



Supermicro Super Diagnostics Offline User's Guide

Revision 1.1.0

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Revision History

Date	Rev	Description
April 17, 2017	1.0	1. Initial document.
June 27, 2018	1.1.0	1. Added the command to access the graphic user interface. 2. Added the section about the the graphical user interface of Supermicro Super Diagnostics Offline.

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```
Name: SMC_cookie Session: 973016679.275537
Timestamp: 20040721258
Portal: 0
Expires: Tue, 01-Aug-2004 22:40:58 GMT
Domain: Supermicro.com
Path: /
```

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1 Overview

The intricacy of today's computer systems makes it difficult to find the root cause of faults or problems within a system. For this reason, the Supermicro Super Diagnostics Offline was designed to provide a complete diagnosis of a system and its components at system boot-up.

With this tool, you can take an inventory of the quantities of installed devices and BIOS of the target system, double-check the previous record with the actual quantities and current BIOS data, and check some devices for errors. These devices include CPU, memory, BMC, HDD, USB, power supply, backplane, PCI-E, VGA and network.

1.1 Prerequisites

- The Supermicro Super Diagnostics Offline is applicable on systems with the following motherboards: X10 Grantley UP/DP series, X11 Purley UP/DP series, X10 Brickland QP series, X11 Greenlow UP series, X11 Bakerville SoC series, H11 Naples UP/DP series, and B1/B10/B11/B2 series.
- Set the time at the local system before running the tool.
- For remote diagnostics:
 - BMC firmware and SMCIPMITool are both required. Make sure their revisions are the same as or newer than those that support the Supermicro Super Diagnostics Offline. Find the revision numbers of the required software in the readme file in the Supermicro Super Diagnostics Offline package.
 - The instructions of commands are transmitted via the BMC. Make sure the network connection is established and maintained when initiating.

1.2 Diagnostic Process

When the Supermicro Super Diagnostics Offline is started, it collects information on the devices installed on the target system to generate the basic system information. Based on this information, the tool then detects the devices and ensures their presence. Upon detection, the tool can use the detection results to diagnose the health status of the devices.

1.3 Tool Interface

The Supermicro Super Diagnostics Offline requires commands to run the diagnostics. Two modes are provided for users to have better control of the tool:

- Command Mode: Allows users to conduct diagnostics with a variety of parameters.
- Summary Mode: Displays the problematic components.

1.4 Supported List of Components for Diagnosis

Component	Diagnosis Area
BIOS	Checks BIOS POST errors from NVRAM and reports fail results. The BIOS image checksum is also checked.
CPU	Checks CPU for floating-point, SSE, SSE2, SSE3, AVX, brand-string, frequency, cache, and temperature.
Fan	Checks fan(s) to ensure their functionality and to confirm fan speed control is working.
Hard Drive	Supports SATA (connected to PCH)/SAS (connect LSI 3108/3208)/NVMe diagnosis. The tool checks HDD S.M.A.R.T information for errors.
IPMI	Checks IPMI I2C bus/NIC mode/Network Service.
Memory	Tests for memory address, pattern and bit-shift test. The default setting is to run address, 8-bit pattern, and 8-bit bit-shift tests only. However, the tool also allows the use of different parameters to run 8-bit, 16-bit, 32-bit, and 64-bit pattern and bit-shift tests with a loop count.
Network	The tool requires “Network Stack” and “UEFI PXE OPRM” to be enabled in BIOS Setup for network diagnostics. The network cable also needs to be connected and the tool will send an IP request to confirm the network connection.
PCIe	Checks all add-on cards to detect for correctable errors, non-fatal errors, fatal errors, unsupported requests and pending transactions. Also checks the VPD (Vital Product Data) integrity.
Power Supply	Detects Supermicro PSU information including slave address, status, input voltage, input current, input power, main output voltage, main output current, main output power, temperature and fan speed.
