

JMicron 60X MP tool (Ver. B.2.5)

Draft, 2009.03.10

1. Feature:

- Integrate download firmware & read/write testing.
- Concurrent multi-port process.
- Jumperless setting.
- Provide windows user interface and easy to use.
- Auto-selection of system file.
- Auto detect the configuration of flash array and update to INI file.
- Use one button to complete the preformat, download system firmware and read/write test.
- Interface : Data access through USB or USB to SATA bridge(JM20329) or USB to PATA bridge(JM20335).
- Input device information such as serial number, model name...etc.
- Read/write defect table.
- Error proof mechanism.

2. Functions:

2-1. Test item: can select partial test items to do.

2-2. Flash info: disk media setting include flash maker, type, bank number...etc

2-3. Device setting: Input serial number, model name, f/w version, VID/PID...etc.

2-4. F/W setting: Show firmware setting.

2-5. RD: can get special information to analyze.

2-6. H/W setting:

2-1. Test item

- Sata interface test.
- Flash interface test.
- Build defect table.
- Pre-format.
- Download program.
- Read/write test

2-2. Flash setting

- Flash maker.
- Flash type.

- Bank number.
- Channel number.
- Select specified firmware.
- Set drive current
- JEDEC capacity setting

2-3. Device setting

- Input serial number, model name, f/w version, VID/PID...etc.

2-4. FW setting

- Later to early: add early bad blocks to early bad blocks when create defect table.
- Check flash module: check flash ID, max. channel number and max. bank number.
- Erase rebuild early bad : Use the erase method to rebuild early bad blocks.
- Repair used module : Preformat the module with new flash and used flash.
- Recover code block : Erase the code block first.

2-5. RD

- Get defect table from flash.
- Put defect table to flash.
- Rebuild bad block mark

2-6. H/W setup

- Via JMF329 USB to SATA bridge board (PCB No. JM329-DB-001-0) to do all test.



USB to SATA bridge board ↑



3. Notice:

- On EV board, you can always set GPIO5=0 (flash download) to download and test. But when the downloaded firmware is invalid and can't accept ATA vendor command 0xC1(Jump to loader), you may cause system fail. If you want to download f/w again, you have to set GPIO5=1 (host download) to download a valid firmware.
- Flash test may destroy system blocks existed in flash. Don't use MPTool to test flash only.
- When MPVersion = 0 in INI file, user can modify test setting
When MPVersion = 1 in INI file, only <Start> <Refresh> <Close> button can be pressed. If you want to unlock the limit, first set on <RDVersion> checkbox and set password "jmicron", then you can select any button.
- If any fail has caused, you can double click the fail line to get error message.
- "Connect check" combo box provide user to check if the number of detected devices do not match the input value.
- "Red circle button" is used to automatically detect and update flash settings on factory mode. The password is "jmicron". If this process is successful, the button will turn to green.
- You can set USB device to removable media device from [UsbRemovable]=1 of INI file.

4. Error code:

Test item	Error code	Description
Check flash module fail	M00	flash chip, ch, bank, don't match setting
Sata interface test	A00	Read/Write fail
Flash interface test	B00	
Flash RESET fail	B01	"Reset" flash
ReadFlashID fail	B02	Read ID of flash
2nd ReadFlashID fail	B03	Read ID of flash
Flash Erase fail	B04	"Erase" Flash
Flash Program fail	B05	"Program" flash when turn on ECC
Flash Program fail(ECC OFF)	B06	"Program" flash when turn off ECC
Flash ECC fail	B07	
Flash redundancy area test fail	B08	
Flash 2nd Erase fail	B09	"Erase" Flash
Test Memory Fail	B10	Read/Write SRAM
ECC Test fail	B11	
Pre-format	C00	
Table not exist	C01	code block rage, defect table don't exist in flash

Table ecc fail	C02	data of code block rage, defect table are wrong
Number of bad block is over defect ratio	C03	number of bad block in too much on per chip
Number of free block is too large	C04	number of reserved block is too much
Total bad block number (%d) is over (MaxFreeBlcokNum-25)	C05	number of bad block in too much on total system
Build Table Fail	C06	building system table for SSD fail
Download program	D00	
Read/write test	E00	LBA read/ write fail

