



SATA and PATA NANDrive™ Manufacturer Interface Command (MIC)

Application Note

Rev 01.300

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NDA Required

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1.0 INTRODUCTION

Greenliant SATA and PATA NANDrive™ solid state drives support a special command set, Manufacturer Interface Command (MIC), to help the user manage certain functions in the device. The MIC provides a password protected interface that enables the user to read, add and modify the default configuration information stored in the SATA and PATA NANDrive firmware. The default configuration is stored mainly in the Manufacturer Configuration Table, which consists of two tables: the Feature Configuration Table and Media Configuration Table. Additional commands are provided for specific SATA and PATA NANDrive model names and serial numbers.

To issue MIC through a SATA interface, the MIC must be implemented by the Write Buffer command followed by the Set Feature command or the SMART Read Log command or the SMART Write Log command, depending on the data transfer type. This implementation applies to SATA NANDrive products and PATA NANDrive products that are behind a SATA bridge.

To check if the commands described in this document are supported or not, the command “Check Version of Firmware Update Boot-Strap Loader” in 1.3 can be executed first. If this command succeeds, then the other commands are supported.

2.0 TARGET PRODUCTS

The contents of this application note apply to the below NANDrive solid state drives:

PATA NANDrive

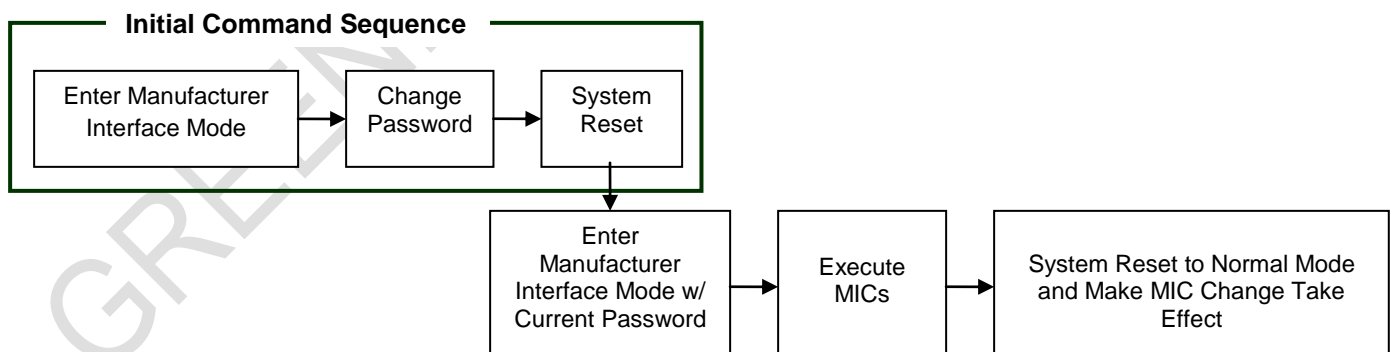
GLS85LP1002A, GLS85LP1004B, GLS85LP1008B, GLS85LP1016B, GLS85LP1032A,
GLS85LP0512P, GLS85LP1002P, GLS85LP1004P, GLS85LP1008P

SATA NANDrive

GLS85LS1002A, GLS85LS1004A, GLS85LS1008A, GLS85LS1016A, GLS85LS1032A,
GLS85LS1032B, GLS85LP1064B, GLS85LS1002P, GLS85LS1004P, GLS85LS1008P,
GLS85LS1016P, GLS85LS1032P

3.0 PASSWORD PROTECTION

The manufacturer interface commands are password protected¹⁾. In order to access all the commands, the “Enter Manufacturer Interface Mode” command must be first executed with the correct password. Before making changes to the configuration of NANDrive, the Greenliant Systems default password must be changed to a unique password by supplying the initial command sequence as shown below. **Contact Greenliant field application engineering (FAE) for more information.**



¹⁾ During execution of MIC, normal ATA commands will still work.

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3.1 Execute MIC

This section is for SATA NANDrive products and PATA NANDrive products that are behind a SATA bridge. All MICs are supported and implemented as follows, except the command "Get Bad Block Information of a Media Chip" sub-command 41h, which is described later in this document.

MIC with no data:

- Execute Write Buffer command to pass in the command data structure for a desired MIC
- Execute Set Feature command to implement the desired MIC

MIC with data transfer to the host:

- Execute Write Buffer command to pass in the command data structure for a desired MIC
- Execute SMART Read Log command to read the data for the desired MIC

MIC with data transfer from the host:

- Execute Write Buffer command to pass in the command data structure for a desired MIC
- Execute SMART Write Log command to write the data for the desired MIC

Run the command "Check Version of Firmware Update Boot-Strap Loader" in section 4.1 first to check if the NANDrive device supports the commands described in this specification.

3.2 Commands for Implementing the MIC

The following commands are used to implement the MIC.

