

Windows Studio ITS User Guide

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Date:	

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Revision History

Version	Date	Author	Description
1.0.0.0	2020/03/08	Randy Huang	First Release.
1.0.0.1	2020/03/09	Max	Text modification
1.0.0.2	2020/07/23	Randy Huang	FW upgrade modification. Auto scan channel modification. Scan frequency spectrum modification. Sensor test modification
1.0.0.3	2020/12/25	Randy Huang	Update OS requirement. Update console function. Update Key function. Add MicroOpen test. Add Sensor test setting flow.
1.0.0.4	2020/04/09	Randy Huang	Update the painting function table. Update the frequency spectrum. Add setting single node threshold at Uniformity/MicroOpen function. Add FPC mode test.
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1.0.0.8	2021/10/12	Joe Hung	Add Wifi ITS connection and intro.
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1.0.1.0	2022/02/09	Evayn Cheng Steven Sun	1. Add the description of Auto Gen. Function. 2. Text modification. 3. Add Report Mode instructions. 4. Add FPC Mode instructions.
1.0.2.0	2022/04/15	Evayn Cheng	1. Modify UI for the stylus project 2. Modify Tuning function description 3. Modify UI of FW Upgrade 4. Update UI of the Drawing test.
1.0.2.1	2022/05/10	Evayn Cheng	1. Modify sensor test UI. 2. Add console tool description

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1.0.2.2	2022/07/27	Steven Sun	1. Modify sensor test UI-Setting / GPIO / Painting 1. Add new function and UI for uniformity Raw Data Test 2. Add new function read FW ID/Custom ID/EDID...
1.0.3.0	2022/11/03	Evayn Cheng/ Joe Hung/ Steven Sun	1. Modify UI 2. Add C model description

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1. Introduction

ILITEK TP Test Studio supports USB and I2C interface (connect with ILITEK Bridge). It has 3 parts of the main function as bellows:

Sensor Test: Quality test of sensors for Mass production

Tuning: Tuning parameters for performance adjustment.

Debug: Performance and data observation.

Requirement

- RAM: 4G RAM above.
- (Operation System, OS): Windows 7 above.

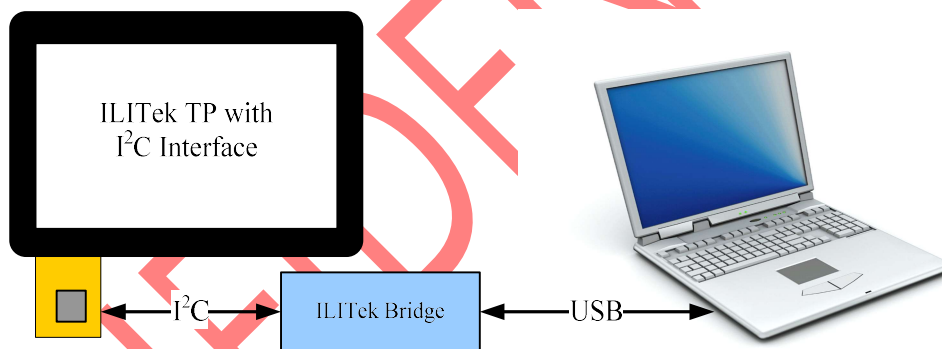


Fig 1-1 I2C interface (ILITEK Bridge must)

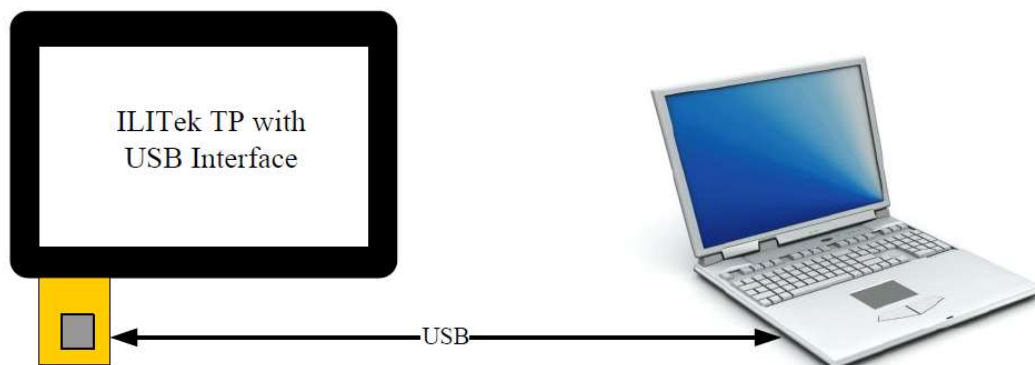


Fig 1-2 USB interface

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➤ ILITek Bridge (I2C to USB)

Tool must use an ILITEK bridge to connect touch controller while interface is I2C.

The bridge firmware version must be newer than V3.1.0.0(include V3.1.0.0)

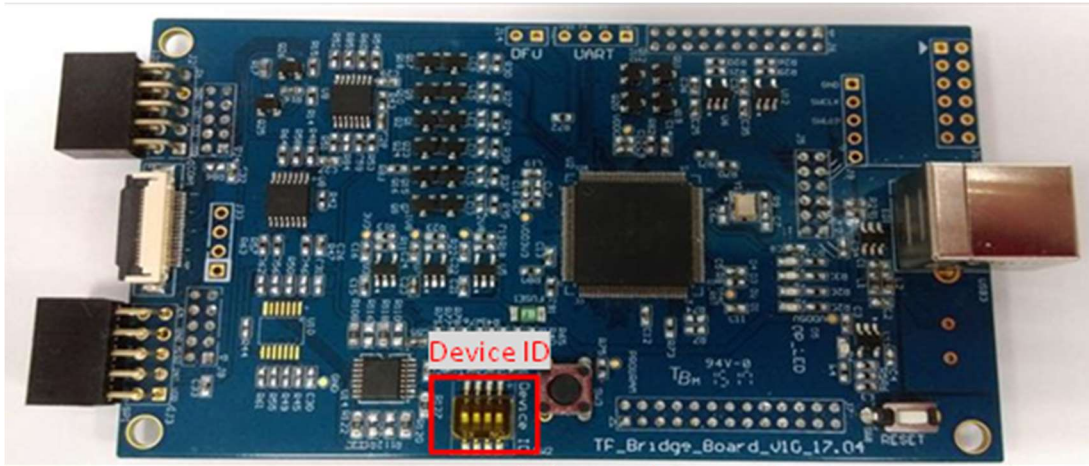


Fig 1-3 ILITEK Bridge V10

2. Wifi ITS - Remote Device Connection via Wifi/Socket

Wifi ITS - Remote Device Setting and Steps

Wifi ITS is a function that could access the remote Linux-OS-based device which ILITEK Touch IC is connected to. Before connection via Wifi ITS, please check the list as below.

- Wifi ITS requires two Tools executed at the same time as below.
 - ITS Studio, which supports Wifi ITS function, executed on Windows device.
 - ILITEK Linux Daemon Tool, which supports Wifi command, executed on Linux-OS-based device.
- Should have Linux Daemon Tool provided by ILITEK.
- Both Linux-OS-based remote device (Client) and Windows ITS device (Host Server) are connected to the same IP domain.

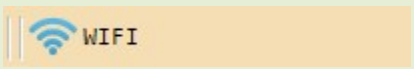
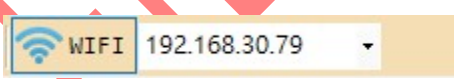
項目	名稱	說明	
1	Wifi ITS	Icon	Description
			Wifi ITS disable
			Wifi ITS enable, Please select the correct server IP
2	Connect button	Status	Description
		Disconnect	not connected/ Wifi and remote device is disconnected
		Wifi Connecting	Wait for remote device connection
		Connect	Remote device is connected/ click again to disconnect

Table 2-1 Wifi ITS connection

The overall architecture of Wifi ITS is shown below.

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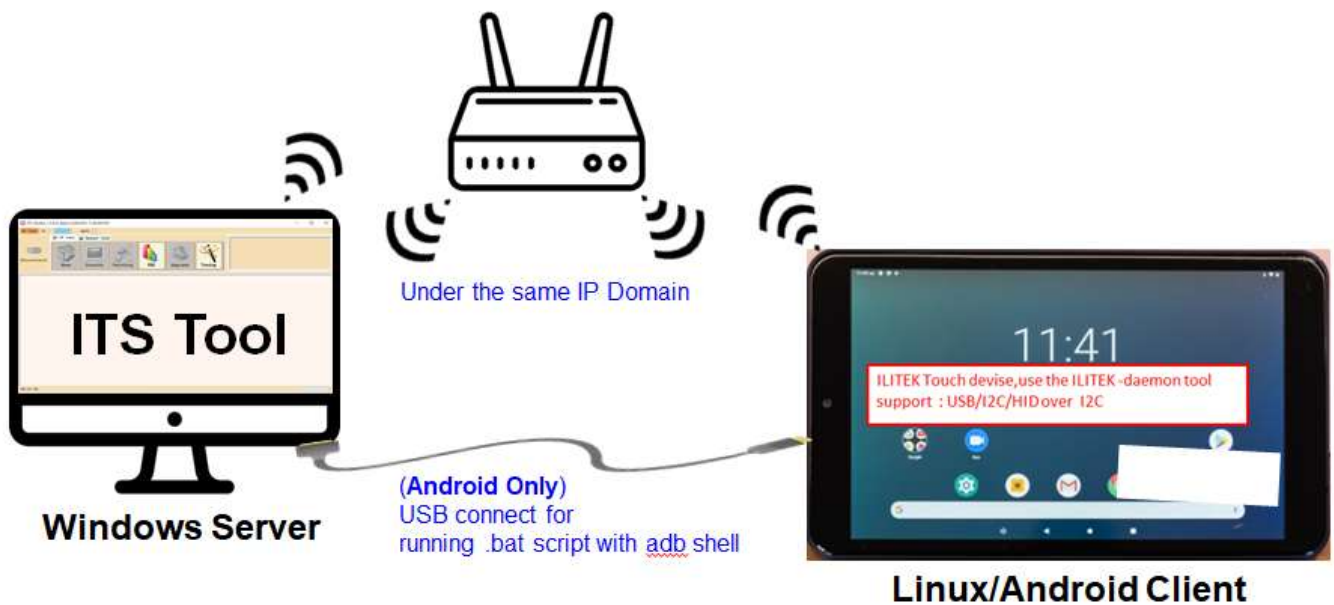

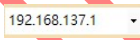




Fig 2-1 Wifi ITS Architecture

Settings for Remote Device Connection

Please following below steps to connect Wifi ITS with Remote Device.

1. Enable Wifi ITS button 
2. Select corresponding Server IP  (under the same IP address with Remote Device)
3. Click connection button , Wifi ITS Server would start to wait Slave connection.
4. Use Wifi Setting Windows at down-left side to create script (/Script/Wifi_Daemon_Init.sh), then execute it at Remote Device.
5. After successfully connect , ITS main functions would be available as usual.

For users, who don't know how to use ILITEK Daemon Tool, setting windows would be shown after enabling Wifi ITS button. After setting and clicking "Apply All" button, it would create a .bat and .sh file in "Script" folder under the same directory of ITS_Studio.exe. .bat file is generated for Android remote device, and .sh file is generated for Other Linux-OS-based remote device. If users know how to use ILITEK Daemon Tool on remote device, please ignore the setting window.

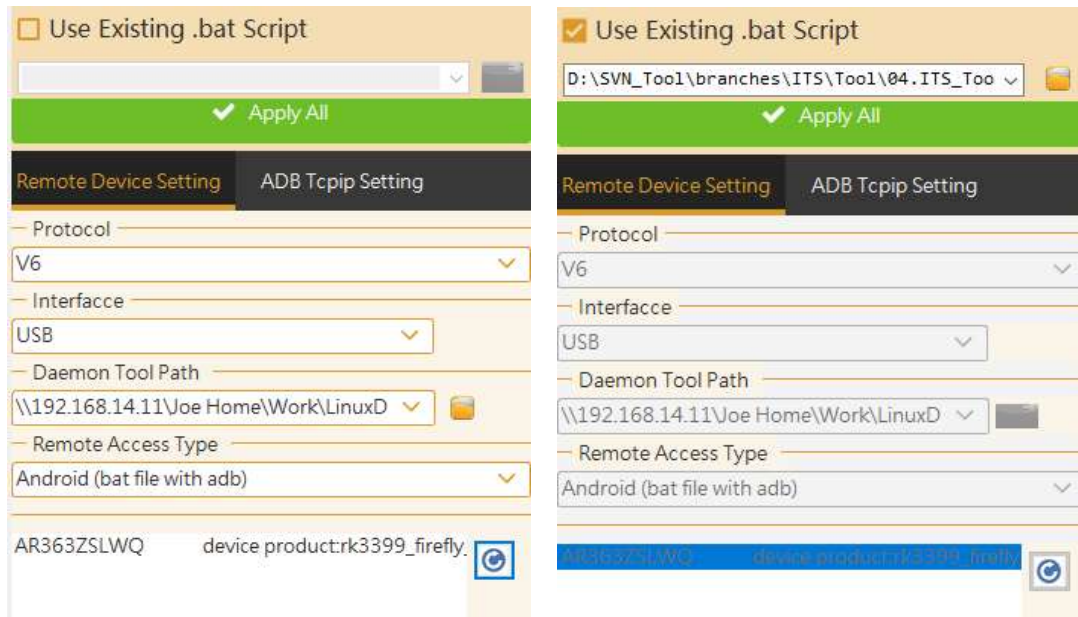


Fig 2-2 Setting window after clicking connection button

Please follow below steps according to different Remote Device.

a. Android Remote Device

1. To automatically adb push ILITEK Linux Daemon Tool into Remote Device, **please firstly connect USB between remote device and ITS host device.**
2. Select "Remote Access Type" as Android, connected android devices would be listed below. If no devices pop up, please check USB connection and press "refresh" button again, then choose a device that ITS should connect to.
3. If users would like to set adb connection wirelessly, please refer to following chapter about adb tcpip setup. **If Android device reboot and unable to connect IP automatically, we suggest that connect USB again then set adb tcpip again.**
4. Select ILITEK Touch IC Protocol and Interface, and the path of ILITEK Linux Daemon Tool.
5. After press "Apply All" button, .sh and .bat script would be created and automatically executed.

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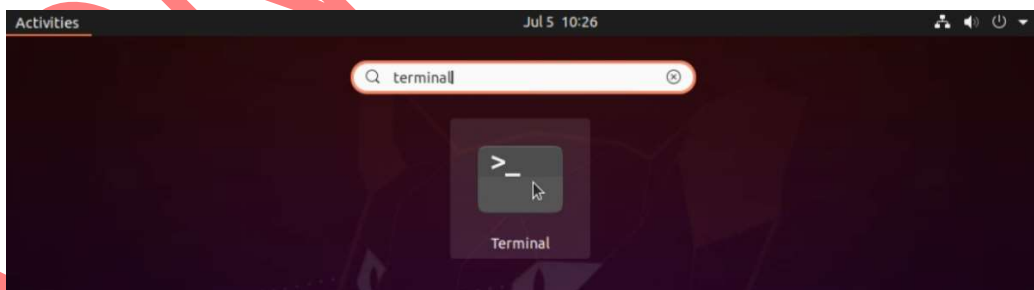
b. Other Linux-OS based Remote Device

1. Select ILITEK Touch IC Protocol and Interface, and the path of ILITEK Linux Daemon Tool.
2. Select “Remote Access Type” as Other Linux OS, then press “Apply All” button.
3. Afterward, .sh script would be generated, please put .sh script and ILITEK Daemon Tool under the same directory in remote device via SSH or USB drive. Then, chmod it to be executable, and run the .sh script. Wifi ITS should be connected. Please refer to next page (Ubuntu demo.) for more detailed description.

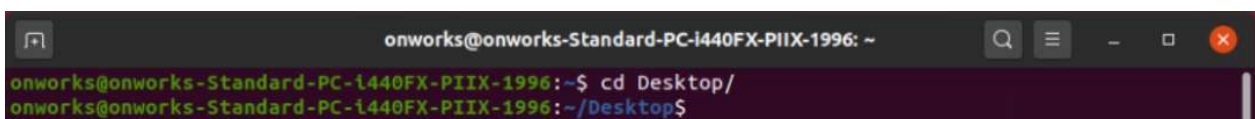
※ Created Wifi_Daemon_Init.bat/ Wifi_Daemon_Init.sh script would be put into Script folder in the same directory of ITS_Studio.exe.

Steps for Ubuntu-OS (or Other Linux-OS-based device).

1. Please finish Wifi ITS setting window first, and “Remote Access Type” should be “Other Linux-OS”. After clicking “Apply All” button, “Wifi_Daemon_Init.sh” would be created under the same directory as ITS_Studio.exe.
2. Put ILITEK Daemon Tool and “Wifi_Daemon_Init.sh” to the same directory with executable path, ex. Desktop or Download.
3. Open a Terminal (Ctrl + Alt + T), and check ILITEK Daemon Tool is executable as below.
 - a. Open a Terminal (Ctrl + Alt + T)



- b. Go to the path of tool and script. cmd: “cd <Path to ILITEK Daemon Tool and .sh file>”



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- c. change tool to be executable. cmd: "chmod 777 <ILITEK Daemon Tool Path>"

```
onworks@onworks-Standard-PC-l440FX-PIIX-1996:~/Desktop$ chmod 777 ./ilitek_ldv3_0_6_1_x86_64
onworks@onworks-Standard-PC-l440FX-PIIX-1996:~/Desktop$ ls -l
-rwxrwxrwx 2 onworks onworks 4096 Nov 29 2020 ilitek_ldv3_0_6_1_x86_64
-rw-r--r-- 2 onworks onworks 4096 Nov 29 2020 Wifi_Daemon_Init.sh
```

4. ITS Tool should be Wifi Connecting state, run the scrip, cmd: "source <.sh File Path>"

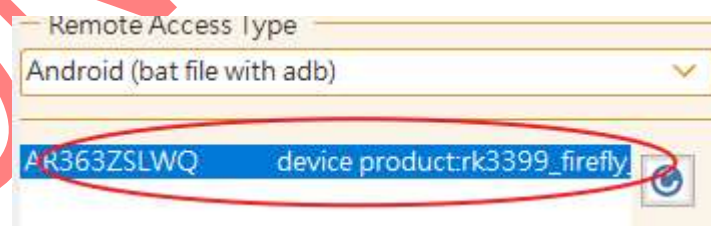
```
onworks@onworks-Standard-PC-l440FX-PIIX-1996:~/Desktop$ source ./Wifi_Daemon_Init.sh
open_usb_hid_device, ILITEK usb_hid device found, devnum=4, 0x222A:0x0001
Change to Suspend mode:Success
Para:USB
Server IP: 192.168.137.1
Send Buffer Size: 524288 bytes
```

5. Daemon Tool is ready for Wifi ITS connection, please check connection status of ITS Studio.

Steps for Android - ADB Wireless Setting

Before adb wireless had been set up, or after Android reboot, please connect USB wire between Android device and Host PC.

1. Enable Android Wifi function, and connect to the same IP domain as Host PC manually.
2. Select "Remote Access Type" as "Android", ADB Tcpip Setting tab would pop up.
3. Firstly check Android device is shown in devices list below. If usb is connected and devices do not show below, please try to press "refresh" button at right side.



4. Press "ADB Tcpip Setting" tab, please press "Get Remote Device IP" firstly. Wifi connection information would come up below. Please try to find IP address of Android device. If Wifi is connected, please find keyword "wlan". If Ethernet is connected, please check keyword "eth".
5. Key in IP address in text box of "Remote Device IP".

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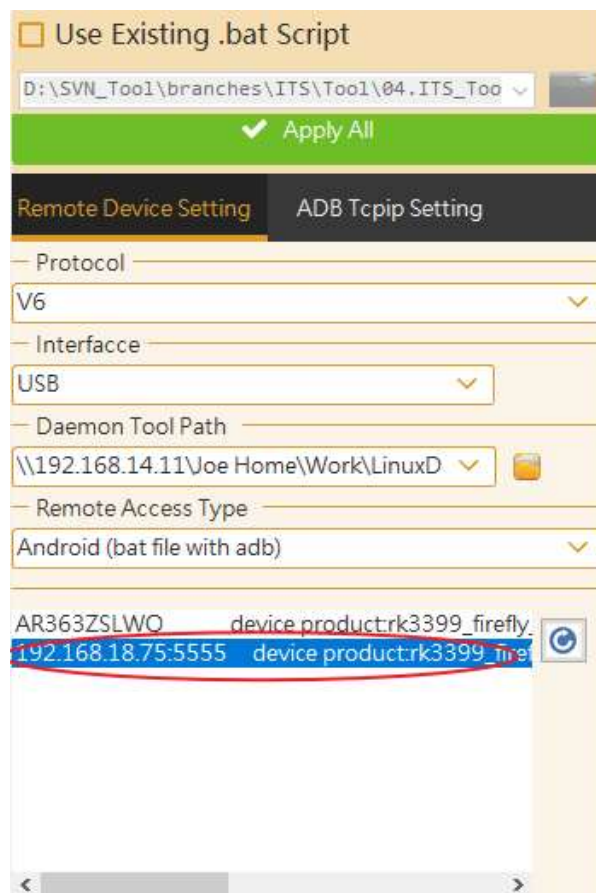
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6. Press “Setup ADB Tcpip” button. If specific window pops up as below figure, it means adb tcpip has been set up successfully. We suggest user should remove USB connection now at this moment.



7. Back to “Remote Device Setting” tab, please press “refresh” button again. New adb device should pop up with Android device IP, which was set before, please choose this one then press “Apply All”.



Wifi ITS Connection Anomaly Handling

Please check with steps from top to bottom listed below. **If it could not solve your issue, please notify ILITEK for help.**

a. Please check error message when executing Wifi_Daemon_Init.sh/.bat, the most common error listed below:

- **adb.exe not found:** Please check you do have adb.exe in /Script/. folder, under the same directory of Windows_Studio_ITS.exe.
- **adb.exe run failed:** Please check USB connection between remote device and PC.
- **Linux_Daemon_ITS tool not found:** Please check you do have *_arm/*_arm64/*_x86_64 tools in /Linux_Daemon_ITS/. folder, under the same directory of Windows_Studio_ITS.exe.

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- **Linux_Daemon_ITS run failed:** Please check connection between remote device and ILITEK controller. For I2C interface, please check ILITEK I2C Driver is installed normally. For USB interface, please try to find ILITEK devices with command “lsusb”. For HID-over-I2C interface, please check ILITEK file node with /dev/hidraw* is created normally.

- b. Please check Windows_Studio_ITS program is allowable as an exception for Windows firewall. Find “Windows Firewall” or “Windows Defender Firewall”, and choose “Allow an app or feature through Windows Firewall”. Please make sure ITS Studio is checked as below.



3. Main Tool Function

Home

The Home function shows TP information

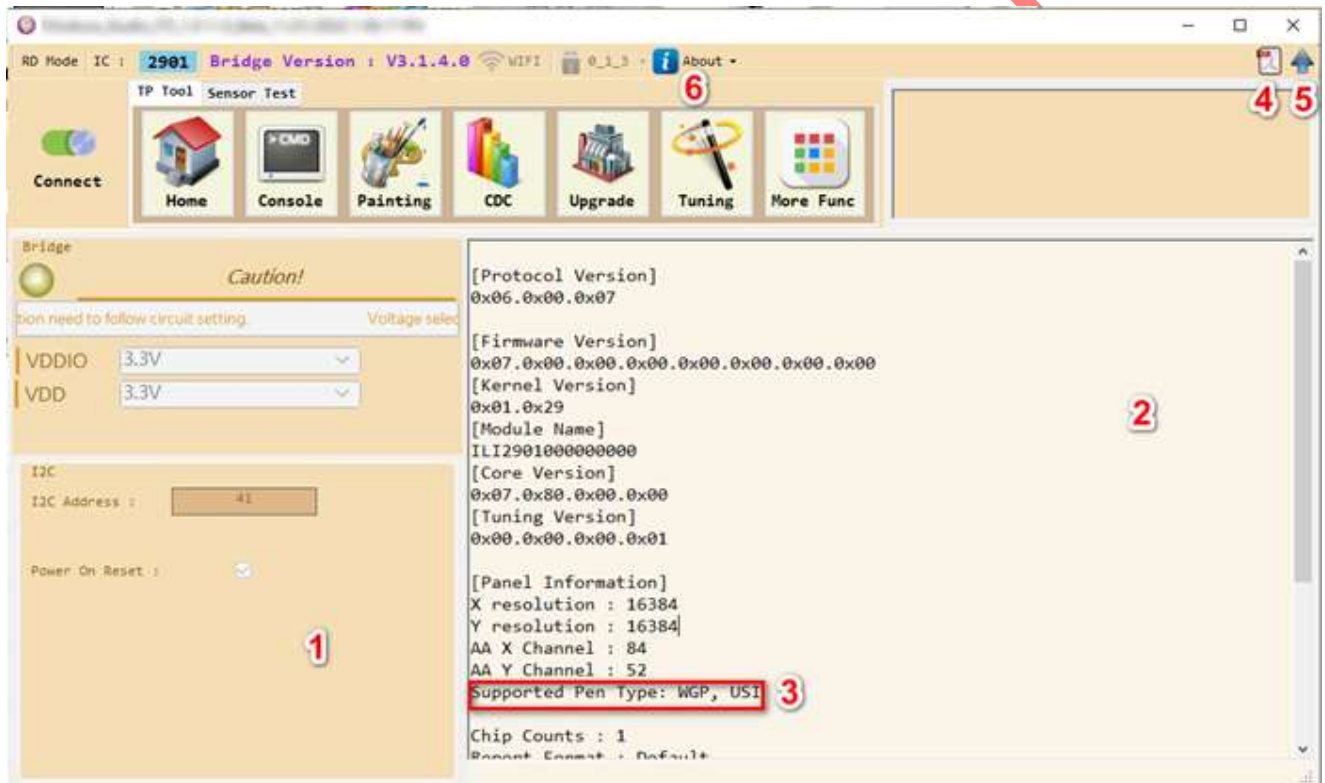


Fig 3-1 Home function

The detailed description of the Home function:

Item	Name	Description
1	Bridge Set-tings	<ul style="list-style-type: none"> For bridge board setting, this screen is hidden automatically if the device is detected as USB. You can use Alt + B to open or close the page. When using a bridge connection, the bridge fw version will be checked and the following message will pop up if the version is wrong

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2	Protocol Version	Version of report protocol
	Firmware Version	Development version of FW
	Kernel Version	IC type.
	Core Version	Algorithm version of FW.
	Tuning Version	Tuning version.
	X/Y Resolution	X/Y resolution
	AA X/Y Channel	Channel number of TX/RX.
	Support Fingers	Number of support finger.
	Support Touch Keys	Keys numbers.
	Chip counts	The number of chips
	Report Format	Report format
	Current mode	The mode of IC running.(AP mode or BL mode)
	FW CRC	The check code of firmware.
	Support Touch Keys	The number of supporting hardware keys or virtual keys
3	Supported Pen Type	To display stylus mode, it only show on stylus mode
4	Manual	Show the manual
5	collapse	Collapse the function bar

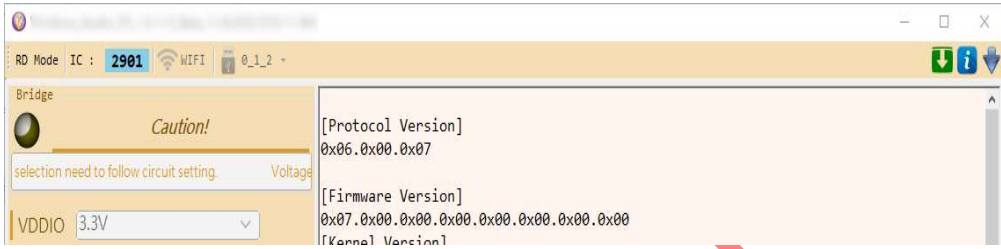
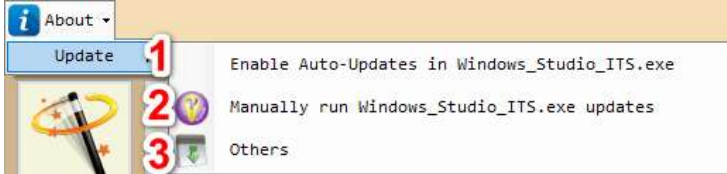
		
6	Download	<p>Click it and pop out of the download tool</p>  <ol style="list-style-type: none"> 1. When running Windows_Studio_ITS.exe, it will start detecting if there is a new version of Windows_Studio_ITS.exe available 2. Update Windows_Studio_ITS.exe manually. 3. Download or update extra functions of Windows_Studio_ITS.exe.

