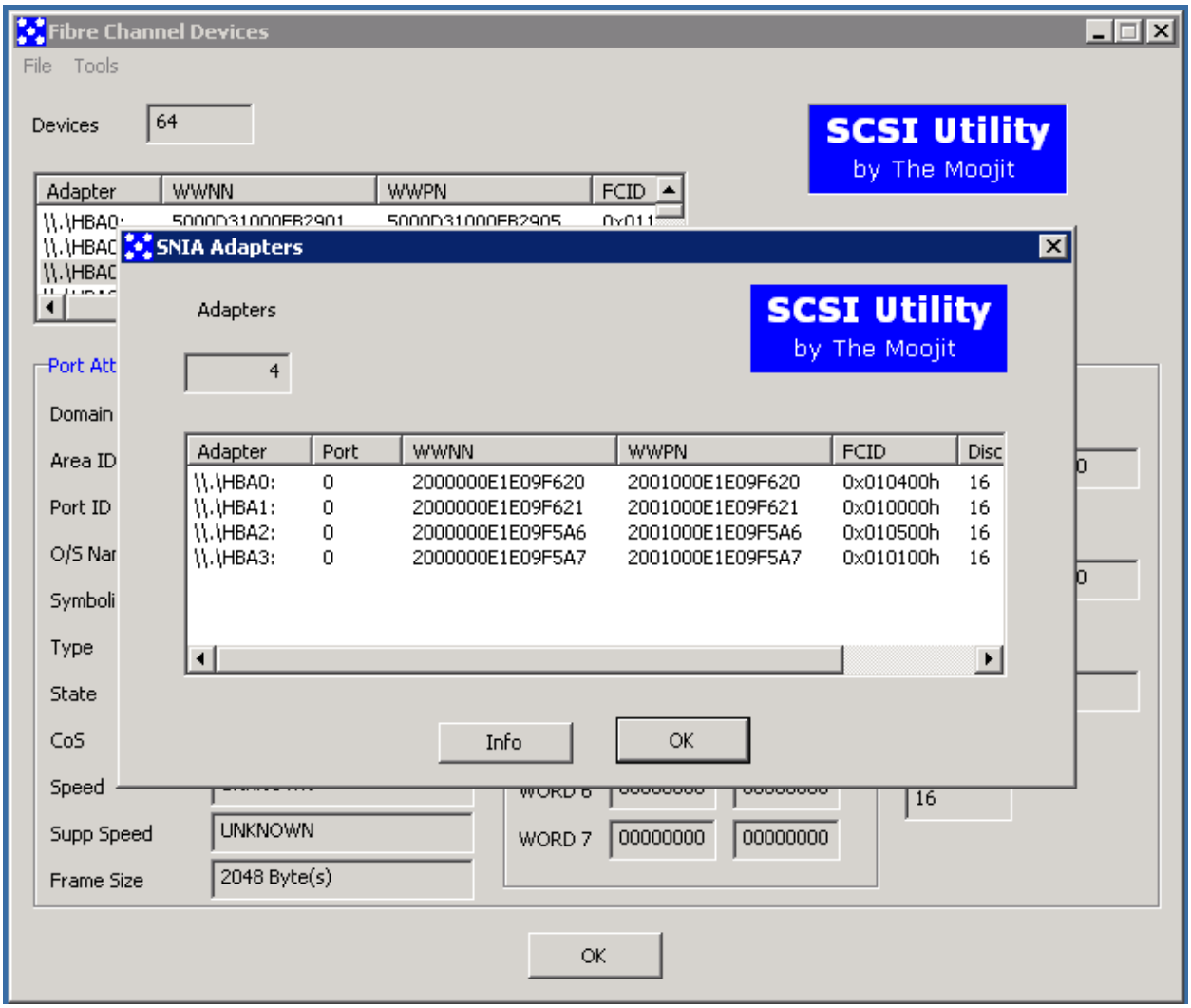
HBA Statistics and Information Dialog (HSID)

This display shows detailed information pertaining to the FC HBA selected by the user. Please refer to the T11 specification for more details on the parameters displayed.



