



INNODISK iSMART Linux Execution File V6 General User Guide

INNODISK PUBLIC DOCUMENT
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Revision History

Revision	Description	Date
V6	Official release	Nov, 13, 2020

1. Execution File for Linux

iSMART reports following items to show the information of SSD. However, due to the support of controller, you may see only part of items for a product.

Item	Description
Health	Health indicates the percentage of remaining disk life.
AverageEraseCount	The average erase count of all blocks.
MaximumEraseCount	The maximum erase count of all blocks.
TotalBadBlock	The total counts of bad block.
LaterBadBlock	After user used SSD for a period of time, there will have some bad block. Later bad block is unstable. SMART firmware will stop using bad block and do bad block replacement.
InitialFreeBlock	When system has a new bad block, free block is needed to do the replacement.
FreeBlock	The count of free block.
TotalEraseBlock	This value shows block erase counts of whole SSD.
ECCFailCount	The count of fail ECC.
CorrectedECCCount	The count of corrected ECC.
ReadLaterBadBlockCount	Total numbers of bad block occurring by reading data with ECC error.
WriteLaterBadBlockCount	Total numbers of bad block occurring by writing data with flash error.
EraseLaterBadBlockCount	Total numbers of bad block occurring by erasing block with error.
TotalGoodBlock	The total counts of good block.
InitialBadBlock	The count of initial bad block.
FlashEnduranceCount	The count of flash endurance.
Temperature	The temperature range is from -50℃~105℃ on a single disk. It supports commercial temperature (0℃~70℃) and industrial temperature (-40℃~85℃). *For SATA III drives iSMART only support temperature on industrial temperature products.
iAnalyzer	Demonstration of user behavior.

There are several version iSMART execute files for different application.
For example, you could choose the "iSMART_64" if the OS is support Linux 64-bit.

```
allen@allen-OKDS: ~/svn_sw/trunk/Flash/iSMART/sample
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$ ll
total 1004
drwxrwxr-x 3 allen allen 4096  7  9 14:40 ./
drwxrwxr-x 15 allen allen 4096  7  8 18:10 ../
-rw-rw-r-- 1 allen allen 855  7  9 14:40 arm.mk
-rw-rw-r-- 1 allen allen 2700  7  9 14:40 Flash.ini
-rw-rw-r-- 1 allen allen 94  7  9 14:40 HOWTO.md
drwxrwxr-x 2 allen allen 4096  7  9 14:40 include/
-rwxrwxr-x 1 allen allen 181700  7  9 14:40 iSMART_32*
-rwxrwxr-x 1 allen allen 206304  7  9 14:40 iSMART_64*
-rw-rw-r-- 1 allen allen 196610  7  9 14:40 libsmart_32.a
-rw-rw-r-- 1 allen allen 266056  7  9 14:40 libsmart_64.a
-rw-rw-r-- 1 allen allen 1713  7  9 14:40 linux.mk
-rw-rw-r-- 1 allen allen 31269  7  9 14:40 main.c
-rw-rw-r-- 1 allen allen 19676  7  9 14:40 main.o32
-rw-rw-r-- 1 allen allen 29424  7  9 14:40 main.o64
-rw-rw-r-- 1 allen allen 644  7  9 14:40 Makefile
-rw-rw-r-- 1 allen allen 582  7  9 14:40 mo.txt
-rw-rw-r-- 1 allen allen 8063  7  9 14:40 osr_test.c
-rw-rw-r-- 1 allen allen 6376  7  9 14:40 osr_test.o32
-rw-rw-r-- 1 allen allen 9096  7  9 14:40 osr_test.o64
-rw-rw-r-- 1 allen allen 862  7  9 14:40 ppc.mk
-rw-rw-r-- 1 allen allen 950  7  9 14:40 qnxnto.mk
-rw-rw-r-- 1 allen allen 870  7  9 14:40 solaris.mk
-rw-rw-r-- 1 allen allen 999  7  9 14:40 windows.mk
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$

allen@allen-OKDS: ~/svn_sw/trunk/Flash/iSMART/sample
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$ sudo ./iSMART_64
*****
* Innodisk iSMART V6.0.00                                     2020/11/13 *
*****
```

For products information as below:

➤ Device for SATA interface (SD_)

SARMT attribute check	<code>./iSMART -d /dev/sd^a*</code>
-----------------------	---