5. INI file definition:

	Type	Description
[Setting]		
ProductModel	String	Show the product model. Default value “JM” will hide.
MPVersion	0/1	‘1’ for Factory MP, 0 for RD setting.
ShowTitle	0/1	
TimeOut	Dec	Value of time out(Unit: Min)
EnBarCode	0/1	Enable barcode input
EnDumpFreeBlockInfo	0/1	Enable dump the Free block information to log files
LogPath	String	The log file path setting
[TestItems]		
EnFlashModule	0/1	Enable flash module test
EnSataTest	0/1	Enable Sata Test
EnFlashTest=1	0/1	Enable flash Test
EnPreFormat=1	0/1	Enable pre-format process
EnDownload=1	0/1	Enable download code process
DownloadType=1	0/1	Download SATA /USB code (SATA: bit0,USB:bit1)
EnRWTest=0	0/1	Enable read/write test
EnFormat=0	0/1	Enable format process
DiskFormat=0	0/1	Format file system type select (NTFS: 0, FAT32: 1)
DiskLabel	String	Disk volume label assign (FAT32 at most 11 characters)
SaveDefTable=0	0/1	Save Def. Table
[DeviceSetting]		
ModelNum	String	SATA identify model number
FirmwareVer	String	SATA identify firmware version
SerialNum	String	SATA identify/USB serial number
SNAutoInc	0/1	Serial number auto increase
SNDecimal	0/1	Serial number use hexadecimal(0)/decimal(1)
SNErrReuse	0/1	Reuse serial number of error device. (0: assign new SN for each device. 1: use last fail device’s SN if had.)
VendorName	String	USB vendor name
ProductName	String	USB product name

VID=152D	String	USB VID
PID=0602	String	USB PID
ManufString	String	USB manufacture string
ProductString	String	USB product string
[FlashSetting]		
Capacity	Dec.	Flash capacity check (2 ⁿ Gbytes)
FlashName	String	Stored flash name selection
Channel	Dec.	Stored channel selection
Bank	Dec.	Stored bank selection
DrvCurrent=0	Dec.	Store drive current selection
ExtFlashFile=flash.ini	String	Flash attributes setting file (Must have)
[FwSetting]		
DefPercentage	Dec.	Defect block ratio
ResPercentage	Dec.	Reserve block ratio
Bch8ReadErrorThreshold	Dec.	Mark block as defect when ECC fail bits over/equal the threshold in BCH 8
Bch15ReadErrorThreshold	Dec.	Mark block as defect when ECC fail bits over/equal the threshold in BCH 15
Bch8EccErrorCopyThreshold	Dec.	Copy data to good block when ECC fail bits over/equal the threshold in BCH 8
Bch15EccErrorCopyThreshold	Dec.	Copy data to good block when ECC fail bits over/equal the threshold in BCH 15
WearLevelFrequency	Dec.	Difference of average and max erase count is the value x2
SmartEnable	0/1	Enable SMART feature
SecurityEnable	0/1	Enable security feature
SlumberEnable	0/1	Enable slumber feature
InterleaveEnable	0/1	Enable interleave feature
ScrambleEnable	0/1	Enable scramble feature (Internal mechanism)
RemapEnable	0/1	Enable remap feature (Internal mechanism)
ParallelMemEnable	0/1	Enable parallel memory feature (Internal mechanism)
SecurityEraseEnable	0/1	Erase all addressable data when GPIO 1 = 0
UsbRemovable	0/1	1=Set USB device to removable media device.