3.2.1 Write Buffer

Bit ->	7	6	5	4	3	2	1	0
Command (7)	E8h							
C/D/H (6)	X				X			
Cyl High (5)					X			
Cyl Low (4)					X			
Sec Num (3)					X			
Sec Cnt (2)					X			
Feature (1)					X			

This command requires a transfer of a single sector of data containing a MIC data structure²⁾ from the host, which is defined as the following:

Byte	Content
0	Reserved (set byte to 0)
1	Feature
2	Sector Count
3	Sector Number
4	Cylinder Low
5	Cylinder High
6	Driver Head
7	Command
8 – 511	Reserved (set all bytes to FFh)

After this command succeeds, Set Feature or SMART Read Log or SMART Write Log must be executed to complete the MIC.

²⁾ Refer to Section 6 for the command code of each MIC.

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3.2.2 Set Features

Bit ->	7	6	5	4	3	2	1	0	
Command (7)	EFh								
C/D/H (6)	X				X				
Cyl High (5)					X				
Cyl Low (4)					X				
Sec Num (3)					X				
Sec Cnt (2)					X				
Feature (1)					BFh				

When the device receives this command, it will execute the MIC previously transferred via Write Buffer command²⁾.

Requirement: Write Buffer command must be executed prior to this command to prepare the desired MIC.

3.2.3 SMART Read Log

Bit ->	7	6	5	4	3	2	1	0
Command (7)	B0h							
C/D/H (6)	X				X			
Cyl High (5)	C2h							
Cyl Low (4)	4Fh							
Sec Num (3)	BFh							
Sec Cnt (2)	Number of sectors to read							
Feature (1)	D5h							

This command transfers a number of sectors of data based on the Sec Cnt register to the host²⁾.

Requirement: Write Buffer command must be executed prior to this command to prepare the desired MIC.

3.2.4 SMART Write Log

Bit ->	7	6	5	4	3	2	1	0
Command (7)	B0h							
C/D/H (6)	X				X			
Cyl High (5)	C2h							
Cyl Low (4)	4Fh							
Sec Num (3)	BFh							
Sec Cnt (2)	Number of sectors to write							
Feature (1)	D6h							

This command requests a transfer of a number of sectors of data based on the Sec Cnt register from the host²⁾.

Requirement: Write Buffer command must be executed prior to this command to prepare the desired MIC.

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4.0 COMMAND TO CHECK VERSION NUMBER

ATA Command: 82h

Sub command	Content
09h	Get Number of Bad Block Sectors of a Media Chip

4.1 Check Version of Firmware Update Boot-Strap Loader

Bit ->	7	6	5	4	3	2	1	0
Command (7)	82h							
C/D/H (6)	X			Drive	X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	09h							

This command checks the version of the firmware update boot-strap loader. This command does not require pre-execution of the Enter Manufacturer Interface Mode command.

The Check Version of Firmware Update Boot-Strap Loader command output will take the following format:

Bit ->	7	6	5	4	3	2	1	0
C/D/H (6)	X						X	
Cyl High (5)	Version Number (high byte)							
Cyl Low (4)	Version Number (low byte)							
Sec Num (3)	X							
Sec Cnt (2)	X							
Feature (1)	X							

The supported version number is 0200h.

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5.0 MANUFACTURER CONFIGURATION TABLE

The Manufacturer Configuration Table consists of the Feature Configuration Table as described below.

5.1 Configuration Table Definition

The Configuration Table is stored inside the embedded flash memory. It occupies 256 bytes total. The Configuration Table consists of the following entries:

Table 5-1: Configuration Table

Name	Byte address	Number of Bytes	Comment
Feature Table Version	00h	1	Feature Configuration Table Version
Init Control	01h	1	Initialization control ³⁾
Reserved	02h – 1Eh	5	Reserved bytes (Set all bytes to FFh)
Checksum	1Fh	1	Checksum byte is determined such that sum of above data bytes and checksum byte equals zero.
Reserved	20h - FFh	224	Reserved.

- 3) Init Control - This byte controls the ATA Controller initialization (low level format) process. Below are the scenarios when setting this byte with different value:

FFh	Force the device to (re)start the initialization process.
FEh	Same as FFh, except that the runtime defect table is used during initialization.
55h	State after initialization has been completed successfully.

Warning: The initialization operation will cause all user data to be lost.

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6.0 MANUFACTURER INFORMATION COMMANDS

The following commands access the contents of SATA and PATA NANDrive.