*^a,^b,^c: Device name

➤ Device for PCIe interface (nvme_)

SARMT attribute check	<code>./iSMART -d /dev/nvme⁰*</code>
-----------------------	---

*⁰,¹,²: Device name

```
allen@allen-OKDS: ~/svn_sw/trunk/Flash/iSMART/sample
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$ sudo ./iSMART_64
*****
* Innodisk iSMART V6.0.00                                     2020/11/13 *
*****
Syntax: ./iSMART 64 [-option ...]
Sample: ./iSMART_64 -d /dev/sdb
Sample: ./iSMART_64 -d /dev/nvme0n1
Option:
-d : device
```

```
allen@allen-OKDS: ~/svn_sw/trunk/Flash/iSMART/sample
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$ sudo ./iSMART_64 -d /dev/sdb
*****
* Innodisk iSMART V6.0.00                                     2020/11/13 *
*****
Model Name       : SATA SSD 3TE7
Serial Num       : B0011905300270091
FW Version       : D20519
WWN / EUI64      : 5000000000000000
OSR              : YES
```

```
allen@allen-OKDS: ~/svn_sw/trunk/Flash/iSMART/sample
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$ sudo ./iSMART_64 -d /dev/nvme0
*****
* Innodisk iSMART V6.0.00                                     2020/11/13 *
*****
Model Name       : M.2 (P80) 3TG3-P
Serial Num       : 20191206AA10093AF001
FW Version       : N190306
WWN / EUI64      : 0000000000000000
OSR              : NO
```

The sample result is as following picture.

```
allen@allen-OKDS: ~/svn_sw/trunk/Flash/iSMART/sample
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$ sudo ./iSMART_64 -d /dev/sdb -a 1
*****
* Innodisk iSMART V6.0.00                                     2020/11/13 *
*****
Model Name       : SATA SSD 3TE7
Serial Num      : B0011905300270091
FW Version      : D20519
WWN / EUI64     : 5000000000000000
OSR             : YES
-----
BusType         : 11
Capacity        : 55.90 GB
LBAs            : 117231408
Health          : 99.97
PE Cycle        : 3000
AVG. Erase      : 1
Temperature     : 28
Power ON Hours  : 68
Power ON Cycle  : 21
LBA48           : YES
HPA             : NO
NCQ             : YES
TRIM            : YES
Security        : YES
TSensor         : YES
Crypto Erase    : NO
Transfer        : SATA/600
Interface       : Serial ATA
Standard        : ATA9
Analyzer        : YES (Enable) Ver 1
Write Protect   : YES (Disable)
InnoRobust      : NO
QEraser         : NO
-----
ID      RAW Value      Value      SMART Attributes
-----
[05] [12006464000000000000] [ 0] Later Bad
[09] [12004464440000000000] [ 68] Power On Hours
[0C] [12001500150000000000] [ 21] Power Cycle Count
[A3] [12000A000A0000000000] [ 10] Total Bad Block Count
[A5] [12000200020000000000] [ 2] Max Erase Count
[A7] [12000100010000000000] [ 1] Avg Erase Count
[A9] [00006464640000000000] [100] Device Life
[AA] [13006464FA0000000000] [250] Spare Block Count
[AB] [12000064000000000000] [ 0] Program Fail Count
[AC] [12000064000000000000] [ 0] Erase Fail Count
[C0] [12000F000F0000000000] [15] Abnormal power cycle count
[C2] [02001C641C00180025031C] [28] Temperature
[E5] [00006464983C98B3767200] [ 0] Flash ID
[EB] [02000000000000000000] [ 0] Later Bad Block Read
[EB] [02000000000000000000] [ 0] Later Bad Block Write
[EB] [02000000000000000000] [ 0] Later Bad Block Erase
[F1] [120064640F0000000000] [15] Total LBAs Written
[F2] [12006464020000000000] [ 2] Total LBAs Read
```



```
allen@allen-OKDS: ~/svn_sw/trunk/Flash/iSMART/sample
[EB] [020000000000000000000000] [          0] Later Bad Block Erase
[F1] [120064640F000000000000] [         15] Total LBAs Written
[F2] [1200646403000000000000] [          3] Total LBAs Read

-----
Read & Write
-----
Sequential Read  = 3%   (3)
Random Read     = 97%  (117)
Sequential Write = 0%   (0)
Random Write    = 100% (1)
-----
Sequential Read
-----
Size      Percentage  Count
128.x K   34%         (1)
64.x K    0%         (0)
32.x K    33%         (1)
16.x K    0%         (0)
8.x K     0%         (0)
4.x K     0%         (0)
0.x K     33%         (1)
-----
Sequential Write
-----
Size      Percentage  Count
128.x K   0%         (0)
64.x K    0%         (0)
32.x K    0%         (0)
16.x K    0%         (0)
8.x K     0%         (0)
4.x K     0%         (0)
0.x K     0%         (0)
-----
Random Read
-----
Size      Percentage  Count
128.x K   13%        (15)
64.x K    3%         (4)
32.x K    8%         (9)
16.x K    5%         (6)
8.x K     5%         (6)
4.x K     1%         (1)
0.x K     65%        (76)
-----
Random Write
-----
Size      Percentage  Count
128.x K   0%         (0)
64.x K    0%         (0)
32.x K    0%         (0)
16.x K    0%         (0)
8.x K     0%         (0)
4.x K     0%         (0)
0.x K    100%        (1)
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$
```