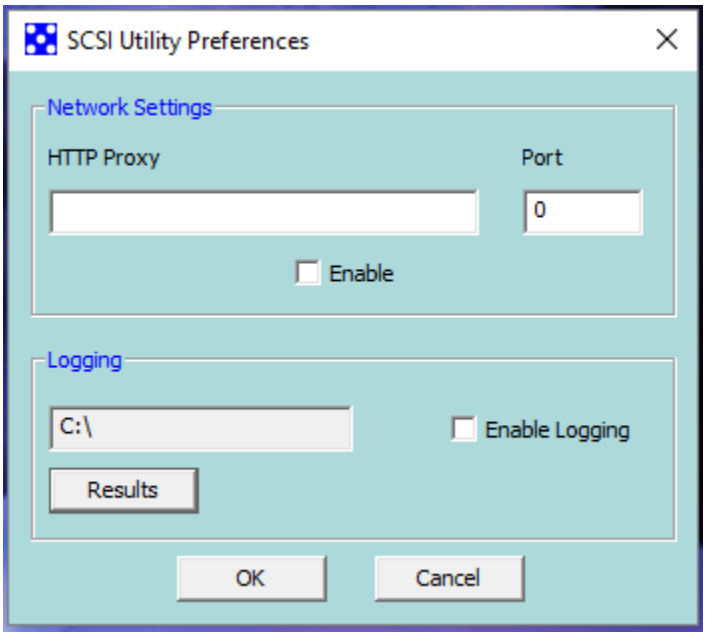
SNIA Adapters Dialog (SAD)

This display summarizes the FC HBA ports enumerated in the host and displays the number of FC nodes enumerated by each HBA port.



Preferences Dialog (PrefD)

The PrefD dialog allows the user to set HTTP PROXY information if required for remote server licensing and enable or disable logging.



GUI Items

Network Settings - HTTP Proxy

HTTP proxy string (e.g. myproxy.foo.com)

Network Settings – Port

HTTP proxy tcp port (e.g. 80)

Network Settings – Enable

If checked, HTTP proxy will be used for license server communications.

Logging – Results

Opens a dialog that allows the user to select destination for log file.

Logging – Enable Logging

If checked, logging will be enabled on all SCSI I/O's. Log file will be saved in Results directory.

OK

Accepts all changes made in dialog and closes dialog.

Cancel

Ignores all changes made in dialog and closes dialog.

Inquiry Information Dialogs

The Detail button on the main dialog page will display the INQUIRY DATA (SPC-4 FORMAT) dialog shown on the left. The EXTENDED INQUIRY DATA (SPC-4 FORMAT) dialog shown on the right can be displayed by selecting the “More -> Extended Inquiry” menu item.

Inquiry Data

More

Standard Inquiry

INQUIRY DATA (SPC-4 FORMAT)

Bit / Byte	7	6	5	4	3	2	1	0
	PERIPHERAL QUALIFIER				PERIPHERAL DEVICE TYPE			
0	0x0				0x00			
	RMB			Reserved				
1	0			0x00				
	VERSION							
2	0x05							
	AERC	Obsolete	NormACA	HISUP	RESPONSE DATA FORMAT			
3	0	0	0	0	0x2			
	ADDITIONAL LENGTH (n-4)							
4	0x41							
	SCCS	ACC	TPGS		3PC	Reserved		PROTECT
5	0	0	0x0		0	0x0		0
	BQUE	ENCSERV	VS	MULTIP	MCHNGR	Obsolete	Obsolete	ADDR16
6	0	0	0	0	0	0	0	0
	RELADR	Obsolete	WBUS16	SYNC	LINKED	Obsolete	CMDQUE	VS
7	0	0	0	0	0	0	1	0
	VENDOR ID							
8-15	WDC							
	PRODUCT ID							
16-31	WD5000AAKX-753CA							
	PRODUCT REVISION LEVEL							
32-35	17.0							
	Vendor Specific							
36	0x41							
	Vendor Specific							
37	0x54							
	Vendor Specific							
38	0x41							
	Vendor Specific							
39	0x00							
	Vendor Specific							
40	0x00							
	Vendor Specific							
41	0x00							
	Vendor Specific							
42	0x00							

Extended Inquiry

Extended Inquiry

EXTENDED INQUIRY DATA (SPC-4 FORMAT)