ATA CMD 81h

Sub Command	Content
00h	Reserved
01h	Enter Manufacturer Interface Mode
02h	Reset controller
03h – 07h	Reserved
08h	Change Password
09h – 1Fh	Reserved
20h	Change Model Name
21h	Change Serial Number (first 10 Bytes)
22h – 30h	Reserved
31h	Enable/Disable DMA Support
32h	Reserved
33h	Change CHS Parameter
34h	Change LBA Parameter
35h – 3Fh	Reserved
40h	Get Initialization Error Info
41h – 44h	Reserved
45h	Get Error Log
46h	Reserved
47h	Get Fatal Error Log
48h – 50h	Reserved
51h	Get Device Configuration Parameters ⁴⁾
52h	Get Special Function Zone Configuration Table ⁴⁾
53h	Update Special Function Zone Configuration Table ⁴⁾
54h – FFh	Reserved

ATA CMD 8Bh

Sub command	Content
55h	Configure the Write Protect Mode
AAh	Configure the Power Down Mode

ATA CMD 8Ch

Sub command	Content
X	Read all block age

ATA CMD 8Dh

Sub Command	Content
X	Read runtime bad block age

⁴⁾ Special Function Zone Related.

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6.1 Enter Manufacturer Interface Mode

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	01h							

This command requires a transfer of a single sector of data from the host, which is defined as the following:

Byte	Content
0 – 1	Reserved (set all bytes to FFh)
2 – 33	Password (must be exactly 32bytes)
34 – 127	Reserved (set all bytes to FFh)
128 – 255	1's complement of data byte 0 - 127
256 – 511	Reserved (set all bytes to FFh)

The supplied password has to match the resident password stored in the encrypted password table. **Contact Greenliant Systems for the default manufacturer interface password information.**

After the input password is matched with the resident password, the manufacturer interface mode is enabled and all other manufacturer interface commands can be executed. All other ATA Commands will be rejected until the device is powered off or a hardware/software reset is issued to the controller.

For a factory shipped controller, a Change Password command must be executed right after the Enter Manufacturer Interface Mode command. Refer to Section 1 for more information.

If password does not match, this command is invalid and no action will be taken.

6.2 Reset Controller

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X			Drive	X			
Cyl High (5)					X			
Cyl Low (4)					X			
Sec Num (3)					X			
Sec Cnt (2)					X			
Feature (1)					02h			

This command resets the controller, which is the same as the ATA pin reset function. There is no data transaction using this command. After the controller receives this command, it will trigger a global reset.

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6.3 Change Password

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	08h							

This command will change the resident password required by the Enter Manufacturer Interface Mode command.

The default password that is programmed in the new controller must be changed in order to use other manufacturer interface commands. After successful execution of this command for the first time, the firmware will be able to execute the rest of the commands.

This command requests a transfer of a single sector of data from the host, which is defined as the following:

Byte	Content
0 – 1	Reserved (set all bytes to FFh)
2 – 33	Password (must be exactly 32bytes)
34 – 127	Reserved (set all bytes to FFh)
128 – 255	1's complement of data byte 0 - 127
256 – 511	Reserved (set all bytes to FFh)

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6.6 Enable / Disable DMA Support

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	Mode							
Feature (1)	31h							

This command enables or disables DMA support.

Mode = 0 to disable DMA support

Mode = 1 to enable DMA support

6.7 Change CHS Parameter

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	01h							
Feature (1)	33h							

This command requests a transfer of a single sector of data from the host, which is defined as the following:

Byte	Content
0	Head - 1
1	Sector
2	Cylinder Low byte
3	Cylinder High byte
4 – 511	Reserved (Set all bytes to FFh)

This command changes the Cylinder (C), Head (H) and Sector (S) of NANDrive

Cylinder = non-zero

Head = 1 to 16

Sector = 1 to 255

NANDrive requires re-initialization after Change CHS Parameter command is successful to take effect. If the capacity of new CHS parameter is out of allowed capacity range, re-initialization will result with initialization error code 94h or 86h. If this error occurs, issue the Change CHS Parameter command with a working CHS value and initialize NANDrive again.

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6.8 Change Logical Block Address (LBA) Parameter

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	34h							

This command requests a transfer of a single sector of data from the host, which is defined as the following:

Byte	Content
0	LBA [0:7]
1	LBA [8:15]
2	LBA [16:23]
3	LBA [24:31]
4 – 511	Reserved (Set all bytes to FFh)

This command changes the LBA of the device. LBA = 48 bit LBA, the highest 16bits are all zero, only low 32bits are valid.

Device requires re-initialization after Change LBA Parameter command is successful to take effect. If the capacity of new LBA parameter is out of allowed device capacity range, re-initialization will result in an initialization error code 94h or 86h. If this error occurs, issue the Change LBA Parameter command with a working LBA value and initialize the device again.