Table 3-1 Home function table

ITS Tool Auto-Updates

Starting from V1.0.11.0, ITS Tool provides an automatic update function. If a newer version of ITS Tool is detected when running ITS Tool in **RD mode** in a networked environment, a message will pop up prompting the user to update; conversely, the automatic update function of ITS Tool will be automatically disabled when running sensor test in **OP mode**.

The following conditions will occur when the automatic update is provided:

Case 1: If there is no network communication, a message will pop up, click confirm then ITS Tool will enter into use.

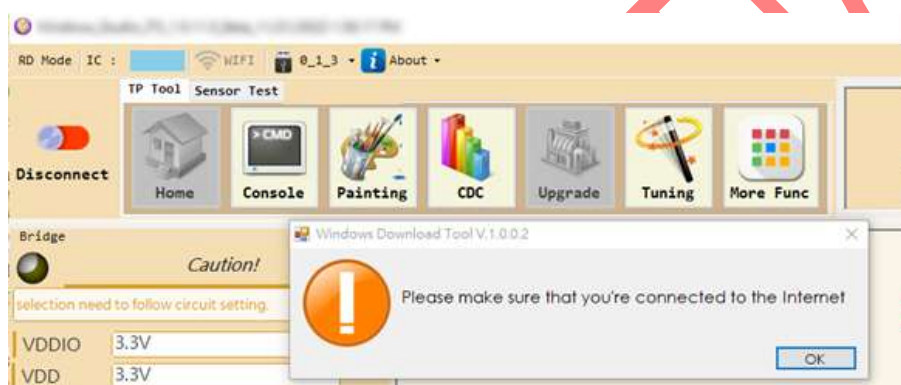


Fig 3-2 no network communication

Case 2: If there is network communication, ITS tool can be updated to the newest version



Fig 3-3 update window message

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The message reminds that ITS tool can be updated immediately or be updated next time, if you choose update ITS Tool next time, and you can set a reminder message to tell how often.

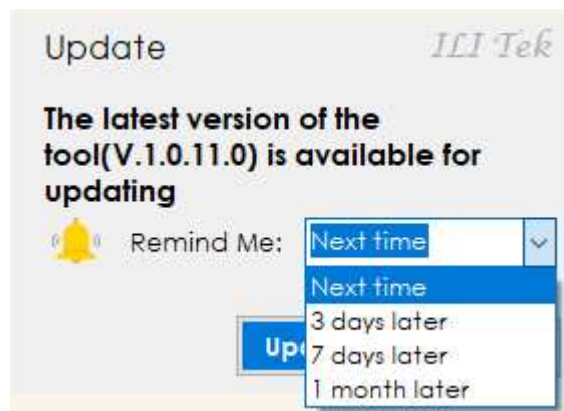


Fig 3-4 if you choose not to update, you can set the next time to remind

After updating, Fig 3-5 will pop-up and to update, re-start ITS Tool immediately.



Fig 3-5 update window

Case 3: If your ITS tool version is detected after the automatic update is turned on in a normal network communication environment, you need to force the update.

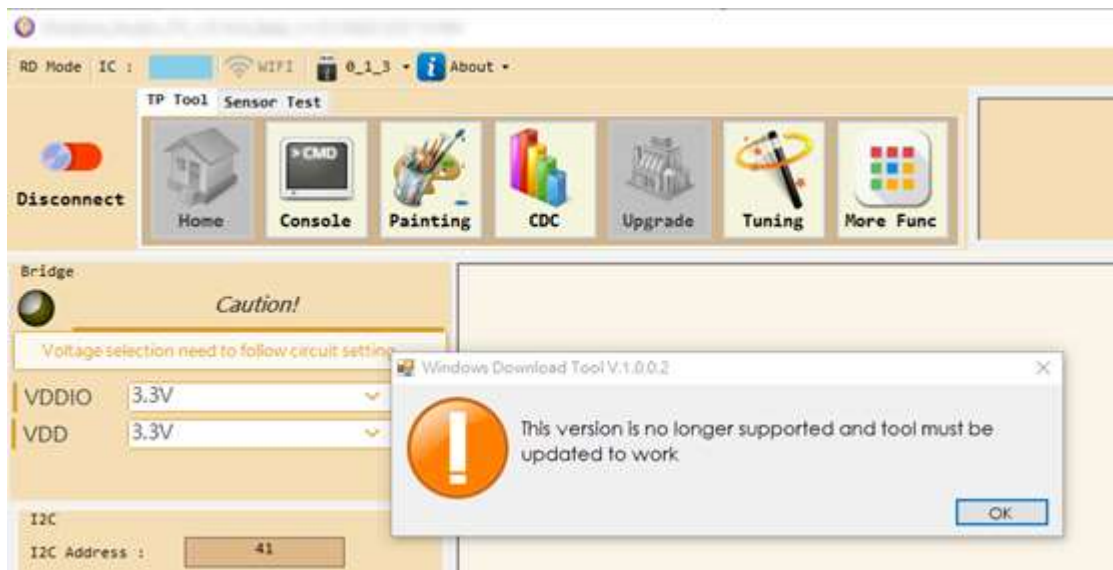


Fig 3-6 force to update

The following icon pops up, perform the update, and after the update, ITS Tool restarts.

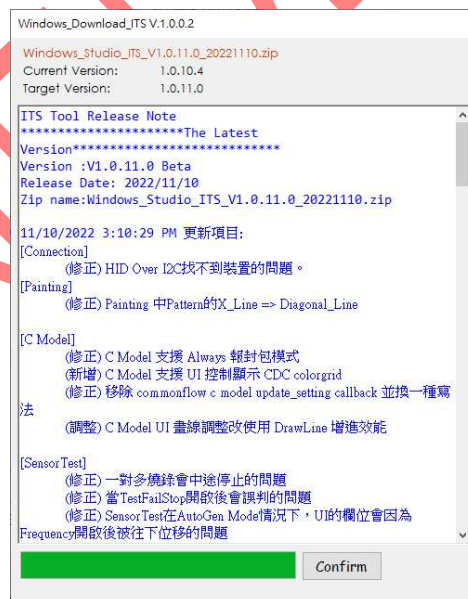


Fig 3-7 update window

Case 4: If you do not want to automatic updates of Windows_Studio_ITS.exe, please uncheck Enable Auto-Updates Windows_studio_ITS.exe.

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Fig 3-8 Disable “Enable Auto-Updates in Windows_Studio_ITS.exe”

Case 5: Windows_Studio_ITS.exe is shown as the latest version.

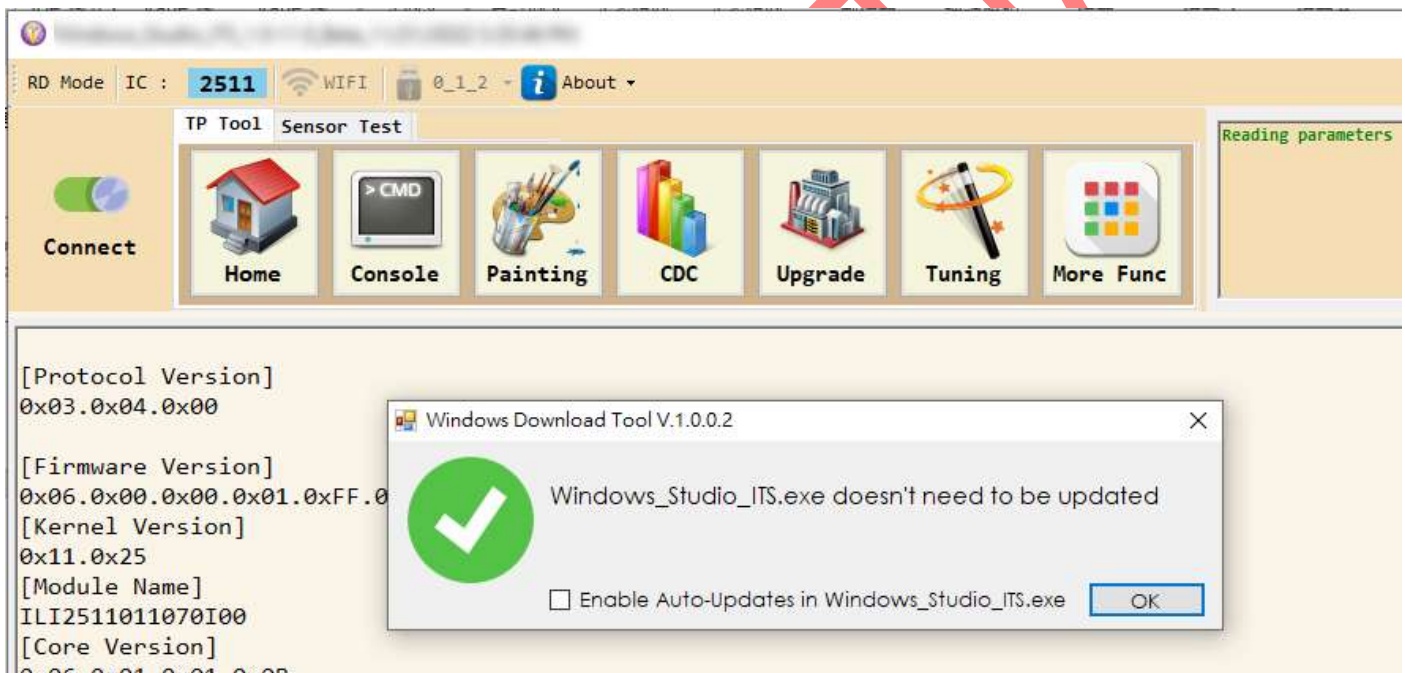


Fig 3-9 Windows_Studio_ITS.exe is the latest version

Download

To download the extra tools of ITS Tool, when you click the download button, the download tool will pop out, tool shows what tools can be downloaded, tool size and tool exists or not.

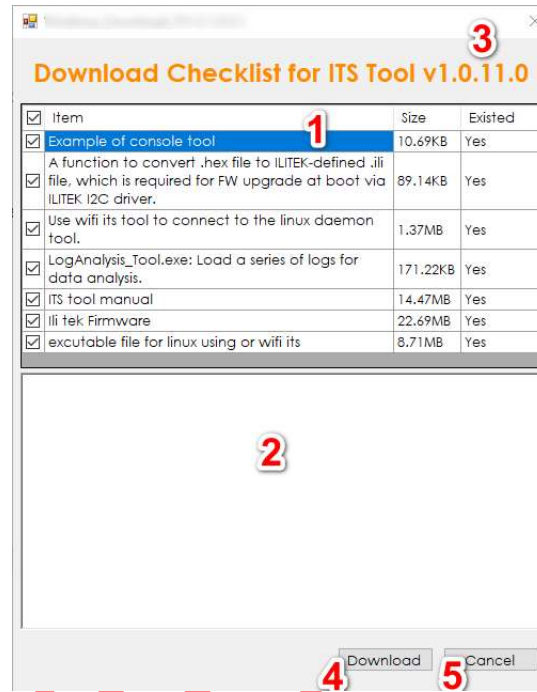


Fig 3-10 download page

Item	Name	Description
1	Item List	List the items available for download and the size of each item and whether the item exists in the current folder
3	Status	Show download progress
4	Show Version	Show the ITS Tool version
5	Start to download	Start to download
6	Cancel	Cancel

Table 3-2 download UI description

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Name	Description
Example of console tool	To download Batch\
A function to convert .hex file to ILITEK-defined .ili file, which is required for FW upgrade at boot via ILITEK I2C driver.	To download ILITek_HexToILI.exe;ilitek_ic_info.ini
Use wifi its tool to connect to the linux daemon tool.	To download Script\
LogAnalysis_Tool.exe: Load a series of logs for data analysis.	To download LogAnalysis_Tool.exe
ITS tool manual	To download the manual
Ili tek Firmware	To download firmware files.
executable file for linux using or wifi its	To download Linux_Daemon_ITS\

Table 3-3 Download Item

Item	Command	Format
1	Write	Write [Report ID] [Cmd Header] [Length] [Cmd Data] Ex: 03 A3 01 20 The command only supports hexadecimal system
2	Read	Read [Report ID] [Cmd Header] [Length] Ex: 03 A3 10 The command only supports hexadecimal system
3	Delay	Delay [Time ms] Ex: Delay 10 The command only supports decimal system
4	Forloop	Forloop,int(repeat Time) #The commands under for need to be tabbed, please do not use spaces #For loop only supports single layer, please do not use multiple layers Ex: Forloop,100 Write,03,A3,01,20 Delay,10 Read,03,A3,10 Delay,10
5	#	Note

Table 3-5 Console script description

Painting

The Painting function (List mode) can show drawing, FW status and coordinates.

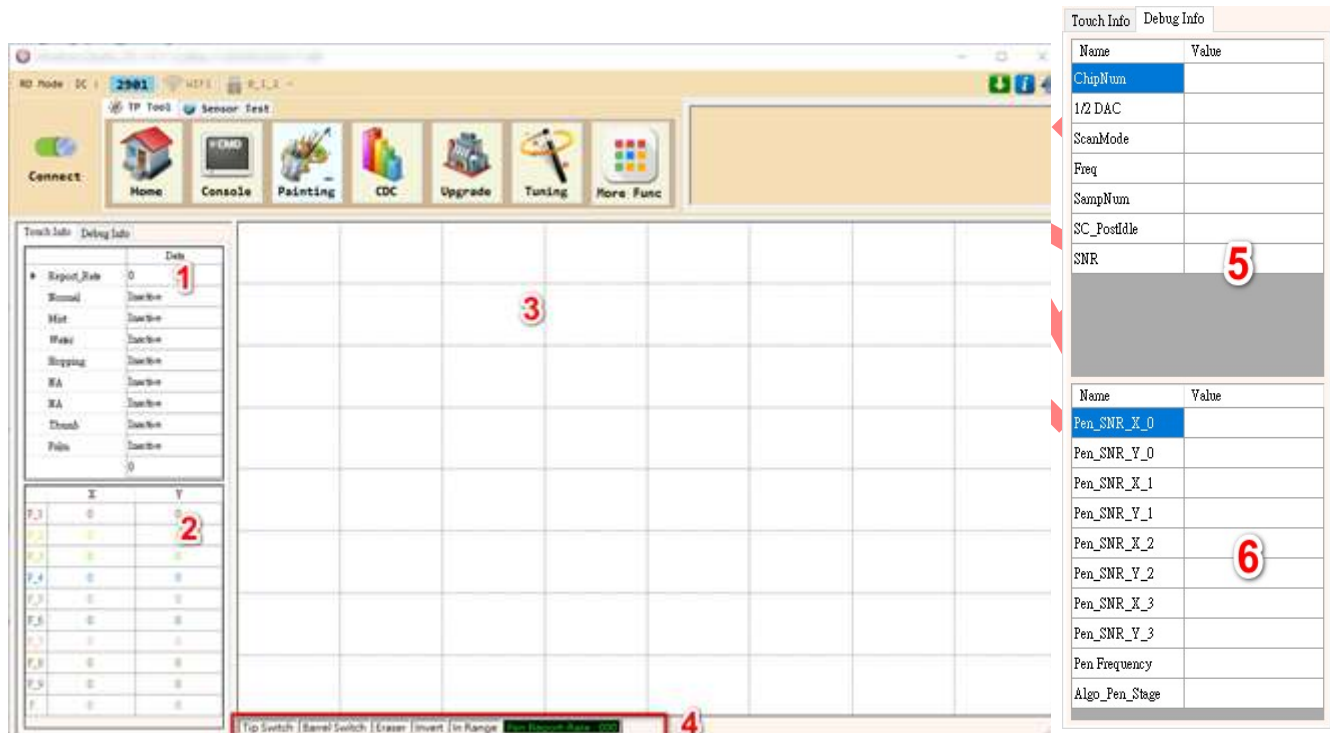



Fig 3-12 Painting function (List mode)

The detailed descriptions of the Painting function (List mode)

Item	Name	Description
1	Mode status	Show report rate and FW mode.
2	Coordinate	Show touch coordinate.
3	Drawing board	Click right button can activate further functions. 

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		The detailed descriptions of the drawing board function (List mode) as (table 3-7)
4	The status of stylus	Shows the information of using stylus New Pressure: the value by pressure.
5	Location	show the coordinate point
6	SNR	Calculate SNR of the pen

Table 3-6 Painting function (List screen) table

Function	Description
Clear (Keyboard “C”)	Clear drawing canvas
Resolution	Keep_aspect_ratio: shrink drawing area with same aspect ratio for border checking. Fill Form: full screen in drawing box.
Mode	ListMode: Non-full screen FullScreen: Full screen
Background Color	Canvas Color <ul style="list-style-type: none"> • White • Black
Pattern	Canvas Auxiliary Lines <ul style="list-style-type: none"> • Straight Line • X Line
Spin	<ul style="list-style-type: none"> • Horizontal: rotate the image to flip it horizontally • Vertical: rotate the image to flip it vertically
Pen Pressure Effect	Tracking thickness of stylus <ul style="list-style-type: none"> • None : normal • X1: one time the size of original tracking • X2: two times the size of original tracking
Performance	<p>This function provides real-time touch report performance analysis.</p> <p>Two columns would appear on the info. panel as below.</p> <p>1. GapRatio:</p>

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	<p>What is the biggest ratio of the gaps between consecutive reported positions ?</p> <p>This item measures the Euclidean distance between each (x, y) coordinate for a finger id, then computes the ratio of those distances and their neighbors.</p> <p>A smooth and constant speed tracking line should have roughly equal gaps between consecutive reports. If there are dropped frames, smoothing issues or inconsistent scans, some gaps may be much larger than others, then causing larger gap ratio as the result.</p> <p>2. Gitter:</p> <p>How stationary was the finger ? This item measures the maximum distance between any two (x, y) coordinates reported for a finger id and makes sure there wasn't too much movement.</p> <p>This is used when a finger is meant to be completely stationary, and reported coordinates should be locked in certain range.</p> <p>If LCM_PHYSICAL_X/LCM_PHYSICAL_Y are set in PaintTool.ini file, maximum distance would be unit in mm.</p>
Touch Up Circle	Show the circle icon when touch release.
Pen Status Bar	Whether to show Pen Status Bar (Full Screen can use it too)
Record(Ctrl+R)	Start to record or stop recording.

Table 3-7 Drawing board function table

The Painting function (Full screen) is same with List mode, but it has the extra function button do clear and exit.

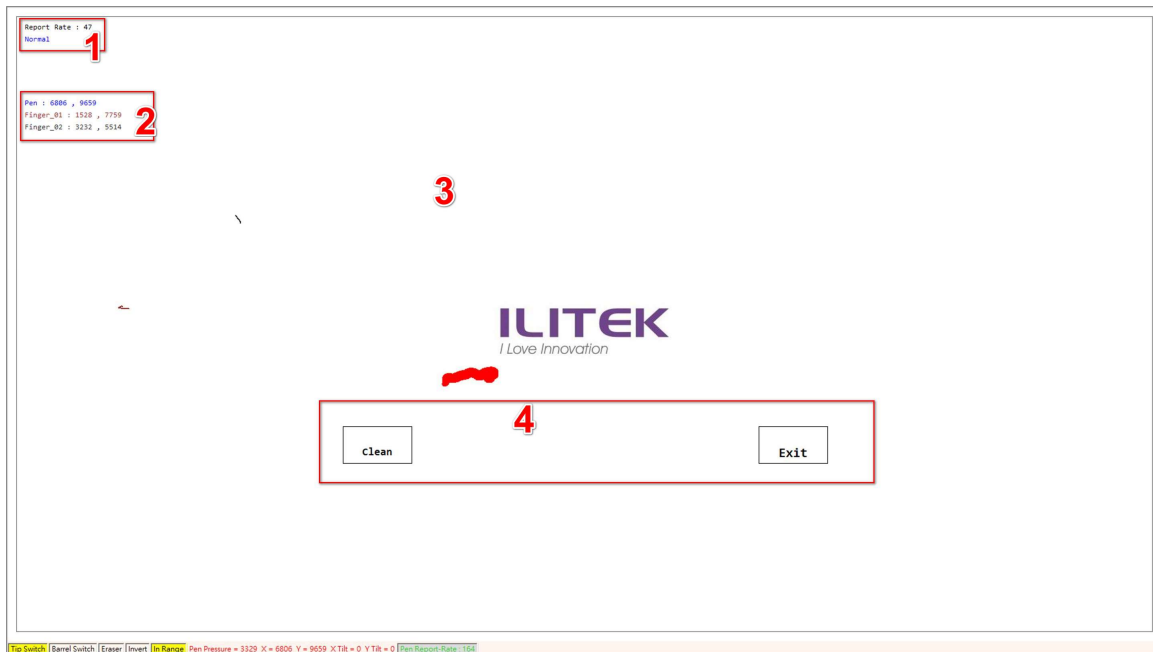
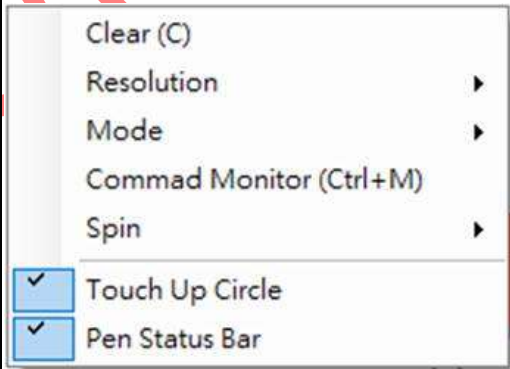


Fig 3-13 Painting (Full screen)

The detailed descriptions of the Painting function (Full screen) as (table 3-8):

Item	Name	Description
1	Mode status	Show report rate and FW mode.
2	Coordinate	Shows touch coordinate.
3	Drawing board	<p>Click right button can activate further function.</p>  <p>The detailed descriptions of the drawing board function (List mode) as</p>

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		(table 3-7)
4	Function button	Clear: Clear drawing board Exit: Exit Painting and back to Home function.

Table 3-8 Painting function (Full screen) table

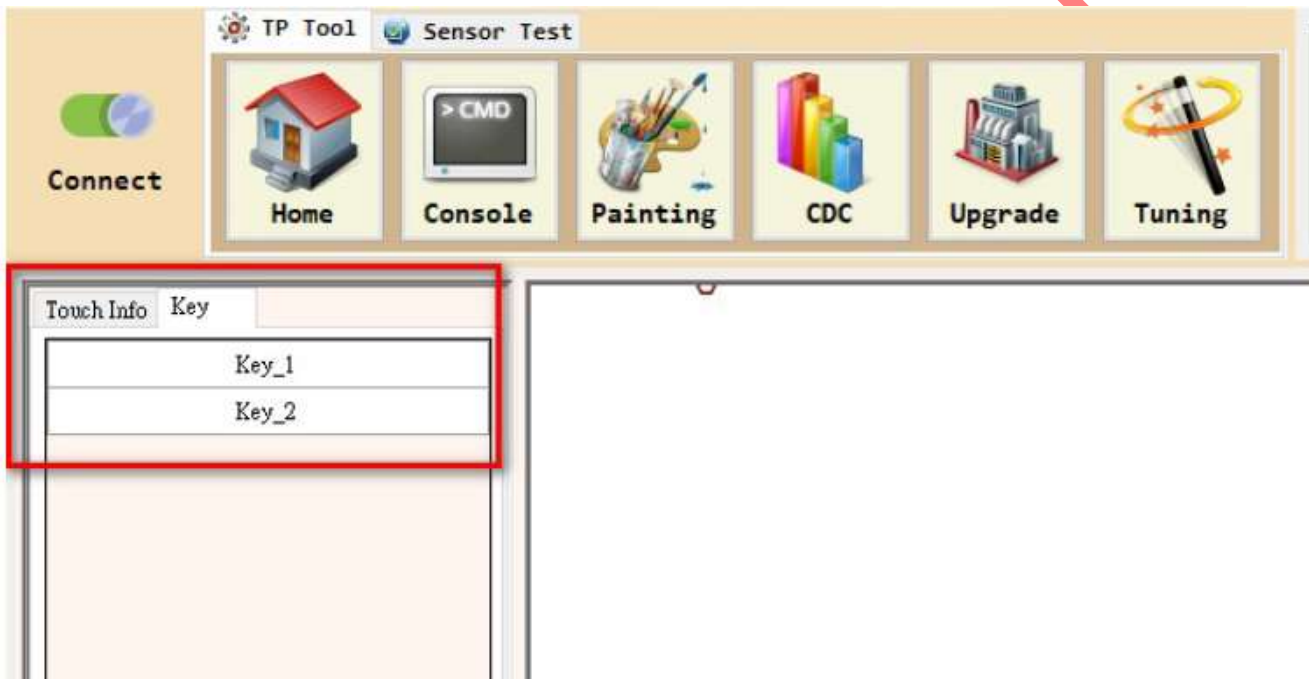


Fig 3-14 Painting function of supporting key (List mode)

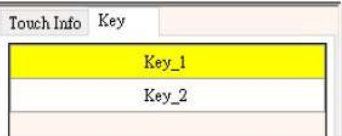
Item	Name	Description
1	Key	 <p>It will add a sheet to display key status when this is a version of firmware supporting key.</p> <p>If you press the key, the relative button will change it's the color.</p>

Table 3-9 Painting function of supporting key (List mode) table



Fig 3-15 Painting function of supporting key (Full screen)


Item	Name	Description
1	Key	 <p>It will add a figure to display key status when this is a version of firmware supporting key.</p> <p>If you press the key, the relative button will change it's the color.</p>

Table 3-10 Painting function of supporting key (Full screen) table

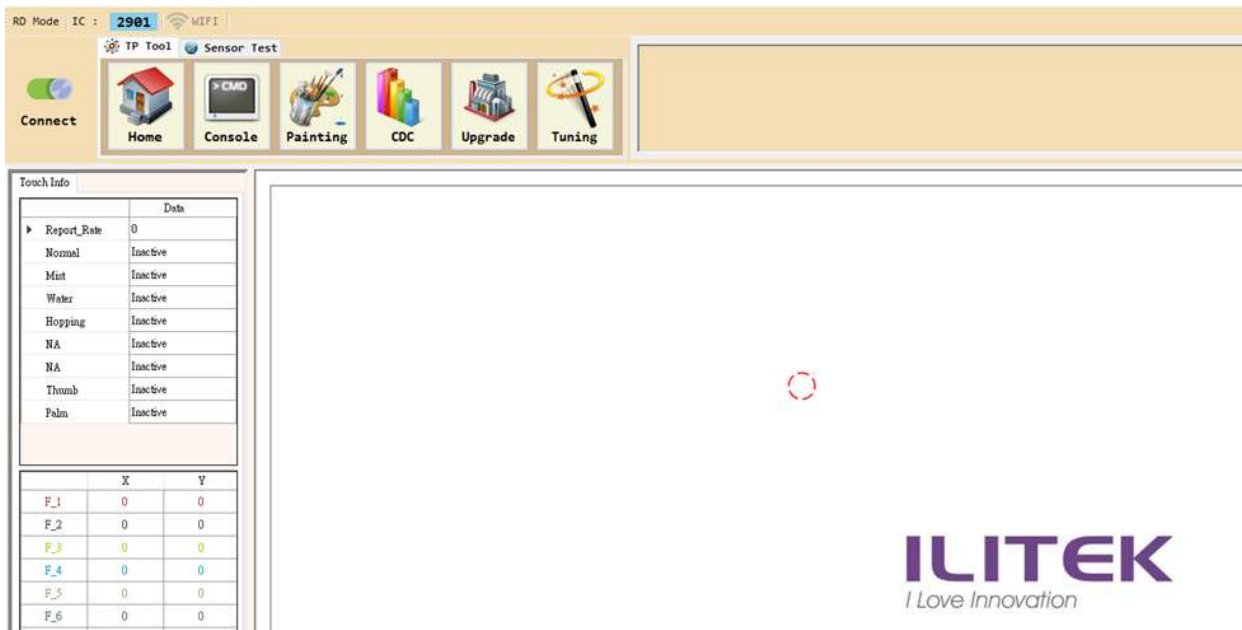


Fig 3-16 Support hover state of the stylus mode

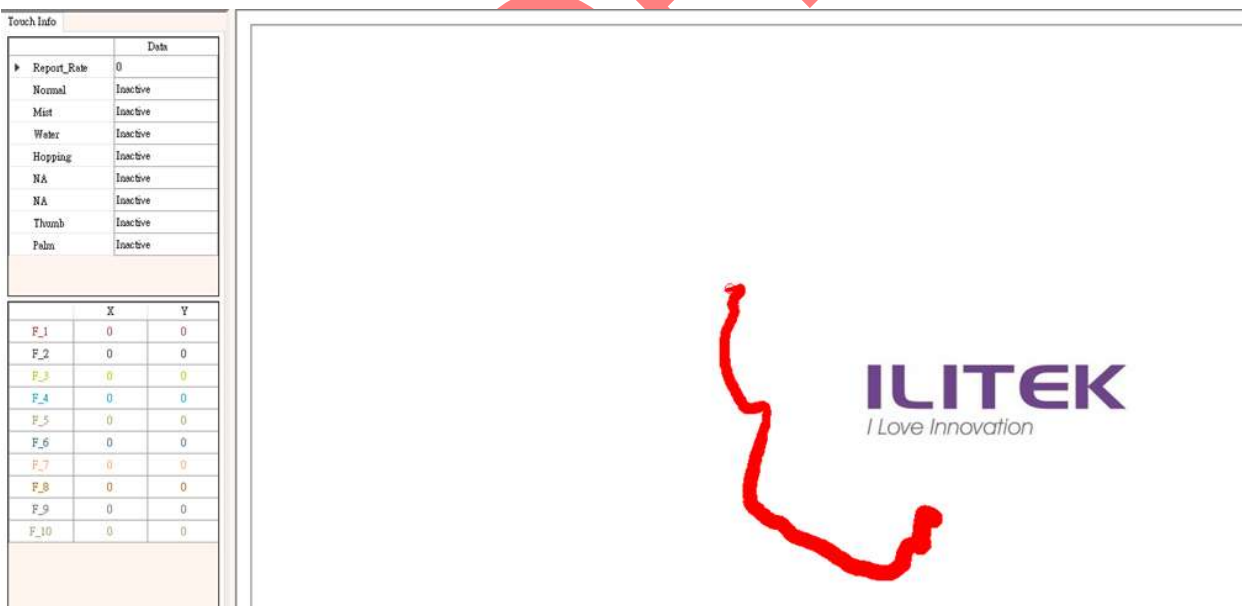


Fig 3-17 the thickness of the track changes according to the size of the press when using the stylus

When tool disconnect, you can playback a file.