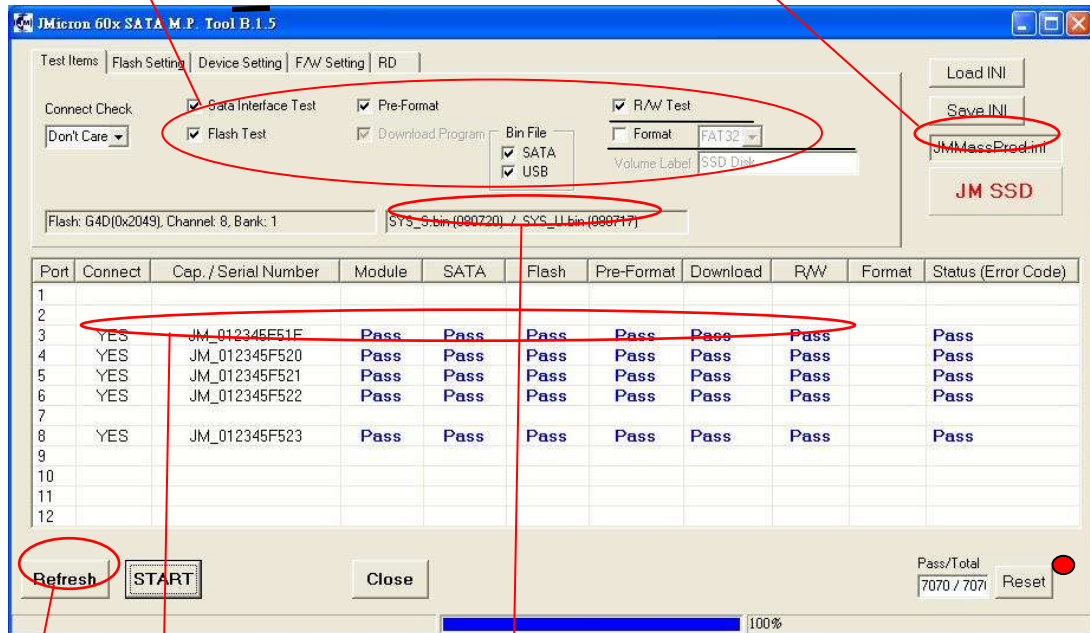
UsbLedP14	0/1	1=set GPIO#14 as USB LED, 0=set HDDA as USB LED.
SecurityCounter	Dec	Security counter (default is 5)
IDEMA_Capacity_Enable	0/1	Enable IDEMA capacity
IDEMA_Capacity	Dec	Value of IDEMA capacity
[RDSetting]		
TableIn	String	Defect table save to
TableOut	String	Defect table write from

6. Illustrations:

● Test items

You can select partial test items to execute.

Current selected configuration file name



Double click this line to get original firmware version.

Download file name (SATA file/USB file) & version

First to identify tested device.

● Flash setting

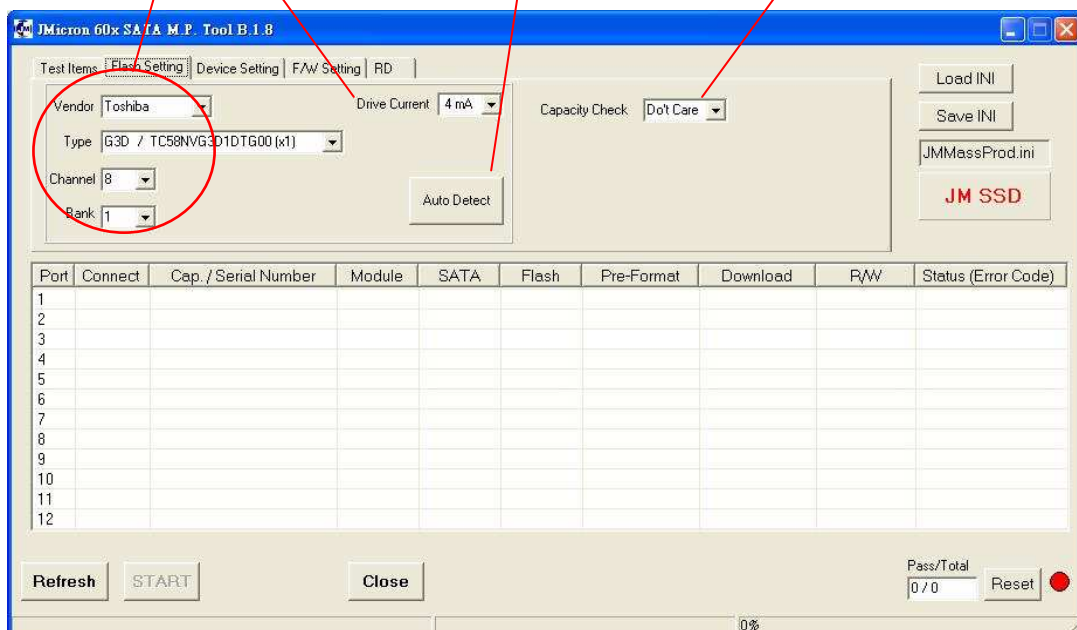
Select correct flash setting

Select correct capacity depended on flash setting.

If you don't want to check it, select "don't care" item.

IO drive current setting

Auto detect flash array configuration.