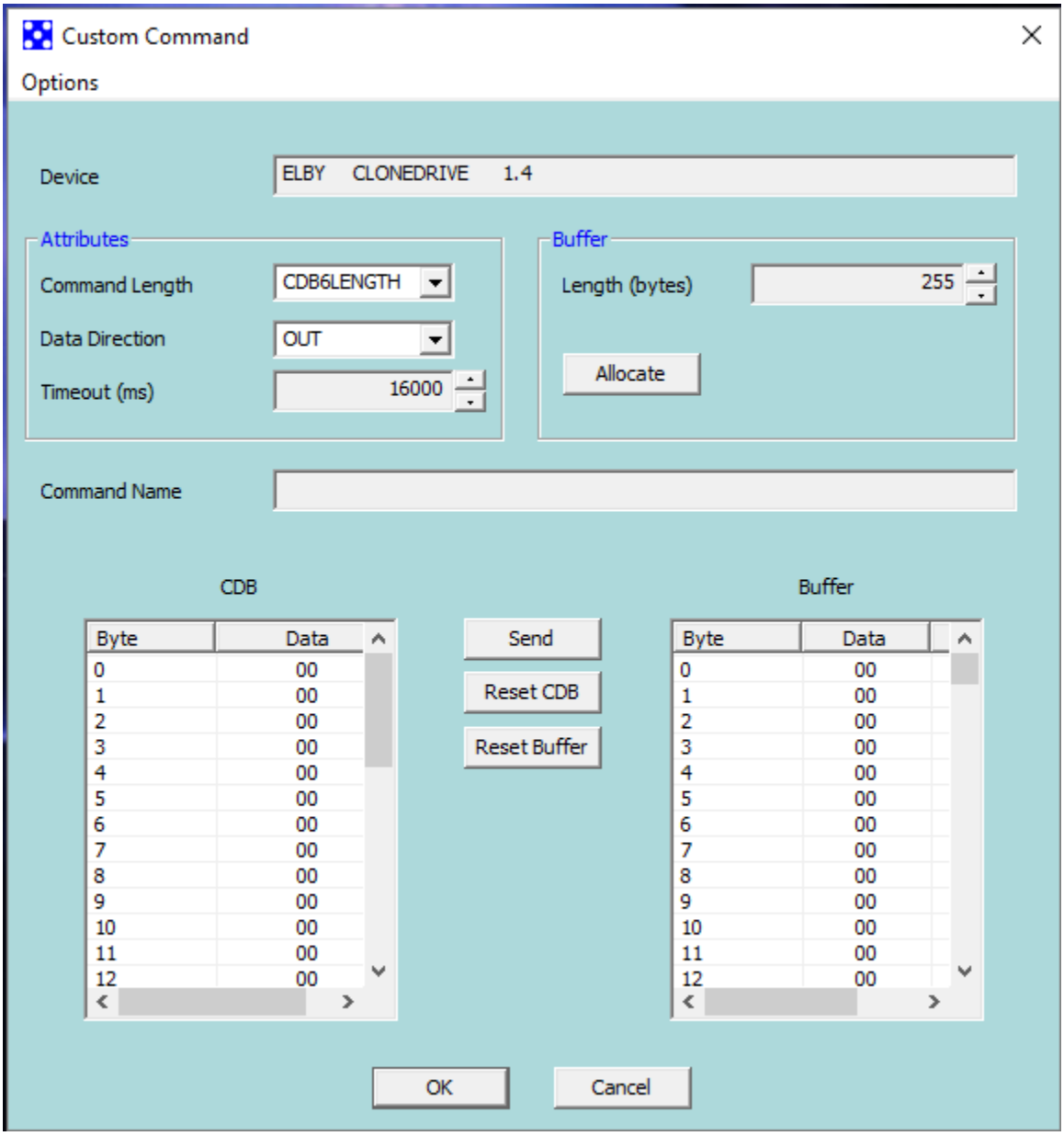
Bit / Byte	7	6	5	4	3	2	1	0
	PERIPHERAL QUALIFIER				PERIPHERAL DEVICE TYPE			
0	0x0				0x0			
	PAGE CODE							
1	0x00							
	PAGE LENGTH (MSB)							
2	0x0							
	PAGE LENGTH (LSB)							
3	0x0							
	ACT MICROCODE		SPT			GRD_CHK	APP_CHK	REF_CHK
4	0x0		0x0			0	0	0
	Reserved	UASK_SUP	GRP_SUP	PRI_SUP	HEADSUP	ORDSUP	SIMPSUP	
5	0x0	0	0	0	0	0	0	
	Reserved				WU_SUP	CRD_SUP	NV_SUP	V_SUP
6	0x0				0	0	0	0
	Reserved		PII_SUP	Reserved				LUICLR
7	0		0	0x0				0
	Reserved		R_SUP	Reserved				CBCS
8	0		0	0				0
	Reserved			MULTI_IT_NEXUS_DL				
9	0			0x0				
	EXTENDED SELF-TEST COMPLETION MINUTES (MSB)							
10	0x00							
	EXTENDED SELF-TEST COMPLETION MINUTES (LSB)							
11	0x00							
	POA_SUP	HRA_SUP	VSA_SUP	Reserved				
12	0	0	0	0x00				

Byte	Data
13	00
14	00
15	00
16	00
17	00
18	00
19	00

OK

Custom Command Dialog (CCD)

The CCD allows the user to create, save and send any SCSI CDB to the selected device.



Menu Items

Options – Import Buffer

Imports any file and uses its contents for Buffer. Buffer listing will be updated on import.

Options – Import Command

Imports a previously saved command (includes buffer also)

Options – Save Command
Save current CDB settings and Buffer to SCSI Utility .cmd file.

Options – Exit
Closes Dialog

GUI Items

Device
Displays selected device's SCSI Inquiry vendor, model and revision strings.

Attributes – Command Length
Dropdown that allows user to select CDB length.