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Fig 3-18 The thickness of the track changes according to the pressure when using the stylus

Item	Name	Description
1	Painting Area	Show the track
2	Frame number	Frame number
3	Button	Functions: <ul style="list-style-type: none"> ● Load: load a file ● Stop: stopping play. ● Play: start to play
4	Speed Control	<ul style="list-style-type: none"> ● Control the paly speed
5	File name	File name
6	Frame bar	Progress bar

Table 3-11 Paint function description

CDC (Capacitive to Digital Convertor)

The CDC functions (Connected) display digital data of touch panel. If the product supports stylus, please refer to Figure 3-12.

- **Connected: Record mode**

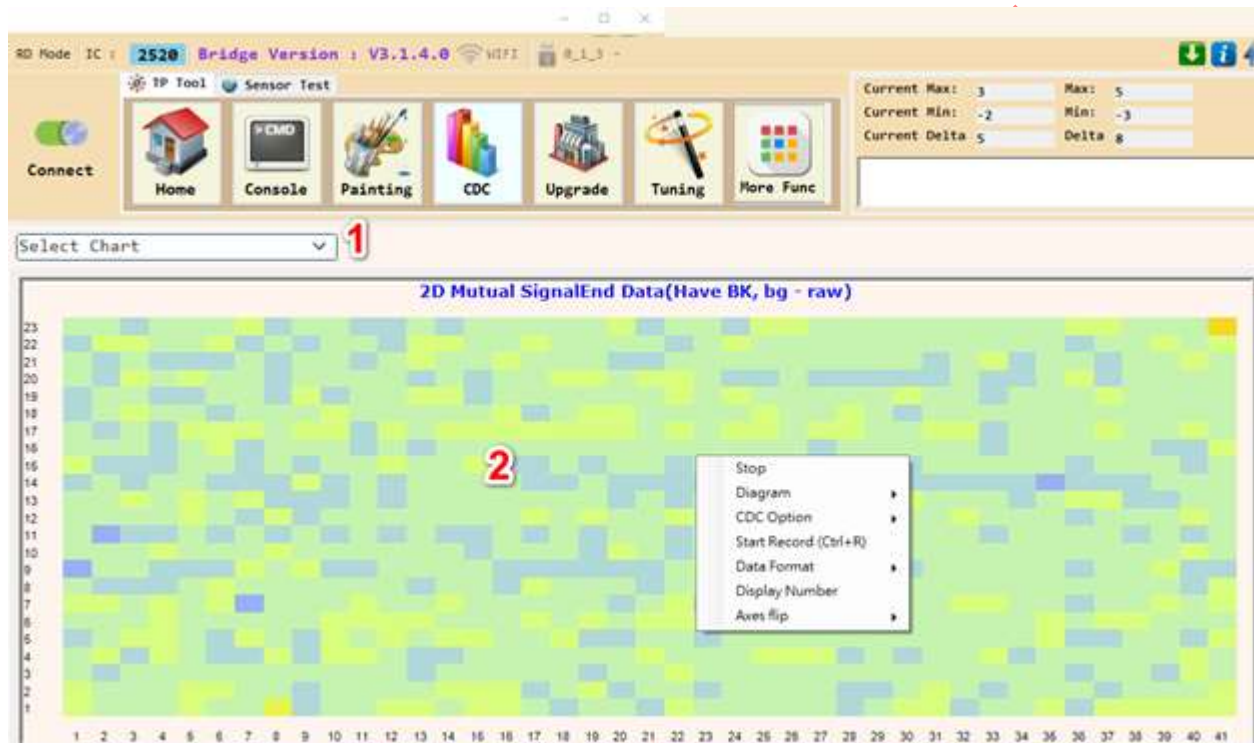


Fig 3-19 CDC (Connected)

The detailed descriptions of the CDC function (Connected) as (table 3-10):

Item	Name	Description								
1	Select Chart	<p>The drop-down menu selects which data types to display in the CDC value display area.</p> <ul style="list-style-type: none">-Mutual Data-Self Data-Key Data-Pen Data <div><div>Select Chart</div><div><div><input checked="" type="checkbox"/> MutualData</div><div><input type="checkbox"/> SelfData</div><div><input type="checkbox"/> KeyData</div><div><input type="checkbox"/> PenData</div></div><div><div>OK</div><div>Cancel</div></div></div>								
2	CDC function	<p>Click right button can activate further function.</p> <div><div>Stop</div><div>Diagram</div><div>CDC Option</div><div>Start Record (Ctrl+R)</div><div>Data Format</div><div>Display Number</div><div>Axes flip</div></div> <table><thead><tr><th>Control</th><th>Description</th></tr></thead><tbody><tr><td>Stop</td><td>Stop updates CDC data.</td></tr><tr><td>Diagram</td><td>2-D: Show data by 2D. 3-D: Show data by 3D. 2-D / 3-D: Show data by both</td></tr><tr><td>CDC Option</td><td>Mutual Raw Data(BK): Original Data Mutual Raw Data(No BK): Internal debug data. Mutual BG Data(Have BK): Background Data Mutual SignalEnd Data(BG -Raw): Data for algorithm. Mutual All Node: MP uniformity test data. Mutual Open Data: MP open test data..</td></tr></tbody></table>	Control	Description	Stop	Stop updates CDC data.	Diagram	2-D: Show data by 2D. 3-D: Show data by 3D. 2-D / 3-D: Show data by both	CDC Option	Mutual Raw Data(BK): Original Data Mutual Raw Data(No BK): Internal debug data. Mutual BG Data(Have BK): Background Data Mutual SignalEnd Data(BG -Raw): Data for algorithm. Mutual All Node: MP uniformity test data. Mutual Open Data: MP open test data..
Control	Description									
Stop	Stop updates CDC data.									
Diagram	2-D: Show data by 2D. 3-D: Show data by 3D. 2-D / 3-D: Show data by both									
CDC Option	Mutual Raw Data(BK): Original Data Mutual Raw Data(No BK): Internal debug data. Mutual BG Data(Have BK): Background Data Mutual SignalEnd Data(BG -Raw): Data for algorithm. Mutual All Node: MP uniformity test data. Mutual Open Data: MP open test data..									

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	<p>Calibration Data(DAC_P, Mutual): Internal debug data. Calibration Data(DAC_N, Mutual): Internal debug data.</p> <ul style="list-style-type: none"> ● USI: Only the stylus state can be selected. (參考圖 3-11) <ul style="list-style-type: none"> ■ ACK ■ Tip_0 ■ Tip_1 ■ Tip_2 ■ ST <p>Sensor pin short data: MP short test data</p>
Start Record (Ctrl+R)	<p>Click to start/stop record(Ctrl + R) data and save the log to the "Record_File" folder in ITS tool folder.</p> <p> Record_File</p> <p>File name: YYYY_MM_DD_hh_mm_ss.csv</p>
Data Format	<p>Original: Show original data.</p> <p>Max Hold: Show maximum value of every node.</p> <p>Min Hold: Show minimum value of every node.</p> <p>Delta (Max - Min): Show Peak-to-Peak data of every node (Max-Min).</p> <p>Signal: Show difference between 1st frame and current frame. (Simulate Signal End data)</p> <p>Windows2: The result of subtracting the Rx channel adjacent to each other and then subtracting the Tx channel adjacent to each other</p>
Axis flip	<p>Axis X: rotate the image to flip it horizontally</p> <p>Axis Y: rotate the image to flip it vertically</p>

Table 3-12 CDC function (Connected) table

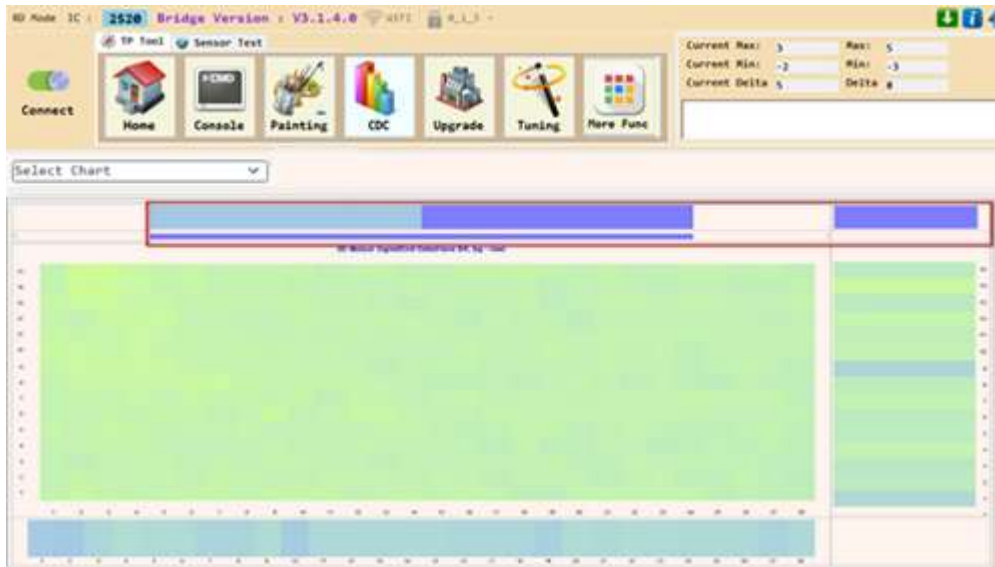


Fig 3-20 CDC (Connected in key mode)

Item	Name	Description
1	KEY display area	This area will display the volume of touching screen.

Table 3-13 CDC function (Connected) table

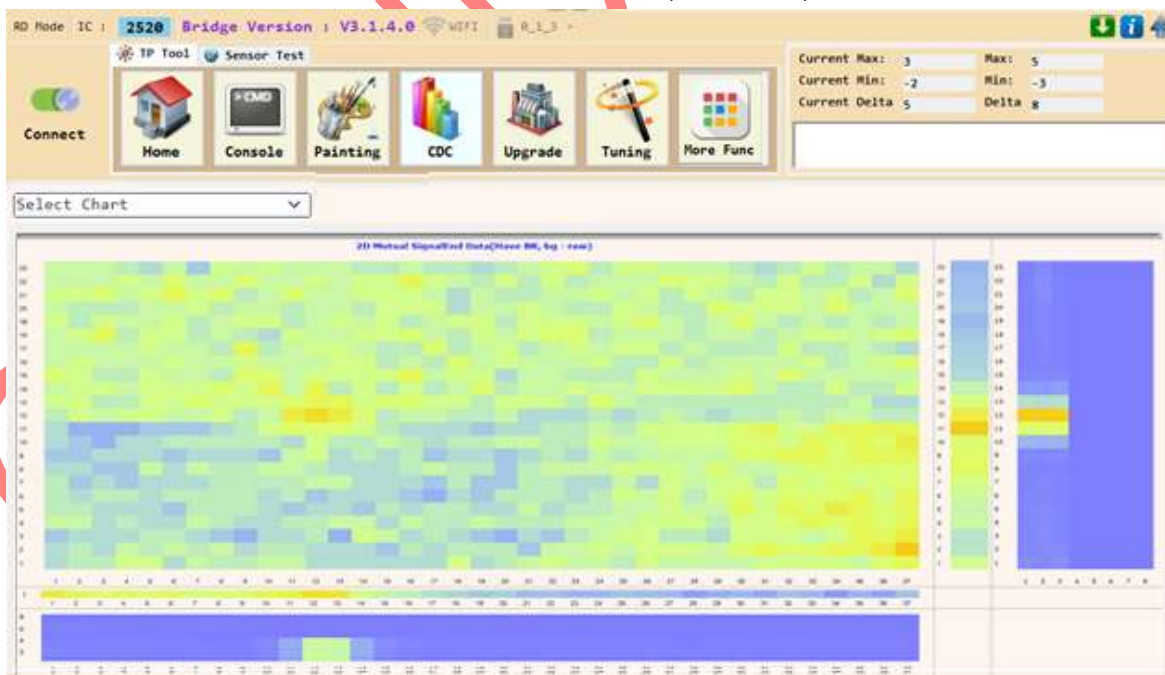


Fig 3-21 the default screen of the stylus (under the connection status)

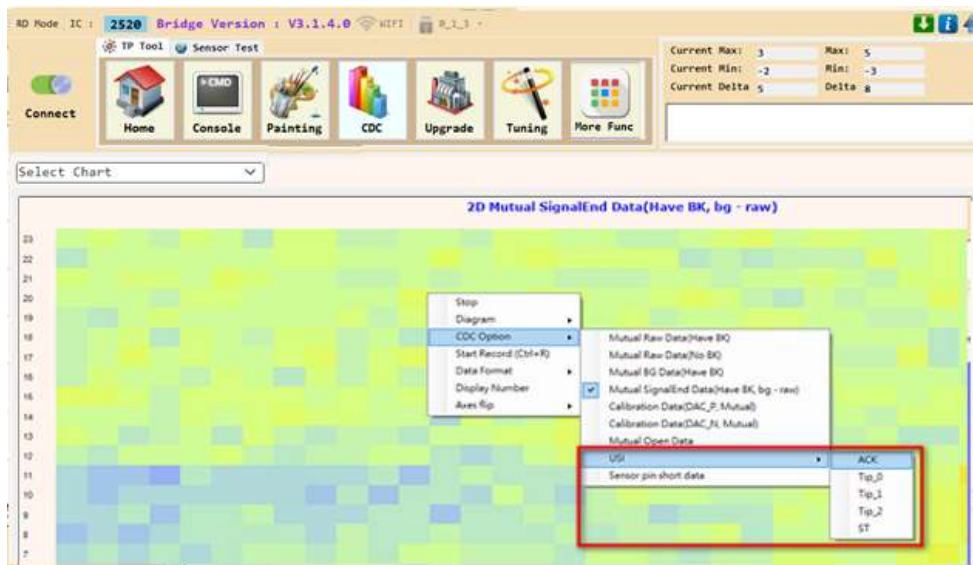


Fig 3-22 There are five modes to choose from when selecting the USI option

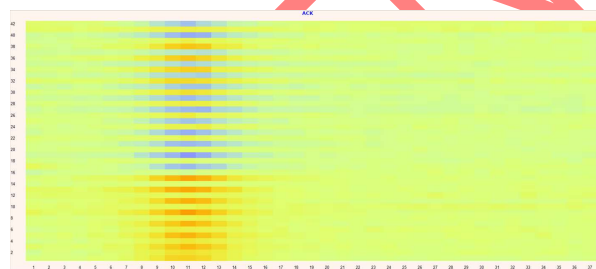


Fig 3-23 ACK

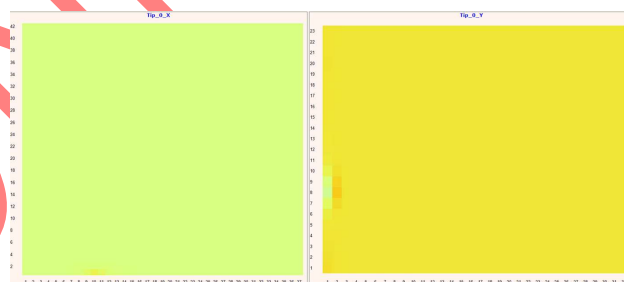


Fig 3-24 Tip_0

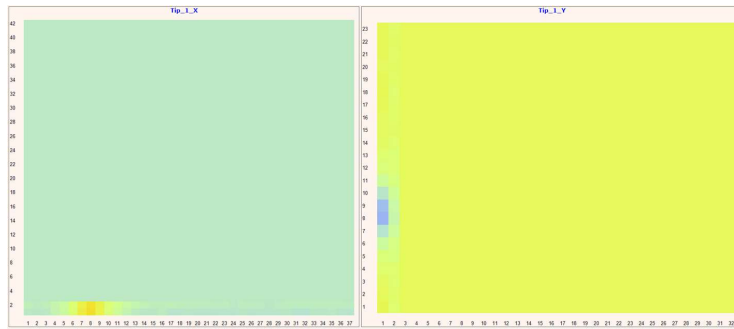


Fig 3-25 Tip_1

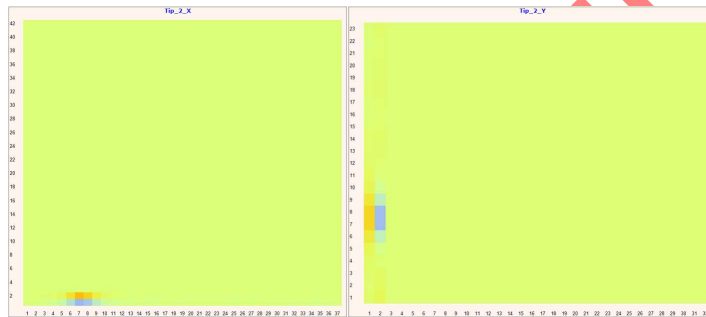


Fig 3-26 Tip_2

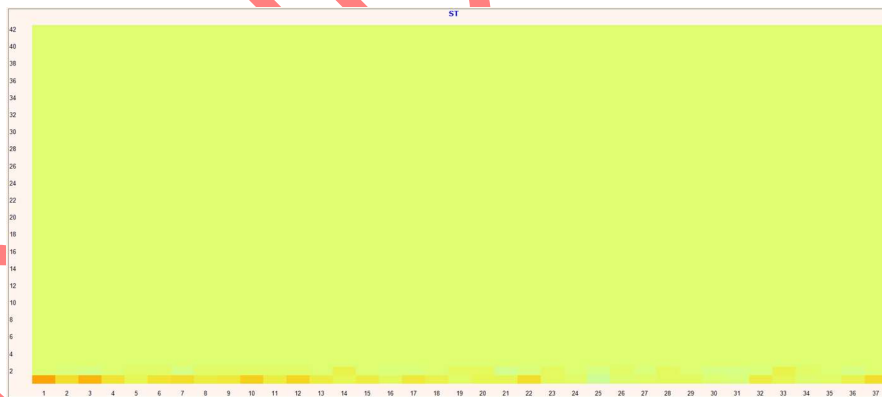


Fig 3-27 ST

The CDC function (Disconnect) has a playback function.

- Disconnect: Playback mode

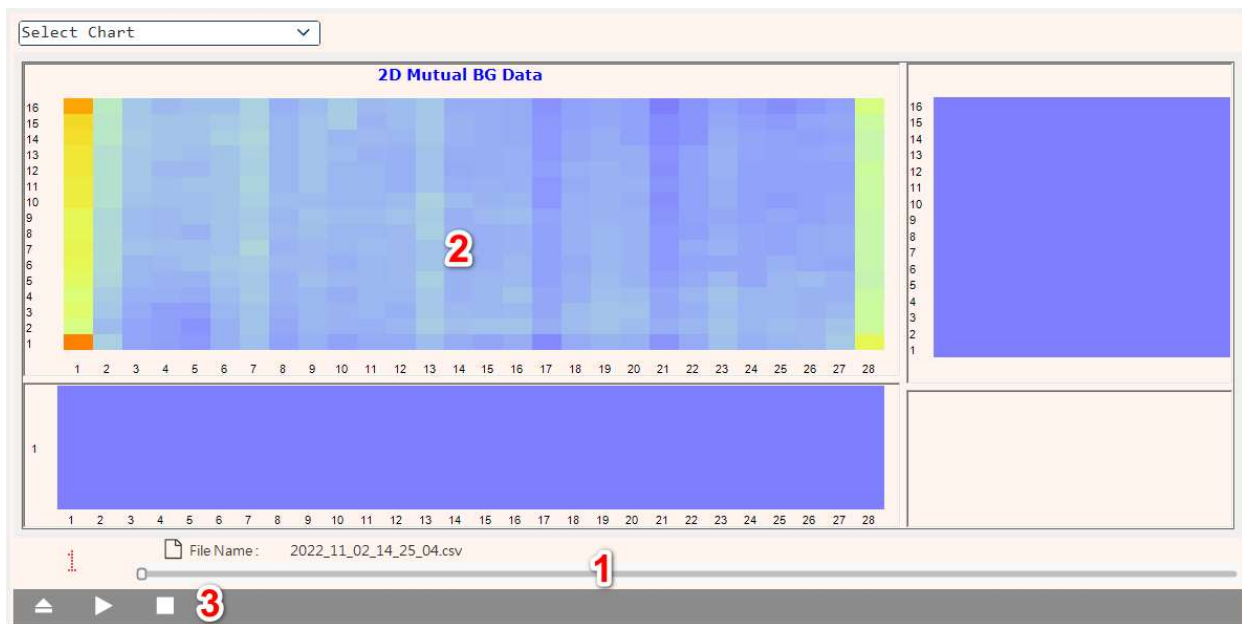


Fig 3-28 CDC Playback (Disconnect)

The detailed descriptions of the CDC playback function (Disconnect) as (table 3-12):

Item	Name	Description
1	Frame bar	Plays the frames and shows the progress. Click bar: Stop playback and forward/backward 3 frame. Drag bar: Can dragged to the aim frame. File name: show the currently playing file name
2	CDC Area	*Show CDC data *right-click menu
3	Button	Load: Open record file. Stop: Stop playback.

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		Play: Start playback.
--	--	------------------------------

Table 3-14 CDC playback table

CONFIDENTIAL


FW Upgrade

The FW upgrade function can do the FW update function.



Fig 3-29 FW Upgrade

The detailed descriptions of the FW upgrade function as (table 3-15):

Item	Name	Description
1	Hex File Path	Click the  button to select .hex file which user wants to upgrade.
2	Progress bar	Upgrade process status.
3	Run	Click button to upgrade firmware.
4	Open FW file	Click to open hex file in file system.
5	Check box	<ul style="list-style-type: none"> Force Upgrade: force to upgrade AP and DATA code without checking different between Hex file and IC code. FW_CheckOnly: Show the differences between HEX file and IC code.

		<pre> Check FW Format Set Touch Mode =====> Before Upgrade =====> Read IC All CRC16 Block_0 CRC : IC = 0xF22F, Hex = 0x2CAE (Different) Block_1 CRC : IC = 0x512A, Hex = 0xE37D (Different) Block_2 CRC : IC = 0x87F0, Hex = 0x87F0 (Same) CRC different!! </pre> <ul style="list-style-type: none"> ● I2C_HW_Reset(After Upgrade): reboot IC using I2C interface after burning done. ● I2C ByPass INT: enable this function, it makes the speed of the upgrading fw speed up.
6	Message box	Show upgrade message.

Table 3-15 FW Upgrade table

Tuning

The tuning function can fine-tune the touch performance with tuning function.