- **Device setting**

Model name for SATA device & inquiry data for USB device

USB device info

Model Number (24) JM_012345F524

Serial Number (12-20) JM_012345F524

Auto Increase ☒

Port	Connect	Cap. / Serial Number	Module	SATA	Flash	Pre-Format	Download	R/W	Format	Status (Error Code)
1										
2										
3	YES	JM_012345F51F	Pass	Pass	Pass	Pass	Pass	Pass		Pass
4	YES	JM_012345F520	Pass	Pass	Pass	Pass	Pass	Pass		Pass
5	YES	JM_012345F521	Pass	Pass	Pass	Pass	Pass	Pass		Pass
6	YES	JM_012345F522	Pass	Pass	Pass	Pass	Pass	Pass		Pass
7										
8	YES	JM_012345F523	Pass	Pass	Pass	Pass	Pass	Pass		Pass
9										
10										
11										
12										

Pass/Total 7070 / 7071

Automatic increase serial number

- **F/W setting**

See section 2-5.

These setting don't save to INI file when close application.

Refer to .INI definition.

Later -> Early ☒

Defect block ratio 28 (1/1000)

Reserved block ratio 67 (1/1000)

Wear level frequency 128

ECC Error Copy Threshold

BCH 8 3 (bits)

BCH 15 5 (bits)

Read Error Threshold

BCH 8 6 (bits)

BCH 15 11 (bits)

SMART ☒

Security ☐

Slumber ☐

Interleave ☒

Scramble ☒

Remap ☒

Parallel Memory ☒

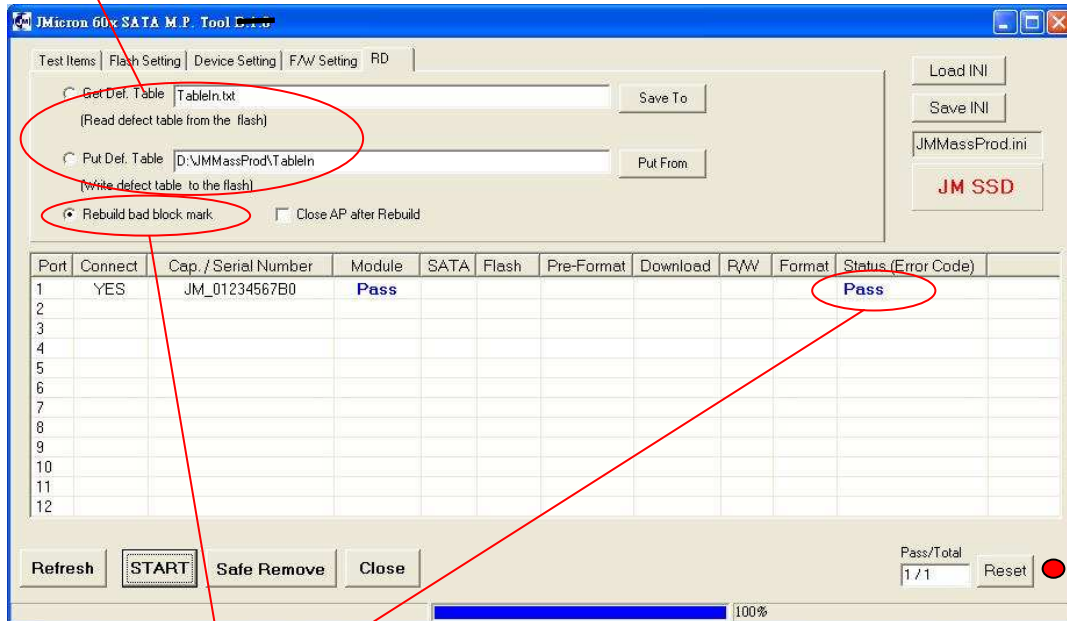
Security Erase ☐

Port	Connect	Cap. / Serial Number	Module	SATA	Flash	Pre-Format	Download	R/W	Status (Error Code)
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Pass/Total 0 / 0