Attributes – Data Direction
Dropdown that allows user to select data direction. IN = device server to application client; OUT = application client to device server; UNSPECIFIED = no data will be transferred with command and BIDIRECTIONAL = data will be transferred from application client to device server and device server to application client.

Attributes – Timeout
SCSI I/O timeout in milliseconds (default setting is 16000 ms)

Buffer – Length (bytes)
Length of Buffer to allocate (default setting is 255). When CCD dialog is opened, a 255 Buffer will be pre-allocated.

Buffer – Allocate
Allocates new Buffer initialized to all zeros equal to Length and populates in Buffer listing. Previous Buffer and its contents will be lost.

Command Name
If command has been saved, this will display the name given.

CDB
CDB contents (maximum length is 32). CDB locations are editable by user double clicking on appropriate Data offset location.

Buffer
Buffer contents (length equal to buffer length setting). Buffer locations are editable by user double clicking on appropriate Data offset location.

Send
Sends the Command and optional buffer to the device.

Reset CDB
Resets CDB listing to all zeros.

Reset Buffer
Resets Buffer listing to all zeros

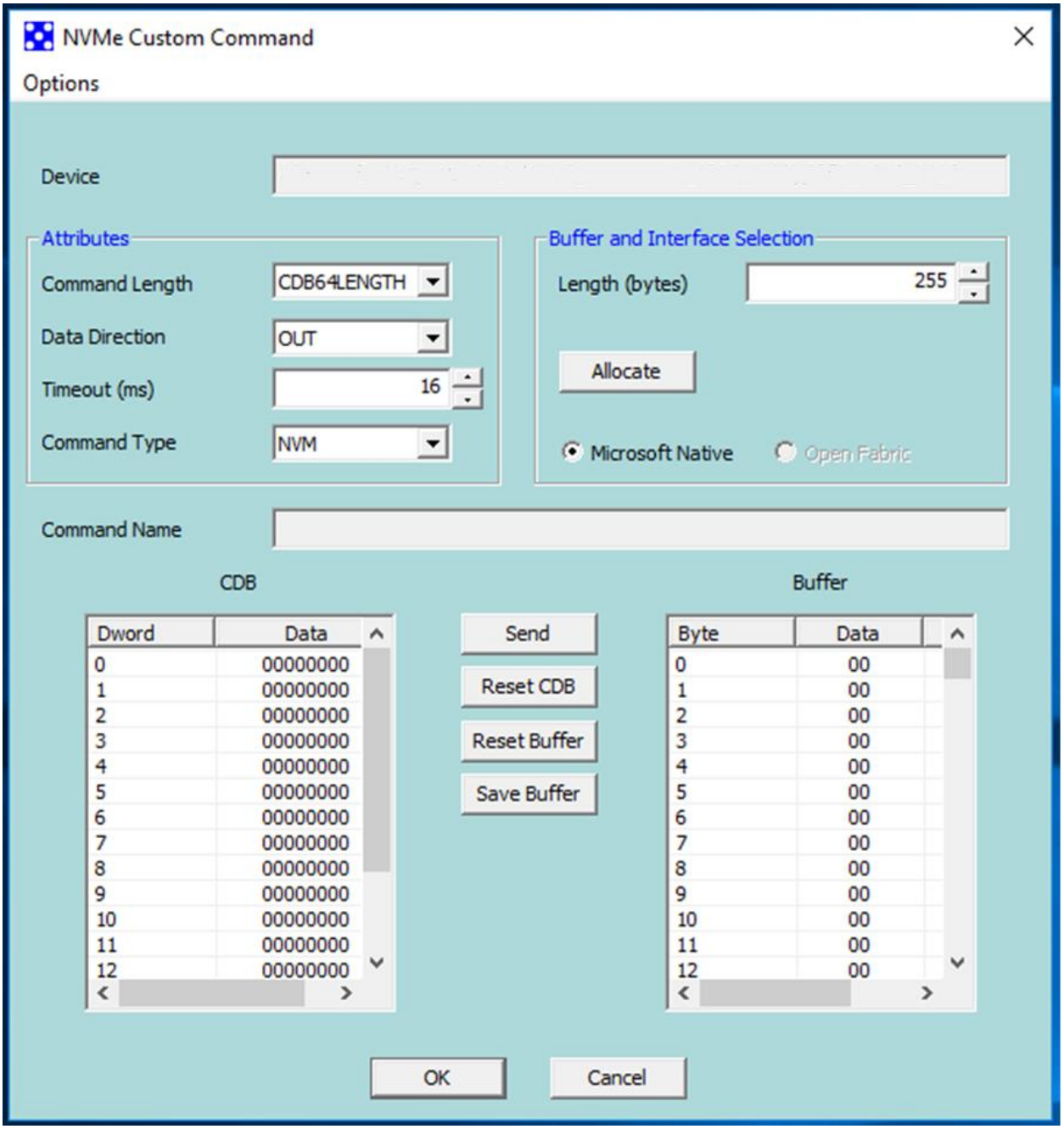
Save Buffer
Save the contents of buffer to file.

