

**Silicon Motion, Inc.**

# **DYNA-SM32X**

**USB2.0 flash media controller**

## **USB TEST PROGRAM**

➤ Introduce:

The program is for SMI SM32X' s Mass Production. This tool can test up to 16 devices at once.

➤ Platform:

There are two drivers for different platform:

- win98\_factory\_driver:

- *Windows98*

- winXP\_factory\_driver:

- *Windows 2000*

- *Windows XP*

➤ Environment Setup:

- Setting Function:(see the Fig. 1)

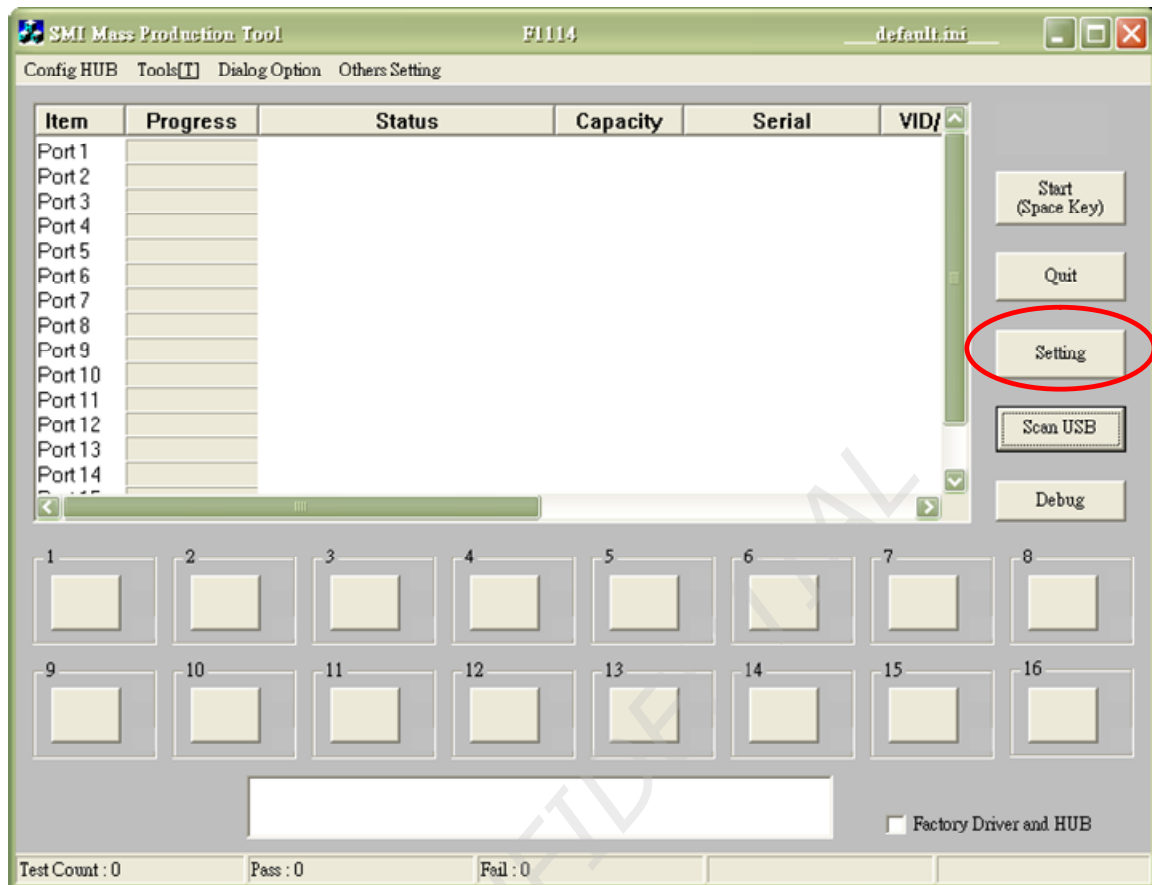


Fig. 1 Setting Function of SM32X Production Tool

It will allow the user to change CID information.

- Password Entering:(see the Fig. 2)

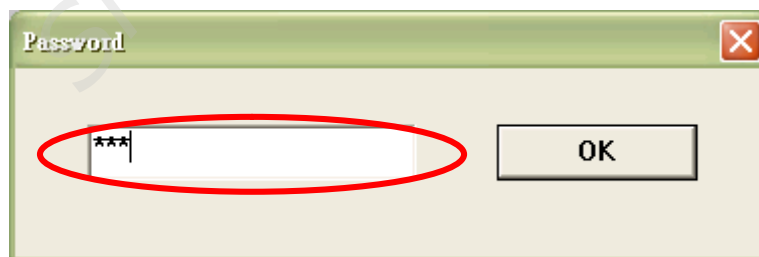


Fig. 2 Password entering for 「Setting」 Function.

The system default password is 「320」. The wrong password led user to edit the 「Begin Serial」 and 「End Serial」 fields only.

- Loading the INI File:(see the Fig. 3)

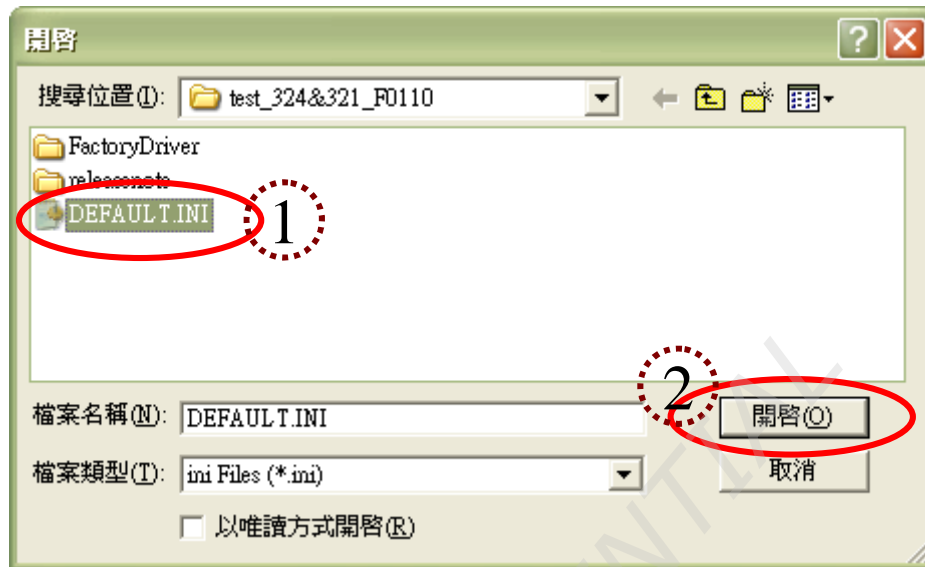


Fig. 3 Loading the INI file for 「Setting Function」 .