6.9 Get Initialization Error Info.

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	40h							

This command returns an Error Code corresponding to the failure mode of NANDrive initialization. The Get Initialization Error Info command output will take the following format:

Bit ->	7	6	5	4	3	2	1	0
C/D/H (6)	X				X			
Cyl High (5)	Low Level Format Status(0=Not Done, 1=Done)							
Cyl Low (4)	Error Code							
Sec Num (3)	X							
Sec Cnt (2)	X							

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6.9.1 Initialization Error Code List of NANDrive

Error Code	Description
01h	Unknown vendor error
06h	Single high channel mode error
07h	Different single channel in two MIB
09h	Unbalanced MIB mode
12h	Generating Block Pool error
15h	Bad Configure Sector
16h	Block 0 Bad
17h	This is returned after device is refreshed. (init ctrl is set to ECh)
18h	Unknown Error
1Ah	Controller Signature info is lost
1Dh	Only Support SATA configure
70h	Manufacture Defect Table Read error
75h	Manufacture Defect Table program/erase error
79h	Signature information program error
7Bh	Block management table program/erase error
80h	No device detected
81h	Not the same NAND error
83h	Unknown device error
84h	Unbalanced channel error
86h	Too many bad blocks
92h	Too many groups error
94h	Invalid User CHS/LBA
96h	Too many sections error
97h	Bad Controller Signature Info
99h	Only Support ATA configure
9Bh	Only Support NANDrive configure

6.10 Get Error Log

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	45h							

This command transfers a single sector of data to the host, which is defined as the following:

Byte	Content
0 - 511	Error info if non-FF

This command produces data for Greenliant Systems use only for debug purposes.

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6.11 Get Fatal Error Log

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	47h							

This command transfers a single sector of data to the host, which is defined as the following:

Byte	Content
0 - 511	Fatal error info if non-FFh

This command produces data for Greenliant Systems use only for debug purposes.

6.12 Read All Block Age

This command is used to read all the blocks' age base on the Logic Entry and Free List

Bit	7	6	5	4	3	2	1	0
Command	0x8C							
C/D/H	X			Drive	X			
Cyl High	X							
Cyl Low	X							
Sec Num	Group Number							
Sec Cnt	Segment Number							
Feature	X							

Input Parameter:

Group Number (0~63): The number of a specified group.

Segment Number (0~31): The number of a specified segment.

If specified group or segment does not exist, respond with command abort.

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Return Data:

This command transfers 512 bytes of data containing blocks' age to the host, as defined below.

Byte	Content
0 – 512	<p>64 Blocks' Age. Format of 1 Block Age(8Bytes):</p> <p>ByteN+0 --- Entry Type 0x00: Logical Block 0x01: Free Block 0x02: Inter-Use type1 0x03: Inter-Use type2 0x04: Inter-Use type3 0xFF: Invalid Entry</p> <p>ByteN+1 --- Physical Addr High Byte ByteN+2 --- Physical Addr Middle Byte ByteN+3 --- Physical Addr Low Byte ByteN+4 --- Resv(0x00) ByteN+5 --- Age High Byte ByteN+6 --- Age Middle Byte ByteN+7 --- Age Low Byte</p> <p>For a non-existent block, All the 8 bytes are 0xFF.</p>

Host Read All Blocks' Age example code:

Group Number = 0 to a max value of 63

Each Group Number contains Segment Number = 0 to a max value of 32. The read age operation is ended. To read all Blocks' Age for a device, two FOR loops are used as follow:

```

found_max_sgn = 0;
error = 1; max_gpn = 64;
done = 0; max_sgn = 32;
for (gpn=0; gpn< max_gpn; gpn++)
{
    for (sgn=0; sgn< max_sgn; sgn++)
    {
        if (Read All Blocks' Age == error)
        {
            if ((gpn==0)&&(sgn==0)) return error;
            if (found_max_sgn ==1) return done;
            found_max_sgn = 1;
            max_sgn = sgn;
            break;
        }
    }
}

```


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6.13 Read Runtime Bad Block Age

Bit ->	7	6	5	4	3	2	1	0
Command (7)	8Dh							
C/D/H (6)	X			Drive	X			
Cyl High (5)	C							
Cyl Low (4)	C							
Sec Num (3)	NAND Die Number							
Sec Cnt (2)	Segment Number							
Feature (1)	C							

This command is used to read the Bad Block Age based on the number of NAND die used in the NANDrive device.

Input Parameter:

NAND Die Number (0~C): the value of C depends on how many NAND die are used in the NANDrive device. Contact Greenliant Field Application Engineering for more detail.

Segment Number (0~255): The number of a specified segment.

If the specified NAND die or segment does not exist, respond with command abort.

Return Data:

This command transfers 512 bytes of data containing bad blocks' age to the host, as defined below.

Byte	Content
0 – 512	64 Bad Blocks' Age records(8Bytes) Format of 1 Bad Block Age record: ByteN+0 --- Error Code ByteN+1 --- Always 00h ByteN+2 --- Always 01h ByteN+3 --- Block High Byte ByteN+4 --- Block Low Byte ByteN+5 --- Age High Byte ByteN+6 --- Age Middle Byte ByteN+7 --- Age Low Byte If a bad block record is invalid all 8 bytes contains FFh.