OK
Closes Dialog

Cancel
Closes Dialog

NVMe Custom Command Dialog (NCCD)

The NCCD allows the user to send NVMe pass-through commands to the device. Currently, Microsoft only allows commands that are (a) defined in the Command Effects Log and (b) Vendor Specific. Mandatory commands such as NVMe READ and WRITE are not allowed and will fail.



Menu Items

Options – Import Buffer

Imports any file and uses its contents for Buffer. Buffer listing will be updated on import.

Options – Import Command
Imports a previously saved command (includes buffer also)

Options – Save Command
Save current CDB settings and Buffer to SCSI Utility .cmd file.

Options – Exit
Closes Dialog

GUI Items

Device
Displays selected device's SCSI Inquiry vendor, model and revision strings.

Attributes – Command Length
Dropdown that allows user to select the number of DWORDS used in the command. For NVMe, this is fixed at 64 bytes or 16 DWORDs.

Attributes – Data Direction
Dropdown that allows user to select data direction. IN = device server to application client; OUT = application client to device server; UNSPECIFIED = no data will be transferred with command and BIDIRECTIONAL = data will be transferred from application client to device server and device server to application client.

Attributes – Timeout
NVMe I/O timeout in milliseconds (default setting is 16 ms)

Command Type
Dropdown that allows user to select NVM or ADMIN.

Buffer – Length (bytes)
Length of Buffer to allocate (default setting is 255). When NCCD dialog is opened, a 255 Buffer will be pre-allocated.

Buffer – Allocate
Allocates new Buffer initialized to all zeros equal to Length and populates in Buffer listing. Previous Buffer and its contents will be lost.

Command Name
If command has been saved, this will display the name given.

CDB
Command DWORD contents (0 to 15). Command DWORD locations are editable by user double clicking on appropriate DWORD offset location. DWORD bit ordering (reading from LEFT to RIGHT) is MSB to LSB.

Buffer
Buffer contents (length equal to buffer length setting). Buffer locations are editable by user double clicking on appropriate Data offset location.

Send
Sends the Command and optional buffer to the device.

Reset CDB
Resets Command DWORD listing to all zeros.

Reset Buffer
Resets Buffer listing to all zeros

Save Buffer
Save the contents of buffer to file.

OK
Closes Dialog

Cancel
Closes Dialog

T10 PI Consistency Check Dialog (T10CCD)
This dialog allows the user to verify the T10 PI logical guard block on every block of the device. The dialog provides the option of allowing either SCSI Utility or the device server to perform the GRD tag check. In addition, this dialog allows the user to correct GRD tag mismatches if found. The original user data will be maintained if GRD correction is enabled. All PI Types are supported, if the block device is not formatted with PI protection enabled, the test will not run and exit for that device. Multiple block devices can be tested at the same time, detailed logging information is provided.

Running this test provides a method to verify that user data has not changed since it was originally written to the block device. If a GRD tag mismatch is found, there are three possibilities: (a) the user data has changed since the block was written and now the GRD tag does not match the data indicating a silent data mis compare, (b) the device is not initializing the PI fields correctly during format or its manufacturing process and generating false errors or (c) the device is not calculating the GRD tag correctly.

Running this test provides a method to determine the number of blocks that have not been written too since the device's last format operation. Since the GRD tag will always be calculated and updated for any legacy WRITE operation, blocks with a GRD tag not equal to 0xFFFF indicate that a write operation has been performed.

GUI Items

Device Listing

Lists all block devices enumerated by SCSI Utility. Some of the more important fields for each device are listed below:

Progress

Percentage of drive that has been checked.

Status

Status of PI check operations – COMPLETE, RUNNING, PI DISABLED and FAIL.

Sense Key

Sense key if error occurs.

ASC/ASCQ

ASC/ASCQ codes associated with error (in hex).

PI Status

Status of PI check operation – PASS, FAIL or CANCELLED.

Block Guard Errors

Number of GRD tag mismatches found.

% of Errors

Number of GRD tag mismatches found with respect to total blocks reported by block device.

UnWritten Blocks

Number of blocks that have 0xFFFFh for GRD tag signifying the number of blocks that have not been written too. Per T10, a PI formatted block device will always update the GRD tag for any non-PI WRITE.

% UnWritten Blocks

Number of UnWritten blocks with respect to total blocks reported by block device.

PI Type

PI type drive has been formatted with.

Corrected Blocks

If REPLAIR BLOCK GUARD enabled, the number of blocks with GRD tag mismatch that have been corrected.

Total Blocks

Total blocks reported in READ CAPACITY (16) data returned by the block device.