Loading an 「ini」 file which saved in the past or the system default .The system default ini file is located in the same directory with application executable file.

If no setting executed, the setting will be according to the 「default.ini」 file.

■ Configuration:(see the Fig. 4)

Fig. 4 The main frame for 「Setting Function」

There are several parts in the setting main frame, all field descriptions are presented in the Table 1.

Table 1 The field descriptions for 「Setting Function」 .

Main Item	Field	Description
	Disk Label	For WinXP display on file explorer string (If null



		then its OS default string)
	Disk Size	Checking after flash pretest disk capacity from 16M - 4G
	Disk Type	Setting the USB Disk type to USB-ZIP or USB-HDD , (USB-ZIP is removable disk ,USB-HDD is fix disk )
	Enable ISP Select	Selecting the downloaded ISP file name manually (default auto selecting).
	Led Ready	80: plug-in led on 82: plug-in led off
	Led Busy	Led frequency 0: quick 48 : 1 second
	Mode	Choose 「Memory Bar」 for SM32x series.
	Serial Number	Select「no serial number」,「Nbytes」or「No Update Serial」 of serial numbers.  ➤ <b>No serial number:</b> It will not enable USB serial number.  ➤ <b>Nbytes:</b> It will write the serial number into UFD



		<p>and enable it.</p> <p>➤ <b>No Update Serial:</b> It will write the identical serial number to UFD and enable the USB serial number.</p>
	Serial Number Len	The maximum length of serial number.
	Test Result LED flash	LED flash after production success.
	Time Out	It will exit after timeout value if the production looping.
USB	Auto Date Mask	<p>It will make the 「Begin Serial」 including the date if 「SerialMask」 existed the 『YYYY』、 『MM』 and 『DD』 between 「MaskStart Pos」 and 「MaskEnd Pos」. The number of 『Y』、 『M』、 『D』 indicated the display the number of characters. For example: 「2006/1/12」 → YYYY means 『2006』 and YY means 『06』. MM means 『01』 and MM means 『01』. DD means 『12』 and D means 『2』.</p> <p>If the Date value in the 「Begin Serial」 is different to the current date of production, the all『#』positions</p>



		will be reset if 『Auto Date Mask』 is checked.
	bcdDevice	Set the user' s USB Device ID version (customer can setting the version for different modal )
	Begin serial	Set the First serial number according to 「Serial Mask」.
	Mask End Pos	The Date character(Y:Year , M:Month , D:Day) finished in which one. If 「Auto Date Mask」 is disable, the 「Mask End Pos」 will be disable too. The pos value start from 1 and end of 「Serial Number Len」 .
	Mask Start Pos	The Date character(Y:Year , M:Month , D:Day) start in which one. If 「Auto Date Mask」 is disable, the 「Mask Start Pos」 will be disable too. The pos value start from 1 and end of 「Serial Number Len」 .
	PID	Set the USB Product ID
	Product Str	Set the Product Information 20 bytes
	Serial Mask	It will make the 「Begin Serial」 display according to the mask. The specific character of 『#』 will be the increasing serial number set. For example, if the mask



		showed as 『DD###』 , then the 「Begin Serial」 will be between 『DD000』 and 『DD999』 . If 「Mask Start Pos」 is 1 and 「Mask End Pos」 is 2 and 「Auto Date Mask」 is check, today' s Day is 『12』 , then the 「Begin Serial」 well be between 『12000』 and 『12999』 .
	Vendor Str	Set the Vendor Information 20 bytes
	VID	Set the USB Vendor ID
Inquiry	Product	Inquiry Product String 16 bytes
	USB Power	Setting the USB maximum power.(From 100mA to 500mA step by 100mA)
	Vendor	Inquiry Vendor String 8 bytes
Specific Application	Auto capacity	When the option enabled, it will fit to the maximum capacity of UFD without 「Bad block over setting」
Support	SM321AC	<ul style="list-style-type: none"> <li>➤ <b>AGAND</b> : Support AGAND downgrade production.</li> <li>➤ <b>NR</b> : Ignore the Fail when production.</li> <li>➤ <b>Micron</b> : Support Micron downgrade production.</li> </ul>
	SM321BB	<ul style="list-style-type: none"> <li>➤ <b>NR</b> : Ignore the Fail when production.</li> </ul>

		<ul style="list-style-type: none"> <li>➤ <b>Spectek</b> :Support Spectek downgrade production.</li> <li>➤ <b>Half Size</b>: Downgrade the capacity to half.</li> </ul>
	SM324BB	<ul style="list-style-type: none"> <li>➤ <b>Half Size</b>: Downgrade to capacity to half.</li> <li>➤ <b>-R</b> : Support AGAND -R downgrade production.</li> </ul>
340	CID ISP Folder	It just for SM340 production. The ISP folder position.
	ROM File	It just for SM340 production. The ROM file that will be downloaded.
Test Item	Copy Test	<p>Doing simple read write test with percentage and patterns</p> <p>Setting the pattern and looping within 「set」 button.</p>
	Download ISP	<p>Downloading ISP file to Flash' s into reserved memory.</p> <p>The 「Select ISP」 option will download the ISP with selection.</p>
	Enable Turn-Off MU	<p>It can support turn-off MU(s) functions with:</p> <ul style="list-style-type: none"> <li>➤ <b>Turn-Off Upper MU</b>: turn off the upper half mu(s).</li> <li>➤ <b>Turn-Off Bottom MU</b>:turn off the bottom half mu(s).</li> <li>➤ <b>Turn-Off Specific MU</b>: turn off the user setting</li> </ul>

