



OTi

***Production Tool Multi-Device***  
————— *Ours Technology Inc.*

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# 1. Introduction

## 1.1 License Agreement :

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## **VI. Other Regulations**

Should one have any questions regarding the said contract, please contact Ours Technology Inc.

Website: <http://www.oti.com.tw>

E-mail: [support@oti.com.tw](mailto:support@oti.com.tw)

### **1.2 Warning :**

PTMD means production tool multi-device. Please use USB 2.0 host controller and USB 2.0 hub and USB 2.0 line that had passed the USB IF certification. Because there will be many issues when do the mass production with unstable equipments. And the operator must wear glove to keep away from touching device directly.

### **1.3 Requirement :**

The test platform should be Windows 2000 and Windows 98. In Windows 98, total memory size should not bigger than 512MB.

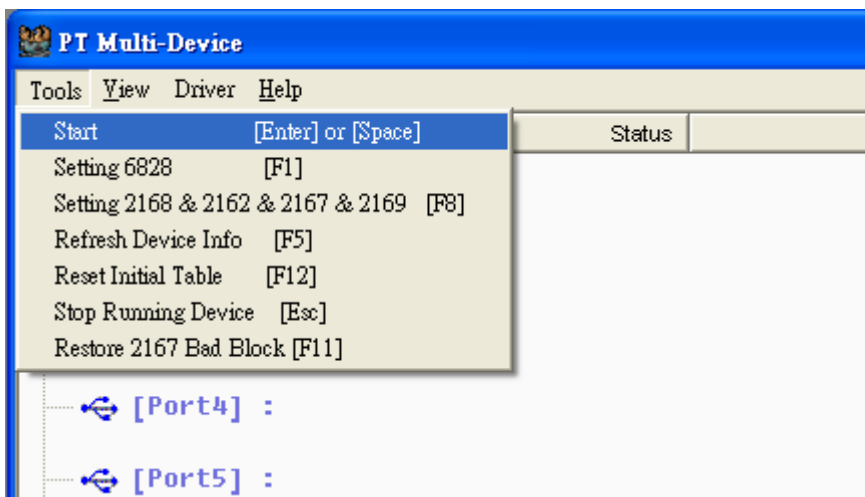
## 2. Installation

Double click the execution file PTMD x.x.x.x, and follow the installation instruction to install it. After you finished the installation, there is the following icon shows on your computer screen. You can double click to launch the operation window.



## 3. Manu & Setting

### 3.1 Tools Setting :



The key in [] means hot key. For example press F1 key will popup 6828 setting dialog and press F8 key will popup 2168 setting dialog.

#### 3.1.1 Start :

Start production, all device plug-in port will do production else finish successfully one.

#### 3.1.2 Setting 6828 :


This configuration is for **6828 Parameter setting**.

#### 3.1.3 Setting 2168 Serial :

Set all detail parameters, refer to **2168 Serial Parameter setting** topic below.

PTMD will load setting from 2168PTLib.set as default, user could press Load button to load other setting or new a setting file and top system bar will show what setting file is loading now. There is a limitation to load a setting file, that file must locate in the same folder with PTMD.exe.

When select this, the Password dialog will display. The default password is NULL, you can push [OK] button to continue or change password to what you want. If you change password, you must to key-in the correct password next time.