- **RD setting**

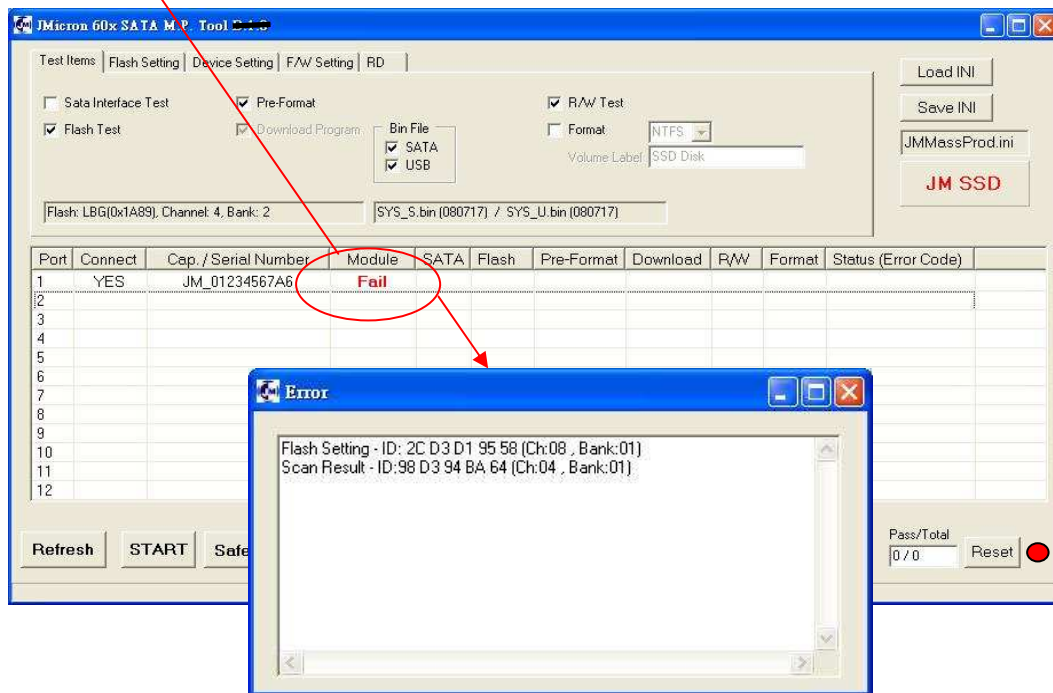
Read/write defect table



Rebuild flash map with bad block mark for defect table creation.

- **Get error message**

Double click this line to get the detailed message

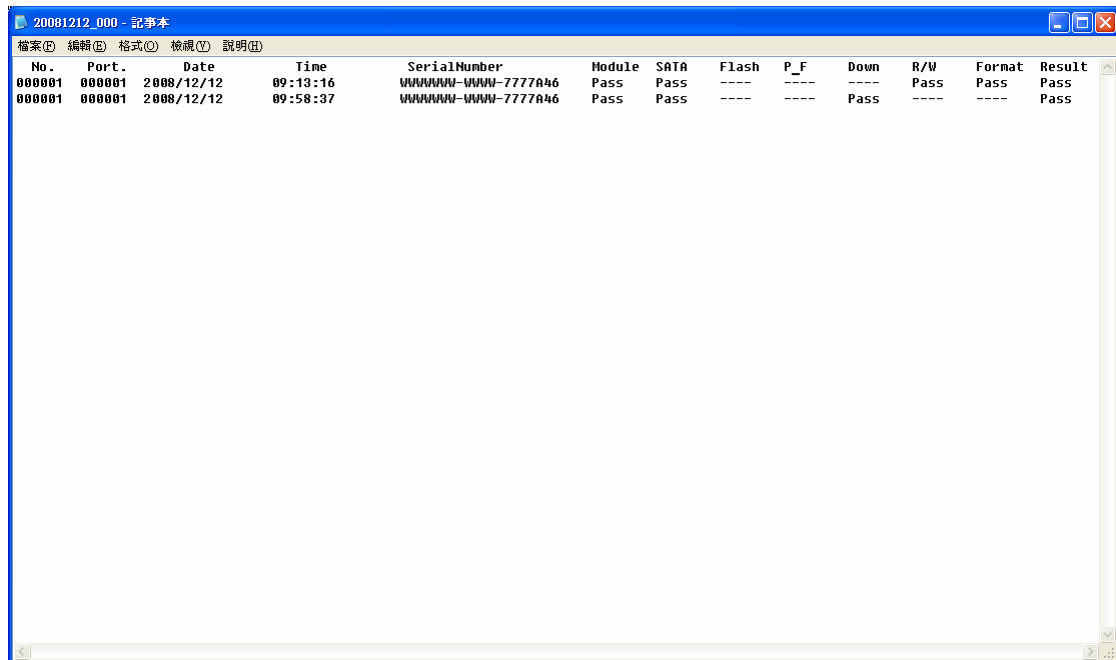


7. Log File:

The MP will generate some log files under the “log” directory.