		<p>specific mu(s).</p> <p>➤ <b>Automatic Turn-Off MU:</b> turn off the maximum badblock MU.</p>
	Format	<p>High level FAT16/FAT32 format.</p> <p><b>To FAT32:</b> format the UFD to FAT32 only.</p>
	Make Auto Run	Writing a CD-ROM image into disk
	Mixing File Support	<p>The mixing file combined with <b>DBF</b> , <b>Pretest file</b> and <b>ISP file</b>. User can use the specific CMB file to production.</p>
	Preload	<p>Downloading the files into UFD with selected folder.</p> <p>➤ <b>FAT format:</b> preload according to the MBR , PBR FAT and Root directory.</p> <p>➤ <b>Non FAT Format:</b> preload according to the selected image file byte by byte.</p>
	Pretest	<p>Initialize the controller and Flash with five modes:</p> <p><b>Erase Bad Block</b></p> <p>Erase Bad Block with 0x55.</p> <p>Erase Bad Block with 0x55 and 0xAA.</p>

		<p>Erase Good Block.</p> <p>Erase Good Block with 0x55 and 0xAA.</p> <p>The <b>Bad block option</b> used for reserved spare block to replace when bad block marked.</p>
	Write CID	<p>Writing the above USB Inquiry etc Configure Information into CID Block.</p>

- Config HUB Function:(see the Fig. 5)

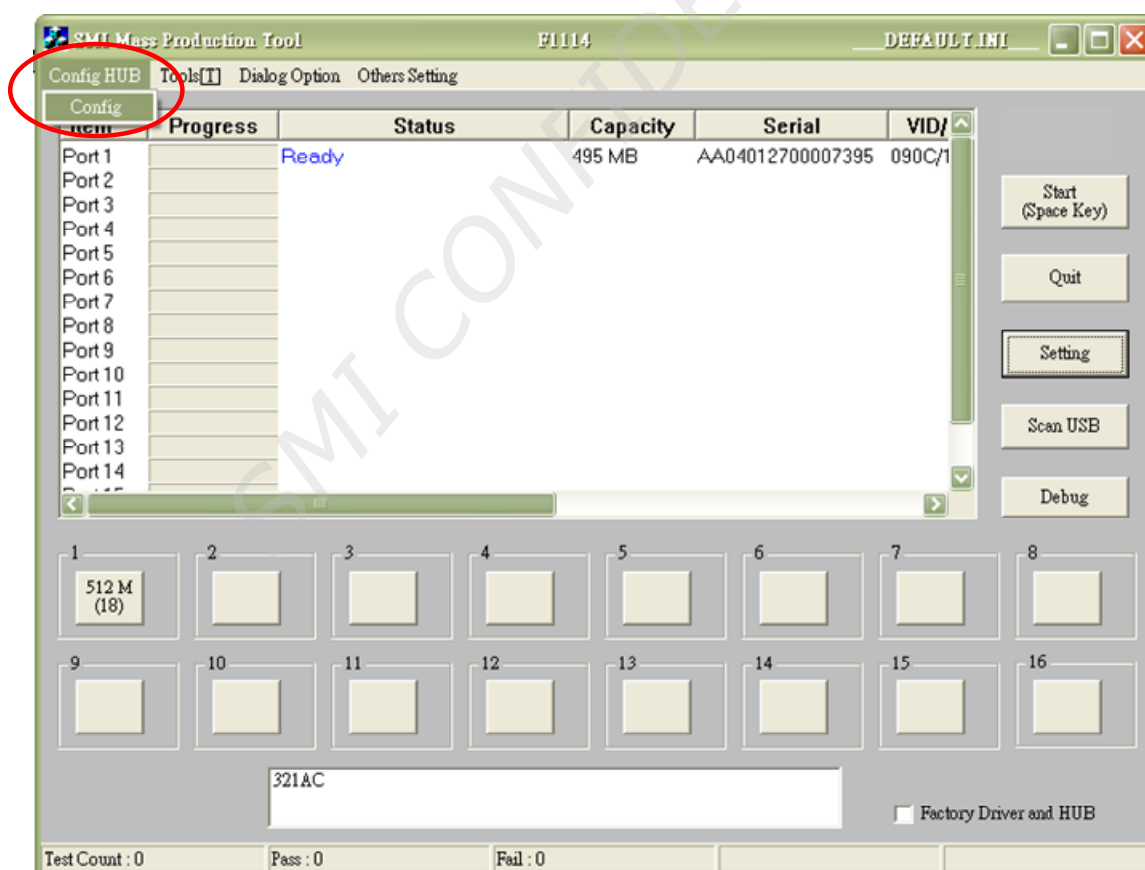


Fig. 5 The 「Config HUB」 function of SM32X Production Tool.

The function supports the sequence configuration for specific USB hub port. The

user can detect the error USB storage device is failed in which port.

■ *Configuration Step:*

Step 1、In the Fig. 6, if the configuration is the first time and the device port labels existed 「O」 or you want to reset the port mapping, press the 『Scan USB』 button without plugging any UFD to reset the configuration.

Step 2、Plugging the prepared USB storage device into USB hub port, the OS will install the default device driver for this USB storage device.