**Password**

Login

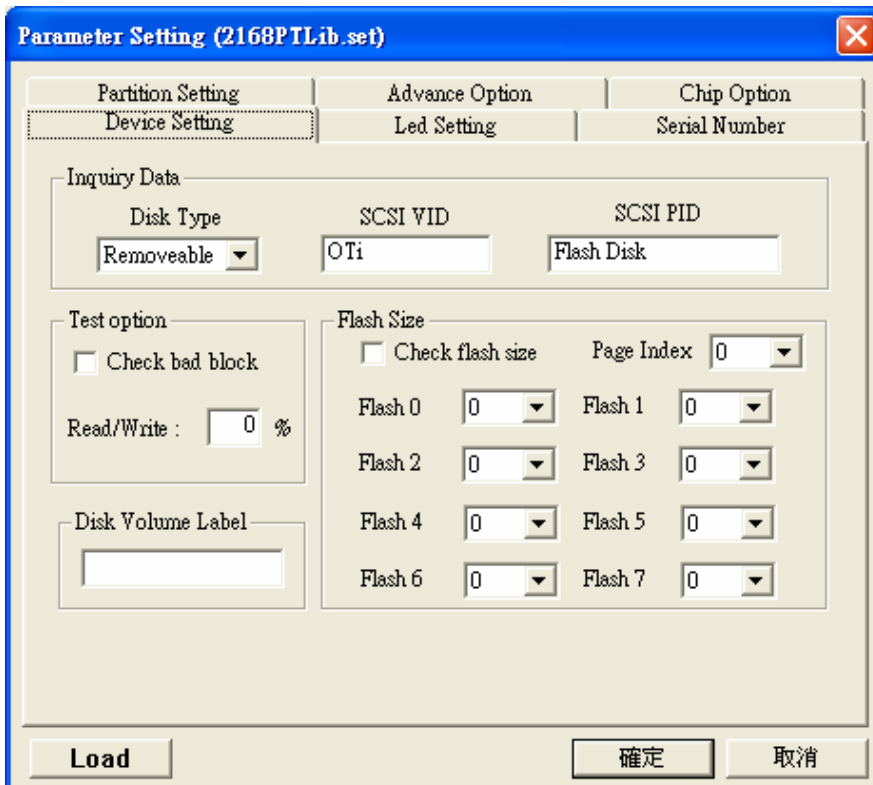
☐ Change Password

Password :

New Password :

OK Cancel

- **Device Setting Page :**



**Parameter Setting (2168PTLib.set)**

Partition Setting    Advance Option    Chip Option

Device Setting    Led Setting    Serial Number

Inquiry Data

Disk Type:     SCSI VID:     SCSI PID:

Test option

☐ Check bad block

Read/Write :  %

Disk Volume Label

Flash Size

☐ Check flash size    Page Index:

Flash 0	<input type="text" value="0"/>	Flash 1	<input type="text" value="0"/>
Flash 2	<input type="text" value="0"/>	Flash 3	<input type="text" value="0"/>
Flash 4	<input type="text" value="0"/>	Flash 5	<input type="text" value="0"/>
Flash 6	<input type="text" value="0"/>	Flash 7	<input type="text" value="0"/>

Load    確定    取消

- **Inquiry Data**

@.Disk Type : Select the disk type as Removable or Fixed disk.

@.SCSI VID : The length of SCSI VID is 8 bytes.

@.SCSI PID : The length of SCSI PID is 16 bytes.

- **Test options**

@.Check bad block : This will check bad block in your device, if there are over bad blocks limitation, it will show "Bad Block Exceed" error code.

@.Read/Write : Input Read/Write test percentage will do **logical** read and write test compare (like drag a file from explore to device), it will according to your input percentage to do read write test area. If you don't want to do this step, input 0 to skip it.

- **Disk Volume Label :**

It is for the "Disk Label" in FAT file system. This is the same action for setting the disk label when format the device in OS.

- **Flash Size**

@.Check flash size : This will check each flash size in your device.

@.Page Index : For normal use, the value is “0”, if the controller support 16 flashes, please select “1” to set the other flash size.

- **Led Setting Page :**

The screenshot shows the 'Parameter Setting (2168PTLib.set)' dialog box with the 'Led Setting' tab selected. The dialog has three main sections: 'Partition Setting', 'Advance Option', and 'Chip Option'. Under 'Advance Option', there are sub-tabs for 'Led Setting' and 'Serial Number'. The 'Led Setting' sub-tab contains two groups of settings: 'Led 0 (Full Speed)' and 'Led 0 (High Speed)'. Each group has three dropdown menus for 'Busy', 'Idle', and 'Suspend'. The 'Busy' dropdown is set to 'Fast', 'Idle' is set to 'Slow', and 'Suspend' is set to 'Off'. At the bottom of the dialog are three buttons: 'Load', '確定' (OK), and '取消' (Cancel).

Led could be flash in different style in USB1.1 and USB2.0.