2. Disable/Enable function

2.1 Function Status Check

```
allen@allen-OKDS: ~/svn_sw/trunk/Flash/iSMART/sample
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$ sudo ./iSMART_64 -d /dev/sdb
*****
* Innodisk iSMART V6.0.00                                     2020/11/13 *
*****
Model Name       : SATA SSD 3TE7
Serial Num      : B0011905300270091
FW Version      : D20519
WWN / EUI64     : 5000000000000000
OSR             : YES
-----
BusType         : 11
Capacity        : 55.90 GB
LBAs            : 117231408
Health          : 99.97
PE Cycle        : 3000
AVG. Erase      : 1
Temperature     : 33
Power ON Hours  : 68
Power ON Cycle  : 21
LBA48           : YES
HPA             : NO
-----
NCQ             : YES
TRIM            : YES
Security        : YES
TSensor         : YES
Crypto Erase    : NO
Transfer        : SATA/600
Interface       : Serial ATA
Standard        : ATA9
Analyzer        : YES (Enable) Ver 1
Write Protect   : YES (Disable)
InnoRobust      : NO
QEraser         : NO
-----
```

2.2 Function Disable / Enable

The Optional function command you could see as the below picture.

(The function is not total same for different SSD series)

For example, if you want to enable the iAnalyzer function, please input the command

“./iSMART -d /dev/*** -a 1”.

Write protect	Disable	./iSMART -d /dev/*** -w 0
	Enable	./iSMART -d /dev/*** -w 1
iAnalyzer	Disable	./iSMART -d /dev/*** -a 0
	Eanble	./iSMART -d /dev/*** -a 1