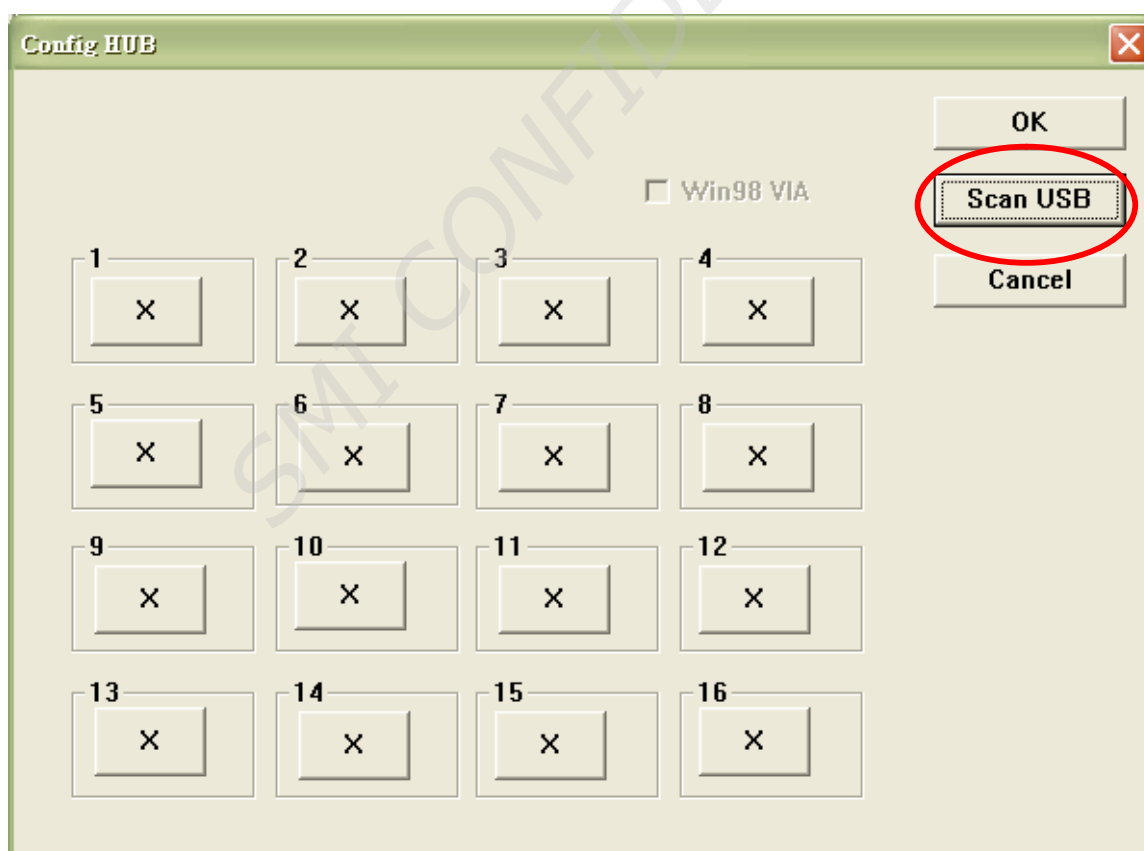


Fig. 6 The process of the first time to configuration in this condition.

Step 3 、 According to your OS version, ran the specific USB storage device driver existed in the 「winXP」、 「Win2000」 or 「win98\_factory\_driver」 directory, and press the 「SMI Factory Driver」 button for driver installation as Fig. 7. If you want to remove the specific USB storage device driver, press the 「Mass Storage Driver」 button in the Fig. 7. The driver will become the system default and this application program will not support exactly.

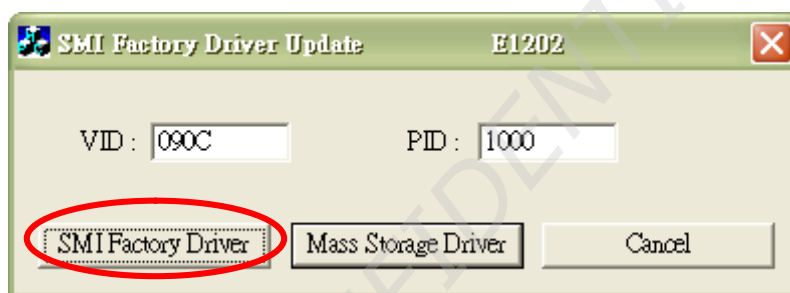


Fig. 7 The installation for Specific USB storage device driver.

Step 4 、 Pressing the 「Scan USB」 button to setup, then the USB hub port will mapping to each button when the label become 「O」 in the Fig. 8. Otherwise it will pop-up an error message in Fig. 9.

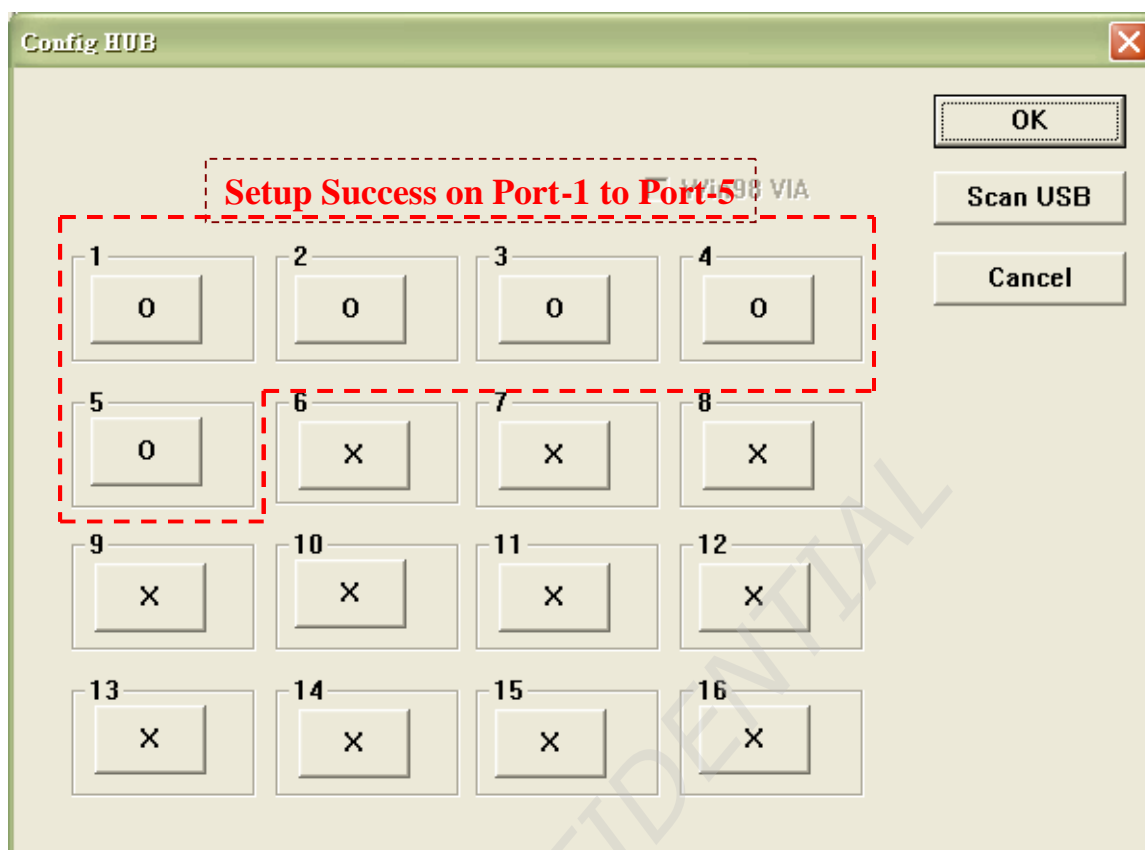


Fig. 8 USB Port mapping to test program success



Fig. 9 Error Message for 「Not Find any device on HUB」

➤ Test Steps:

Step 1、 Plugging the prepared testing devices into the USB hub ports that configured according to 「Config HUB」 function.