- **Serial Number Page :**

The screenshot shows the 'Parameter Setting (2168PTLib.set)' dialog box with the 'Serial Number' tab selected. The dialog has three main sections: 'Partition Setting', 'Advance Option', and 'Chip Option'. Under 'Advance Option', there are sub-tabs for 'Led Setting' and 'Serial Number'. The 'Serial Number' sub-tab contains a 'Serial number' dropdown menu with options: 'Enable', 'Disable', 'Enable only (Skip all production steps)', and 'Enable only + Change SCSI VID/PID'. Below this are two checkboxes: 'Don't change' and 'Enable user define'. The 'User define (Increase one every time)' section has a 'Decimalism' checkbox and a 'Base number' text field containing '0000000000000000'. At the bottom of the dialog are three buttons: 'Load', '確定' (OK), and '取消' (Cancel).

We recommend selecting “Enable” to change the device’s serial number. But if you want to make some testing in



this same testing platform, you can select “Disable” option. The computer will not spend time to detect the new device when device’s serial number was disabled. This will save much time. After you finish the testing, you can select “Enable only (Skip all production steps)” to change serial number only. Selection of this option will not do production steps besides changing serial number. The “Enable only + Change SCSI VID/PID” option is the same as “Enable only” except changing SCSI VID/PID. It will write your SCSI VID/PID setting to your device. **However, when you want to do the complete production step by enabling serial number output or multi LUN device, please be careful.** If the device already has the serial number, please check “Don’t change if serial number exist” option.

## ● Partition Setting Page :

Partition Option: User can select a folder or partition image which to be copied to the device. You can input null string if you don’t want to copy any file. You also can partition your device into multi-LUN or Security-enable by selecting “Partition Option”. Password and hint could be set when the security area was enabled.

Partition Option could be as below,

@.Public Only :

The device will be partitioned into only one public partition. It is accessible to general user.

@.Security + Public (1 LUN) :

Partition the device into two areas for one drive; one is Public area and another is Security area. The Security area can be accessed only with a correct password.

@.Security + Public (2 LUN) :

Partition the device into three areas for two drives; Security area and Public-1 area in Drive1 and Public-2 area in Drive2. Public-1 area can switch to Security area with a correct password.

To copy file to each specific zone, you can specify the source file in the specific space for each zone.

To make a partition image, you should toggle “Record Partition Image” option and select which folder you want to copy to or just let it be empty. Then do the mass production, and partition image will be generated in

“PartitionImage” folder which is in your installation folder. PTMD will not record the image file when it startup, so if you want to make an image file, you should enable this option manually. When you selected partition image in “Source File”, PTMD will check if the capacity of the partition image file is identical with the capacity of device for the mass production. Otherwise, it will be fail.

## ● Advance Option Page :

## ● Erase Flash

If the [AutoScan Bad Block] option in Chip Option Page is not toggled

@.No : Don't erase flash.

@Erase Flash : Erase flash except the original bad block information.

@.Erase All Flash : Erase whole flash including the bad block information. So, it may even erase the vendor's bad block marking.

If the [AutoScan Bad Block] option in Chip Option Page is toggled

@.No : if BadBlockTable exists(old or used flash), the erase function should be toggled to erase BadBlockTable and OTi bad block. If the BadBlockTable doesn't exist (new flash), please don't erase flash.

@Erase Flash : Erase flash except the original bad block information.

@.Erase All Flash : Erase whole flash.

## ● Production Number

This is an optional item. This string can be written into the log file and do not take any effect with the device.

## ● Division drive

If you want to reserve some area which you can put your application or security data, you can use this area. This reserve area is a security area and OS or User can not see this area. However, this option will occupy some capacity and cause the device's total capacity smaller. And this area could be access by using OTi SDK library. This area is for the manufacturer who wants to develop specific application. The maximum value of this parameter is 255.

- **USB VID/PID**

You can change USB VID/PID as you wish, of course you must registry your own USB VID first.

- **USB String**

You can set the USB manufacturer string and product string.

- **Power Consumption**

The default value is 500, and this value must be even number. Device will reply this value to some power saving main boards.

- **Third Party Access ID**

Input ID only if you want develop your own program by OTi's library or do not input anything.

- **Library Access ID**

Input ID only if you want develop your own program to access reserve area by OTi's library or do not input anything.