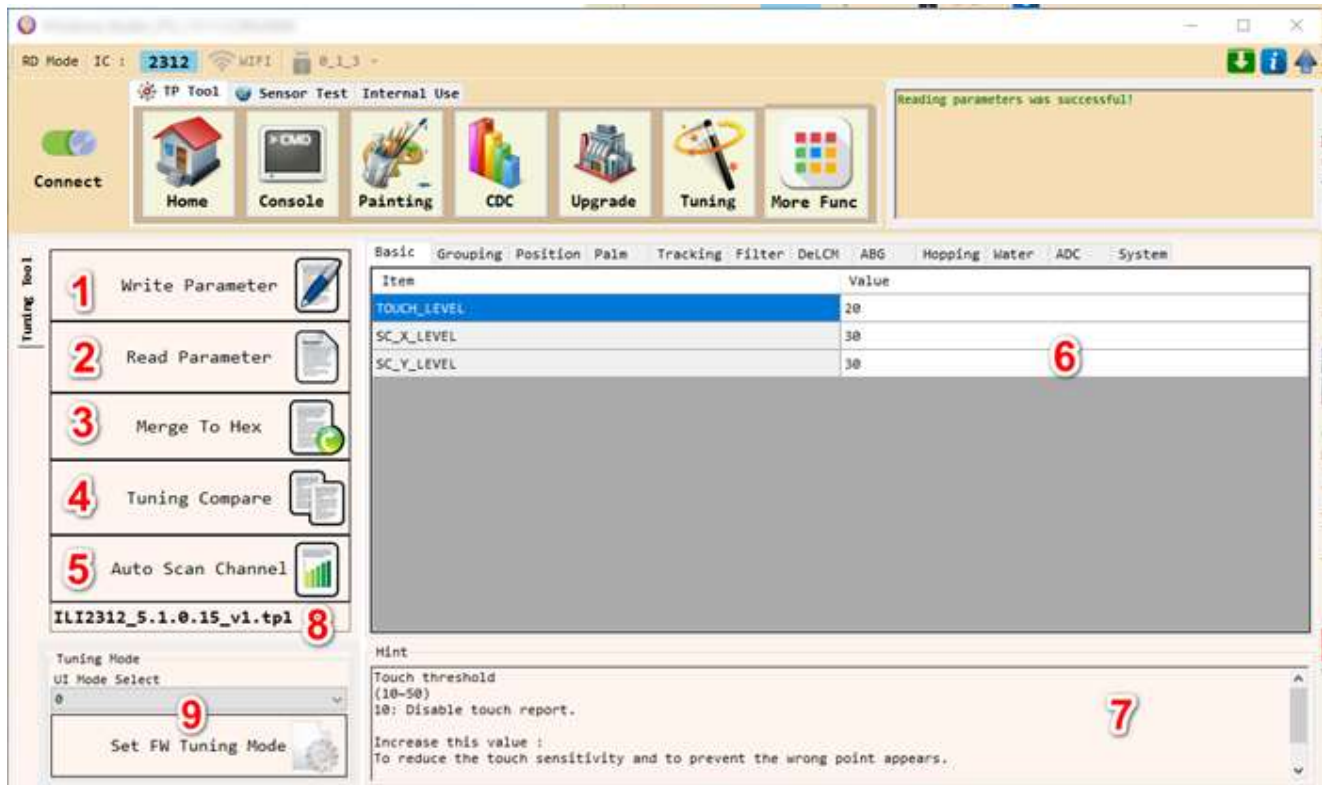


Fig 3-30 tuning tool

The detailed descriptions of the Tuning function

Item	Name	Description
1	Write Parameter	Write parameters from touch controller.
2	Read Parameter	Read parameters into Touch controller.
3	Merge To Hex	Generate hex file with parameters.
4	Tuning Parameter	Parameters editing area
5	Auto Scan Channel	Find sensor channel automatically.
6	Parameters	Edit area
7	Parameter Hint	Clicking on the Tuning field will prompt for the function of this parameter.
8	TPL name	TPL name of FW core version (Path :

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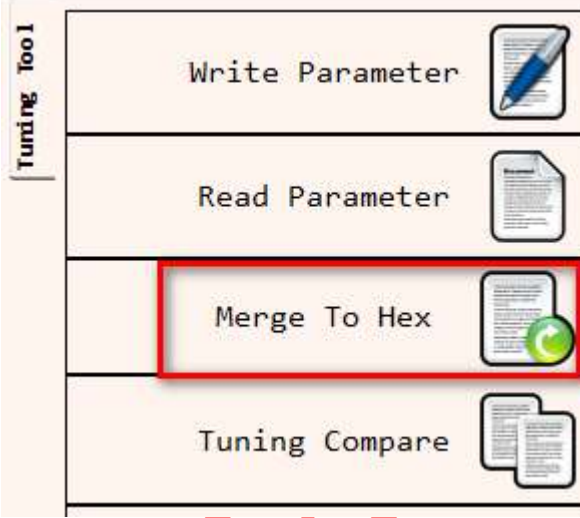
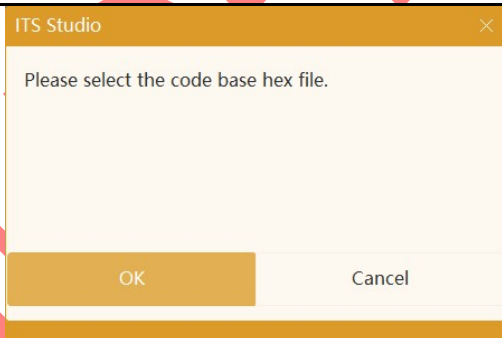
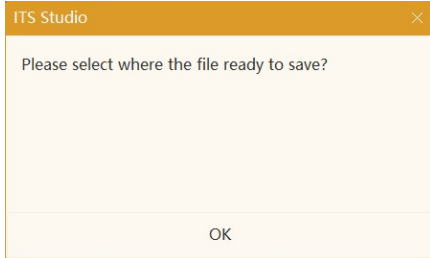
		\ParaData\ILI{IC_Type}\ILI{IC_Type}_{TuningVersion}_v1.tpl)
9	Tuning Mode Selection	There are more modes in the hex file, it can be used to switch mode.

Table 3-16 function table.

CONFIDENTIAL

Merge To Hex

Generate a new hex file with parameters.

Item	Name	Description
1	Merge To Hex	 <p>Choose the function.</p>
2	Code base hex file	 <p>Select a hex file as the base FW.</p>
3	Save file	 <p>Set firmware name and select firmware type to hex file.</p>

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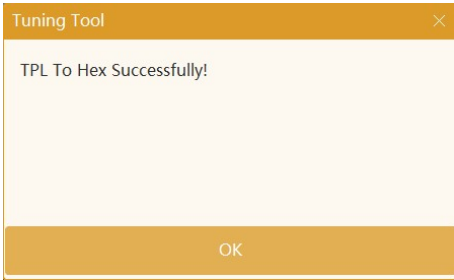
4	Result information	 <p>Save a hex file</p>
---	--------------------	---

Table 3-17 merge to hex table

Tuning Compare

Compare tuning parameters between selected hex files.

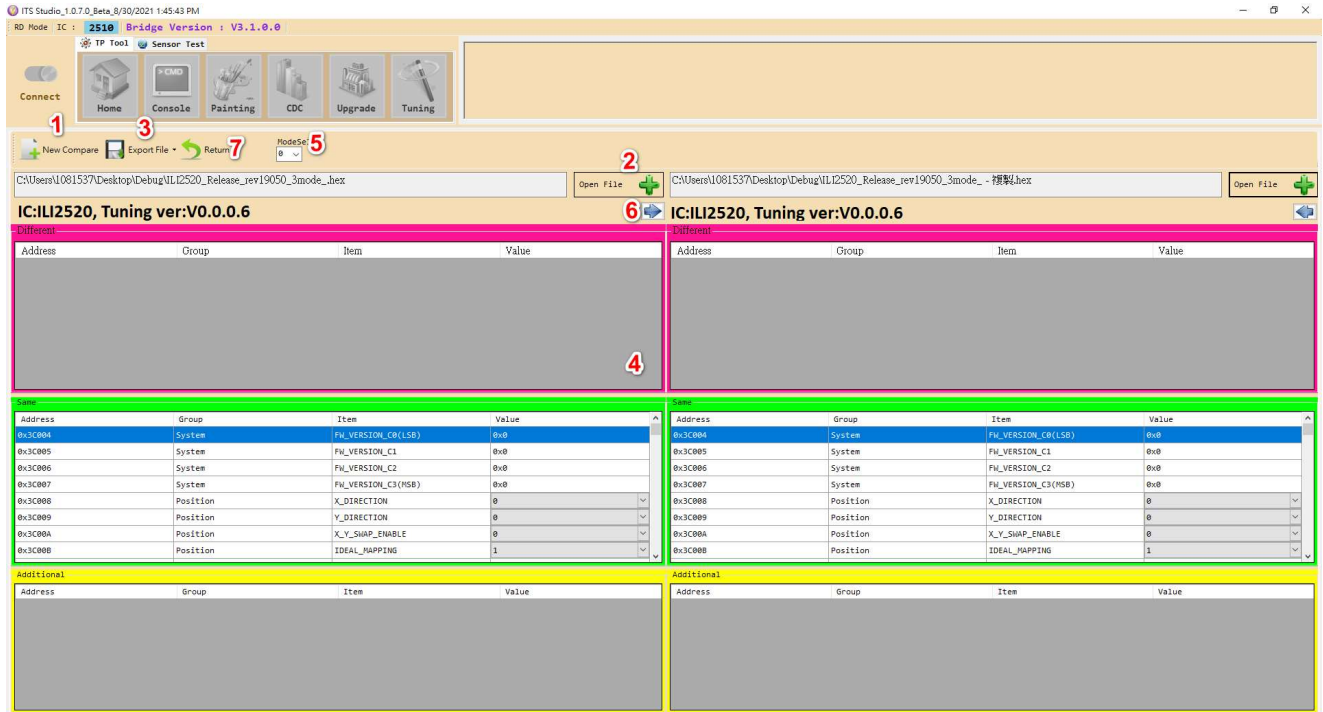


Fig 3-31 Tuning compare

The detailed descriptions of the Tuning compare function:

Item	Name	Description
1	New comparison	A list of available comparison templates is shown.
2	Open File	Select hex file in file system.
3	Export File	Export Left File: Generate a new hex file with left parameters. Export Right File: Generate a new hex file with right parameters.
4	result	Show different parameters between left and right hex files. Show the same parameters between left and right hex files. Show additional parameters between left and right hex files.

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Windows Studio ITS User Guide

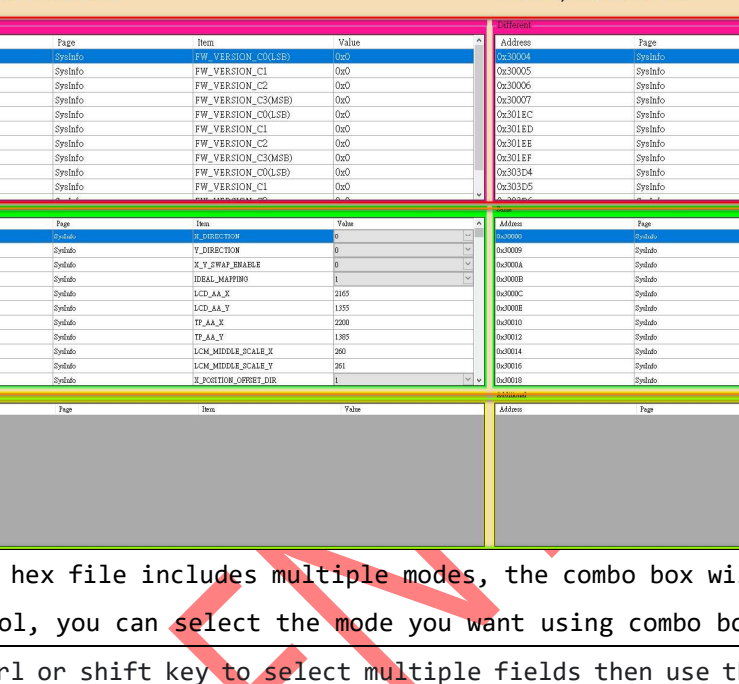
		
5	Mode select	If the hex file includes multiple modes, the combo box will show in the tool, you can select the mode you want using combo box.
6	copy	Use ctrl or shift key to select multiple fields then use this button to copy fields to another side.
7	Return	Exits

Table 3-18 Tuning compare table.

4	Confirm Message	Show result. Yes: Set result into parameters. No: Skip result.
---	-----------------	--

Table 3-19 Auto scan channel table.

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More Functions

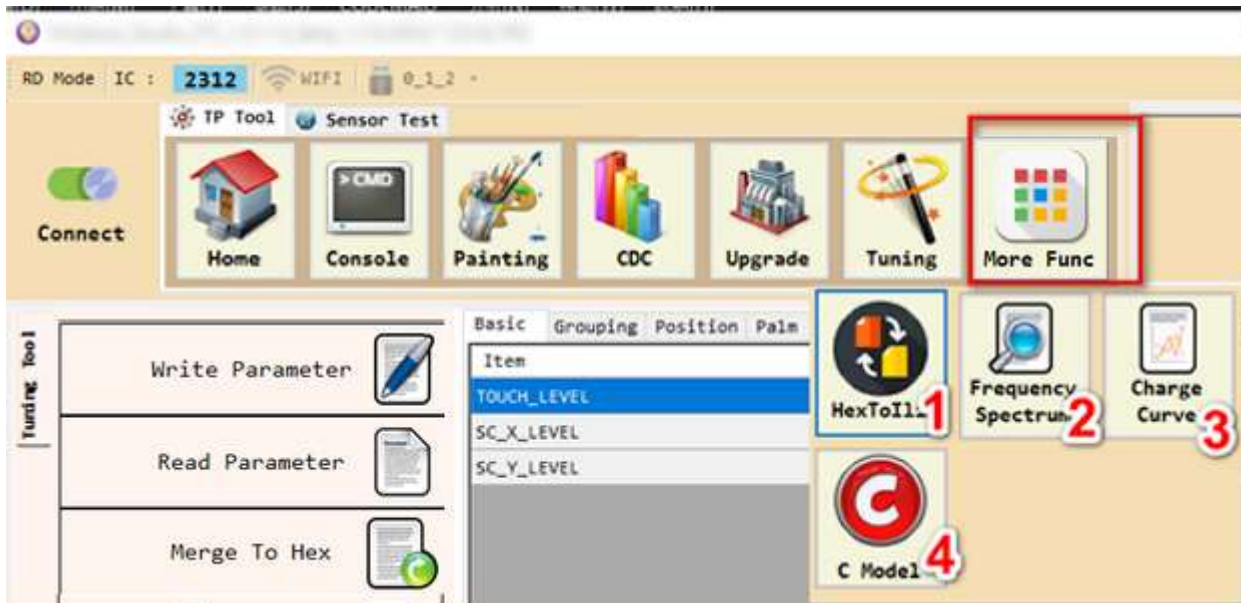


Fig 3-33 More Func Interface

Frequency Spectrum

Noise detects and shows as a spectrum diagram.



Fig 3-34 V3 Frequency Spectrum

The detailed descriptions of the Frequency spectrum function

Item	Name	Description
1	Setting	Start: Set frequency range of noise detection. Step: Set interval of detection range. Min signal level: Set the threshold. $X_PULSE_WIDTH = 96MHz / (Freq*2)$
2	Scan	Starts to scan the frequency.
3	Exit	Exits the function.
4	Log	Save the result of scanning frequency, the file location: NoiseFrqLog/NoiseFrequency_yyyy_mm_dd_T.csv
5	Result	Show result of every frequency.

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		The red bar means the result is bigger than minimum signal level. The green bar means the result is smaller than minimum signal level.
6	Replay Log	Load a log and display the result on the right side.
7	Formula	Show the formula

Table 3-20 V3 Frequency spectrum table.

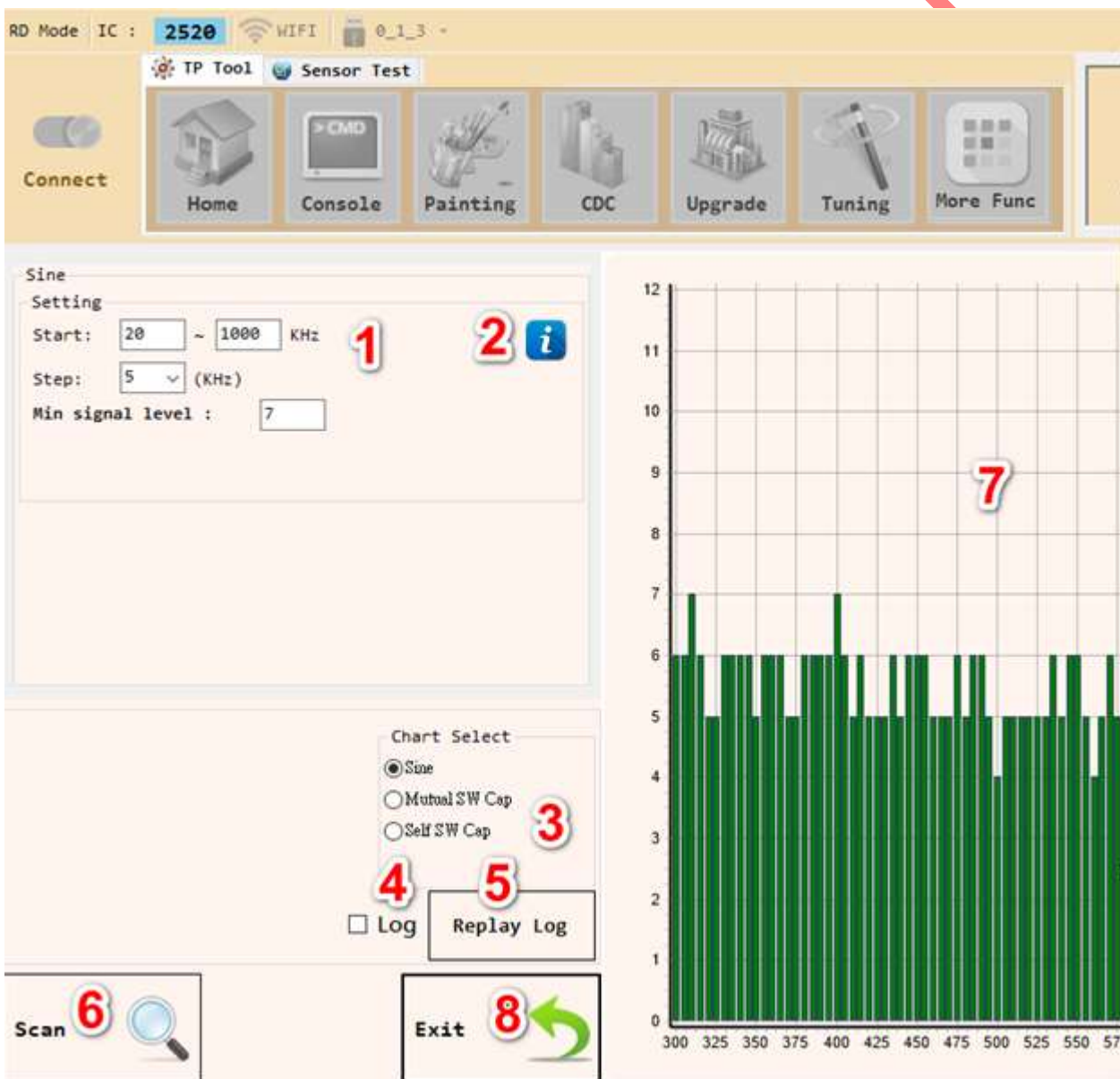


Fig 3-35 V6.0.0~V6.0.1 Frequency Spectrum

Item	Name	Description
------	------	-------------

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1	Setting	Start: Set frequency range of noise detection. Step: Set interval of detection range. Min signal level: Set the threshold.
2	Formula	Show the formula
3	Chart Select	<p>There are fore driving methods in V6 protocol, you can choose which type wants to display.</p> <ul style="list-style-type: none"> a. Mutual Sine b. Mutual SW-Cap c. Self SW-Cap d. Pen <p>When FW supports Pen function, scanning cannot scan Pen and non-Pen data at the same time, so you need to scan them separately.</p>
4	Log	Save the result of scanning frequency, the file location: NoiseFrqLog/NoiseFrequency_yyyy_mm_dd_T.csv
5	Replay Log	Show the result.
6	Scan	Starts to scan the frequency.
7	Scan channel result	<p>Show result of every frequency.</p> <p>The red bar means the result is bigger than minimum signal level.</p> <p>The green bar means the result is smaller than minimum signal level.</p>
8	Exit	Exits the function.

Table 3-21 V6.0.0~V6.0.1 Frequency spectrum table.

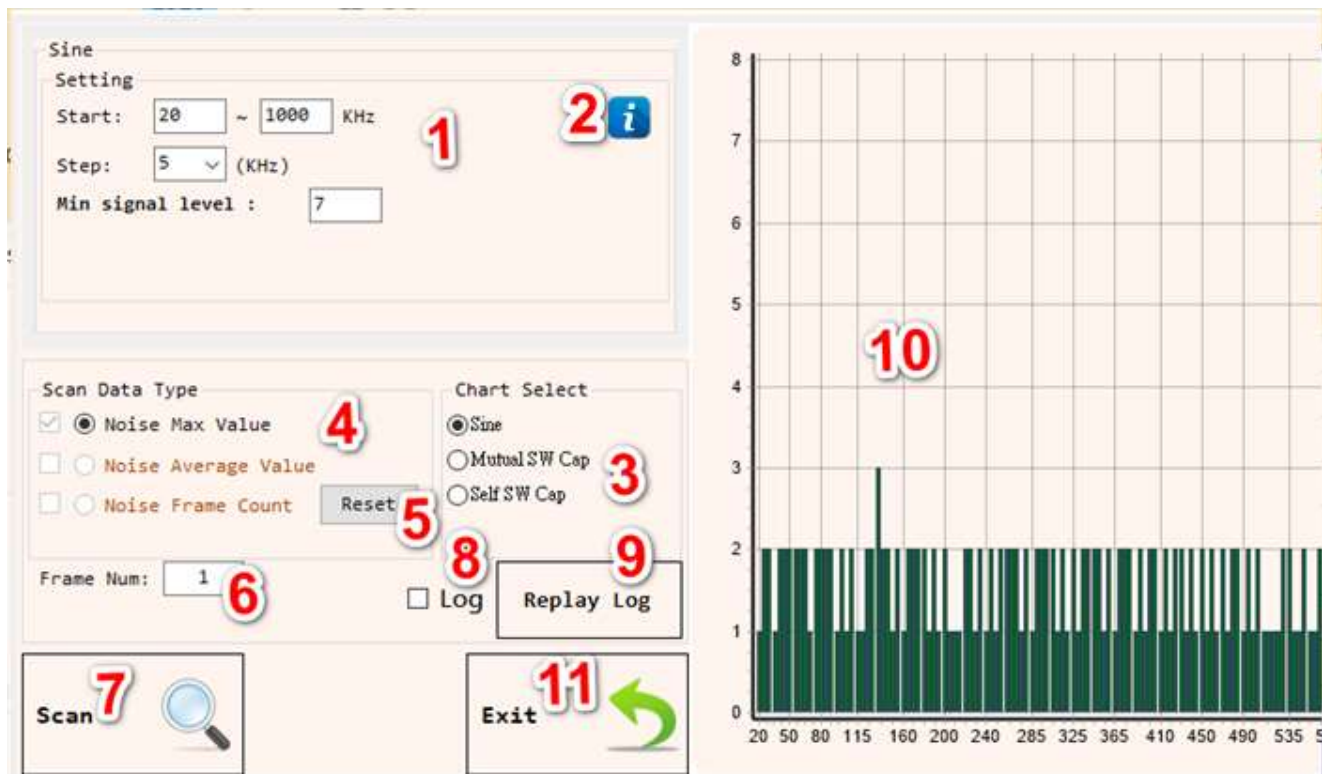
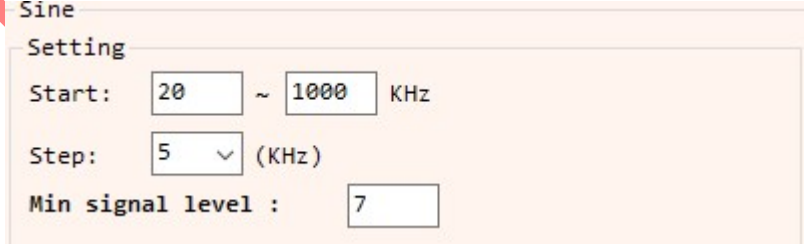
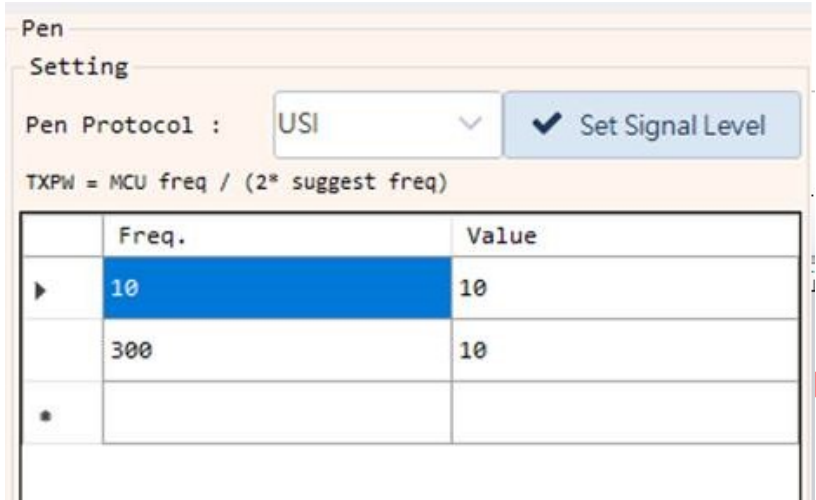


Fig 3-36 above V6.0.2 Frequency Spectrum

Item	Name	Description
1	Setting	<p>a. The setting for Mutual Sine \ Mutual SW-Cap and Self SW-Cap</p> <p>Start: Set frequency range of noise detection.</p> <p>Step: Set interval of detection range.</p> <p>Min signal level: Set the threshold.</p>  <p>b. The setting page for stylus, it only shows in</p>

		 <p>Pen Protocol: WPG/USI/MPP</p> <p>Threshold setting : use “set signal level ”to set before starting to run °</p>
2	Formula	Show the formula
3	Chart Select	<p>There are fore driving methods in V6 protocol, you can choose which type wants to display.</p> <ul style="list-style-type: none"> a. Mutual Sine b. Mutual SW-Cap c. Self SW-Cap d. Pen <p>When FW supports Pen function, scanning cannot scan Pen and non-Pen data at the same time, so you need to scan them separately.</p>
4	Scan data type	<p>There are three data types in every driving method.</p> <ul style="list-style-type: none"> a. Noise Max Value: gets the maximum noise value in every frequency gap. b. Noise Average Value: gets the average noise value in every frequency gap. c. Noise Frame Count: gets the numbers of the frame that noise is bigger than noise threshold.
5	Reset	Re-select the data type.
6	Frame number	Determine how many frames will keep calculating, the value is larger, the processing time is more.
7	Scan	Starts to scan the frequency.

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8	Log	Save the result of scanning frequency, the file location: NoiseFrqLog/NoiseFrequency_yyyy_mm_dd_T.csv
9	Replay Log	Load a file and display the result in the chart
10	Scan channel result	Show result of every frequency. The red bar means the result is bigger than minimum signal level. The green bar means the result is smaller than minimum signal level.
11	Exit	Exits the function.

Table 3-22 above V6.0.2 Frequency spectrum table.