Formatted Blocks

Number of blocks where all PI fields for a given block are 0xFF. Per T10, when a block device is formatted with one of the PI types enabled, all PI fields must be initialized to 0xFF. In this case, GRD tag would be 0xFFFF, APP tag would be 0xFFFF, and REF tag would be 0xFFFF FFFF.

Repair Block Guard

When checked, SCSI Utility will attempt to repair the GRD tag mismatch by calculating the correct T10 PI CRC16, updating the GRD tag field, and finally copying the entire block with PI fields (APP and REF tags are not modified) to the block device. The user should take normal precautions before attempting this procedure – perform a backup of the block device prior to performing this step and place the system on a UPS to prevent a power outage from causing a possible loss of data.

Device Server Check

When checked, SCSI Utility will instruct the block device to perform the GRD tag check instead of SCSI Utility.

Enable Detailed Logging

When checked, if a GRD tag mismatch is found, SCSI Utility will post an event for every block with error which will include LBA location along with user data and PI fields.

Single Block Ops

When checked, if Repair Block Guard is enabled, SCSI Utility will perform single block updates versus the normal multiple block update. StorageWerks has found that some device with GRD tag mismatches may not be able process multi-block updates and return error.

Check

Starts the test on one or more selected block devices.

Cancel

Closes the dialog when no tests are running.

Stop

Stops tests running on selected block devices.

NVMe Support

SCSI Utility has added support for NVMe devices on Windows 10, Server 2016 and later releases from Microsoft. Prior to these Operating System versions, SCSI Utility can enumerate and display NVMe devices, and has limited capability. Starting with these later Operating Systems, SCSI Utility can perform the following operations specific to NVMe:

- Send NVMe Pass-through Commands per the Microsoft restrictions, namely, only vendor specific commands.
- Perform Firmware Downloads
- Perform Firmware Commits

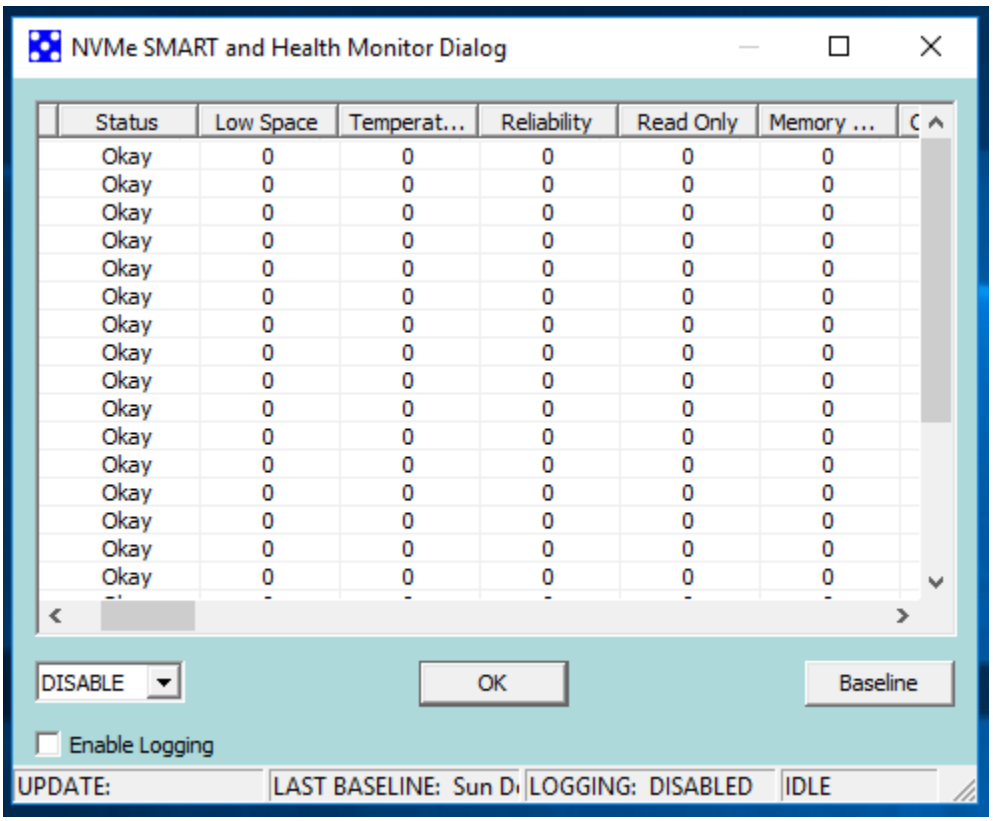
- Display all Log Pages.
- Display all Features.
- Display Controller and Namespace Identify parameters
- Display, log and monitor SMART parameters.

NVMe Firmware Download

When performing firmware download, SCSI Utility will maximize the transfer size based on a combination of driver and device capabilities. At the end of firmware download, SCSI Utility automatically sends a Firmware Commit instructing the device to activate on next reset. The firmware slot used is automatically chosen by SCSI Utility.