- **Chip Option Page :**

Parameter Setting (2168PTLib.set)

Device Setting    Led Setting    Serial Number  
Partition Setting    Advance Option    Chip Option

CD-ROM Option (2168 AG and after)  
☐ Enable CD-ROM    Build Image  
Select Image    [ ]

Chip 2167  
Bad Block Tolerance : ( [ 3 ] + 1 ) X 8

Chip 2166&2169M (MLC)  
Bad Block Tolerance : [ 33 ] (1 to 99, default:0)

Chip 2165 (ISP)  
Source    [ ]

Chip 2168B3 & 2169SB3  
☐ Use Hynix 2Gb DDP or 4Gb QDP

2168B5 & 2169S B5 or after  
51 Clock : [ 30 Mhz(Defau ]  
FIB Clock : [ 30 Mhz(Defau ]  
☒ Enable FAT Optimize  
☐ Use Hynix NR type flash (Disable Copy Back)  
☐ Use Hynix flash

2168B6 & 2169S B6 or after  
☐ AutoScan Bad Block  
Bad Block Tolerance : [ auto ]  
FAT Bad Block Tolerance : [ 2 ]

Load    確定    取消

- **CD-ROM Option**

2168(AG and after) & 2167&2166&2169 could emulate a CD partition. You can toggle this option to enable such feature, then, select an image file or use the "Build Image" function to build an ISO file.

- **Chip 2167&2166&2169M Bad Block Tolerance**

This option is for setting bad block tolerance. If this value was set to bigger number, the device capacity will be smaller. In version 2 of 2166&2169M, to set "Bad Block Tolerance", you have to press F12 to reset the initial table. Then, unplug the device and plug again. Press "Enter" to start the production procedure. After version 3, you don't need to do this step.

For 2167, if flash has been go through the production procedure and want to change "Bad block tolerance" in Chip option setting page, you have to do "2167 restore bad block table" (F11) first. Then do the mass production procedure again.

The bad block tolerance will affect the capacity of device; bigger value will make the device capacity smaller. The minimize value is 0.

- **Chip 2165(ISP)**

For 2165, you should specify the location where store the firmware bin file. You can select the firmware file with this item.

- **Chip 2168B3 & 2189SB3 Use Hynix Mono Type Flash**

Toggle this option only for 2168B3 or 2169SB3 controller and flash types are Hynix mono die. Please do not toggle this option if you don't use this type of flash.

- **2168B5 & 2169SB5 or after**

@.51 Clock : the option are 30 or 24 MHz.

@.FIB Clock : the option are 30 or 24 MHz.

@.Enable FAT : Enable or Disable FAT Optimize.

Enable : The read/write performance would be better, but some space would be reserved to for the advanced algorithm. You will get smaller capacity size. 2 ~ 3 MB of 128 MB is needed for this performance improvement.

@.Use Hynix NR type flash : If select it, the flash "Copy Back" function will disable.

@.Use Hynix flash : If you are using some specific Hynix 1Gb mono or 4Gb mono die flash, please toggle this option.

- **2168B6 & 2169SB6 or after**

**This feature is very important; it is related to the bad block management. Please read it before using this option.**

@.AutoScan Bad Block : This function scans the original bad block information and re-assigns the available logical block number. It is useful when the original bad blocks of flash are over limitation. Each device will have different capacity size if the bad block numbers are different. More detail information is available in the [Bad Block Tolerance] option description. The default option is "disable" and the production procedure is similar with previous version. The default bad block tolerance is 7 or 8 if you disable this "AutoScan" option. We recommend you to use this option when the default production result was fail due to bad block limitation.

@.Bad Block Tolerance : This option is effective only for the [AutoScan Bad Block] was toggled. This option includes auto, 2 ~16, 20, 30, 40, and 50 setting. The "auto" means this production toolset will scan the bad block number of the device and get the maximum bad block number of each flash bank. The production toolset will set the swap space and useful data space base on this maximum bad block number. **If you select "10"** and the original bad block number is not over 10 block in a Bank, the available logical block number size will be "total logic block number minus 12 swap space minus 10". If the original bad block number is over 10, the production result would be fail. There are 7 or 8 spare blocks reserved for future bad block replacement.

@.FAT Bad Block Tolerance : This option is effective only when you enable the "Enable FAT Optimize" option in the same menu. The value could be from 2 to 13.