Charge Curve

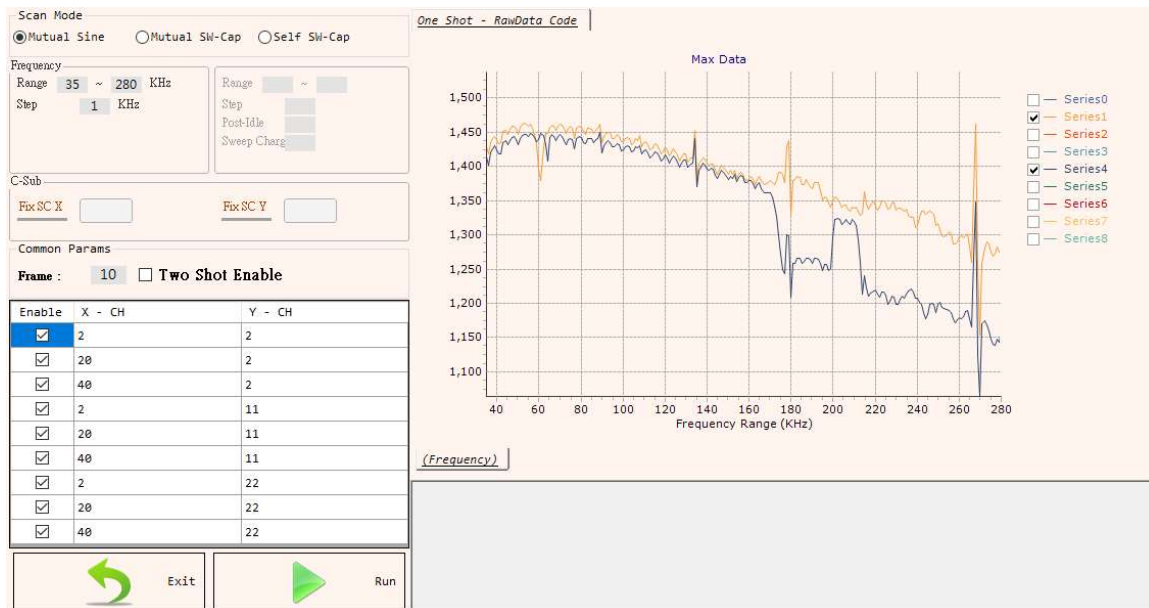


Fig 3-37 Main Operation Interface

On Fig 2-32, the left side is operation display of Charge Curve, the right side is the display area.

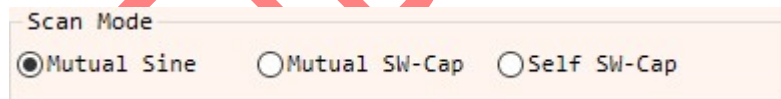


Fig 3-38 Scan Mode

On Fig 2-33, it shows the scan mode what type data do you want to capture, there are three types supports currently, every type has default value and range, if you set the value is out of range, the tool will show hint to remind you and restore the value to default.

2001 out of range [20~2000]

Fig 3-39 hint message

Frequency
Range 35 ~ 280 KHz
Step 1 KHz

Fig 3-40 Sine

The value is default, you must set the scanning range and step, the unit is KHz.

Sweep Charge Sweep Dump
Range 20 ~ 256 Code Range 20 ~ 256 Code
Step 1 Code Step 1 Code
Post-Idle 4 Code Post-Idle 4 Code
Fix Dump 20 Code Fix Charge 30 Code

Fig 3-41 Switch-Cap

The value is default, you must set the sampling range, scanning step, Post-Idle and Fix value.

C-Sub
Fix SC X Fix SC Y

Fig 3-42 Mutual Sine

Mutual Sine didn't support C-Sub.

C-Sub
Fix MC Fix SC Y

Fig 3-43 Mutual SW-Cap

Mutual SW-Cap just only one set of parameters.

C-Sub
Fix SC X Fix SC Y

Fig 3-44 Self SW-Cap

Self SW-Cap set the X and Y separately.

How to use the one-time sampling function

Step1: turn off the twice sampling function and then set the times you want to sample.



Fig 3-45 the times of sampling and option of two shot enable

Step2: make sure the corresponding to the coordinate position of TP

Enable	X - CH	Y - CH
<input checked="" type="checkbox"/>	2	2
<input checked="" type="checkbox"/>	20	2
<input checked="" type="checkbox"/>	40	2
<input checked="" type="checkbox"/>	2	11
<input checked="" type="checkbox"/>	20	11
<input checked="" type="checkbox"/>	40	11
<input checked="" type="checkbox"/>	2	22
<input checked="" type="checkbox"/>	20	22
<input checked="" type="checkbox"/>	40	22

Fig 3-46 9 coordinate positions

Step3: go to run

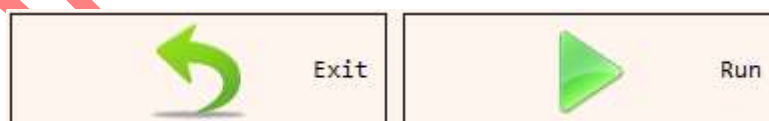


Fig 3-47 Run

Step4: wait to finish.



Fig 3-48 sampling

Step5: make sure the information after sampling



Fig 3-49 Sweep Charge page

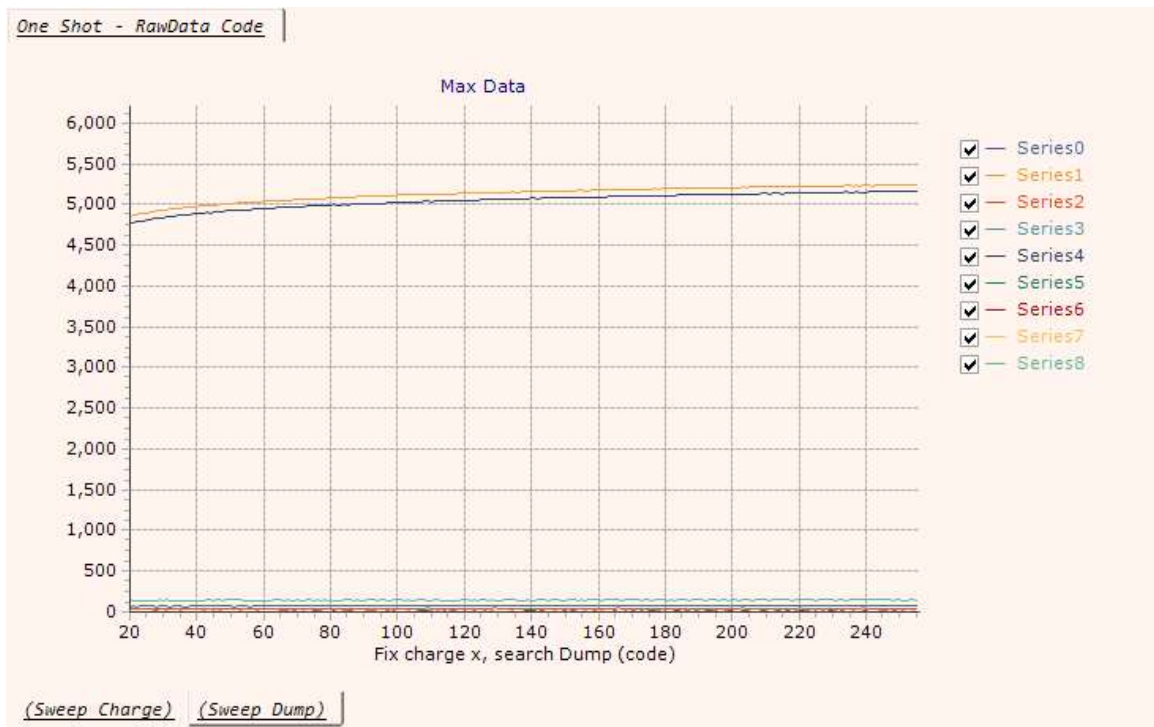


Fig 3-50 Sweep Dump page

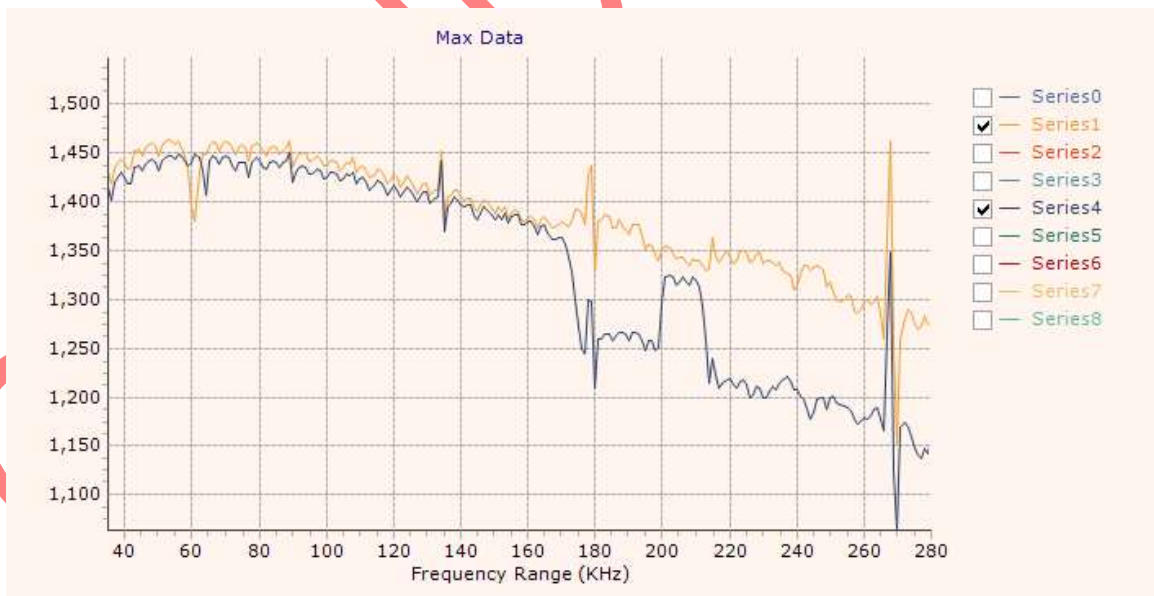


Fig 3-51 enable you want to display data type (Max)

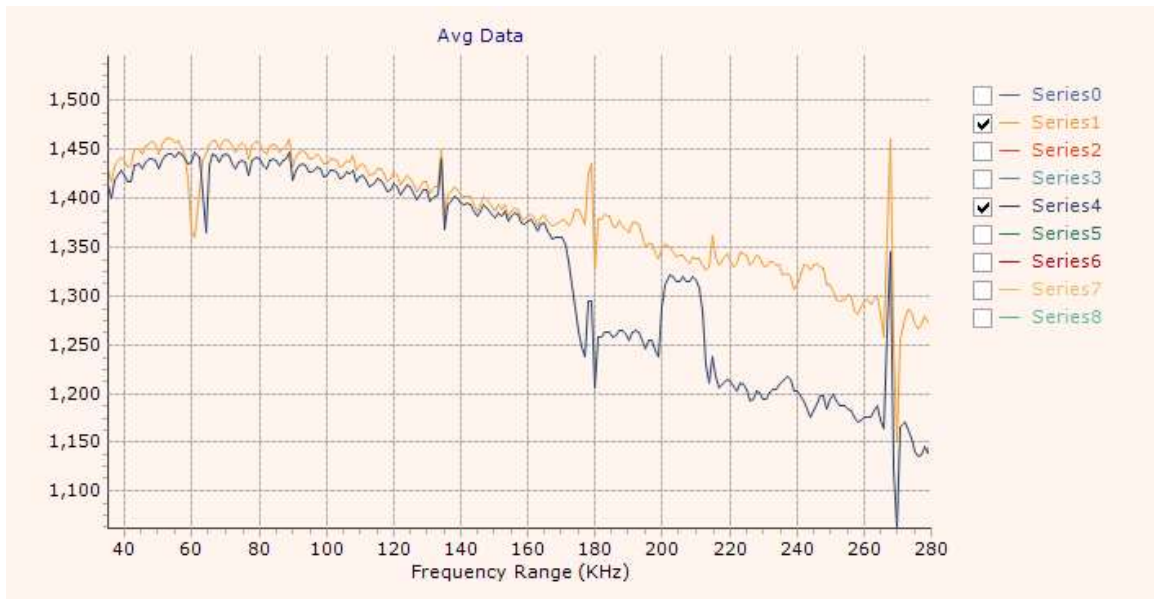


Fig 3-52 enable you want to display data type (Average)

How to tune on the function of sampling difference

Step1: Tune on the Two Shot



Fig 3-53

Repeat the step2 to step4

Step5 : Puts on the copper pillar on the TP you want to test and then presses “sure”

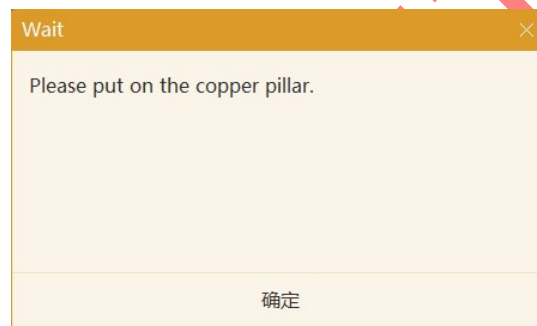


Fig 3-54 message

Step6 : Make sure the difference value



Fig 3-55 finish sampling

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C Model

C-Model provides higher report rate than CDC, and shows raw data and report data at the same time. The raw data of frame is only updated within size of Region of Interest (RoI). The A block on the left side is C-Model setting panel, and B block on the right side shows frame raw data and report data. Each item is introduced in below table. Different setting would result in different data size and data update rate.

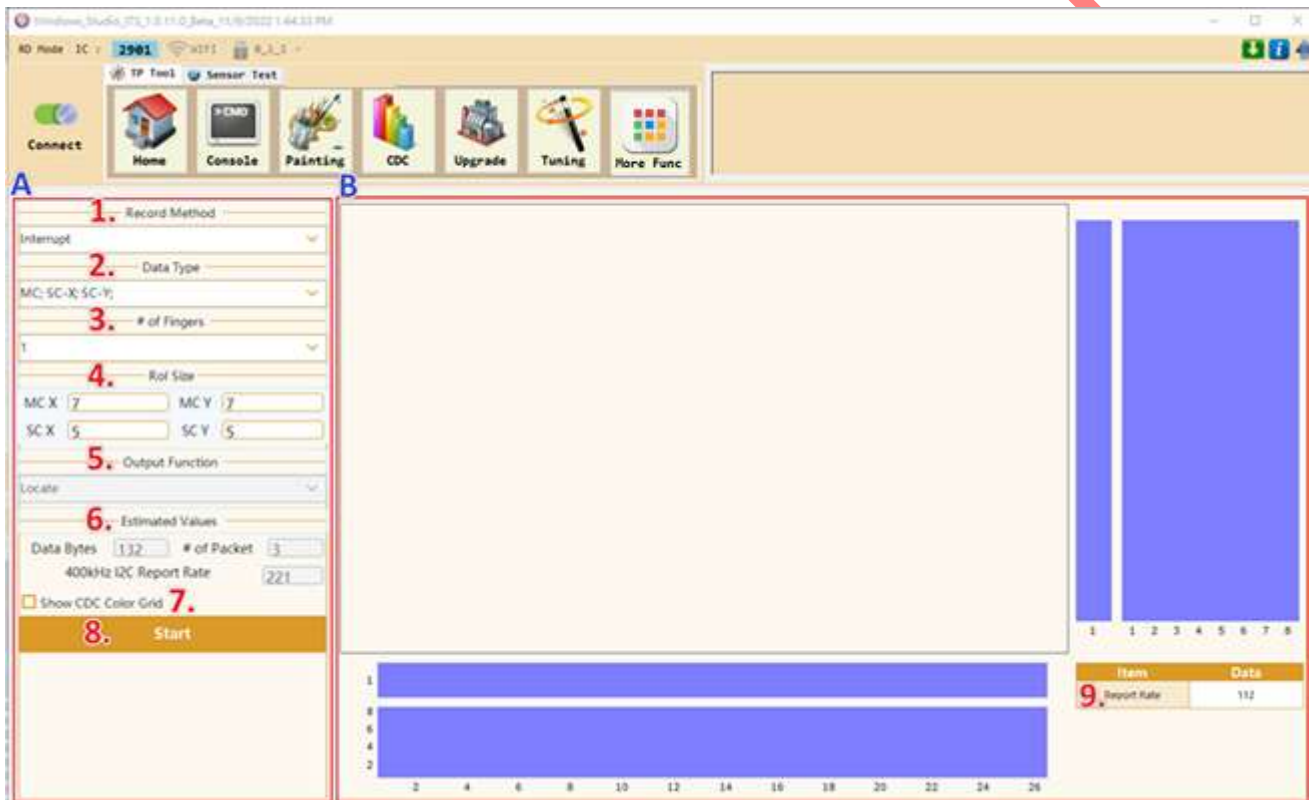


Fig 3-56 C-Model Main Window

No	Name	Description
1	Record Method	a. Interrupt: Packet size is 64 bytes, data is composed of several packets. b. Ctrl: Packet size is 256/1024/2048 bytes, data is parsed from single packet.
2	Data Type	a. MC: Mutual data, touch report data is included b. SC-X: Self X-axis data c. SC-Y: Self Y-axis data d. PEN-TIP: Stylus Tip data, stylus report data is included e. PEN-RING: Stylus Ring data Multiple-choice, not support showing both Finger/Pen data at the same time

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3	# of Finger	Max finger count, the count of stylus is constant 1
4	RoI Size	Size of Region of Interest (RoI), unit in channel count
5	Output Function	Default set as "Locate" , not adjustable currently.
6	Estimated Values	Estimated values, such as the data size and packet counts for a single frame, and report rate for I2C interface with 400K clock rate
7	Show CDC Color Grid	Show CDC frame raw data, default disabled.
8	Start/Stop Button	Start/Stop receiving C-Model packets.
9.	資訊欄	Show real-time report rate when start receiving C-Model packets

Table 3-23 C-Model UI Items Description

After setting and starting C-Model, users could right-click on the right panel to select below functions.



Fig 3-57 C-Model Right-Click Functions

No	Name	Description
1	Start/Stop Record	Click to start/stop data recording, same as shortcut Ctrl-R keys. When re-coding, information shows above the panel as below figure, which means count of CDC frames and report data. Both data would be separately saved under directory "Debug_Record_File" and "Debug_Record_Paint" . Recording... cdc 345 frames, paint 158 frames Saved .csv file could be separately replayed by CDC and Paint Functions.
2	Display Number	Show data number in CDC color grid, default disabled.

Table 3-24 C-Model Right-Click Functions Description

4. Sensor Test Tool

RD/OP Mode switch

In Home or Sensor Test window press keyboard “**Alt+Z**” to switch RD mode. Password is followed Tool version.

For example:

If tool version is V 1.0.0.14, it means password is **10014**.

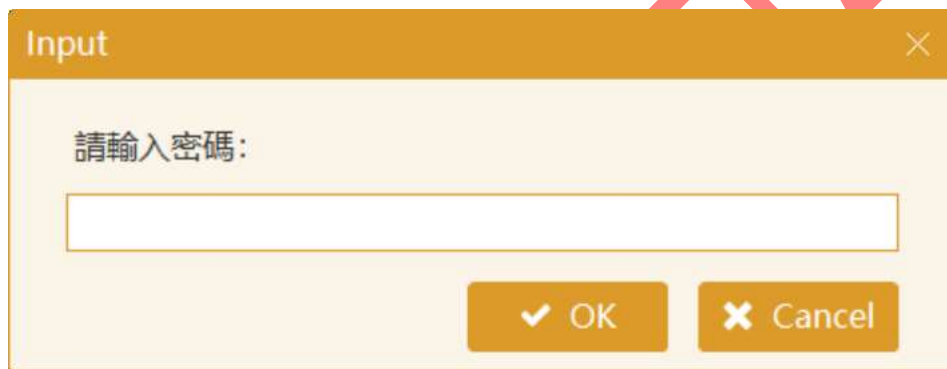


Fig 4-1 Switch mode Password

After key-in the correct password, the MainSetting box will pop-up. (Fig 4-1)

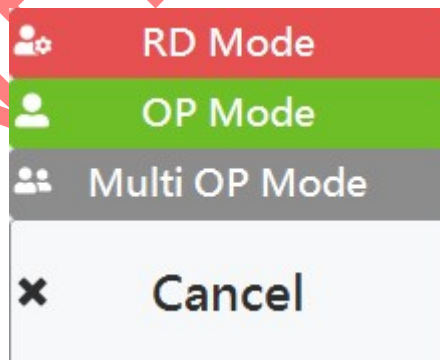


Fig 4-2 Main Setting

※OP Mode: Tool for mass production only. If want to edit configuration, it must be switched to RD mode. (Fig 4-2)

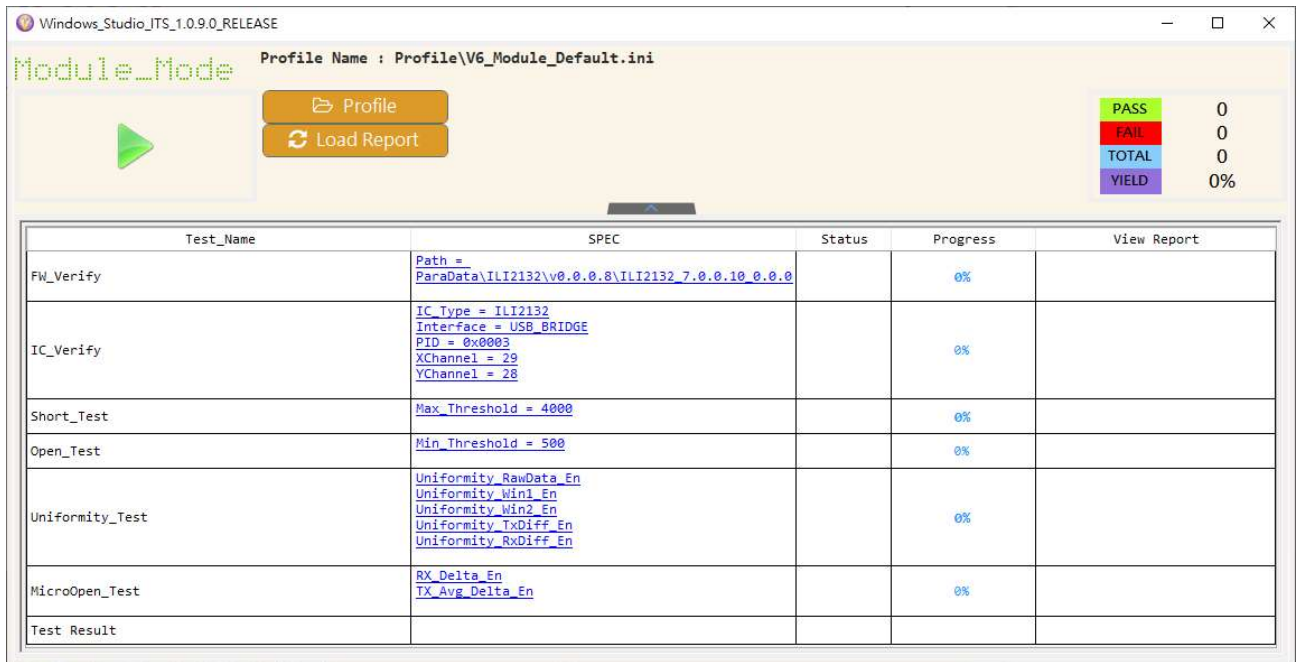


Fig 4-3 Sensor Test Tool (OP MODE)

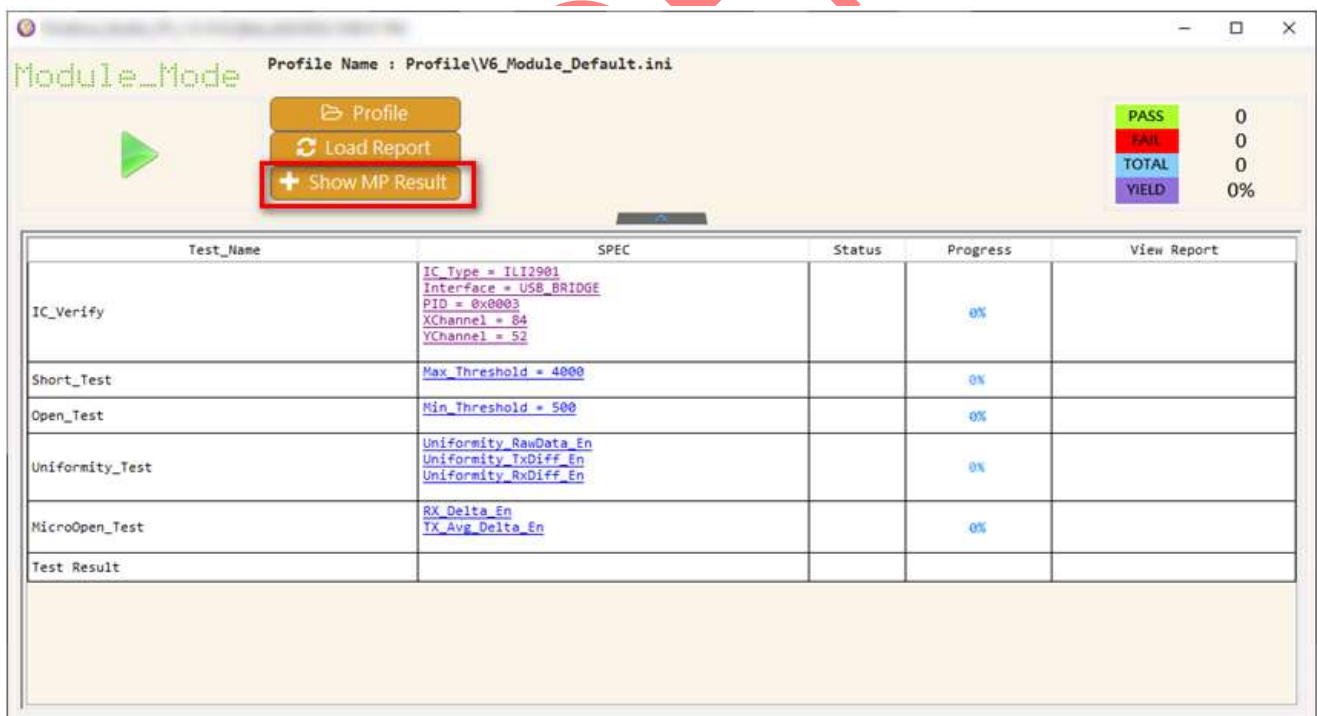


Fig 4-4 Show MP Result at Sensor Test Tool (OP MODE)

※RD Mode: All functions are available

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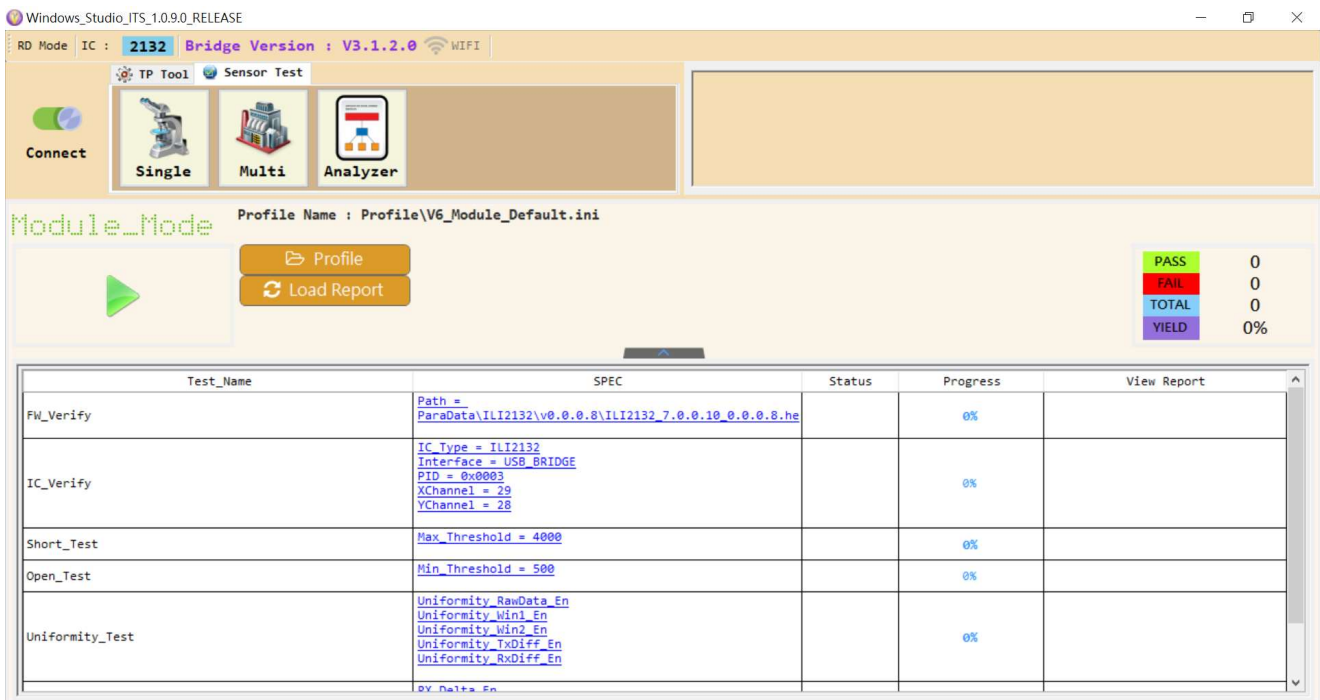