Serial Interface	Conducts the serial port in-bank loopback test.
USB	Detects all USB devices and displays their information. USB diagnostics focus on over-current detection.
Backplane	Detects Supermicro backplane information including node ID, backplane PN (part number), backplane SN (serial number), backplane location, MCU version and configuration ID.
Manufacturer Data	Checks if the onboard CPLD version and manufacturer FRU are supported.

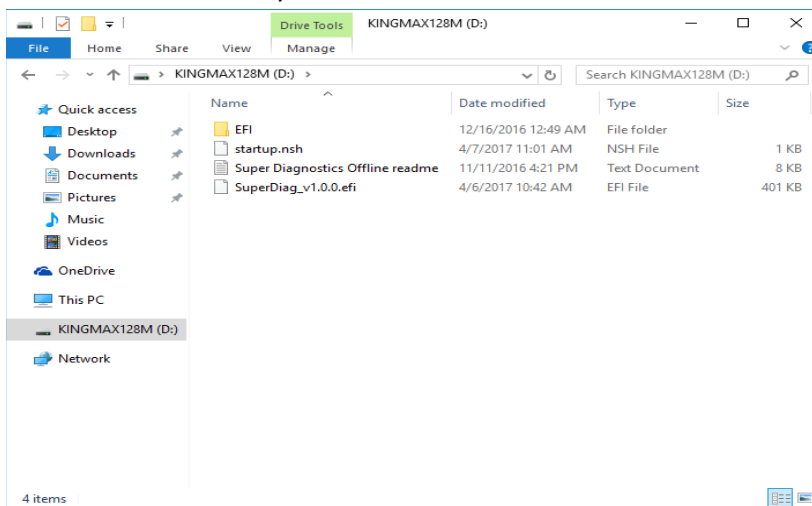
2 Diagnosing a Target System

With the Supermicro Super Diagnostics Offline, you can diagnose a target system both locally and remotely.

2.1 Diagnosing the Target System Locally

2.1.1 Running the Super Diagnostics Offline from a Flash Drive

1. Download the SuperDiag zip file from <https://www.supermicro.com/sms> and save it to a USB pen drive. Note the USB key must be in FAT32 format.



2. Modify startup.nsh to run your specific test item or keep the default setting to run all test items. For supported parameters, see *3 Using Parameters*.
3. On the target system, set the boot option to **EFI USB Key**.
4. Set the Onboard LAN Option ROM to **EFI** and enable the **Network Stack** function in BIOS Setup.
5. Use the USB pen drive to boot and the system automatically runs the diagnostic test.

```
PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x7,0x0)/USB(0x1,0x0)/HD(1,MBR,0x018C2ADE,0x3F,C
x1D4BFC1)