*** Device name (check it in page 4)

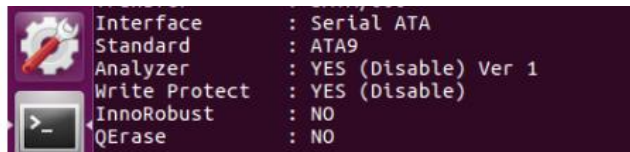
```

allen@allen-OKDS: ~/svn_sw/trunk/Flash/iSMART/sample
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$ sudo ./iSMART_64
*****
* Innodisk iSMART V6.0.00                                     2020/11/13 *
*****
Syntax: ./iSMART_64 [-option ...]
Sample: ./iSMART_64 -d /dev/sdb
Sample: ./iSMART_64 -d /dev/nvme0n1
Option:
  -d : device
  -a : iAnalyzer (0:Disable 1:Enable 2:Clean)
  -w : write protect (0:Disable 1:Enable)
  -c : cryptographic erase
  -e : security erase
       0: Destroy
       1: Quick Erase
       2: USA-AF AFSSI 5020
       3: DoD 5220.22-M
       4: USA Navy NAVSO P-5239-26
       5: NSA Manual 130-2
       6: USA-Army 380-19
       7: NISPOMSUP Chap 8, Sect. 8-501
       8: NSA Manual 9-12
       9: IRIG 106
  -g : get MK erase count
  -s : set LBA via HPA
  -r : OSR test
  -v : get VMware vSphere host SMART
       : 0: 3ME, 3IE3, InnoLite, 3MG2-P, 3MG-P & 3SE
       : 1: 3ME & 3IE3 (SRR)
allen@allen-OKDS:~/svn_sw/trunk/Flash/iSMART/sample$

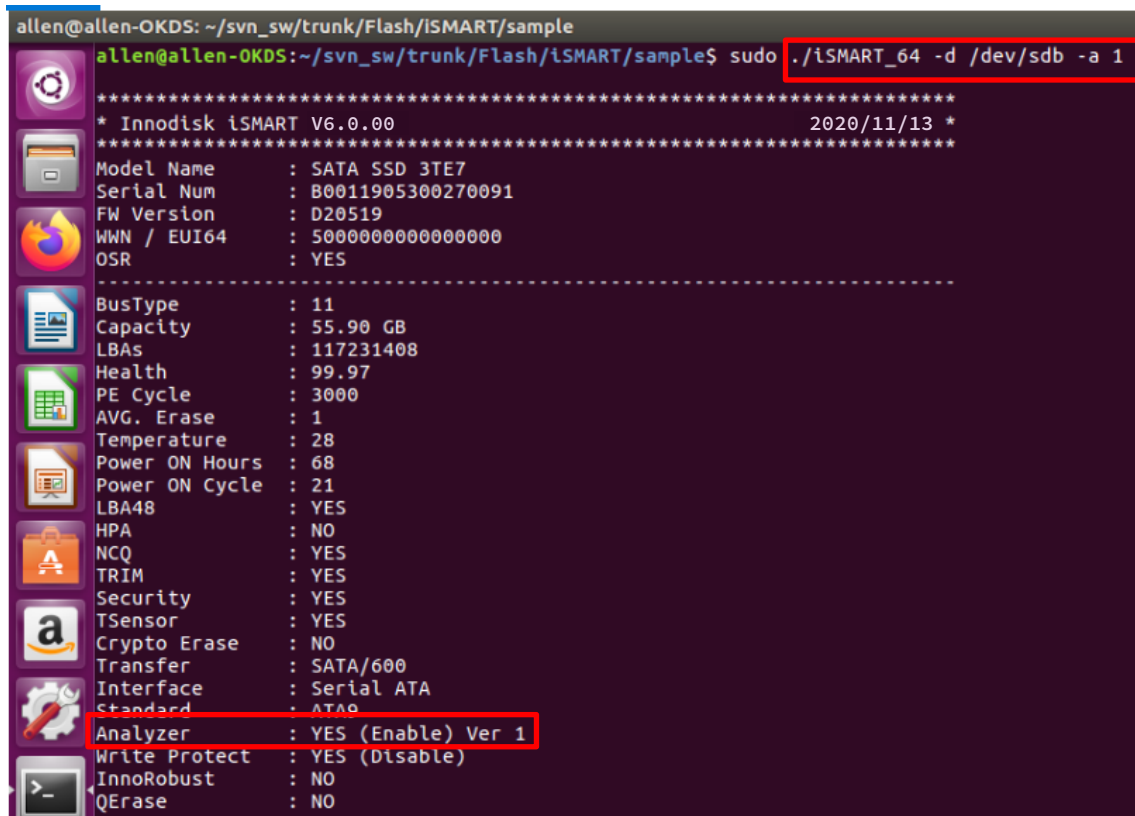
```

Example:

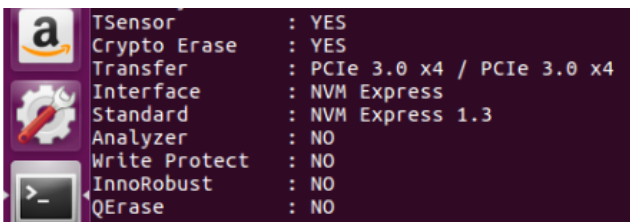
- ✓ The picture shows the SSD support Analyzer, but the status is disable.



- ✓ The picture shows the SSD support Analyzer, and the status is enable.



- ✓ The picture shows the SSD is PCIe interface and support Crypto Erase, but not support write protect function.



3. Support List

3.1. OS List

- Linux kernel 2.6, 32bit, 64bit
- Linux kernel 3.0, 32bit, 64bit
- Linux kernel 4.13.4, 32bit, 64bit