Fig 4-5 Sensor Test Tool (RD Mode)



Fig 4-6 Sensot Test main UI which Show Test Detail Info switch to OFF and Show Test Info Viewer switch to ON

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Sensor Test

Tool show tests items on the screen (Sensor + PCB) as follows. (Fig 3-5)

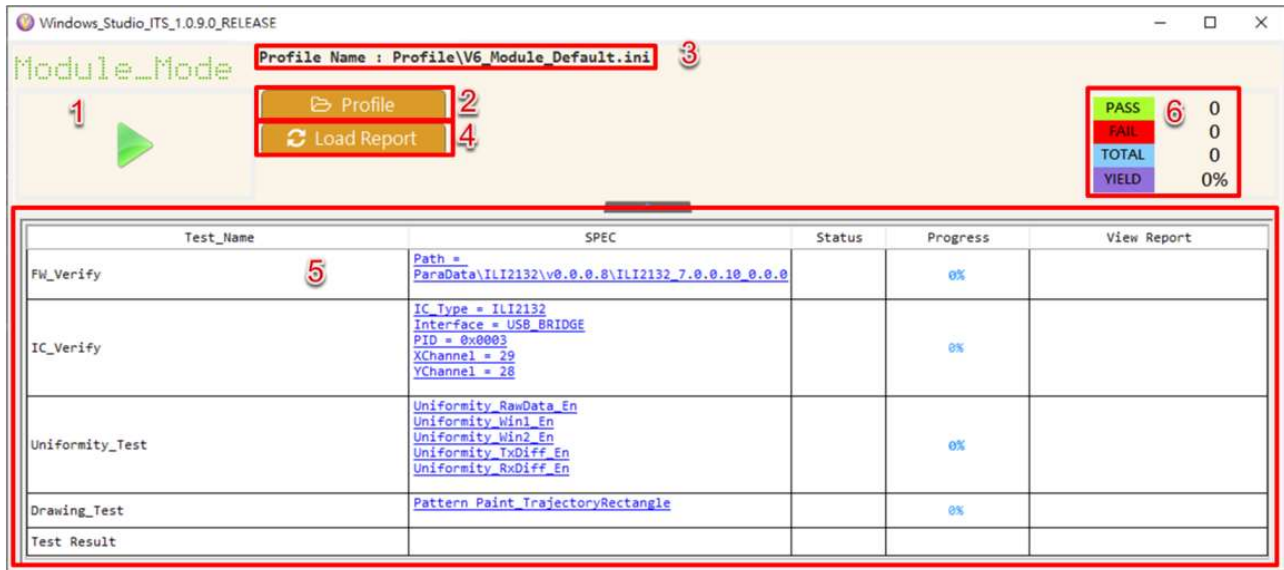


Fig 4-7 Sensor test 1

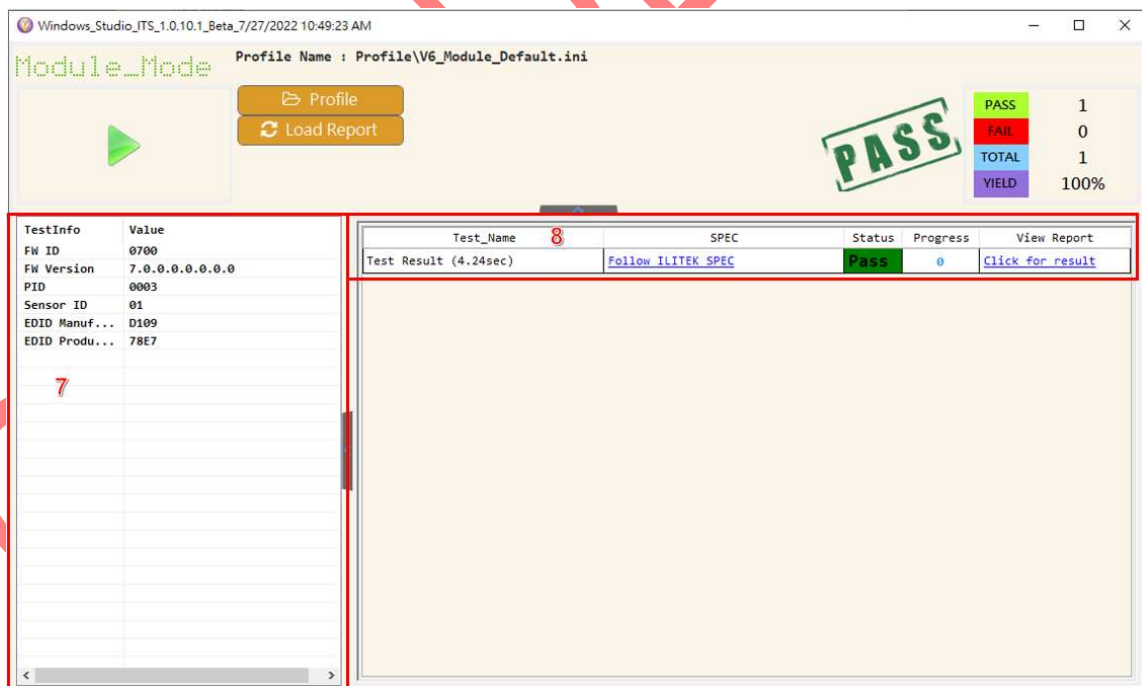


Fig 4-8 Sensor test 2

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The detailed descriptions of the Sensor test function:

Item	Name	Description
1	Start Test	Click button to start test.
2	Load Profile	Select configuration with proper IC type and interface.
3	Profile Name	Show the selected profile path.
4	Load Report	Select test log and show test result on UI.
5	Test List	<p>[Enable] : Test item enable when it is selected.</p> <p>[Test Name] : Test item name</p> <p>[SPEC] : Test criteria and click to do modification.</p> <p>[Status] : Show result. (Pass/Fail)</p> <p>[View Report] : Click "Click for result" show test item result</p>
6	Test Result	Total results
7	Test Info Viewer	<p>A window used to display additional information after the test was finish. You can control whether to switch on or off through Setting - Operator Option - Show Test Info Viewer</p> <p>[FW ID] : The value that protocol 6.0.7 and above supports writing .</p> <p>[FW Version] : The FW version after the test.</p> <p>[PID] : Product ID</p> <p>[Sensor ID] : The Sensor ID written by the FW</p> <p>[EDID Manufacturer Name] : The name of the manufacturer read from the display EDID</p> <p>[EDID Product Code] : A Product Code read from the display EDID</p>
8	Test Result(Simplify)	<p>The form which displayed when Setting - Operator Option - Show Test Detail Info is OFF.</p> <p>It will only display the final result instead of the detailed test content.</p> <p>When Show Test Detail Info was closed, the Setting window cannot be opened by clicking SPEC. Please use the right mouse button to open the Setting page</p>

Table 4-1 Sensor test table

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Sensor Test – SPEC (Profile(F))

The Profile function can load and save configurations.

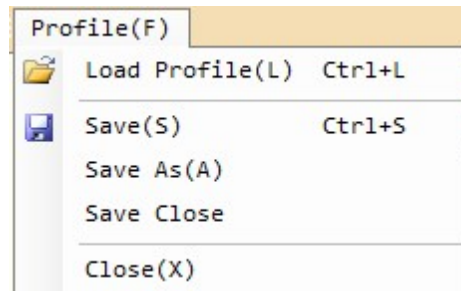


Fig 4-9 Sensor Test – Profile menu

The detailed descriptions of the Profile function as (table 3-2):

Item	Name	Description
Profile menu	Load Profile	Load configuration from file (profile).
	Save(S)	To save modification into file (profile).
	Save As	It can save a new configuration.
	Save Close	Do Save(S) and close.
	Close(X)	Close edit function.

Table 4-2 Profile menu

Sensor Test – SPEC (System)

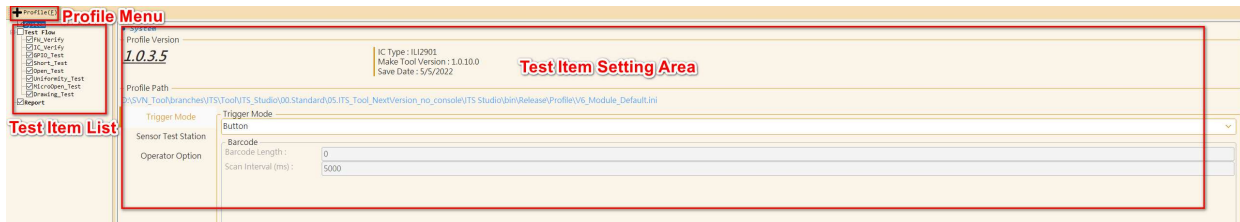


Fig 4-10 Sensor Test – SPEC (System) 1

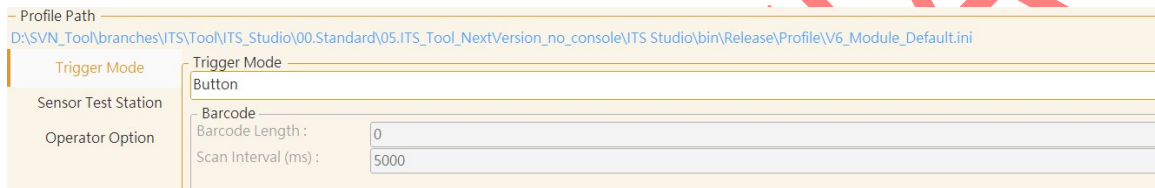


Fig 4-11 Sensor Test – SPEC (System) 2

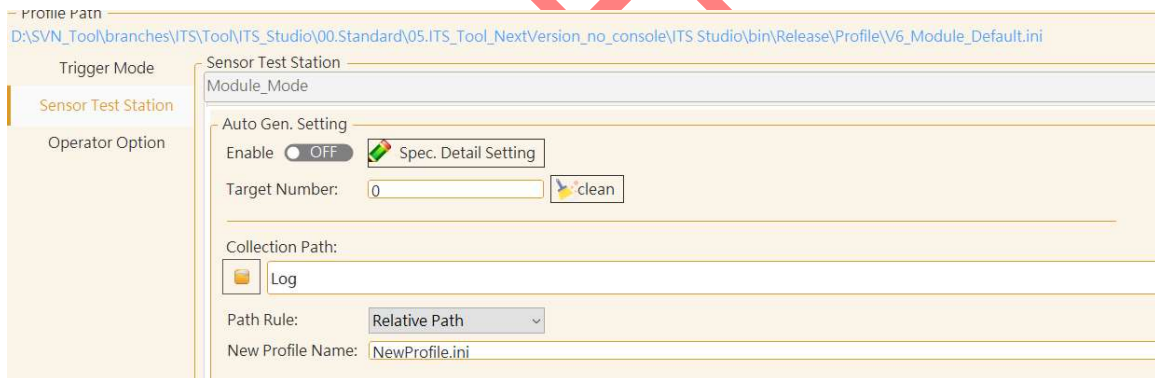


Fig 4-12 Sensor Test – SPEC (System) 3



Fig 4-13 Sensor Test – SPEC (System) 4

The detailed descriptions of the System function:

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Name	Description		
INI Path	Show absolute path of configuration file.		
Profile version	Show profile version. Make Tool Version: tool version Save Date: Profile edited date. IC Type: IC Type of profile		
Test Item Area	Users can select test items and decide whether they want to join the test or not.		
Test Setting Area	Users can set the specifications or parameters of the test item.		
	Options	Description	
	File Path	Profile Data Path	
	Profile Version	The version of profile	
	Save Date	Current date.	
	Make Tool Version	The tool version	
	IC Type	The IC name	
	Trigger Mode	[Trigger Mode]	
		Options	Description
		Button	Use button to start test
		Bar Code	Scan bar code to start test
	Barcode	Options	Description
		Barcode Length	set barcode length. (e.g. The barcode is “123” that means Barcode Length is “3”)
		Scan Interval (ms)	Interval of test in barcode mode.
		Focus Enter	Needs to get “Enter” key to test, doesn’t judge barcode length is enough or not.
	Test Function	[Sensor Test Station]	

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	Setting	Options	Description
		Module_Mode	PCB + Sensor.
		FPC_Mode	PCB Onlt
		AutoGen_Mode	Auto generate profile
		Report_Mode	Load test log.
	Fixture_Tip	Options	Description
		Pick up	Set the hint for pick up fixture.
		Put down	Set the hint for put down fixture.
		Change connector	Set the hint for change connector.
		Blink Timer	Set the time for blink message
	Operator Option	[Operator Option]	
		Options	Description
		TestFailStop	Stop the whole test when one item test fail.
		TestAllDone_FailStop	Stop the whole test after test finish if have one or more fail.
		TestAllDone_PassClose	Close the program if test finish and all results are pass .
		TestStart_AutoTest	Auto start the test when program was launched.

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		TestAllDone_FailClose	Close the program if test finish and have one or more fail.
		TestFinishPwrDown	Shut down the Vdd power after finish test.
		BarcodeWaitForTest	Start test after bar code was scanned
		I2C Detect	OP Mode Only. Auto start the test if it detects I2c data.
		Show MP Result	OP Mode use only Show the button to get MP Result information.
		Show Test Detail Info	Show/Hide the test detail information. (When this item is OFF, please open the Setting page with the right mouse button instad of click SPEC)
		Show Test Info Viewer	A window used to display additional information after the test

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			was finish
		Show Test Error Code	Show/Hide Test Error Code
	Auto Gen. Setting	[Auto Gen. Setting]	
		Options	Description
		Enable	Enable or not
		Path Rule	Select the abs path or rleati pate
		Spec. Detail Setting	Set the new spec value of profile.
		Collection Path	Set the path to collecting logs.
		Folder Selection	select the path
		Target Number	Set the number of Logs to collect
Clean		clear all logs under the path of the specified Log collection	
	New Profile Name	New profile name	
Trigger mode Setting	Trigger mode setting. Button: start test when press button Barcode: start test when barcode is scanned.		
Sensor Test Station	Module Mode: PCB + Sensor. FPC Mode: PCB only. Auto Gen. Mode: Collect the results of sensor test to generate new profiles Report Mode: Get the *.csv to show the result on the main frame.		

Table 4-3 Sensor Test – SPEC (System) table

Sensor Test – SPEC (FW Upgrade)

The FW_Upgrade function can compare CRC of selected hex and CRC of testing TP module.

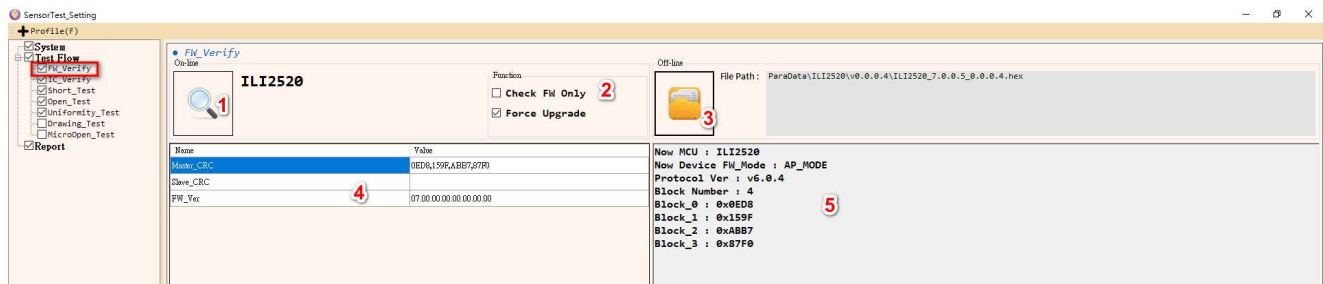
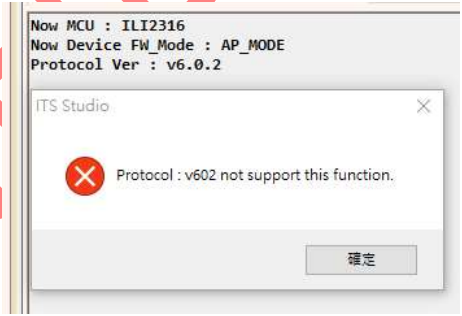


Fig 4-14 Sensor Test – SPEC (FW Upgrade)

Item	Name	Description
1	Scan	Detects the current IC type.
2	Check Box	Force Upgrade: Decide whether to force upgrading. Check FW Only: check the version between hex file and IC. Above two functions can only be chosen one.
3	Select Path	Select the path of the hex file (the path must be all English)
4	CRC Check	Return the CRC value, when some versions could not support, it will show an error message. 
5	FW information	Display Firmware information, the title is named as below: Hex Block_ : means CRC of the hex file. Device Block_ : means CRC of IC. The result of comparison uses font color to highlight, if the color is green, it means CRC is same, if the color is red, it means CRC is differ.

		<div>Hex Block_0 Checksum : 0x550CDA Device Block_0 Checksum : 0x00550CDA Hex Block_1 Checksum : 0x0000 Device Block_1 Checksum : 0xF50A</div>
--	--	--

Table 4-4 Sensor Test – SPEC (FW Upgrade) table

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Sensor Test – SPEC (IC Verify)

The IC_Verify function can load information from touch controller.

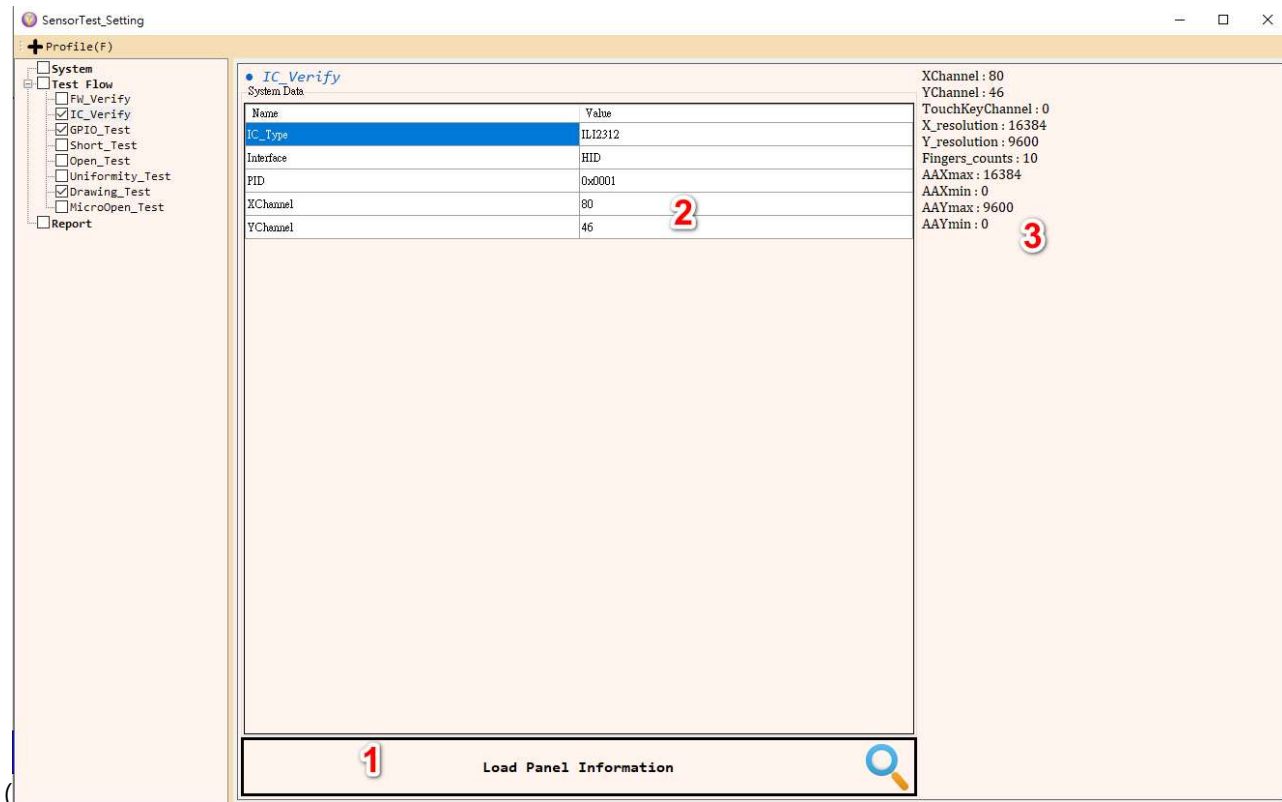


Fig 4-15 Sensor Test – SPEC (IC Verify)

The detailed descriptions of the IC verify function as (table 3-5):

Item	Name	Description												
1	Load Panel Information	Load information from touch controller.												
2	System Data	Show the system data.												
		<table><tr><th>Name</th><th>Description</th></tr><tr><td>IC_Type</td><td>IC type.</td></tr><tr><td>Interface</td><td>Interface.</td></tr><tr><td>PID</td><td>USB product ID.</td></tr><tr><td>XChannel</td><td>Channel number of X direction</td></tr><tr><td>YChannel</td><td>Channel number of Y direction</td></tr></table>	Name	Description	IC_Type	IC type.	Interface	Interface.	PID	USB product ID.	XChannel	Channel number of X direction	YChannel	Channel number of Y direction
		Name	Description											
		IC_Type	IC type.											
		Interface	Interface.											
		PID	USB product ID.											
XChannel	Channel number of X direction													
YChannel	Channel number of Y direction													
3	Panel Info	Show the TP basic information.												

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Table 4-5 Sensor Test – SPEC (IC Verify) table

Sensor Test – SPEC (GPIO)

Fig 4-16 Sensor Test – SPEC (GPIO Test)

Name	Description
SPEC	<p>[GPIO PIN-ID] Depend on the defined code of customized case to compare with FW</p> <p>[Interface] Depend command to get the UART pin self test result from FW °</p> <p>[GPIO] It only enable to test using I2C interface, the goal is to check INT pin of bridge and Reset Pin workable.</p>

Table 4-6 Sensor Test – SPEC (GPIO Test) table

Sensor Test – SPEC (Short Test)

The Short_test function can modify short test criteria.

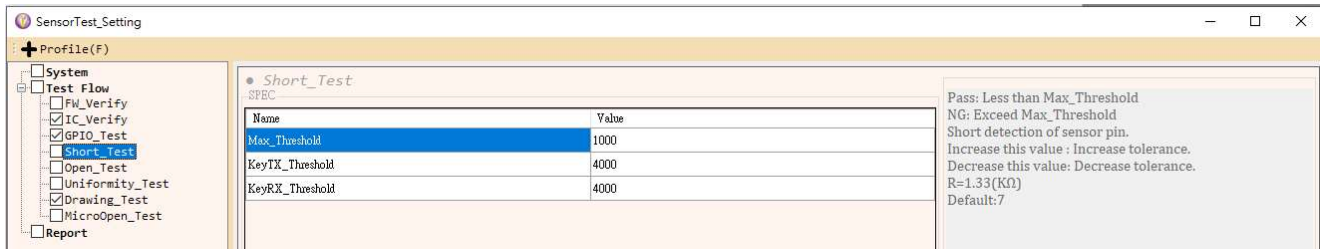


Fig 4-17 Sensor Test – SPEC (Short Test)

The detailed descriptions of the Short test function as (table 3-7):

Item	Name	Description
1	SPEC	<p>[Max_Threshold] Set the allowable maximum value</p> <p>[KeyTX_Threshold] Set the allowable maximum value of Key_TX</p> <p>[KeyRX_Threshold] Set the allowable maximum value of Key_RX</p>

Table 4-7 Sensor Test – SPEC (Short Test) table

Sensor Test – SPEC (Open Test)

The Open_test function can modify open test criteria.

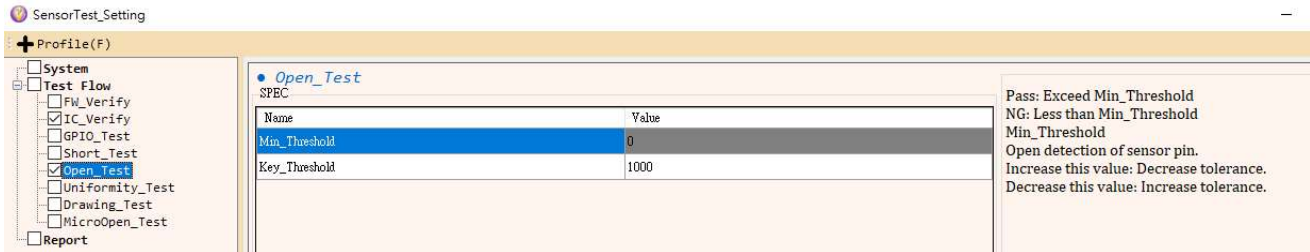


Fig 4-18 Sensor Test – SPEC (Open Test)

The detailed descriptions of the Open test function as (table 3-8):

Item	Name	Description
1	SPEC	<p>Min_Threshold: Define threshold for fully-open.</p> <p>TX_Average_Diff_Gap: Define threshold for micro-open.</p>

Table 4-8 Sensor Test – SPEC (Open Test) table

Sensor Test – SPEC (Uniformity Test)

Set the node of the threshold for Uniformity_RawData / Uniformity_Win1 / Uniformity_Win2 / Uniformity_TxDiff / Uniformity_RxDiff

Click the node of Item5, the X/Y channel and the status of mouse coordination will display on Item6, and pop-up a window to shows the coordination and Up/Low Limit of node.

Use mouse left click on Node twice or click folding button on Item7 to set the coordination and press OK to pop-up a window(Item8) to set the Max/Min Threshold of node, the setting value will save to profile when you click “OK”

You can use mouse right click to drag the area to enable Zoom function, slide to right side to zoom in, slide to left side to zoom out.