b1k0 :Removable HardDisk - Alias hd41a0h0b0b fso
PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x7,0x0)/USB(0x1,0x0)/HD(1,MBR,0x018C2ADE,0x3F,C
x1D4BFC1)
b1k1 :BlockDevice - Alias (null)
PciRoot(0x0)/Pci(0x1F,0x2)/VenHu(CF31FACS-C24E-11D2-85F3-00A0C93EC93B,80)
b1k2 :Removable BlockDevice - Alias (null)
PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x7,0x0)/USB(0x1,0x0)
hd41a0h0b0b :Removable HardDisk - Alias fso b1k0
PciRoot(0x0)/Pci(0x1D,0x0)/USB(0x0,0x0)/USB(0x7,0x0)/USB(0x1,0x0)/HD(1,MBR,0x018C2ADE
,0x3F,0x1D4BFC1)
fso:\> SuperDiag.efi /all

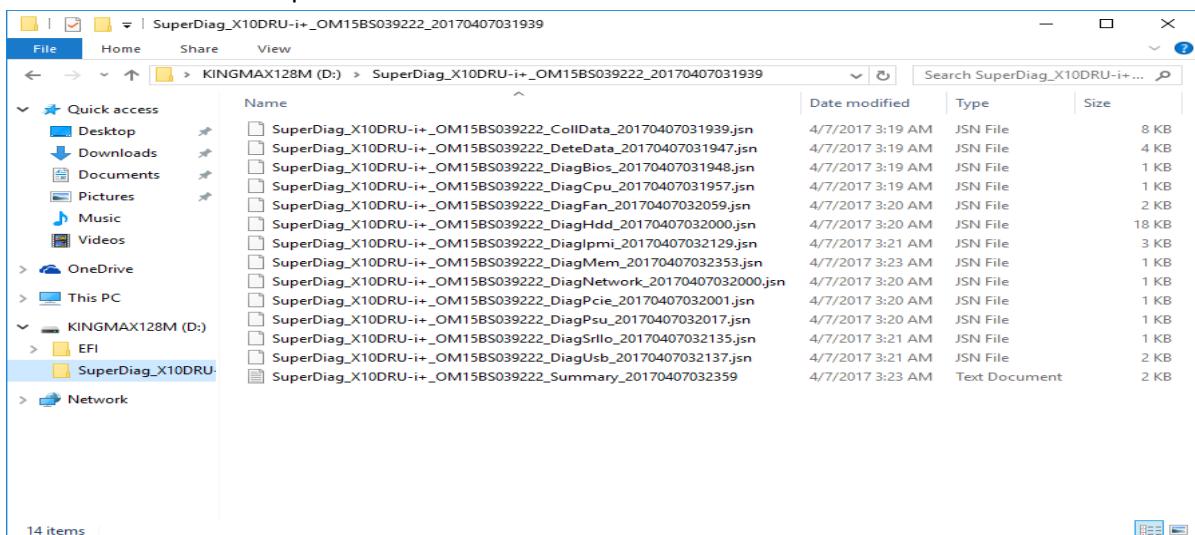
Copyright(c) 1993-2017 Super Micro Computer, Inc.
Execution Time : 03:19:24 04/07/2017
MB Name : X10DRU-i+
MB Serial Number: DH1585039222

Collecting information..... Done!
Detecting components..... Done!

The diagnosis next may take some time. Please wait.
Diagnosing components.....
<Current Test Information>
Type : Memory Diagnostics
Test : Address Test
Progress : 15 %
```

6. By default, the tool runs on the summary mode and displays the results on screen.

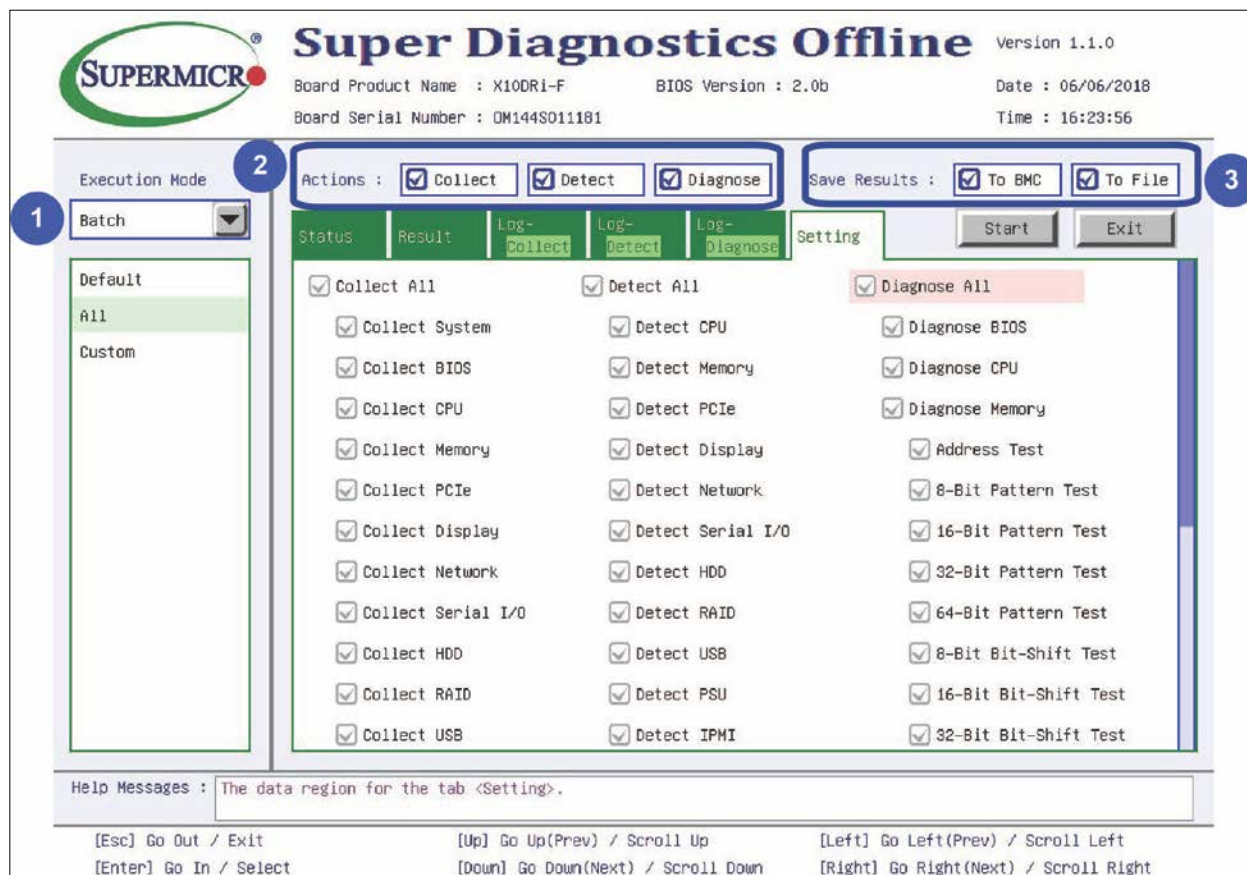
- The tool creates a folder in the pen drive with the board name, serial number and time label in which to save the results. A summary log in plain text (.txt) and the detailed logs in the JSON (.json) format are saved in the pen drive.