### **3.1.4 Refresh Device Info :**

Do not use this option unless the tree view shows incorrect. It will rebuild the tree view and reset device status to **waiting** status.

### **3.1.5 Reset Initial Table :**

This option will reset all devices. Please use this function only when device got **Test Unit Ready** failure message or write protect enable.

### 3.1.6 Stop Running Device :

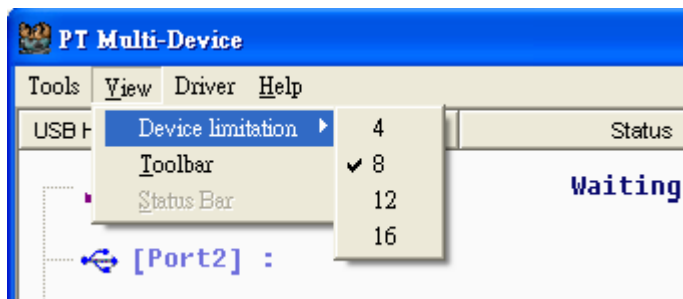
This will stop all running device.

### 3.1.7 Restore 2167 Bad Block :

Restore bad block table, only for 2167.

## 3.2 View Setting :

**3.2.1 Device Limitation :** User can select how many devices to be tested in PTMD at the same time.



**3.2.2 Toolbar :** User can customize the toolbar by using this option.



- **Capa :**

Capacity of device. It will show total capacity of the device including reserve area, security area, and public area.

- **S/N :**

Serial number of device. If nothing was displayed, it means the serial number is not created. You can enable serial number setting in Serial Number page of Parameter Setting Dialog.

- **VIDPID :**

USB VID/PID of device, for example: 0EA0/2168.

- **WP :**

Write protect enable or disable of the device.

- **Flash :**

Flash present status, for example if device mount two flashes in ID0 and ID1, this column will show "01". If the device mounts four flashes, it will show "0123". If the number of this column does not match with the flashes number mounted in the device. There is a problem with the device. The controller gets the wrong flash information or flash ID.

- **Inquiry :**

SCSI VID/PID, user could see SCSI VID/PID in this column.

## 3.3 Driver Setting :

**3.3.1 Reinstall :** If OS use the default driver when you plug the device, press this function to reinstall the production driver.

## 3.4 Help Setting :

**3.4.1 About PT Multi-Device :** Show PTMD version.

## 4. Operation

### Step-1

Plug-in hubs in USB ports, you can see your device tree in the main window. There is no special rule for plugging the hubs and you can connect hub to hub or hub to host as you wish. However, all the hubs should be self powered.


### Step-2

Now you could plug-in device, it will show “Waiting” string in blue color in the Status column. And the icon of tree item will be as below.

 [Port 1]: PT Device      Waiting

### Step-3

To start the production procedure, you can press [Enter] or [Space] bar. If the procedure was finished successfully, it will show “Pass” in green color in the Status column. And the icon of tree item will show as below.

 [Port 1]: PT Device      Pass

When a device passes production procedure, the device should be unplugged. If you want to do production procedure for the same device again, you must plug the same device. Then, Press [Enter] or [Space] bar directly to progress the testing.

If the production procedure was failed, it will show error string as below. The information before “-” is the failure step, and the information after “-” is for what kind of error.

 [Port1] : PT Device    Check ISP Code-ISPCodeNotSupport

## 5.Q&A

**Q:** What's the capacity change for B6 and previous version?

**A:** Because the bad block tolerance for B6 could be configurable, the capacity of the device will be different if different configuration. The following shows the device capacity by using the PTMD2.9.0.11C(2.9.285.7) for B6 controller. The FAT bad block tolerance was set to "2", the same as B5 had.