NVMe SMART and Health Monitor Dialog (NSHMD)

The NSHMD dialog allows for the monitoring and optional logging of all NVMe SMART attributes for each NVMe device discovered by the application. User may select update frequency; default setting is no updates.



GUI Items

SMART Attribute Listing

Displays all SMART attributes supported by the device. For more details, please see latest NVMe Specification. When NSHMD first starts, a baseline is automatically created. When updates are enabled,

latest returned attributes are compared to the baseline. If a threshold is exceeded, status will change to 'Not Okay,' and SCSI Utility will post an event in the application event log when this occurs.

Update Frequency Dropdown

Default setting is no updates. Dropdown that allows the user to select update frequency. When updates are enabled, a countdown timer will be displayed next to UPDATE.

OK

Closes the dialog.

Baseline

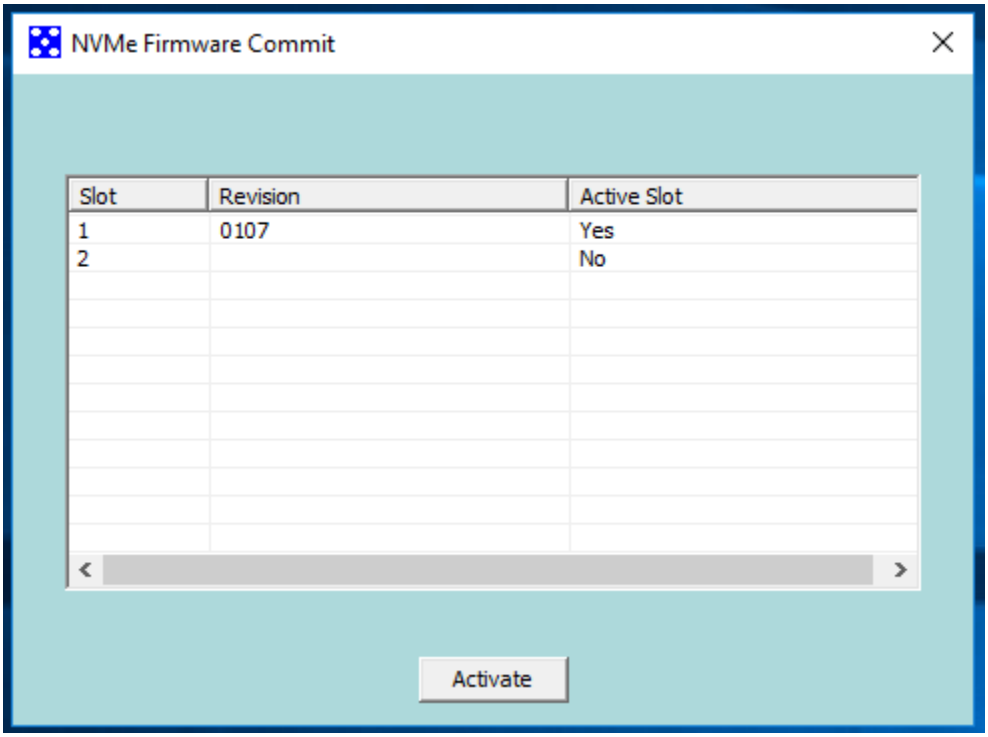
Creates a new baseline for comparisons and updates the LAST BASELINE time stamp.

Enable Logging Checkbox

Default setting is logging disabled. When checked, SCSI Utility will log all NVMe SMART attributes for each device to the location defined in PrefD, and LOGGING will be changed to ENABLED.

NVMe Firmware Commit Dialog (NFCD)

This dialog allows the user to activate another NVMe firmware image located in that slot. Activation will occur on next device reset.