Step 2、 Because test program using the specific driver, so that the 「Factory Driver」 must be selected, and press the 「Scan USB」 for device detect, the button will show the green icon if plugged USB device and configured with 「Config HUB」 function. Otherwise are not changed, the Fig. 10 presents the sub-steps for upper process and result.



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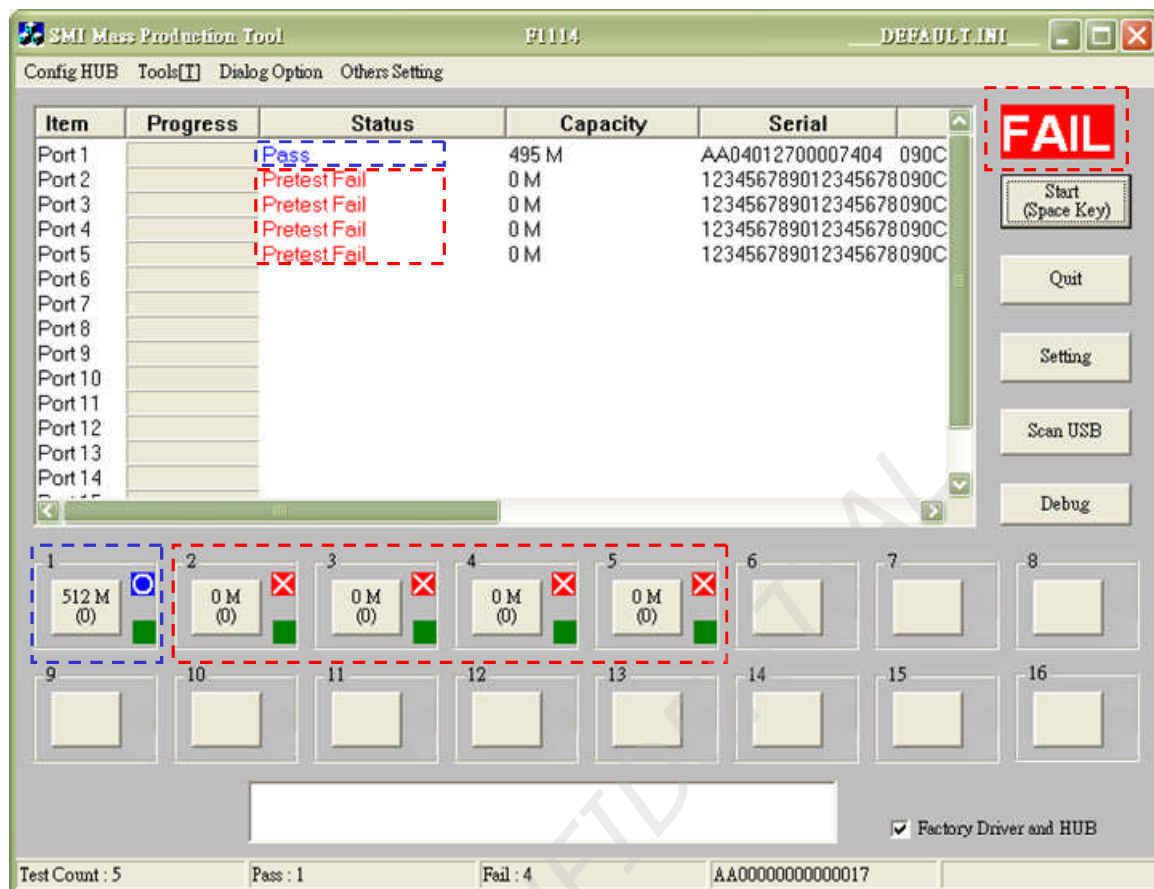


Fig. 11 the result of testing

### ➤ Other Buttons and Key points:

- Tools

The specific tool for mass production.(Fig. 12)

#### ■ Mixing Files

Combining the selected DBF、ISP and pretest file into 「CMB」 file.

#### ■ Decode CMB File

Decoding the 「CMB」 file into specific DBF、ISP and pretest files.

### ■ Create UDisk Image

Creating the Non-FAT format preload image.

### ■ COM Port Connect

Connecting to COM port for production controlling with 「Auto Handler」.

### ■ Multiple Erase All

For multiple erase all bad block for restoring bad block.