- To view the raw data in the JSON format, you can drag and drop the log file to a Google Chrome™ browser or use another method to access data in the JSON format.

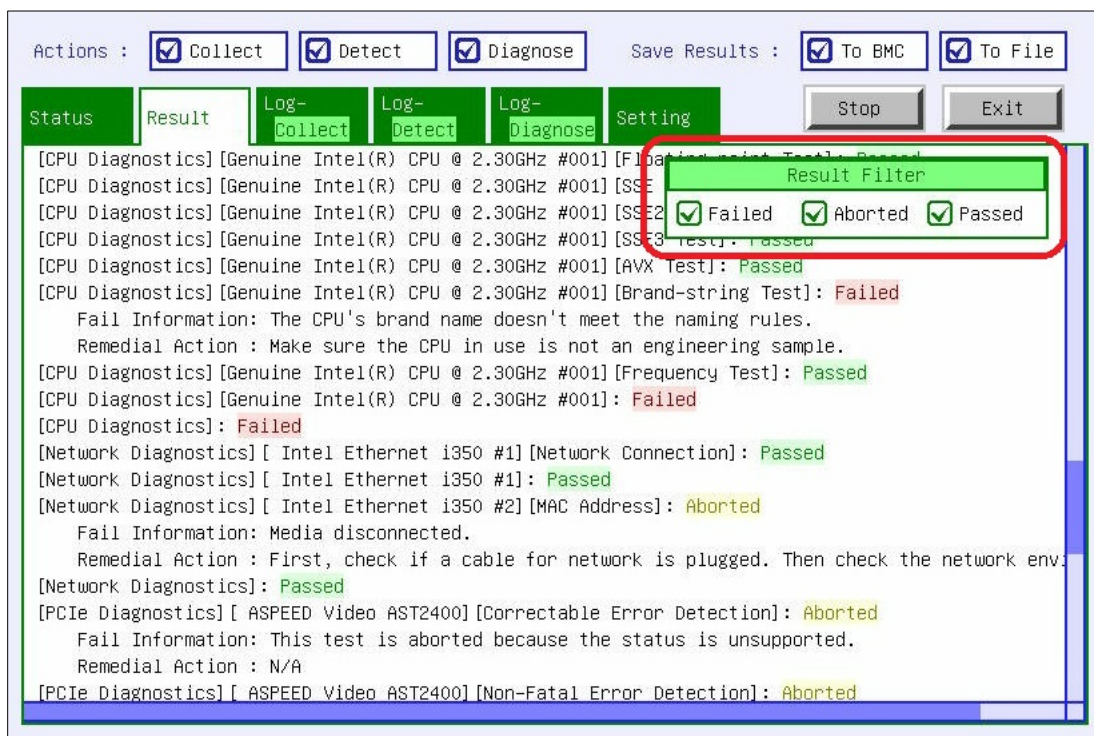
2.1.2 Accessing the Super Diagnostics Offline GUI

The GUI (graphical user interface) version is provided to assist in diagnosing the target system. Run the command **SuperDiag_v1.1.0.efi /gui** to access the GUI. To use the GUI, follow the steps below.



1. Use the Execution Mode drop-down list to select the desired mode. Two options are provided: Single and Batch.
 - **Single:** Select the desired items to be processed.
 - **Batch:** Select **Default**, **All** or **Custom** for further process.
 - **Default:** The selected items to be processed are selected by default and cannot be altered.
 - **All:** Note that it will take a long time to process all items if **All** is selected.
 - **Custom:** Click the **Setting** tab, and click the checkbox(es) of the desired items to be processed.
2. Click the checkbox(es) of the desired actions: Collect, Detect and Diagnose.
 - **Collect:** Collects the data of the selected items.
 - **Detect:** Detects if the selected items are present.
 - **Diagnose:** Diagnoses to determine if the selected items are healthy.
3. In the Save Results, click the checkbox(es) of the desired method(s) to save the diagnostic results. Two methods are provided: **To BMC** and **To File**. Note that the file is saved in .json format.