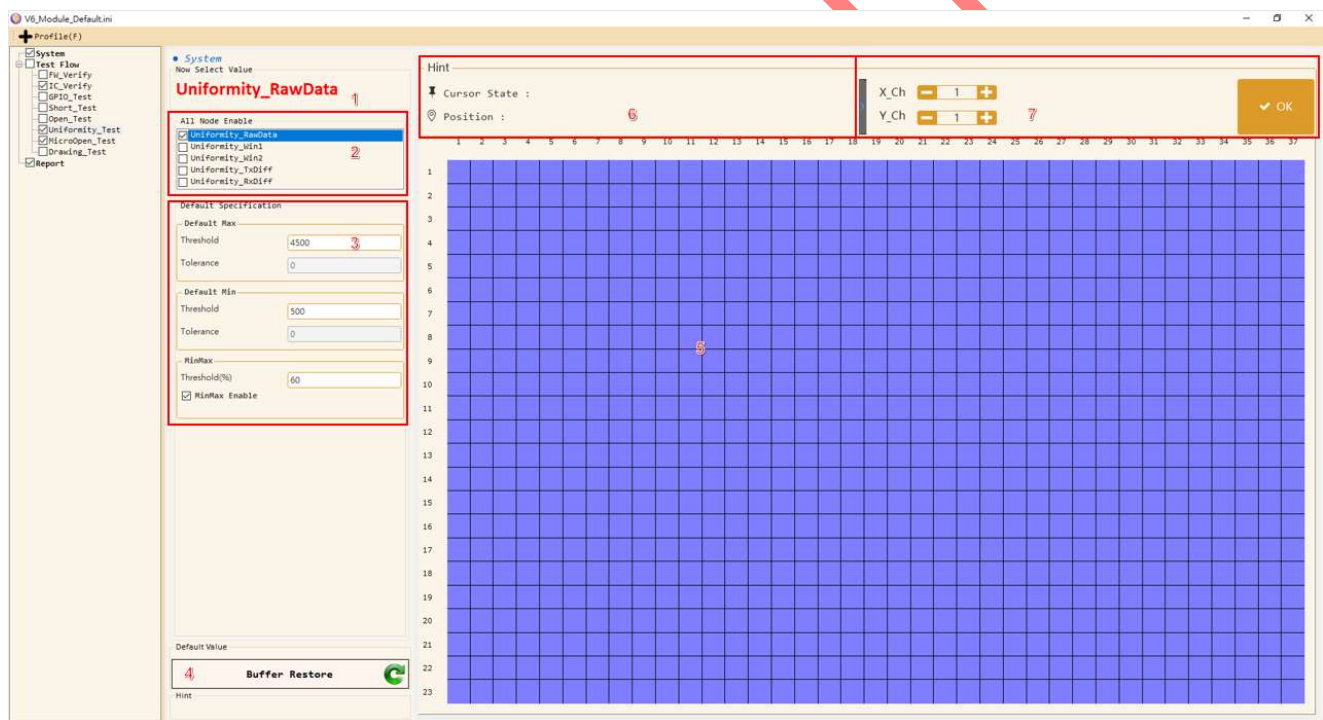


Fig 4-19 Sensor Test – SPEC (uniformity Test 1)

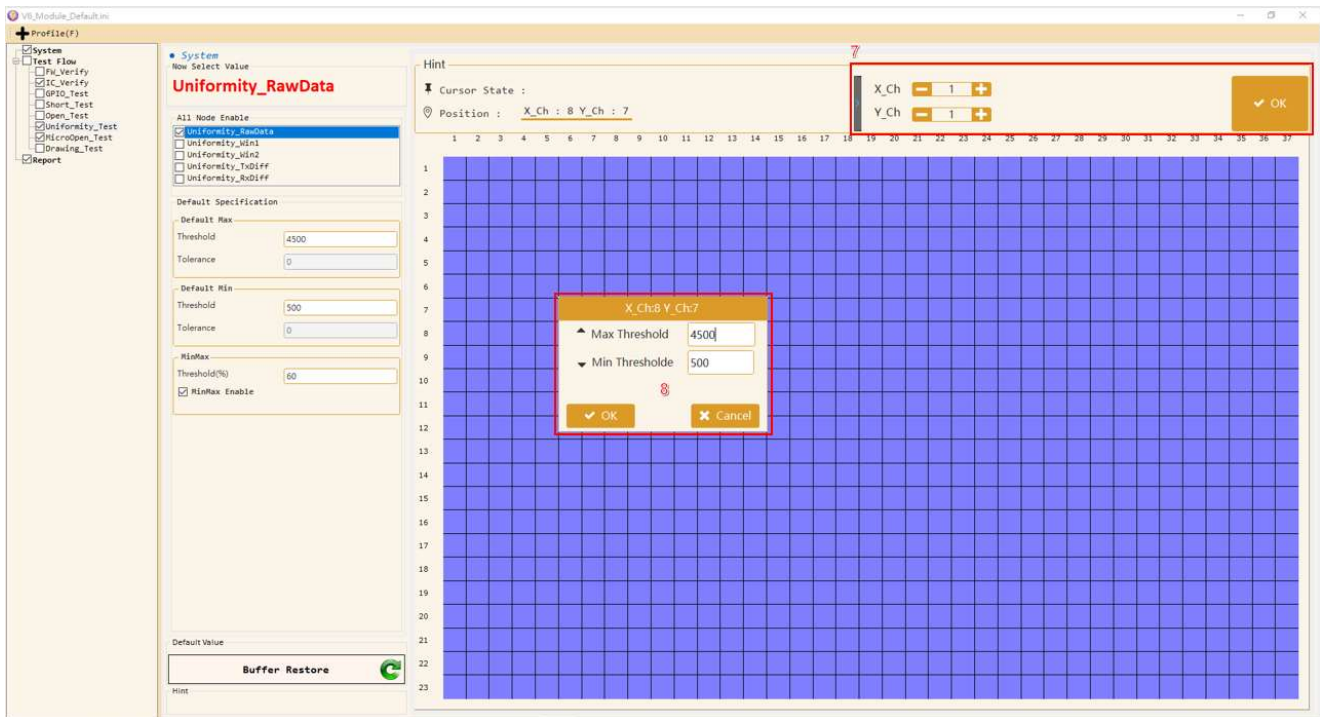
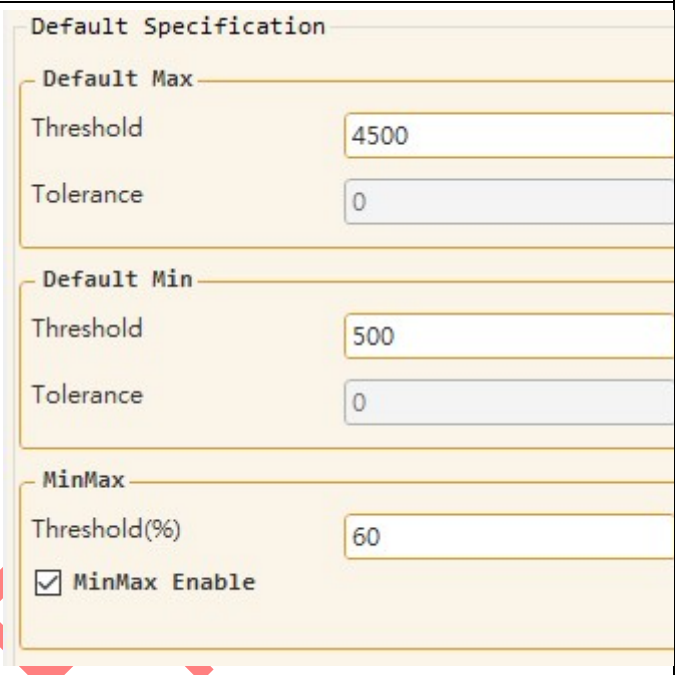

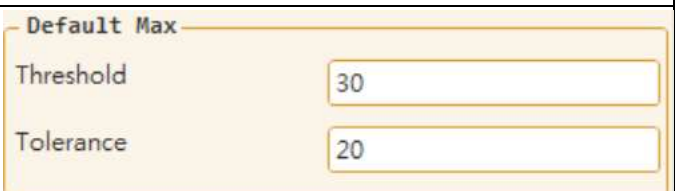
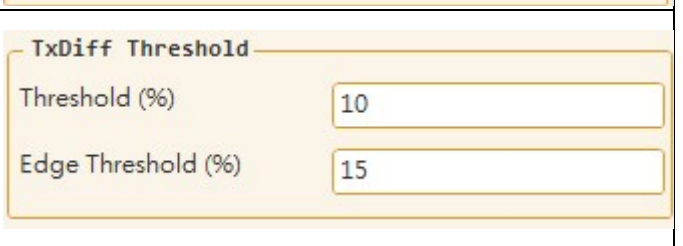


Fig 4-20 Sensor Test – SPEC (uniformity Test 2)

The detailed descriptions of the Uniformity test function:

Item	Name	Description
1	Now select value	Display the current selected test item
2	All Node Enable	Determine each item is checked or not.

3	Default Specification	Select and click the test item to set the value of this item.	
		Test	Figure
		Uniformity_RawData	
		Uniformity_Win1	
		Uniformity_Win2	
		Uniformity_TxDiff	

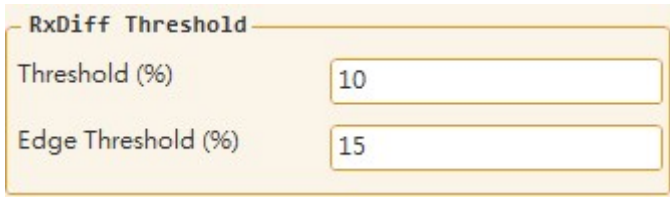
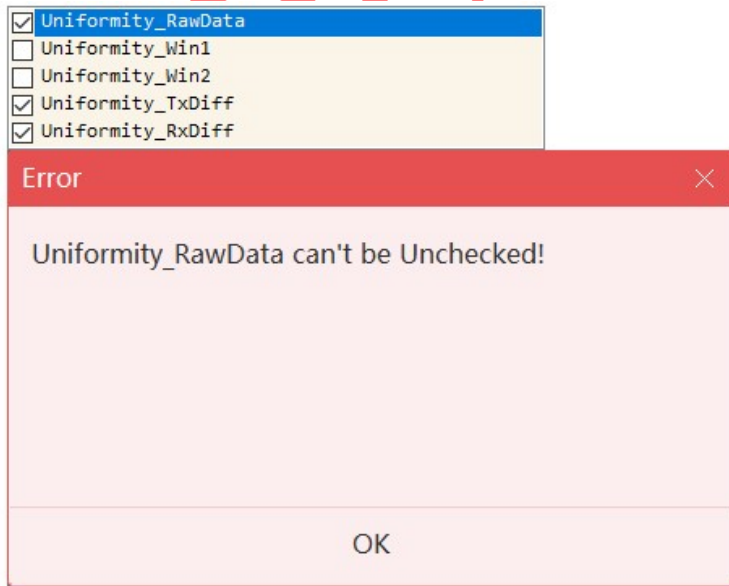
		Uniformity_RxDiff	
4	Buffer Restore	Restore to default value of the current profile.	
5	Node frame	Right click on this area, shows the coordinate in item 8, and set the value of this coordination in item 7.	
6	Status	Click the node to show X/Y Channel and mouse coordination	
7	folding button	click folding button on Item7 to set the coordination and press OK to pop-up window(Item8) to set the Max/Min Threshold of node	
8	Max / Min Threshold	The setting of maximum and minimum value.	
9	Constraint	 <p>When you uncheck the Uniformity_RawData item, a red warning window will pop up.</p>	

Table 4-9 Sensor Test – SPEC (Uniformity test) table

Sensor Test – SPEC (Drawing Test)

This item is a line drawing test, there is a finger drawing (Finger) and a touch pen drawing (Pen).

Pen page can be used as long as the FW has support for the touch pen function.

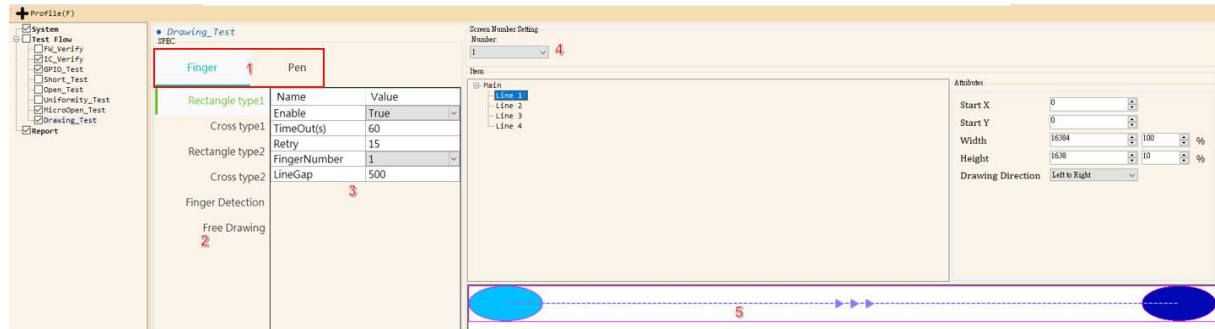


Fig 4-21 Sensor Test – SPEC (Drawing Test)

Item	Name	Description
1	Drawing Method	The setting page for finger drawing and pen drawing.
2	Type	<p>Drawing type</p> <ul style="list-style-type: none"> a. Rectangle type1: draw box test. it can support one or two fingers test. b. Cross type1: draw cross test c. Finger detection: detect N-finger touch panel results d. Rectangle type2: draw a box test without restricting the direction, and adjust the width of the drawing line to fill the drawing area. e. Cross type2: draw cross test, no restriction on the direction, you can adjust the width of the drawing line to fill the drawing area. f. Free Drawing: painting test, you can count down or press virtual button to end the test.
3	setting	To set the conditions for each drawing line type.
4	Screen Number Setting	Projected screen settings when you are testing.
5	preview	Line-type preview window

Table 4-10 Sensor Test – SPEC (Drawing test) table

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Rectangle type1

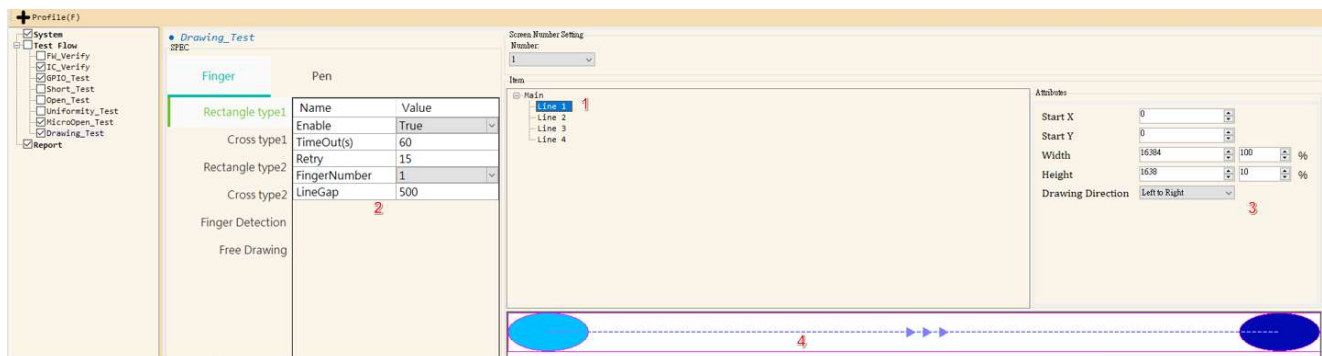


Fig 4-22 Sensor Test – SPEC (Drawing Rectangle test)

Item	Name	Description	
1	Line Se- lection	The line setting	
2	Sub Item Setting	The setting value of rectangle test	
Enable		True: enable ; False: disable	
TimeOut(s)		Time out.	
LineSetting		Display the Coordinate point and size and direction setting value of each line using text.	
Retry		Maximum retry times.	
Finger Number		There are one or two fingers to test.	
Line Gap		If it is a two-finger test, the test distance between the two fingers (unit is pixel)	
3	Preview	preview	
4	Line De- scription	Name	Description
Group		Set the sequence of the line drawing test · 1->2->3->4	
X、Y		The coordinate position of the upper left corner of the judgment range, the unit is the pixel of the screen.	
Width、Height		The distance from the starting coordinate of the upper left corner of the judgment range, in pixels of the screen.	
Direction		The drawing direction of the test can be set up and down	

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			to draw from left to right or from right to left, and left and right can be set to draw from top to bottom or draw from bottom to top.	
5	Screen Number	Screen settings projected during the test		

Table 4-11 Sensor Test – SPEC (Drawing Test-Rectangle) description

Cross type1

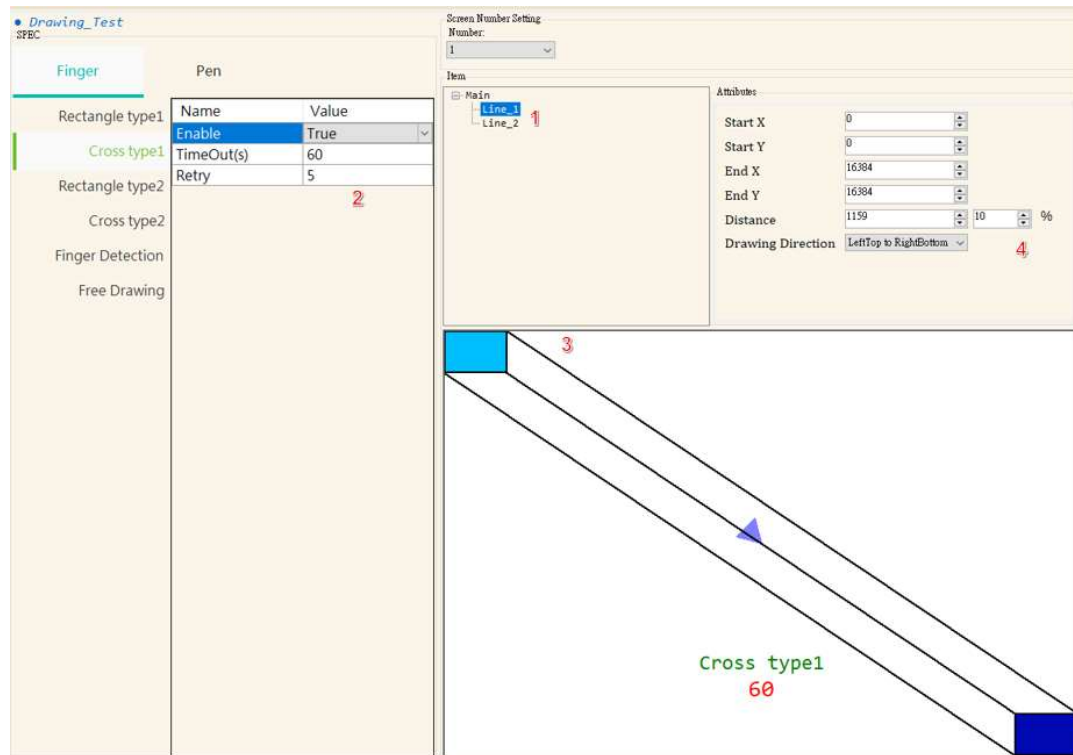


Fig 4-23 Sensor Test -Drawing Test (Cross)

Item	Name	Description	
1	Line Selection	Line setting	
2	Sub Item Setting	setting	
		Enable	True: enable ; False: disable
		TimeOut(s)	Time out.
		LineSetting	Display the Coordinate point and size and direction setting value of each line using text.
		Retry	Maximum retry times.
3	Preview	Preview area	
4	Line Description	Name	Description
		Group	Set the sequence of testing · 1->2->3->4
		X、Y	The coordinate position of the upper left corner of the judgment range, the unit is the pixel of the screen.

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		Width \ Height	The distance from the starting coordinate of the upper left corner of the judgment range, in pixels of the screen.
		Direction	The drawing direction of the test can be set up and down to draw from left to right or from right to left, and left and right can be set to draw from top to bottom or draw from bottom to top.

Table 4-12 Sensor Test – SPEC (Drawing Test-cross) description

Free Drawing

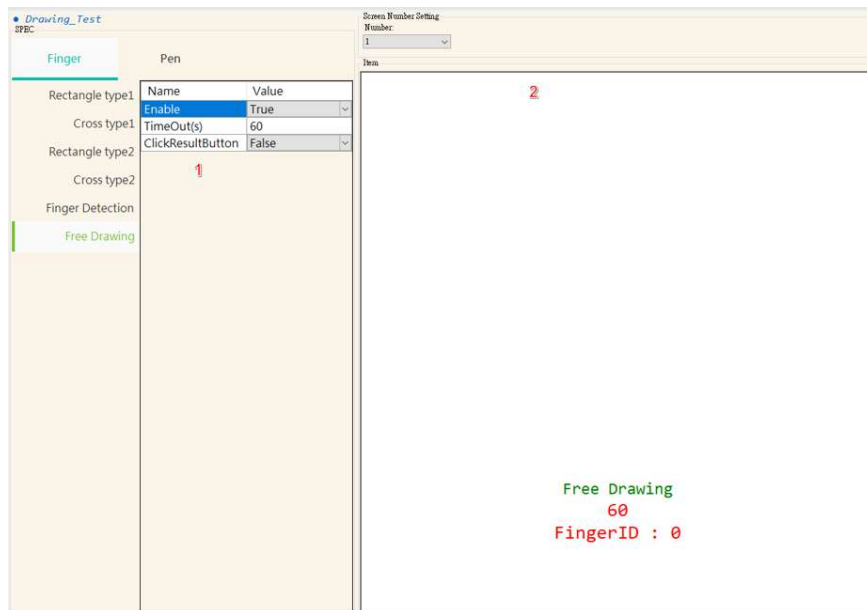


Fig 4-24 Sensor Test – SPEC (Free Drawing Test)

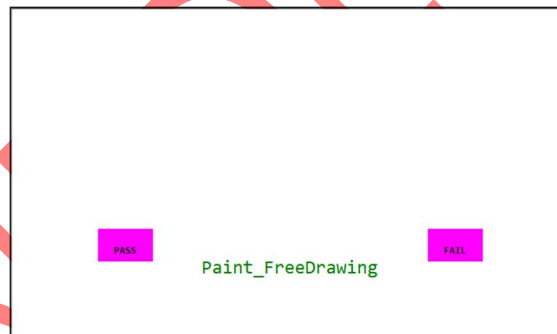


Fig 4-25 Sensor Test – SPEC (Free Drawing Test with virtual buttons)

Item	Name	Description	
1	Sub Item Setting	Enable	True: enable ; False: disable
		TimeOut(s)	Time out.
		Click Result Button	Using virtual button to decide the test is pass or fail.
2	Preview	Preview picture.	

Table 4-13 Sensor Test –Drawing Test(Free-Drawing)

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Finger Detection

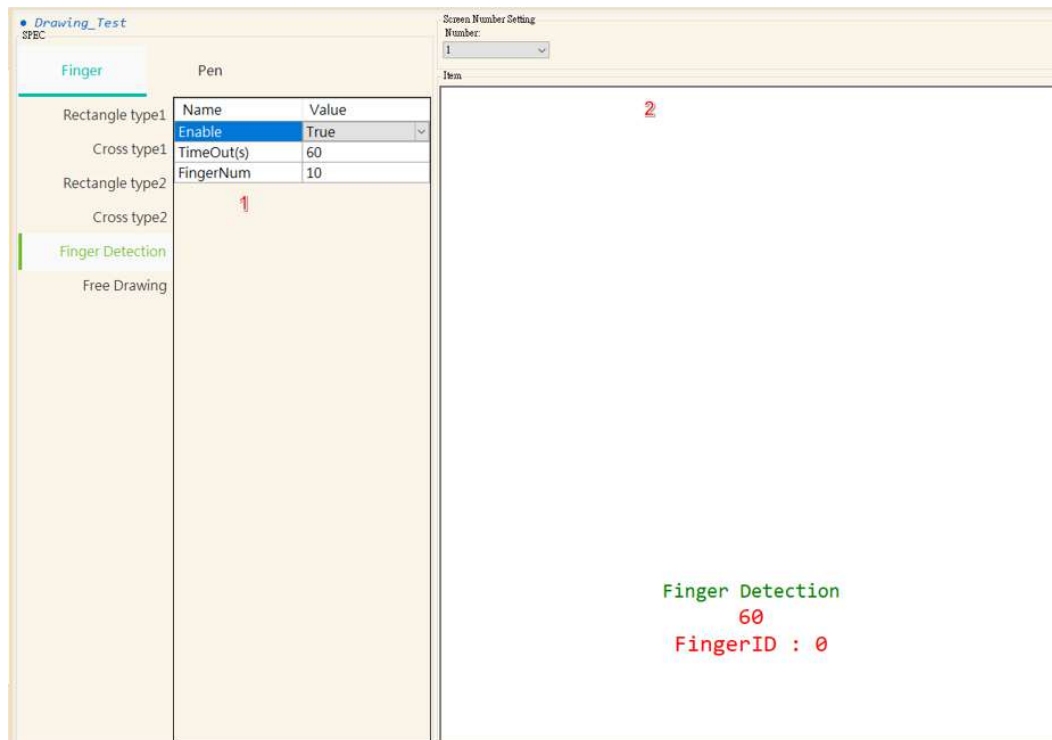


Fig 4-26 Sensor Test – SPEC (Finger Detection)

Item	Name	Description
1	Sub Item Setting	Enable
		True: enable ; False: disable
		TimeOut(s)
2	Preview	Time out.
		Finger Number
		Detect the number of fingers on the touch panel
		Preview picture.