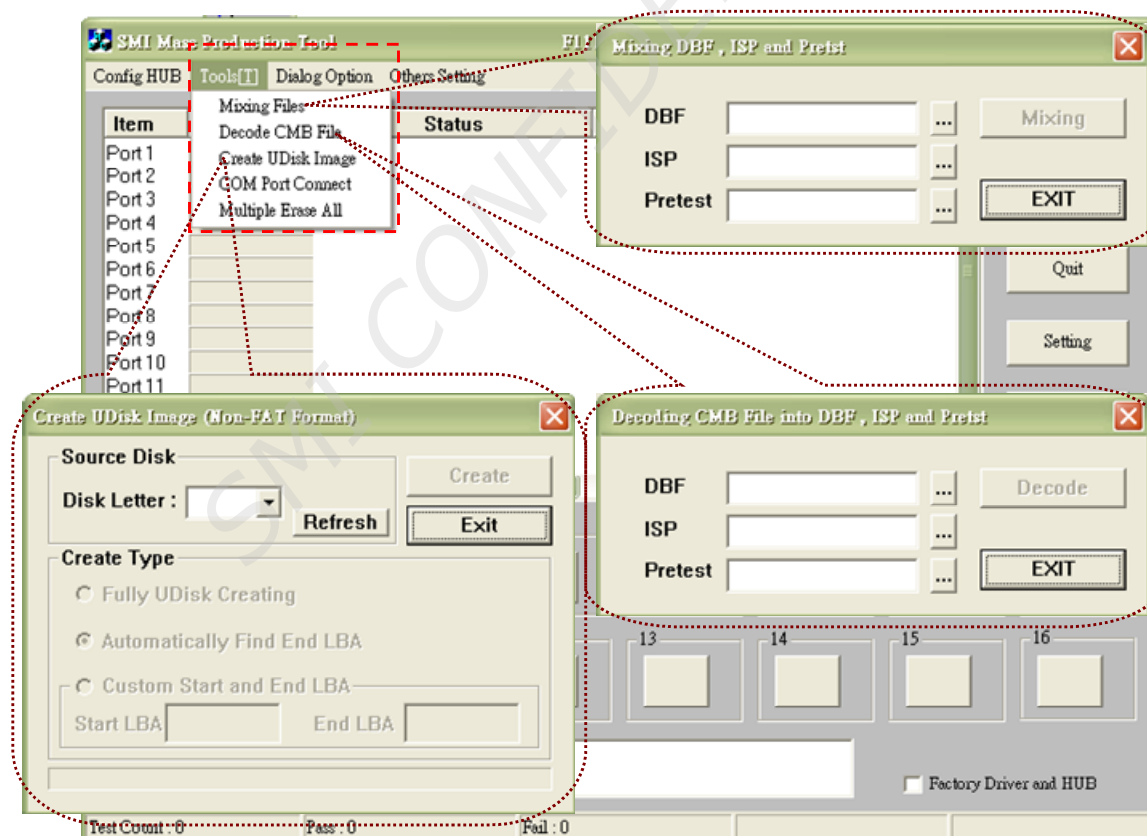


Fig. 12 The tools function and dialog presented.

- Dialog Option:

Setting the UI for 『Fonts Size』、 『Button Hide』、 『Num of Button』 and field show or hide control for the list.(See Fig. 13 ).

■ *Font:*

Setting the font size from 12 to 28.

■ *Button Hide:*

Hiding the buttons and resizing list box into frame size.

■ *Num of Buttons:*

Setting the number of button to display.

■ *Progress:*

Enable the 「Progress」 field in the list box or not.

■ *Status:*

Enable the 「Status」 field in the list box or not.

■ *Capacity:*

Enable the 「Capacity」 field in the list box or not .

■ *Serial Number:*

Enable the 「Serial Number」 field in the list box or not.

■ *VID/PID:*

Enable the 「VID/PID」 field in the list box or not.

■ *Flash ID:*

Enable the 「Flash ID」 field in the list box or not.

■ *Bad Block:*

Enable the 「Bad Block」 field in the list box or not.

■ *Inquiry:*

Enable the 「Inquiry」 field in the list box or not.

■ *Write Protect:*

Enable the 「Write Protect」 field in the list box or not.



Fig. 13 Dialog Option Function.

- Others Setting

- *Extra Setting(Fig. 14)*

It' s used to specific application. These applications are:

- *uDisk Partitions:*

- ◆ Setting the size of Reserve Zone 、Hidden Area and CDRM.

- *The Software USB serial number:*

- ◆ Used to identify the internal product. It's not identical to USB serial number.
- *Preload file into Binary Area:*
  - ◆ There is a simple file system in the ReserveZone, it can support file preload into the reserve zone.
- *Security Disk Support*
  - ◆ There are two modes:
    - Mode-A: The Public/Security mode, just one disk display in the same time.
    - Mode-C: The Public+Public/Security mode, there are two disks display in the same time. The second disk is identical to mode-A.
- *Server Generating SN support*
  - ◆ It needs the socket server to communicate with our MPTool. Just setting the IP address and Port number, our MPTool will negotiate with the server during production.
- *Enable Floppy Support*

- ◆ Setting the one disk become floppy, it also support floppy format to FAT12 and preload functions.

- *COM Communication Settings*

- ◆ Setting the COM port number which connected to 「Auto Handler」 and Enable/Disable the COM port function.

- *Log file settings:*

- ◆ Setup the format of log file and customize information.

- *Enable Unique Serial Number:*

- ◆ If enable this function, MPTool will retrieve the serial number from this ini file only, although used the different INI files.

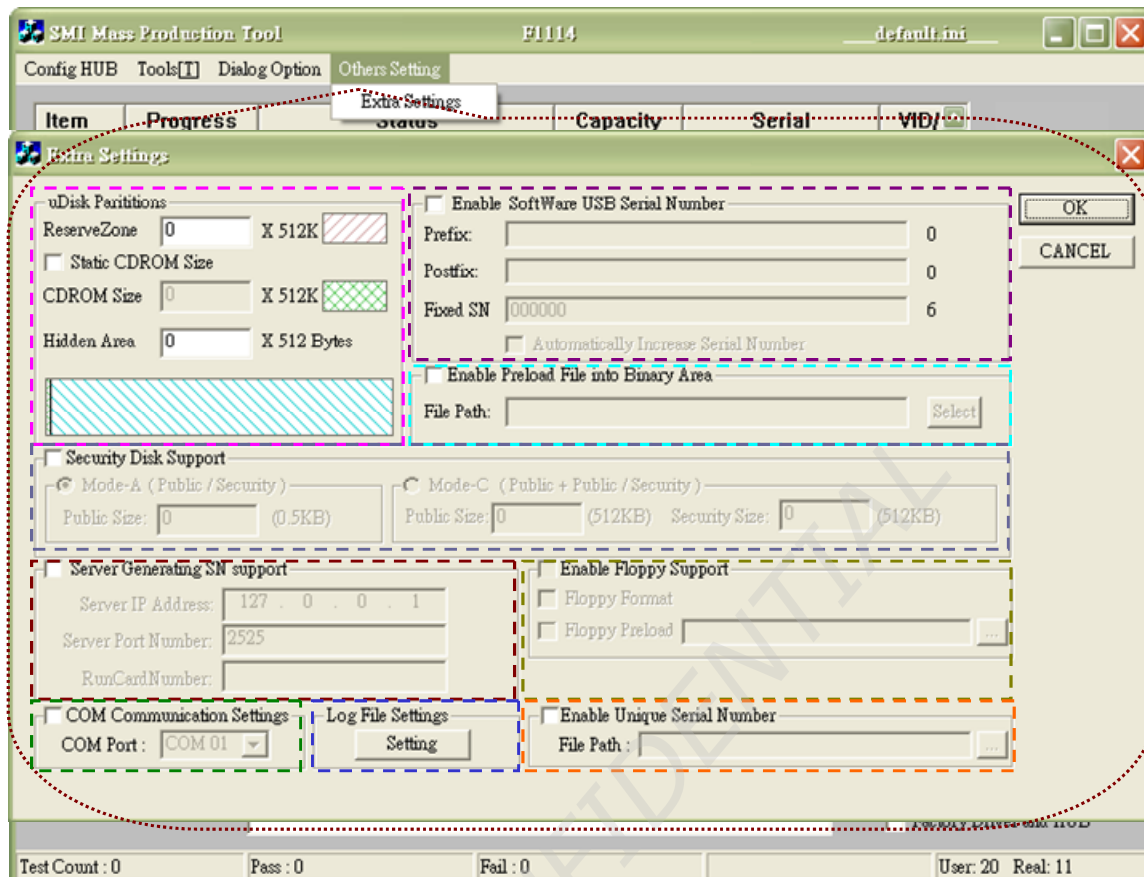


Fig. 14 The Extra Setting Dialog

- Debug Button:

It's for internal debugging using.