4. Click the **Start** button in the top right corner to start the process.

- After results are returned, click the desired checkbox(es) in the Result Filter field to screen the results. Three types of results are provided: **Failed**, **Aborted** and **Passed**.



- For the specific results of collection, detection or diagnosis, click the corresponding tab.

- **Log-Collect**



- **Log-Detect**

Status	Result	Log-Collect	Log-Detect	Log-Diagnose	Setting	Stop	Exit
IPMI Detection							
{IPMI}	Detection						
	Result			Passed			
CPU Detection							
{Genuine Intel(R) CPU @ 2.30GHz #001}	Detection						
	Result			Passed			
Memory Detection							
{18ASF1G72P2-2G1A2 #001}	Detection						
	Result			Passed			
	Serial Number			0CECB535			
HDD Detection							
RAID Detection							
Network Detection							

- **Log-Dianose**

Status	Result	Log-Collect	Log-Detect	Log-Diagnose	Setting	Stop	Exit
BIOS Diagnostics							
BIOS Last POST Code		B4h					
{BIOS Event Log(s)}							
Log Count Check							
	Result	Passed					
Log #001							
	Date	03/16/18					
	Time	15:03:09					
	Code	Smbios 0x16					
	Severity	N/A					
	Description	Log Area Reset/Cleared					
{BIOS Checksum}							
	Result	Passed					
CPU Diagnostics							
{Genuine Intel(R) CPU @ 2.30GHz #001}							
Cache Test							
	Result	Passed					
Floating-point Test							
	Result	Passed					
SSE Test							