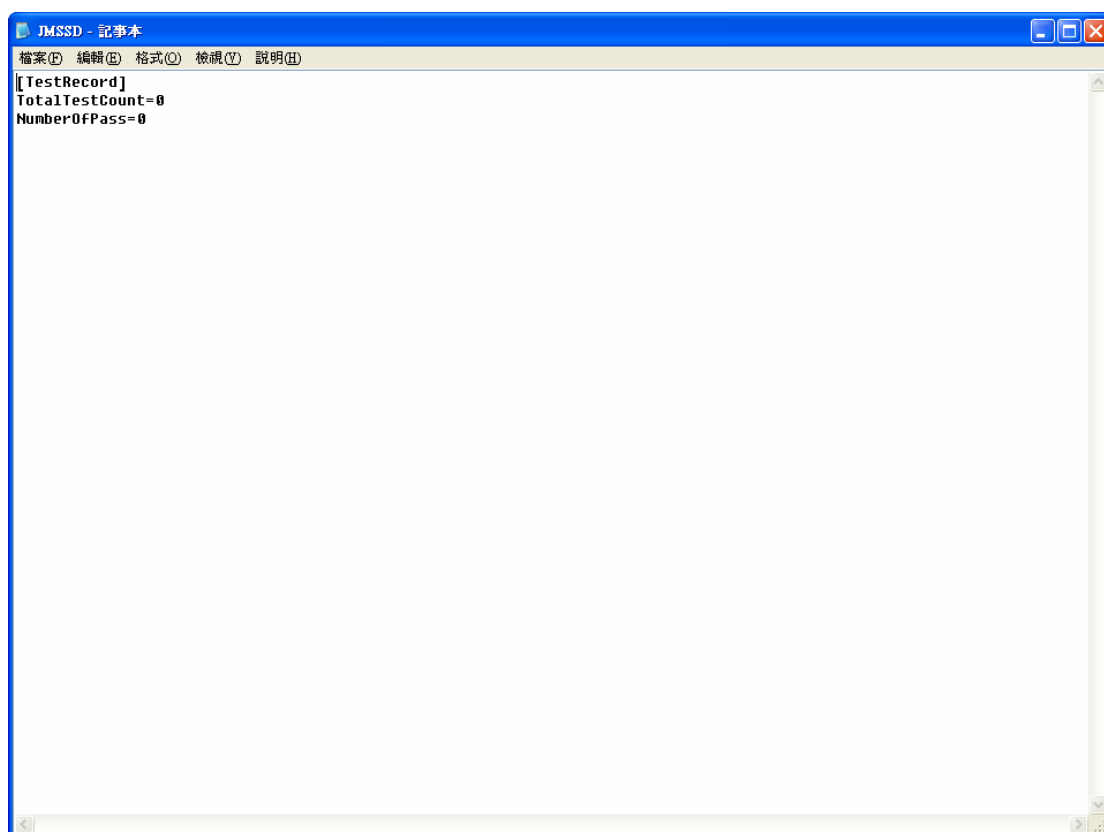
7.1 Daily log(filename like as YYYYMMDD_XXX.txt)

Y:Year, M:Month, D:Day X:count



No.	Port.	Date	Time	SerialNumber	Module	SATA	Flash	P_F	Down	R/W	Format	Result
000001	000001	2008/12/12	09:13:16	WWWWWW-WWW-7777A46	Pass	Pass	----	----	----	Pass	----	Pass
000001	000001	2008/12/12	09:58:37	WWWWWW-WWW-7777A46	Pass	Pass	----	----	Pass	----	----	Pass

7.2 Summary log(filename JMSSD.log)



```
[TestRecord]
TotalTestCount=0
NumberOfPass=0
```

Y:Year, M:Month, D:Day H:Hour M1: Minute Port: Usb port number

8.History:

Version	Date	Firmware version	Remark
B.1.0	08/07/22	080717	
B.1.5	08/08/29	080722	1.check device count 2.error message process.
B.1.6	08/09/01	080826	1.disable R/W test & format item on USB download mode.
B.1.7	08/010/03	080827	1.support 4bank with Bank#0/#4/#8/#12 layout configuration. 2. use “PIO mode” to download BIN file into controller.

B.1.8	08/010/07	080827	1.auto update flash info to mptool.ini 2.support new flash : G4S, TAA1, UAG, UBG, UCG 3.new f/w parameter structure (copyback, security erase) 4.backward compatible(<080924,>=080826)
B.1.9	08/010/16	081016	1. support new flash : G6D, FMC
B.2.0	08/011/03	081028	1. download USB binary code only through USB interface. 2. set USB device to removable media device.
B.2.2	08/12/08	081208	1. support the function of format(FAT32). 2. support the feature of usb led.
B.2.3	09/02/10	090118	1. Unify usb and sata MP Tool. 2. disable format(FAT32) 3. add more error codes
B.2.5	09/03/10	090310	1. support IDEMA capacity