Error code:

60h: Erase Error

63h: Program Error

6Ah: Retired or uncorrectable ECC error

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Host Read New Bad Blocks' Age:

Chip Number = 0 to a max value of 64

Segment Number = 0 to a max value of 255

To read all New Bad Blocks' Age for a device, two FOR loops are used as follow:

```
found_max_sgn = 0;
error = 1; max_scn = 64;
done = 0; max_sgn = 255;
for (scn=0; scn< max_scn; scn++)
{
    for (sgn=0; sgn< max_sgn; sgn++)
    {
        if (Read New Bad Blocks' Age == error)
        {
            if ((scn==0)&&(sgn==0)) return error;
            if (found_max_sgn ==1) return done;
            found_max_sgn = 1;
            max_sgn = sgn;
            break; }
        }
    }
}
```

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7.0 WP#/PD# PIN CONFIGURATION

The WP#/PD# pin can be used for either Write Protect mode or Power-down mode, but only one mode is active at any time. Either mode can be selected through the host command, Set-WP#/PD#-Mode.

7.1. WP# – 8Bh/AAh

This command configures the WP # pin for the Write Protect mode. When the host sends this command to the device with the value AAh in the feature register, the WP# pin is configured for the Write Protect mode.

All values in the C/D/H register—the Cylinder Low register, the Cylinder High register, the Sector Number register, the Sector Count register and the Feature register—need to match the values shown below. Otherwise, the command will be treated as an invalid command.

Bit ->	7	6	5	4	3	2	1	0
Command (7)	8Bh							
C/D/H (6)	X			Drive	X			
Cyl High (5)	6Eh							
Cyl Low (4)	44h							
Sec Num (3)	72h							
Sec Cnt (2)	50h							
Feature (1)	AAh							

7.2. PD# – 8Bh/55h

This command configures the PD# pin for the Power-down mode. When the host sends this command to the device with the value 55h in the feature register, PD# is configured for the Power-down mode.

All values in the C/D/H register—the Cylinder Low register, the Cylinder High register, the Sector Number register, the Sector Count register and the Feature register—need to match the values shown below. Otherwise, the command will be treated as an invalid command.

Bit ->	7	6	5	4	3	2	1	0
Command (7)	8Bh							
C/D/H (6)	X			Drive	X			
Cyl High (5)	6Eh							
Cyl Low (4)	44h							
Sec Num (3)	72h							
Sec Cnt (2)	50h							
Feature (1)	55h							

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8.0 SPECIAL FUNCTION ZONE SETUP COMMANDS

8.1. Get Device Configuration Parameters

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	51h							

This command transfers a single sector of data to the host, which is defined as the following:

Byte	Content
0 – 127	Device Configuration Parameters (see section 5.5)
128-511	Reserved (set all bytes to FFh)

8.2. Get Special Function Zone Configuration Table

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	52h							

This command transfers a single sector of data to the host, which is defined as the following:

Byte	Content
0 – 127	Special Function Zone info (see section 5.5)
128-511	Reserved (set all bytes to FFh)

8.3. Update Special Function Zone Configuration Table

Bit ->	7	6	5	4	3	2	1	0
Command (7)	81h							
C/D/H (6)	X				X			
Cyl High (5)	40h (for GSL85LP) / 10h (for GSL85LS)							
Cyl Low (4)	D0h (for GSL85LP) / 15h (for GSL85LS)							
Sec Num (3)	55h							
Sec Cnt (2)	X							
Feature (1)	53h							

This command transfers a single sector of data to the device, which is defined as the following:

Byte	Content
0 – 127	Special Function Zone info (see section 5.5)
128-511	Reserved (set all bytes to FFh)

Initialization flag is automatically set after this command is executed. The Special Function Zone changes will take effect after the next NANDrive power-up. After the Special Function Zone configuration is set, user LBA and user CHS will not take effect any more. The Change User LBA and Change User CHS commands will also be disabled.