7. When finished, click the **Exit** button in the top right corner to leave the GUI.

2.2 Diagnosing the Target System Remotely

2.2.1 Running the SMCIPMITool

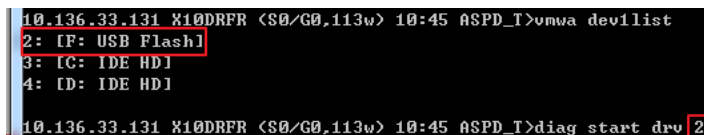
There are two methods to run the SMCIPMITool remotely. You can run the tool with either a UEFI pen drive or a UEFI bootable ISO image. The SMCIPMITool can be run on different platforms. Refer to the commands below to start the SMCIPMITool in shell mode.

Platform	Command
Java	<code>java -jar SMCIPMITool.jar <IP> <username> <password> shell</code>
Windows	<code>SMCIPMITool.exe <IP> <username> <password> shell</code>
Linux	<code>SMCIPMITool <IP> <username> <password> shell</code>

2.2.1.1 With a Pen Drive

1. Download the zipped package “SuperDiag” from <https://www.supermicro.com/sms>
2. Locate and unzip the file “USBForRemoteSuperDiag.zip”, and then save it to a pen drive.
3. Insert the drive in the system, then type “vmwa dev1list” to locate the pen drive.
4. Type “diag start drv <index>” to start the tool.

Example:



```
10.136.33.131 X10DRFR <S0/G0,113w> 10:45 ASPD_T>vmwa dev1list
2: [F: USB Flash]
3: [C: IDE HD]
4: [D: IDE HD]
10.136.33.131 X10DRFR <S0/G0,113w> 10:45 ASPD_T>diag start drv 2
```

2.2.1.2 With a UEFI Bootable ISO Image

1. Download the zipped package “SuperDiag” from <https://www.supermicro.com/sms>
2. Locate and unzip the file “ISOForRemoteSuperDiag.zip” to the system.
3. Type “diag start iso <image>” to start the Tool.

2.2.1.3 Diagnostics Explained

The following steps illustrate how this command is executed.

1. Virtual Media is started to mount the diagnostics image.
2. The boot option is set to UEFI.
3. The remote system is powered off.
4. About 10 seconds later, the remote system is powered on.
5. Super Diagnostics Offline is started to run the check-up.
6. SMCIPMITool will monitor if the diagnostic progress has finished. Once it finished, "done" is shown on the screen of the system where the SMCIPMITool is run.

2.2.2 Executing the Commands

To diagnose the target system remotely, use these three commands.

Command	Description
diag start	Starts diagnosing the target system.
diag download <filename>	Downloads the diagnostic results.
diag display <JSON file>	Displays the diagnostic results from the file.

2.2.2.1 *diag start*

The following steps illustrate how this command is executed.

1. Virtual Media is started to mount the diagnostics image.
2. The boot option is set to UEFI.
3. The remote system is powered off.
4. About 10 seconds later, the remote system is powered on.
5. Super Diagnostics Offline is started to run the check-up.
6. SMCIPMITool will monitor the diagnostics. Once it is finished, "done" is shown on the screen of the where the SMCIPMITool is run.



Note: This command only works properly in shell mode.

2.2.2.2 *diag download <filename>*

The following steps illustrate how this command is executed.

1. The OEM command "generalFileDownload" is executed to download the JSON file from the BMC.
2. The JSON file is saved in the local system.

2.2.2.3 *diag display <JSON file>*

The following steps illustrate how this command is executed.

1. The JSON file is retrieved from the local system.
2. The JSON file is parsed and the result is displayed.

To display the specific diagnostic results, you can use the parameters "pass," "fail" or "info" as filter criteria.

Parameter	Description
pass	Displays the items that have passed the diagnostics.
fail	Displays the items that have failed the diagnostics.
info	Displays the items and their basic information.