GUI Items

Firmware Listing

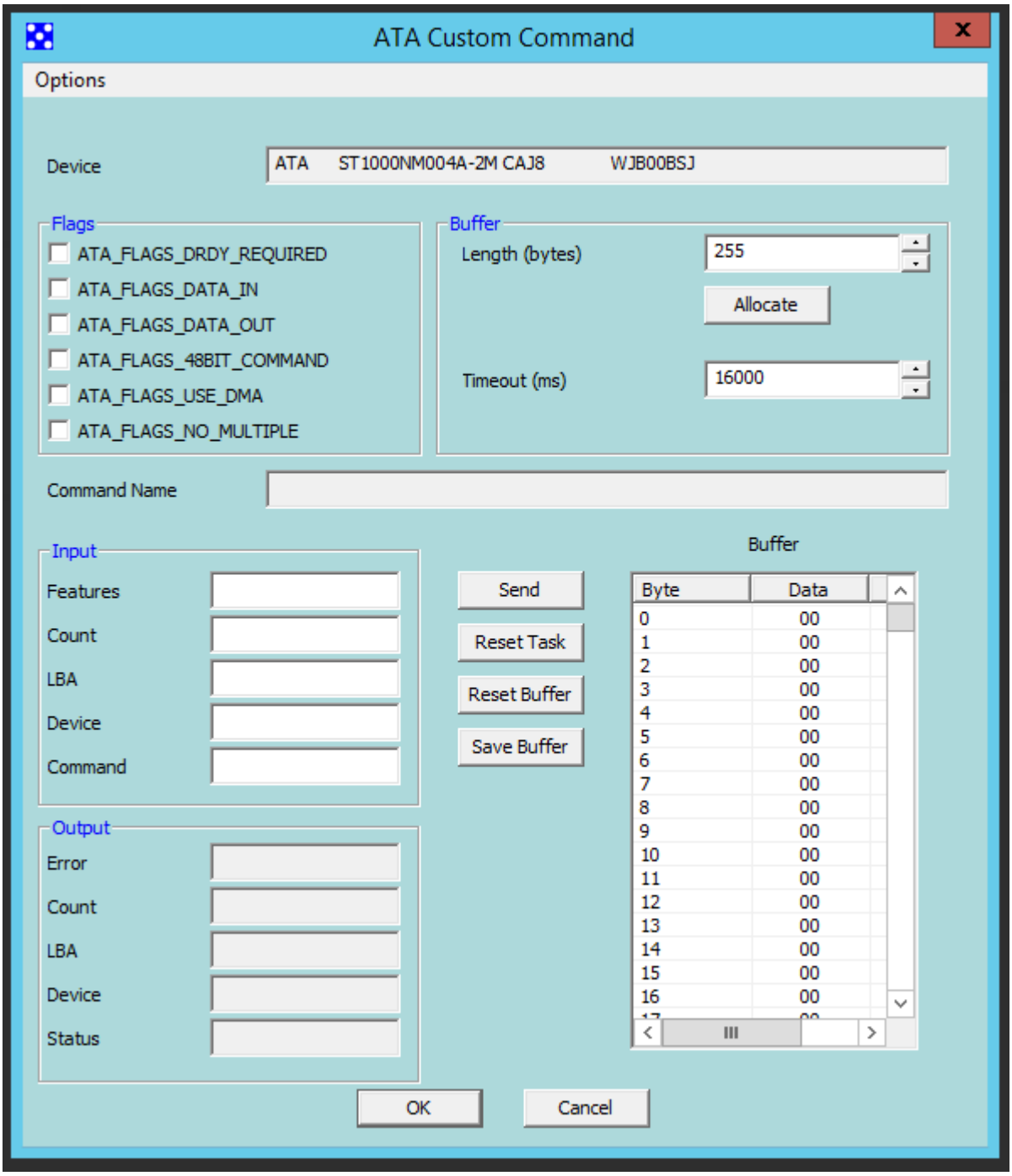
Each row in this listing represents an NVMe firmware slot reported by the device; slot number, firmware revision and currently active slot will be displayed.

Activate

To activate another firmware image, the user must highlight the row and left click this control. Selected firmware image will become active on next device reset.

ATA Custom Command Dialog (ACCD)

The ACCD allows the user to send ATA pass-through commands to the device. User will need to reference both T13 ACS-4 specification and MSDN documentation on "ATA_PASS_THROUGH_EX" data structure to understand how to use this dialog. Please also see the pre-built ATA command examples provided in the SCSI Utility accessories package available from download from www.storagewerks.net.



Menu Items

Options – Import Buffer

Imports any file and uses its contents for Buffer. Buffer listing will be updated on import.

Options – Import Command

Imports a previously saved command (includes buffer also)

Options – Save Command
Save current CDB settings and Buffer to SCSI Utility .cmd file.

Options – Exit
Closes dialogue.

GUI Items

Device
Displays selected device's SCSI Inquiry vendor, model and revision strings.

Flags
See MSDN documentation on "ATA_PASS_THROUGH_EX" data structure.

Buffer – Length (bytes)
Length of Buffer to allocate (default setting is 255). When ACCD dialog is opened, a 255 Buffer will be pre-allocated.

Allocate
Allocates new Buffer initialized to all zeros equal to Length and populates in Buffer listing. Previous Buffer and its contents will be lost.

Command Name
If command has been saved, this will display the name given.

Input
See MSDN documentation on "ATA_PASS_THROUGH_EX" data structure and T13 ACS-4 specification.

Output
See MSDN documentation on "ATA_PASS_THROUGH_EX" data structure and T13 ACS-4 specification.

Send
Sends ATA command to device.

Reset Task
Clears input fields.

Reset Buffer
Clears buffer contents to zero.

Save Buffer
Saves buffer contents to file.