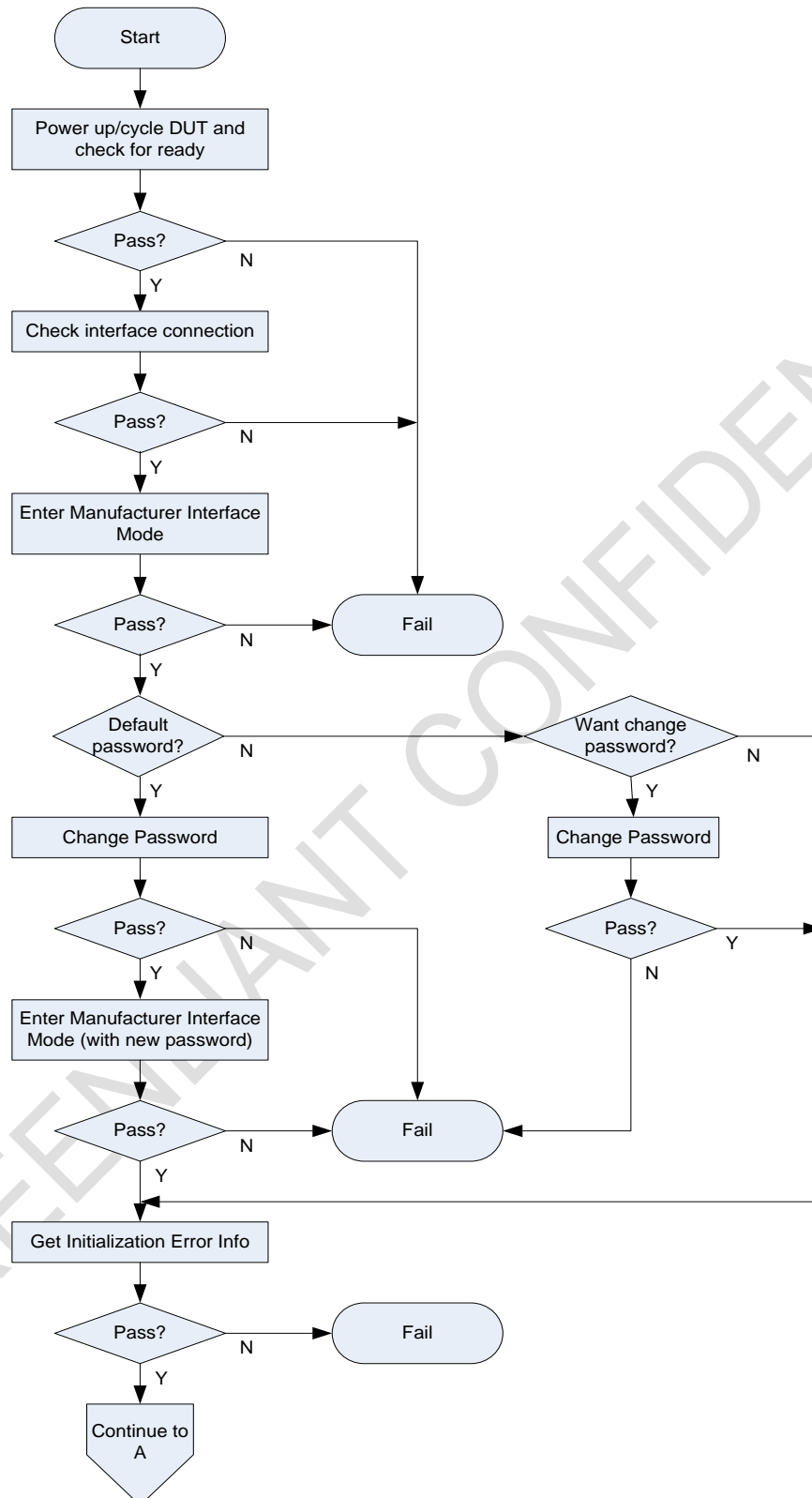
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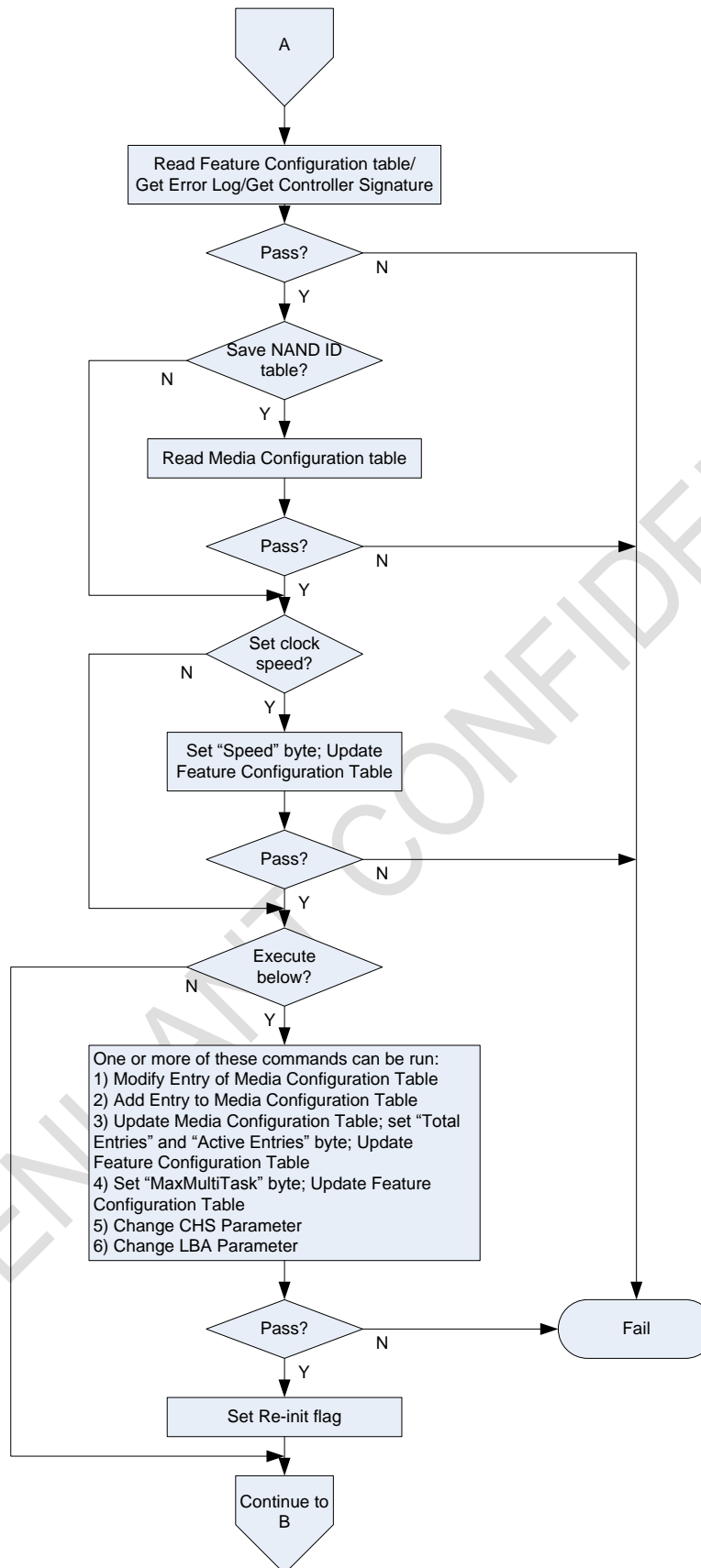
9.0 EXAMPLE FLOW CHART