Usage Examples:

Diag display <JSON file> pass

Diag display <JSON file> fail

Diag display <JSON file> info

2.3 Advanced Tips

During the tool execution, you may interrupt the process via local keyboard or remote console.

- Press the <Esc> key to stop the diagnostics. This not only cancels all tasks but also exits the tool.
- Press the <Ctrl> and <C> keys to bypass memory tests in progress and to proceed to the next task. This key is specific to stopping memory tests.

3 Using Parameters

To have the Supermicro Super Diagnostics Offline conduct a thorough or specific inspection, you may execute the commands with different parameters to meet your needs.

3.1 Primary Parameters

Primary parameters should be used with the prefix "/."

Parameter	Description
/help	Displays all supported parameters and their instructions.
/all	Performs all actions including collecting, detecting and diagnosing.
/dga	Runs diagnostics on all of the collected and detected devices.
/fa	Saves all of the diagnostic logs that were uploaded from the BMC to a file.
/gui	Accesses the graphical user interface of Supermicro Super Diagnostics Offline.
/ca	Collects all info.
/cst	Collects system info.
/cbs	Collects BIOS info.
/cm	Collects memory info.
/cpc	Collects PCIe info.
/cc	Collects CPU info.
/cn	Collects network info.
/cd	Collects display subsystem info.
/cu	Collects USB info.
/ch	Collects HDD info.
/cr	Collects RAID info.
/cps	Collects PSU info.
/css	Collects sensor info.
/ci	Collects IPMI info.
/cbp	Collects backplane info.
/csr	Collects serial I/O info.
/dta	Detects all.
/dti	Detects IPMI.
/dtc	Detects CPU.
/dtm	Detects memory.
/dth	Detects HDD.
/dtr	Detects RAID.
/dtn	Detects network.
/dtu	Detects USB.
/dtd	Detects display subsystem.
/dtpc	Detects PCIe.
/dtps	Detects PSU.
/dtf	Detects fan.
/dtbp	Detects backplane.

/dtsr	Detects serial I/O.
/dgbs	Diagnoses BIOS.
/dgc	Diagnoses CPU.
/dgm	Diagnoses memory.
\$adr	Selects <Address Test>. (Default)
\$p08	Selects <8-Bit Pattern Test>. (Default)
\$p16	Selects <16-Bit Pattern Test>.
\$p32	Selects <32-Bit Pattern Test>.
\$p64	Selects <64-Bit Pattern Test>.
\$b08	Selects <8-Bit Bit Shift Test> . (Default)
\$b16	Selects <16-Bit Bit Shift Test>.
\$b32	Selects <32-Bit Bit Shift Test>.
\$b64	Selects <64-Bit Bit Shift Test>.
\$dadr	Deselects <Address Test>.
\$dp08	Deselects <8-Bit Pattern Test>.
\$db08	Deselects <8-Bit Bit-Shift Test>.
\$lp	Specifies test loop count, e.g. "\$lp 6". (Default: 1)
/dgh	Diagnoses HDD.
/dgn	Diagnoses network.
/dgpc	Diagnoses PCIe.
/dgps	Diagnoses PSU.
/dgf	Diagnoses fan.
/dgi	Diagnoses IPMI.
/dgsr	Diagnoses serial I/O.
/dgu	Diagnoses USB.

3.2 Secondary Parameters

The corresponding secondary parameters are listed right after the primary parameters are typed and should be used with the prefix "\$."

Parameter	Description
\$dst	Deselects the test item.

3.3 Usage Examples

Scenario	Command
Diagnosing all except memory.	SuperDiag.efi /all /dgm \$dst
Diagnosing memory repeatedly.	SuperDiag.efi /dgm \$p16 \$p32 \$p64 \$b16 \$b32 \$b64 \$lp 20
Reading the parameters.	SuperDiag.efi /help

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