2169S(I)-B6

Flash Brand	Flash Type	Flash Amount	Capacity	FAT Disable	FAT Enable
SAMSUNG	K9F5608U0B	2	64MB	62.5MB	62.2MB
	K9F1G08U0M	1	128MB	125MB	122MB
	K9F1G08U0M	2	256MB	250MB	246MB
	K9K4G08U0M	1	512MB	500MB	497MB
	K9W8G08U0M	1	1GB	1000MB	995MB
	K9W8G08U1M	2	2GB	2000MB	1990MB
Hynix	HY27US08121M	NA	64MB	NA	NA
	HY27UA081G1M	1	128MB	125MB	122.9MB
	HY27UG082G2M	1	256MB	250MB	247MB
	HY27UG082G2M	2	512MB	500MB	496MB
	HY27UF084G2M	2	1GB	1000MB	994MB
	HY27UG088G5M	1	1GB	1000MB	995MB
	HY27UG088G5M	2	2GB	2000MB	1990MB

Flash Brand	Flash Type	Flash Amount	Capacity	FAT Disable	FAT Enable
SAMSUNG	K9F1208U0M	1	64MB	62.5MB	62.3MB
	K9F1G08U0M	1	128MB	125MB	122MB
	K9F1G08U0M	2	256MB	250MB	247MB
	K9K4G08U0M	1	512MB	500MB	497MB
	K9K4G08U0M	2	1GB	1000MB	995MB
	K9W8G08U1M	2	2GB	2000MB	1991MB
	K9WAG08U1M	1	2GB	2000MB	1991MB
Hynix	HY27US08121M	NA	64MB	NA	NA
	HY27UA081G1M	1	128MB	125MB	122.9MB
	HY27UG082G2M	1	256MB	250MB	247MB
	HY27UG082G2M	2	512MB	500MB	497MB
	HY27UF084G2M	1	512MB	500MB	497MB
	HY27UG088G5M	1	1GB	1000MB	995MB
	HY27UG088G5M	2	2GB	2000MB	1991MB



## 6. Appendix

### 6.1 Appendix-A

#### ● Log File

PTMD will generate a log file on each port. If plug-in eight devices at the same time, then press start, it will generate eight log files. The naming of the log files are base on sequential port number. It will start from root; the next is port number, and so on. For example, if the log file name is "1.sav0.log", it means the recorded data for port1.

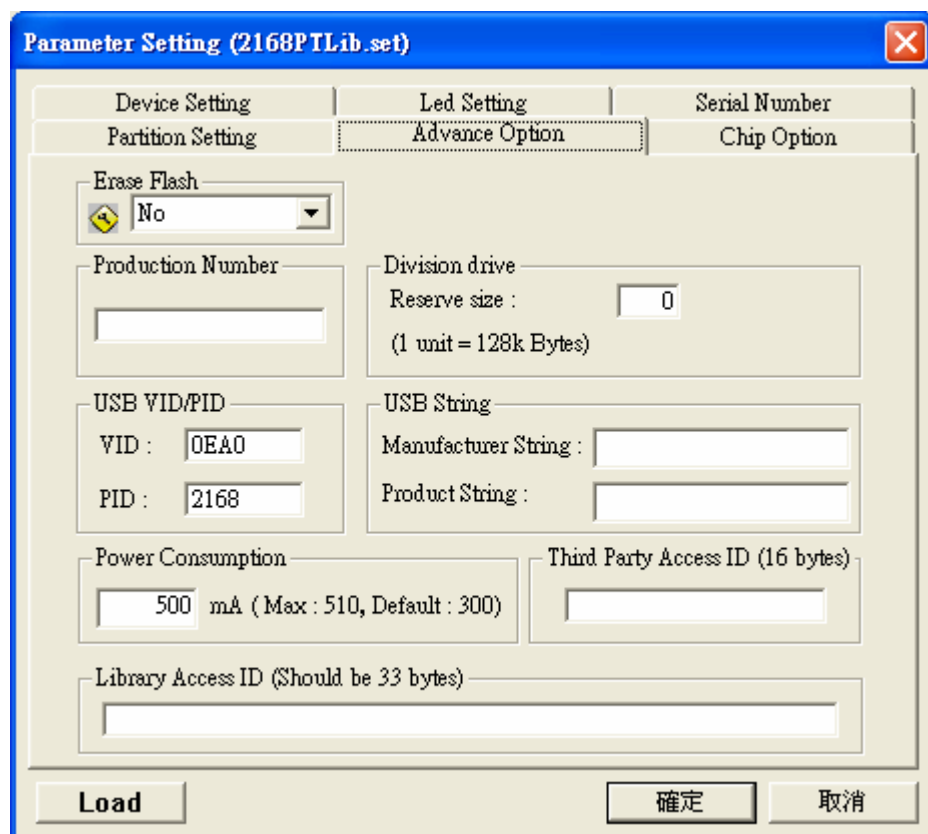
Device information saved in the log file was listed. We explain the meaning of each line as below.