- Read CID:

Press the 「Button」 or 「row item」 of mapped USB hub port, the information for device plugged in this port will be presented in Fig. 15. All fields are defined in Table 2.

**Dialog** [X]

Cancel

VID: 090C

PID: 1000

Serial: AA04012700007414

Vendor Str: SMI Corporation

Product Str: USB DISK

Inquiry: SMI USB DISK

ISP Ver: ISP 2006-10-27

System CLK: 1

IC Ver: 321AC

Tester Version: 0F 1114

ISP Check Sum: 0006ADB4

FLASH: **SLC**

	Maker	Device	3rd	4th
A CE0	2C	DC	80	15
A CE1	00	00	00	00
A CE2	00	00	00	00
A CE3	00	00	00	00
B CE0	00	00	00	00
B CE1	00	00	00	00
B CE2	00	00	00	00
B CE3	00	00	00	00

Bad Block: 18

DSP Version:

MP3: [ ]

WMA-H: [ ]

WMA-M: [ ]

ADPCM: [ ]

18,00,00,00,

Save BadBlock Save Info CardMode

Erase CID and ISP

CardMode: [ ]

Fig. 15 The related information of CID.

Table 2 The field Descriptions of CID .

Field	Description
<b>VID</b>	Now the device USB vid string
<b>PID</b>	Now the device USB pid string
<b>Serial</b>	Now the device USB serial number
<b>Vendor Str</b>	Now the device USB vendor string
<b>Product Str</b>	Now the device USB product string
<b>Inquiry</b>	Now the device SCSI inquiry string



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<b>ISP version</b>	Now the device ISP version
<b>System CLK</b>	Now the controller clock setting ,only for 320 controller clock setting.
<b>IC ver</b>	Now the device controller hardware version
<b>Bad Block</b>	Show after pretest , bad block information
<b>ISP Check sum</b>	Read back download isp check sum
<b>FLASH</b>	Show flash maker code 、 device code 、 the 3 <sup>rd</sup> and 4 <sup>th</sup> Byte information.
<b>DSP Version</b>	The SM340 related information.
<b>Save Badblock</b>	It will scan the fully disk to save the all badblock.
<b>Save Info</b>	Save the FlashID 、 CID 、 WPRO 、 PAR 、 CardMode 、 InforBlock(s) and ISP information into file for RD debugging.
<b>Card Mode</b>	It will display the all card mode of current plugged UFD.
<b>Erase CID, ISP</b>	Erasing the current UFD's CID and ISP.

- INI Setting

Below item not show on setting UI , must modify 「ini」 file :

- (1) CUSTOMER
- (2) READCLK
- (3) WRITECLK
- (4) RESERVEZONE

The all field in 「ini」 file description in Table 3.

Table 3 The all field descriptions in the 「INI」 file.

Name	Bytes	Default Value	Descript
<b>SERIALMETHOD</b>	1	0	0: USB serial number is increase 1: USB seial number is 0 2: USB serial number no update



<b>USBMAXPOWER</b>	1	0	0: USB Power define 100mA 1: USB Power define 200mA 2: USB Power define 300mA 3: USB Power define 400mA 4: USB Power define 500mA
<b>DISKTYPE</b>	1	1	0: USB-HDD 1: USB-ZIP
<b>DISKSIZE</b>	1	0	0: No Check DiskCapacity 1: 16M , 2: 32M , 3: 64M , 4: 128M 5: 256M , 6: 512M , 7: 1G , 8: 2G 9: 4G
<b>APPLICATION</b>	1	1	0: Card Reader 1: Flash Disk 2: CardReader+FlashDisk
<b>VID</b>	4	090C	USB Vendor ID
<b>PID</b>	4	1000	USB Product ID
<b>VENDORSTR</b>	20		USB Vendor String
<b>PRODUCTSTRING</b>	20		USB Product String
<b>SERIALBEGIN</b>	20		USB Serial number begin
<b>SERIALEND</b>	20		USB Serial number end , when serial number count to the number , program will stop
<b>INQUIRYSTRING</b>	16		SCSI Inquiry Product String
<b>INQUIRYVENDOR</b>	8		SCSI Inquiry Vendor String
<b>DISKLABEL</b>	32		Disk Volume Label
<b>DID</b>	4	1000	USB bcdDevice version number
<b>DEFAULTISP</b>	1	0	0: Auto Select ISP file download 1: Force select a ISP file download
<b>ISPFIL</b>	256		IF DEFAULTISP equal 1 then download the ISP File
<b>BADBLOCK</b>	1	20	Setting Pretest bad block range SLC must



			more than 20 , MLC must more than 44
<b>CUSTOMER</b>	1	1	For different customer Application used.
<b>AUTORUNFILE</b>	256		Autorun Image file name.
<b>RESERVEZONE</b>	1	0	Reserve data zone , size= n*1024 sector
<b>BOOTTYPE</b>	1	0	0: when format MBR offset 0x1BE=0 1: when format MBR offset 0x1BE=0x80
<b>PRETESTTIME</b>	1	3	0: NO R/W 1: R/W 55 2: R/W 55 AA 3: No Erase
<b>EnableFactoryDriver</b>	1	1	0:Select Default driver 1:Select Factory Driver for test
<b>LEDREADY</b>	1	80	80: Plug in Led ON 82:Plug in Led OFF
<b>LEDBUSY</b>	1	48	Led frequency
<b>PRETEST</b>	1	1	0:disable pretest 1:enable pretest
<b>WRITECID</b>	1	1	0:disable write CID 1:enable write CID
<b>FORMAT</b>	1	1	0:disable format 1:enable format
<b>COPYCOMPARE</b>	1	1	0:disable copy compare 1:enable copy compare
<b>DOWNLOADISP</b>	1	1	0:disable download ISP 1:enable download ISP
<b>MAKEAUTORUN</b>	1	0	0:disable AUTORUN 1:enable AUTORUN
<b>PRELOAD</b>	1		0:Disable Preload 1:Enable the Preload function
<b>CCSCHEDULE</b>	256		Copy Compare schedule list
<b>CCFAILCOUNT</b>	4		0:Failed if one byte different and return false directly. 1: Failed if one byte different but compare until finished.
<b>CCRANDOM</b>			0:Sequence write and sequence read