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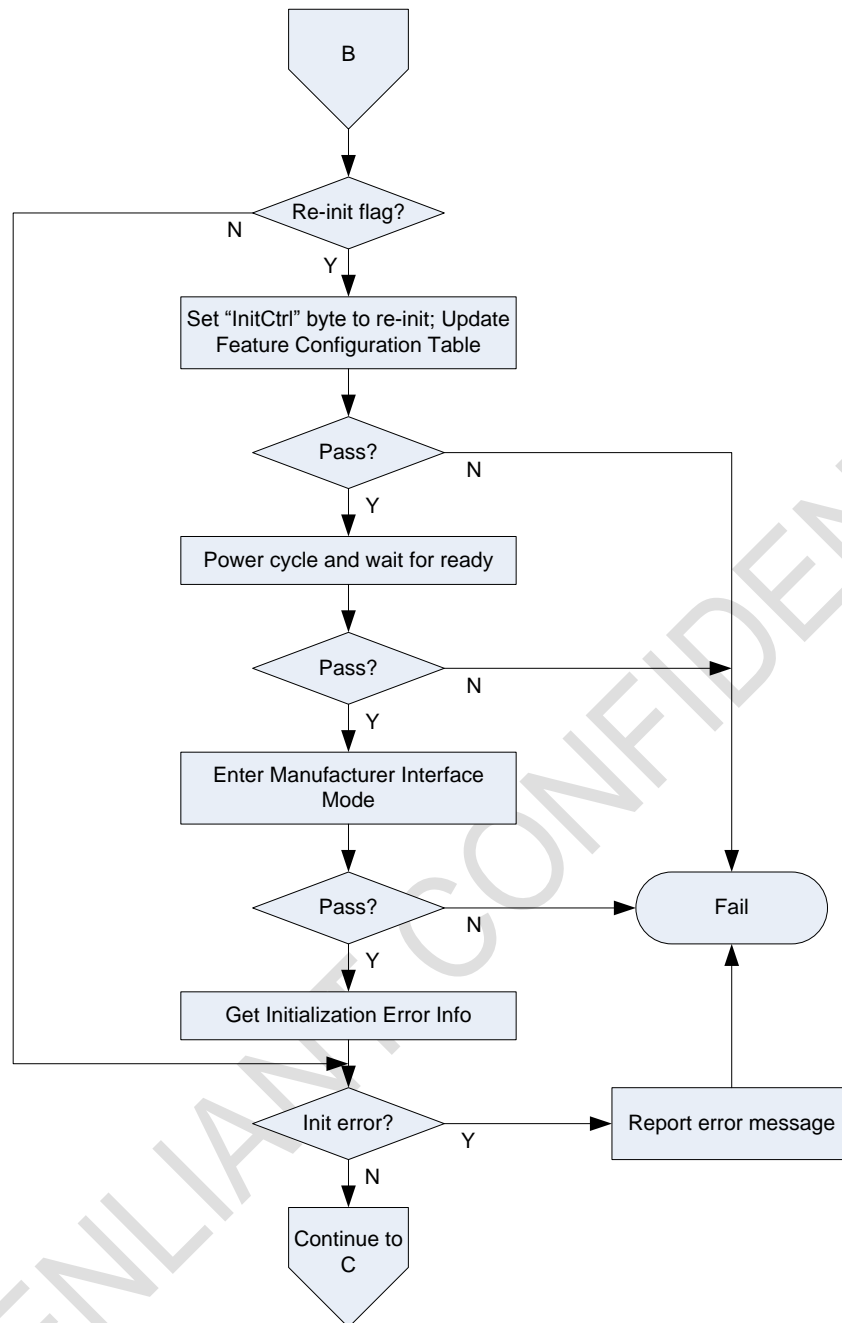
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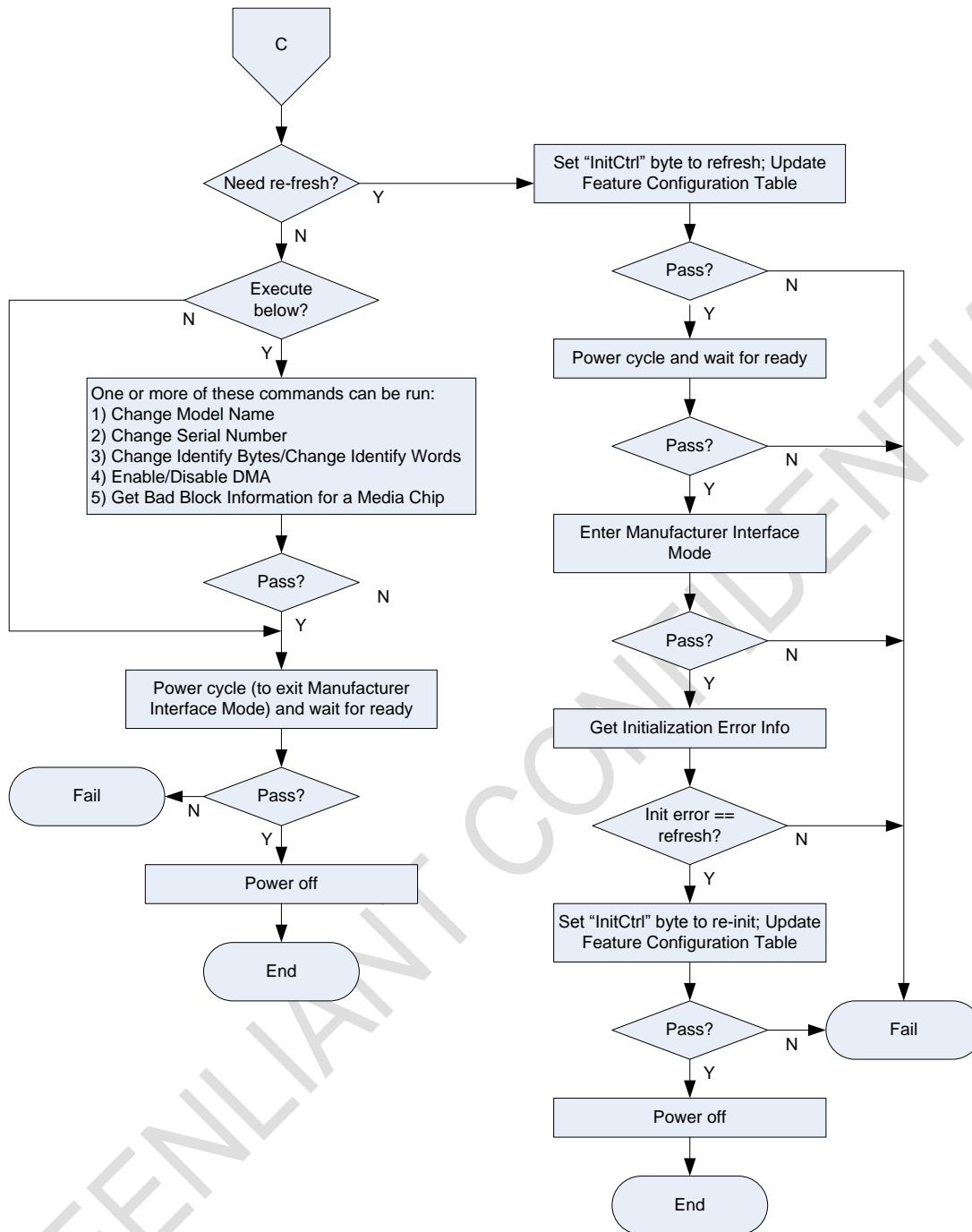
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REVISION HISTORY

Revision	Description	Date
00.001	Initial Draft	September 13, 2011
01.100	Release of NANDrive Specification for MIC	October 27, 2011
01.200	Updated the document format and Section 2 for target products Updated Section 5.1, removed ECh option for initialization control byte	July 17, 2013
01.300	Updated Section 6.0, removed subcommands 0x43 and 0x46 from MIC command set; Removed Sections 6.10 and 6.12.	December 20, 2013

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