[2003/7/15 10:16:42]	←Finish time
PTMDVersion=2.9.0.11Beta2	←The version of PTMD
USBPort=1	←Port 1 device
Capacity=31.3	←Device capacity
SerialNumber=3F42183F136409BF	←Serial number, if serial number disable this item will be blank
ChipVersion=000021680208303530383033	←The firmware chip version
USBVIDPID=0EA02168	←USB VID/PID
FlashNumber=0	←Present flash ID, refer to "Flash" in "View Setting" topic
SCSIVIDPID=test / test	←SCSI VID/PID
AutoScanBadBlockLocation=	←Show original bad block presentation, only record when "AutoScan Bad Block" option checked (refer to Chip Option page). It just support 2168-B6 version.
BadBlockLocation=	←Show original bad block presentation, only record when "Check Bad Block" option checked (refer to Device Setting page) or it will be Blank. It just support the version before 2168-B6.
Final BadBlockLocation=	←Show original and OTi bad block presentation, only record when "Check Bad Block" option checked (refer to Device Setting page)
DownloadSourcePassPub1=	←The path of source file which would be copied to Public1 area.
DownloadDataSizePub1=	←The size of source file.
DownloadSourcePassSec=	←The path of source file which would be copied to Security area.
DownloadDataSizePub1=	←The size of source file.
DownloadSourcePassPub2=	←The path of source file which would be copied to Public2 area.
DownloadDataSizePub2=	←The size of source file.
Result=PASS	←Result, if ok, it will show "PASS". Or it will show error step and error code. If you select "Enable only (Skip all production steps)" in serial number setting page, here will show "PASS (Change serial number only)".

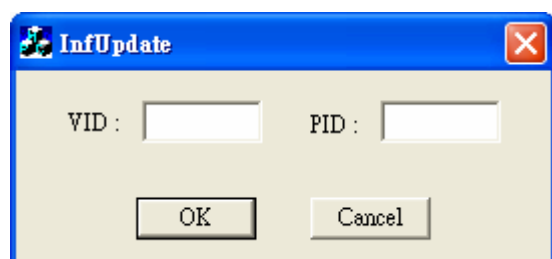
## 6.2 Appendix-B

### ● About InfUpdate.exe

If you changed the USB VID/PID setting in Parameter Setting dialog as below, then, went through the production procedure. The VID/PID will be different from the device supporting list of the production driver. This will cause the production driver can not recognize this device. If you want to do the production procedure with the same device again, the production tool can not detect the device. So, you need this program. It will update the PTMD driver with your own USB VID/PID. So, please run the “Infupdate” program from Start menu->Program Files-> ProductionTool MD-> INF Update, and key in your VID/PID. Then, press “OK”, this program will update your driver automatically.



The image shows a Windows-style dialog box titled "Parameter Setting (2168PTLib.set)". It has a blue title bar with a close button. The dialog is divided into several sections by tabs: "Device Setting", "Led Setting", "Serial Number", "Partition Setting", "Advance Option", and "Chip Option". The "Advance Option" tab is currently selected. Within this tab, there are several input fields and checkboxes. At the top left, there is a checkbox labeled "Erase Flash" with a dropdown menu set to "No". Below this is a "Production Number" field. To the right, there is a "Division drive" section with a "Reserve size" field set to "0" and a note "(1 unit = 128k Bytes)". Below the "Production Number" field, there is a "USB VID/PID" section with "VID" set to "0EAO" and "PID" set to "2168". To the right of this is a "USB String" section with "Manufacturer String" and "Product String" fields. Below the "USB VID/PID" section, there is a "Power Consumption" section with a field set to "500 mA (Max : 510, Default : 300)". To the right of this is a "Third Party Access ID (16 bytes)" field. At the bottom of the dialog, there is a "Library Access ID (Should be 33 bytes)" field. At the very bottom, there are three buttons: "Load", "確定" (Determine), and "取消" (Cancel).