			1:Random write and random read.
<b>CopyCmpPattern</b>			0:pattern with 0~255 1:pattern with 0 2: pattern with FF 3: pattern with 55 4: pattern with AA 5: pattern with 33 6: pattern with CC 7: pattern with 66 8: pattern with 99 9: pattern with Customize1 10: pattern with Customize2 11: pattern with Customize3 12: pattern with EF Customize1:the customize file path Customize2: the customize file path Customize3: the customize file path
<b>EndInfo</b>			ENDHEAD32:The ENDHEAD value for 32MB flash ENDSECTOR32:The ENDSECTOR value for 32MB flash ENDCYLINDER32:The ENDCYLINDER value for 32MB flash ENDHEAD64:The ENDHEAD value for 64MB flash ENDSECTOR64: The ENDSECTOR value for 64MB flash ENDCYLINDER64: The ENDCYLINDER value for 64MB flash ENDHEAD128:The ENDHEAD value for 128MB flash ENDSECTOR128: The ENDSECTOR value for 128MB flash ENDCYLINDER128: The ENDCYLINDER value for 128MB flash ENDHEAD256:The ENDHEAD value for



			<p>256MB flash</p> <p>ENDSECTOR256: The ENDSECTOR value for 256MB flash</p> <p>ENDCYLINDER256: The ENDCYLINDER value for 256MB flash</p> <p>ENDHEAD512:The ENDHEAD value for 512MB flash</p> <p>ENDSECTOR512: The ENDSECTOR value for 512MB flash</p> <p>ENDCYLINDER512: The ENDCYLINDER value for 512MB flash</p> <p>ENDHEAD1024:The ENDHEAD value for 1024MB flash</p> <p>ENDSECTOR1024: The ENDSECTOR value for 1024MB flash</p> <p>ENDCYLINDER1024: The ENDCYLINDER value for 1024MB flash</p> <p>ENDHEAD2048:The ENDHEAD value for 2048MB flash</p> <p>ENDSECTOR2048: The ENDSECTOR value for 2048MB flash</p> <p>ENDCYLINDER2048: The ENDCYLINDER value for 2048MB flash</p> <p>ENDHEAD4096:The ENDHEAD value for 4096MB flash</p> <p>ENDSECTOR4096: The ENDSECTOR value for 4096MB flash</p> <p>ENDCYLINDER4096: The ENDCYLINDER value for 4096MB flash</p>
<b>ENABLEENDCHS</b>			<p>0:Using the system default EndCylinder, EndHead and EndSector</p> <p>1:Using the manual setting in 「EndInfo」</p>
<b>ITEMCOUNT</b>	4		The number of end info in the list
<b>APP3IN1=0</b>	1	0	Support Autorun+Public+Security UFD production
<b>CIDPATH</b>	256		For SM340 CID existed folder



<b>ROMPATH</b>	256		For Sm340 Rom file existed path
<b>PRELOADPATH</b>	256		Preload file path
<b>PARTIALSIZE</b>	4		For partial flash setting.
<b>ENABLEPARTIAL</b>	1		Enable the partial flash support or not.
<b>ISNR</b>	1		For NR flash
<b>ISMICRON</b>	1		For Micron flash
<b>ISAGAND</b>	1		For AGAND flash
<b>FONTSIZE</b>	2		The Font size value
<b>NUMOFBUTTON</b>	2		The number of button for display
<b>PROGWIDTH</b>	4		The width of Progress field
<b>STATUSWIDTH</b>	2		The width of Status field
<b>CAPWIDTH</b>	2		The width of Capacity field
<b>SNWIDTH</b>	2		The width of Serial Number field
<b>VIDPIDWIDTH</b>	2		The width of VID/PID field
<b>FLASHIDWIDTH</b>	2		The width of Flash ID field
<b>BADBLOCKWIDTH</b>	2		The width of Bad Block field
<b>WPWIDTH</b>	2		The width of Write Protect field
<b>INQWIDTH</b>	2		The width of Inquiry field
<b>ENPROG</b>	1		0: Hide the Progress Field 1: Show the Progress Field
<b>ENSTATUS</b>	1		0: Hide the Status Field 1: Show the Status Field
<b>ENCAP</b>	1		0: Hide the Capacity Field 1: Show the Capacity Field
<b>ENSN</b>	1		0: Hide the Serial Number Field 1: Show the Serial Number Field
<b>ENVIDPID</b>	1		0: Hide the VID/PID Field 1: Show the VID/PID Field
<b>ENFLASH</b>	1		0: Hide the FlashID Field 1: Show the FlashID Field
<b>ENBADBLK</b>	1		0: Hide the Bad Block Field 1: Show the Bad Block Field
<b>ENINQ</b>	1		0: Hide the Inquiry Field 1: Show the Inquiry Field



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<b>ENWP</b>	1		0: Hide the Write Protect Field 1: Show the Write Protect Field
<b>BUTTONHIDE</b>	1		0: Show the Button 1: Hide the Button
<b>AUTOCAPACITY</b>	1		0: Disable auto capacity function. 1: Disable auto capacity function
<b>SNLEN</b>	4		Serial Number Length
<b>SERIALMASK</b>	20		The Mask of Serial number
<b>AUTODATE</b>	1		0: Disable the auto date in the mask 1: Enable the auto date in the mask
<b>AUTODATESTART</b>	2		The start position of Date in serial mask
<b>AUTODATEEND</b>	2		The end position of date in serial mask.
<b>CLUSTERTYPE</b>	1	1	If the value is 1 for normal Cluster size, if set to 0, SONY FAT32 over 4GB will fit to 32KB cluster size.
<b>DISABLEK9F2GFORCEID</b>	1	0	0: Enable the K9F2G A-Dye 2Plane mode. 1: Disable the K9F2G A-Dye 2Plane mode.
<b>MSC</b>	1	1	0: Disable SM321BB support Case 13 but enable the AutoRun function. 1: Enable SM321BB support Case 13 but disable the autorun function.
<b>ENABLEFINGERPRINTCHECK</b>	1	0	0: Disable automatic install/Uninstall factory driver 1: Enable automatic install/Uninstall factory driver.