The image shows a small Windows-style dialog box titled "InfUpdate". It has a blue title bar with a close button. The dialog contains two input fields: "VID" and "PID". Below these fields are two buttons: "OK" and "Cancel".

## 6.3 Appendix-C

### ● Error Message

xxx-DeviceWriteProtect : Device is “write protect”.

xxx-DataTransferFail : Partition and format device fail.

xxx-R&WtestFail : Read/Write test fail.

xxx-InitialTestFail : TestUnitReady fail when plug-in device.

xxx-OpenDeviceFail : Can't open device handle.

xxx-AllocMemoryFail : Allocate memory fail.

xxx-CheckInitTableFail : Check Initial table fail.

xxx-ChipNotSupport : Unsupport this chip version.

xxx-CheckSizeFail : Check the size of flash which mounted on the device fail.

xxx- Chip n-BadBlockExceed : The BadBlock of Chip n is over limitation.

xxx- InitTableProofFail : Proof the initial table fails.

xxx- DeviceInPowerSavingMode : The device is in power saving mode.

xxx- GetSNFromLibFail : Get serial number from library fail.

xxx- LibIDWrongFormat : Check Library Access ID fail.

xxx- SecuritySizeInvalid : The size of security is invalid.

xxx- CopyFilePathInvalid : The file wants to be copied to device is invalid.

xxx- NoFlashDetect : Can't detect any flash exists.

xxx- ExceedRootDirLimit : The File Descript Block is out of range.

xxx- FilePathInvalid : The f/w bin code is invalid.

xxx- ReadFileFail : Read some file fail (Reserved area map file or f/w bin code).

xxx- ImageSizeNotIdentify : The partition image size is not equal to the partition size.

xxx- ISPCodeNotSupport : Not support this f/w bin code.

xxx- ISPCodeSizeWrong : The size of f/w bin code is wrong.

xxx- CDImgCantFind : The CD image path is invalid.

xxx- CDImgSizeExceed : The size of CD image is over partition size.

xxx- BadBlockToleranceOver : The autoscan badblock tolerance is over the setting badblock tolerance.

xxx- GetAuthorizedDataErr : Get SW Authorize data fail.

xxx- ConfirmErr : Confirm SW Authorize already done fail.

xxx- LicenseKeyExhaust : The license key of SW Authorize is exhaust.

Request sense :

xxx- MediaNotPresent : The media is not present.

xxx- CmdInvalid : The command is invalid.

xxx- InvalidFieldInCDB : Invalid field founded in CDB.

xxx- NotReadyToChange : The device is not ready to change.

xxx- TargetOperatChg : Target operates change.

xxx- PasswordFail : The password is wrong.

xxx- SecurityDisable : Security function disables.

xxx- DeviceIsLock : The device is lock now.

xxx- ConfigFlashNow : The device is configuring flash now.

xxx- CmdSignatureError : Cmd signature error.

xxx- Canceled : Cancel running.

xxx- CorrectReadErrOverTime : Correct read error over time.

xxx- BuildBBTableNow : Build BadBlock table now.

xxx- BuildBBTableOK : Establish BadBlock table ok.

xxx- BuildBBTableFail : Establish BadBlock table fail.

xxx- BBInvalid : BadBlock is invalid.

## 6.4 Appendix-D

- Production time (include Read/Write Test & check Bad Block)

### 2168 with Samsung's flash

Capacity	Production time
128MB (Samsung K9F1G *1)	1m 28s
256MB (Samsung K9F2G *1)	2m 55s
512MB (Samsung K9K4G *1)	5m 52s
1GB (Samsung K9K4G * 2)	11m 40s
2GB (Samsung K9W8G *2)	23m 30s
4GB (Samsung K9W4G * 4)	47m 5s
512MB (Samsung K9F4G08 *1)	8m 23s
1GB (Samsung K9K4G08 *1)	17m 10s
2GB (Samsung K9WAG08 *1)	34m 7s

### 2169S with Samsung's flash

Capacity	Production time
256MB (Samsung K9F1G *2)	2m 10s
512MB (Samsung K9F1G *4)	4m 24s
1GB (Samsung K9K4G * 2)	8m 50s
2GB (Samsung K9W8G *2)	17m 32s