Table 4-14 Sensor Test –Drawing Test(Finger Detection)

Rectangle type2

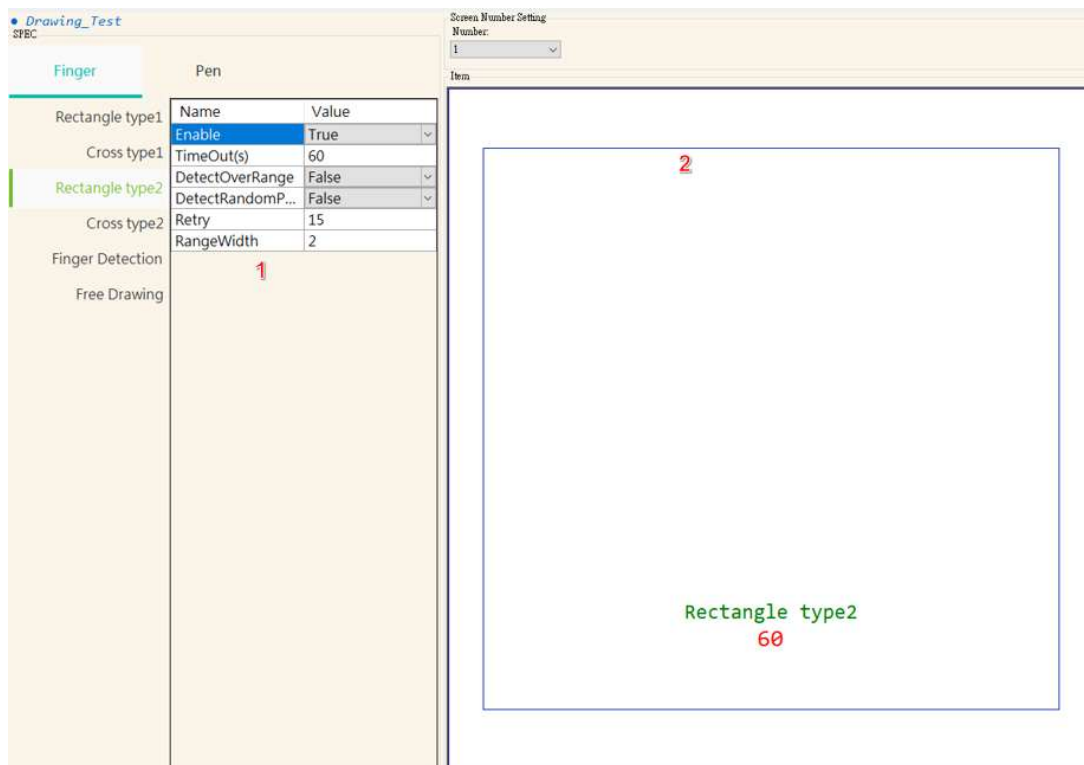


Fig 4-27 Drawing Test – Trajectory Rectangle

Item	Name	Description
1	Sub Item Setting	Enable
		True: enable ; False: disable
		TimeOut(s)
		Time out.
		DetectOver-Range
		True: Turn on the check if the boundary is exceeded ; False: Turn off the check if the boundary is exceeded
		DetectRandomPoint
		True: Turn on the check if tool gets any the random points ; False: Turn off the check if tool gets any the random points
		Retry
		Maximum retry times.
		RangeWidth
		The width of drawing area (unit is channel)
2	Preview	Preview area

Table 4-15 Sensor Test –Drawing Test (Trajectory Rectangle)

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Cross type2

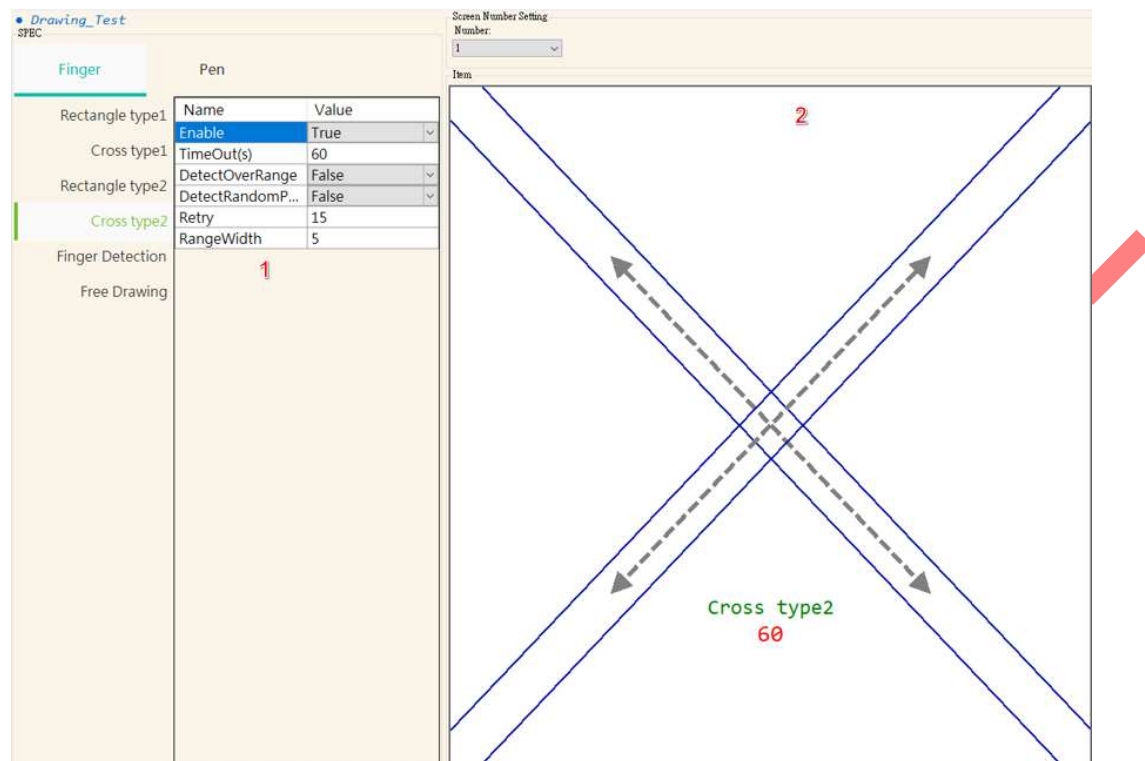


Fig 4-28 Drawing Test – Trajectory Cross

Item	Name	Description
1	Sub Item Setting	Enable
		True: enable ; False: disable
		TimeOut(s)
		Time out.
		DetectOver-Range
		True: Turn on the check if the boundary is exceeded ; False: Turn off the check if the boundary is exceeded
		DetectRandomPoint
		True: Turn on the check if tool gets any the random points ; False: Turn off the check if tool gets any the random points
		Retry
		RangeWidth
		Maximum retry times.
2	Preview	The width of drawing area (unit is channel)
		Preview

Table 4-16 Sensor Test –Drawing Test (Trajectory Cross)

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Sensor Test – SPEC (Micro Open Test)

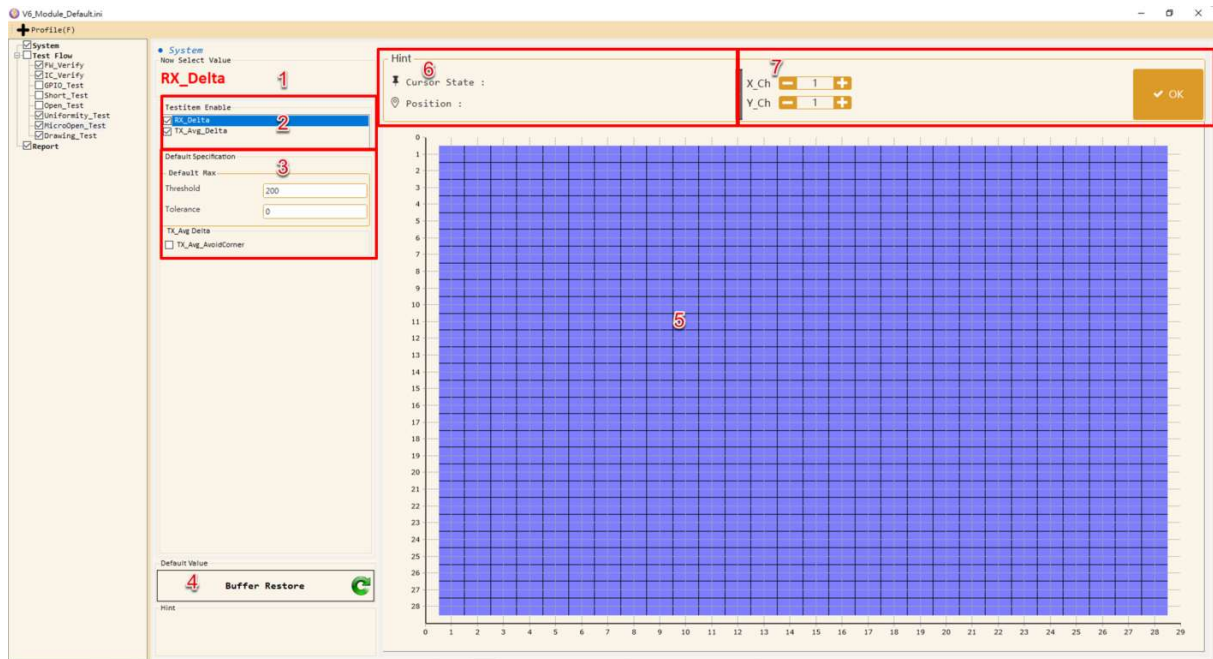


Fig 4-29 Sensor Test – SPEC (micro open test 1)

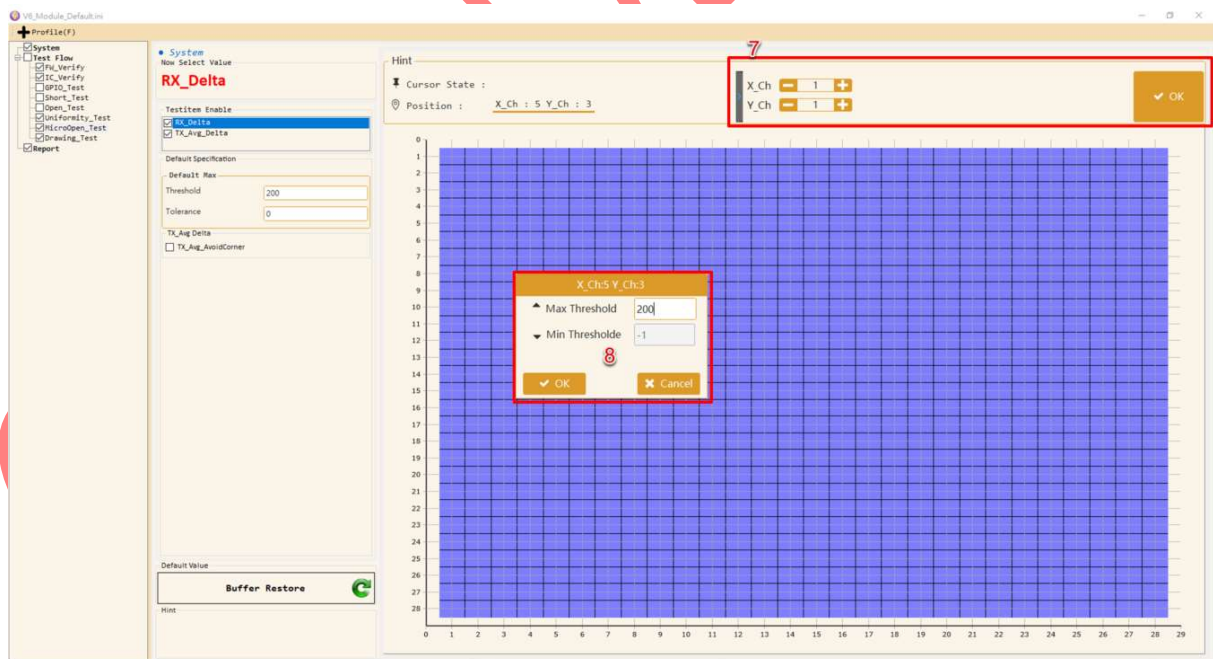


Fig 4-30 Sensor Test – SPEC (micro open test 2)

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Item	Name	Description						
1	Now select value	Display the current selected test item						
2	Test Item Enable	Determine each item is checked or not. RX_Delta: 2 dimensions frame, subtract two adjacent RX direction TX_Abg_Delta: 1 dimension frame, subtract two adjacent TX direction then get the average.						
3	Default Specification	<div>Click the test item to set the value.</div> <table><tr><th>Test</th><th>Figure</th></tr><tr><td>RX_Delta</td><td><div>Default Max Threshold 200 Tolerance 0</div></td></tr><tr><td>TX_Abg_Delta</td><td><div>Default Max Threshold 200</div></td></tr></table>	Test	Figure	RX_Delta	<div>Default Max Threshold 200 Tolerance 0</div>	TX_Abg_Delta	<div>Default Max Threshold 200</div>
Test	Figure							
RX_Delta	<div>Default Max Threshold 200 Tolerance 0</div>							
TX_Abg_Delta	<div>Default Max Threshold 200</div>							
4	Buffer Restore	Resort to the default of the current profile.						
5	Node frame	Right click on this area, shows the coordinate in item 8, and set the value of this coordination in item 7 °						
6	Status	Click the node to show X/Y Channel and mouse coordination						
7	folding button	click folding button on Item7 to set the coordination and press OK to pop-up window(Item8) to set the Max/Min Threshold of node						
8	Max / Min Threshold	The setting of maximum and minimum value.						

Table 4-17 Sensor Test - SPEC (Micro Open test) table

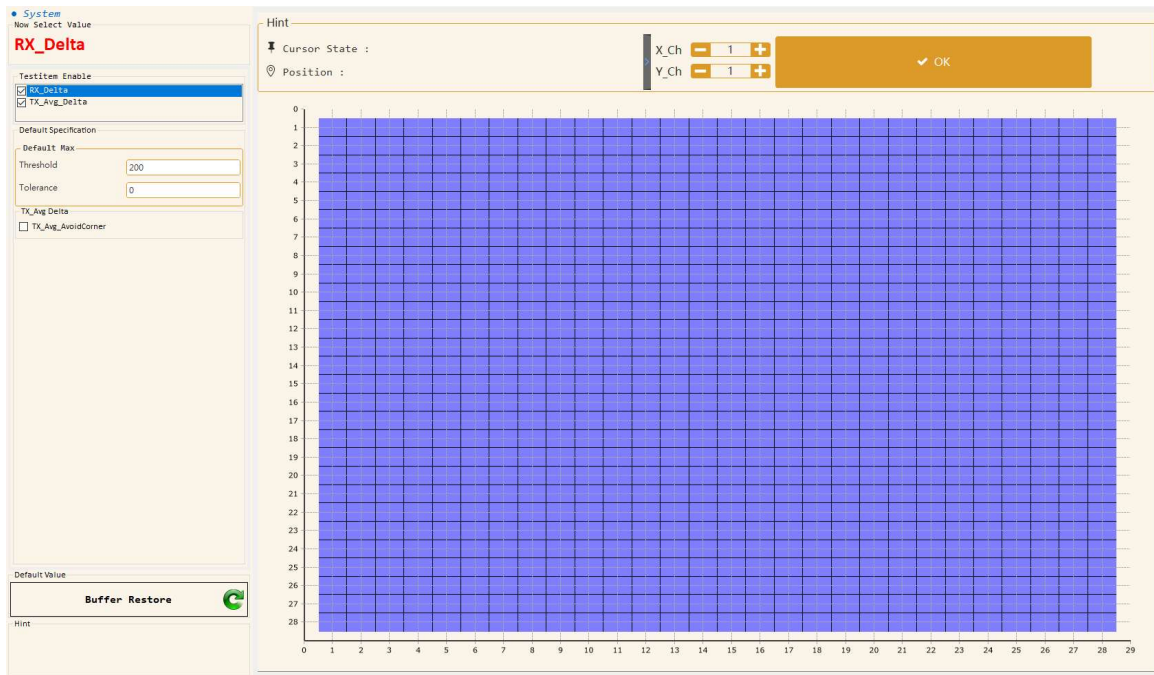


Fig 4-31 Sensor Test – RX delta setting

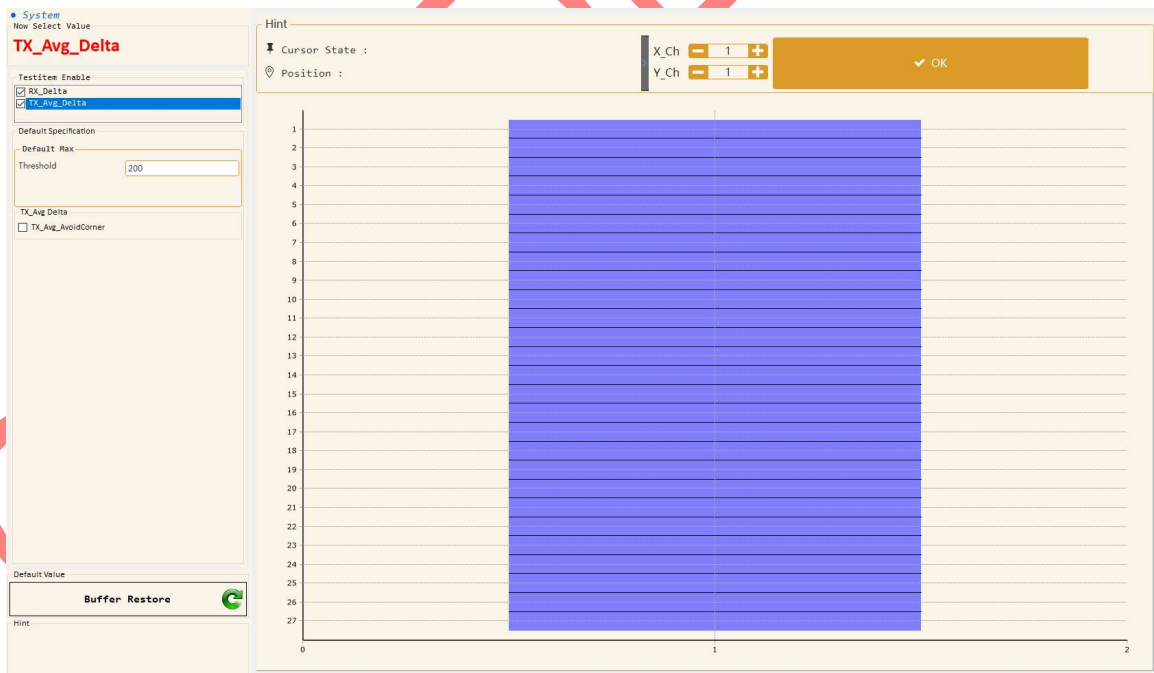


Fig 4-32 Sensor Test – SPEC (RX_Avg_Delta setting)

Sensor Test – SPEC (Report)

The Report function can define the saving log file name and path.

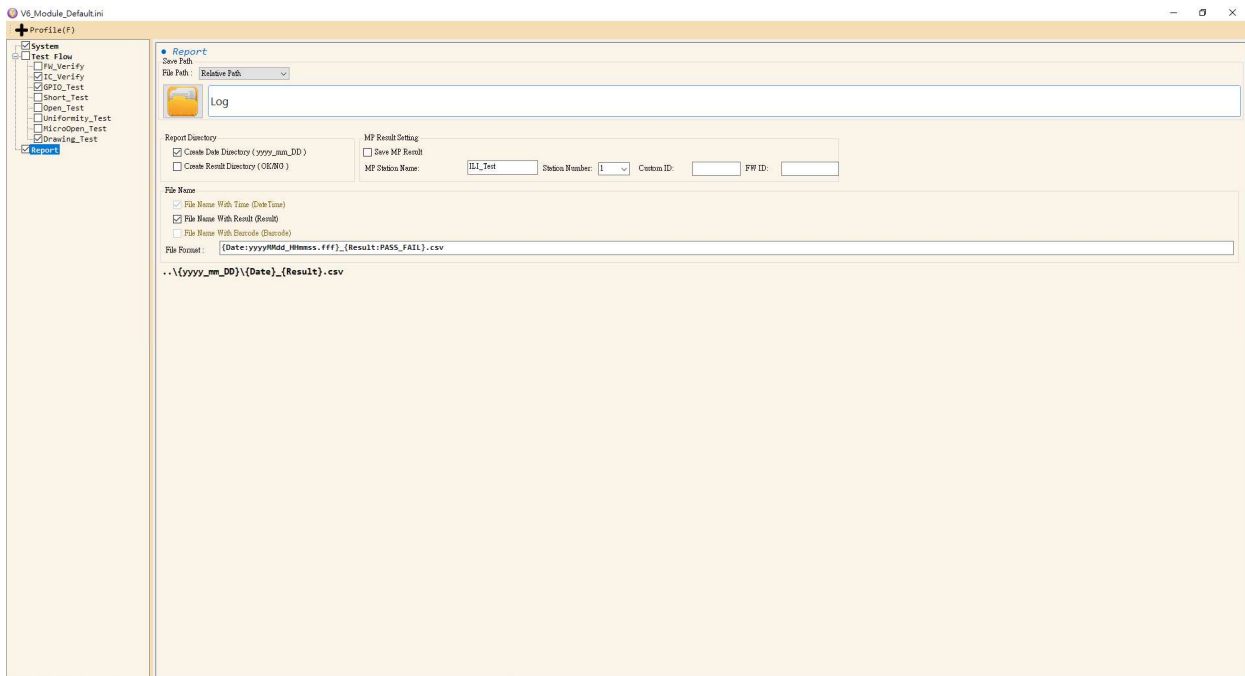


Fig 4-33 Sensor Test – SPEC (Report)

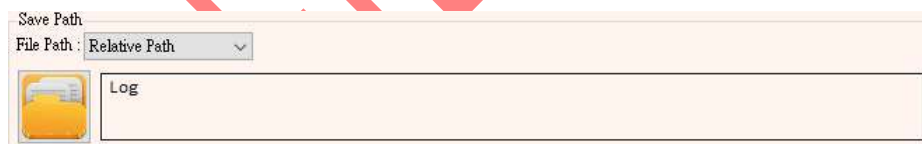


Fig 4-34 Sensor Test – the path of the testing result setting (Report)

The detailed descriptions of the Report function:

Item	Name	Description	
1	Save Path	Name	Description
		Absolute Path	User-defined save log path.
		Relative Path	System defines save log path.
2	Report Directory	Name	Description
		Create Date Directory(yyyy-mm-DD)	Create the log repository sub-folder for the record

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3	File Name	date.	
		Create Result Directory(OK/NG)	Create the log repository sub-folder for the record OK/NG.
		Name	Description
		File Name With Time (Date Time)	Define the log file format show the test date.
		File Name With Result (Result)	Define the log file format show the test result.
		File Name With Barcode (Barcode)	Define the log file format show the barcode.

Table 4-18 Sensor Test – SPEC (Report) table

MP Result Setting

☐ Save MP Result

MP Station Name: Station Number:

Fig 4-35 MP-Result V6 serial

MP Result Setting

☐ Save MP Result

MP Station Name: Station Number: Custom ID: FW ID:

Fig 4-36 MP-Result V3 serial

Name	Description												
Log file name setting	Default format of file name has data information, if want to add the result to file name string, please check the File Name With Result(Result)												
Testing station setting	<table> <tr> <th>Options</th><th>Description</th></tr> <tr> <td>Save Block Box</td><td>Save the test result to flash</td></tr> <tr> <td>Station Name</td><td>Station name</td></tr> <tr> <td>Station Number</td><td>Station number.</td></tr> <tr> <td>Custom ID</td><td>The Custom ID that record to IC</td></tr> <tr> <td>FW ID</td><td>The FW ID that record to IC</td></tr> </table>	Options	Description	Save Block Box	Save the test result to flash	Station Name	Station name	Station Number	Station number.	Custom ID	The Custom ID that record to IC	FW ID	The FW ID that record to IC
Options	Description												
Save Block Box	Save the test result to flash												
Station Name	Station name												
Station Number	Station number.												
Custom ID	The Custom ID that record to IC												
FW ID	The FW ID that record to IC												

Table 4-19 Sensor Test - SPEC (Report) table

Sensor Test - SPEC (FPC Test)

FPC testing is an Open Test on a PCBA that needs to be used with a dedicated Profile and fixture.

The home screen functions was the same as the Sensor Test main screen. The method of initiation is to import the FPC-specific Profile to enter the FPC_Mode.

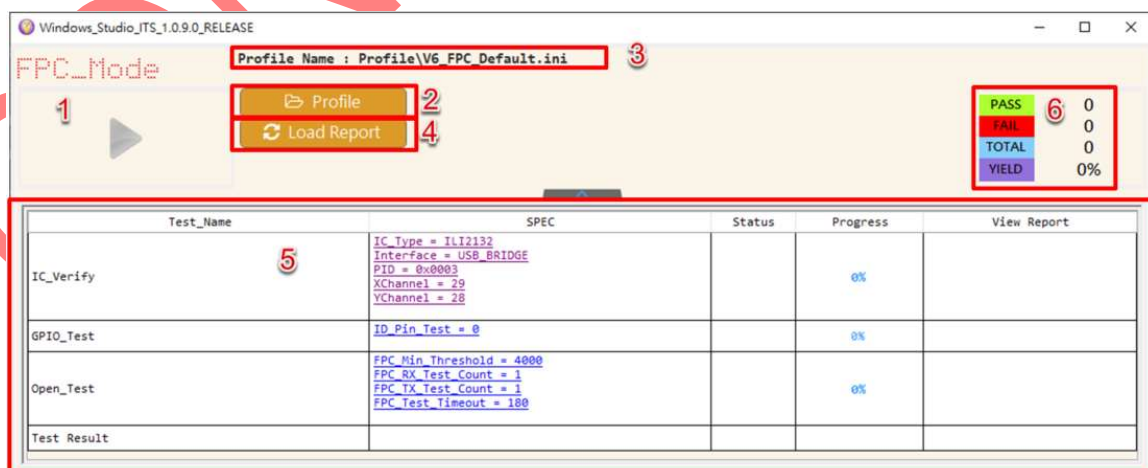


Fig 4-37 FPC Test UI

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Name	Description
Start Test	Click to start the test.
Load Profile	Select the profile file.
Profile Name	Show the profile name that was selected.
Load Report	Select the test log and show data into UI .
Test Content	[Enable] : Check the test item was selected or not. [Test Name] : The name of test items [SPEC] : The spec for test item. [Status] : Show the test results. [View Report] : The Results Data window will be displayed when clicked.
Test Result	Display test success/failure/yield/total number of times information

Table 4-20 FPC Mode description.

Sensor Test - SPEC (FPC Setting)

The FPC setting function is shared with Module Test, and the FPC operation prompts in the red box below can be modified according to the text you actually want to display.

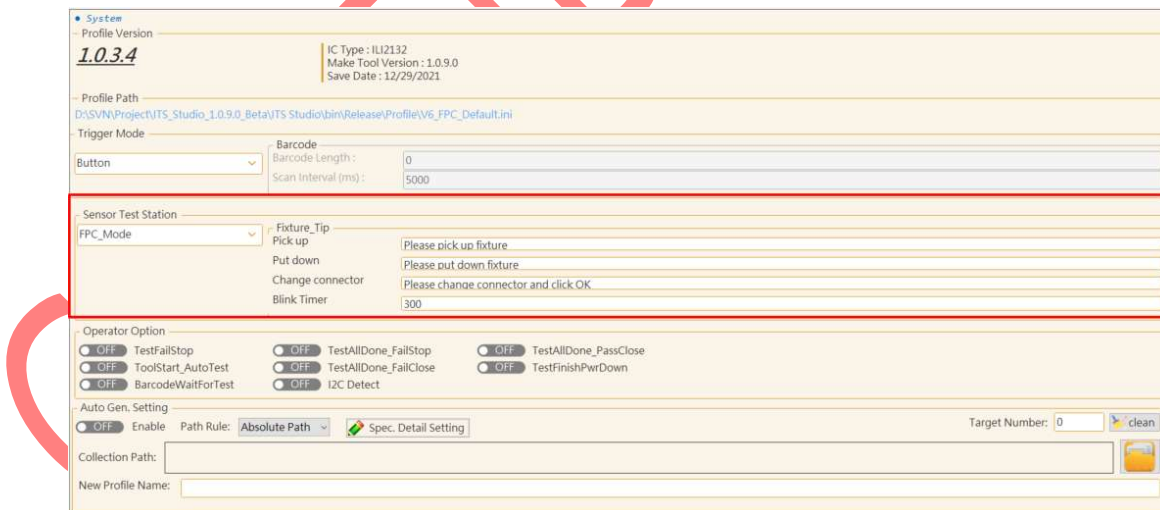


Fig 4-38 FPC Setting UI

Name	Description			
Fixture_Tip	Fixture_Tip	Options	Description	

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		Pick up	Set the hint for pick up fixture.
		Put down	Set the hint for put down fixture.
		Change connector	Set the hint for change connector.
		Blink Timer	Set the time for blink message

Table 4-21 FPC Setting description.

Sensor Test – SPEC (FPC Short Test Setting)

Except for the Open Test and Short Test settings, FPC is common to the Module Test.

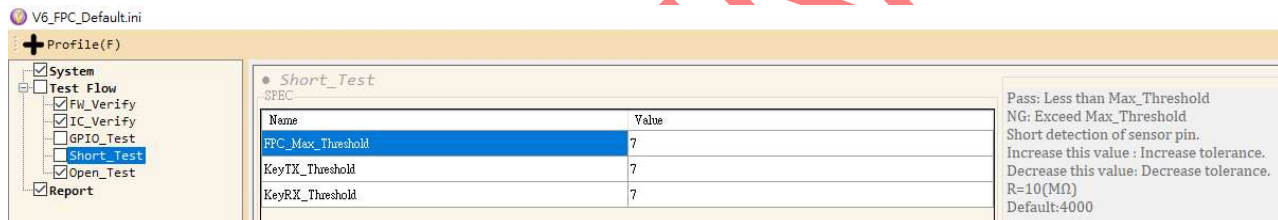


Fig 4-39 FPC Setting – Short Test

Name	Description
SPEC	[FPC_Max_Threshold] Setting the up limit of the Threshold.
	[KeyTX_Threshold] Setting the up limit of the KeyTx.
	[KeyRX_Threshold] Setting the up limit of the KeyRx.

Table 4-22 FPC Setting – Short Test description.

Sensor Test – SPEC (FPC Open Test Setting)

Except for the Open Test and Short Test settings, FPC is common to the Module Test.

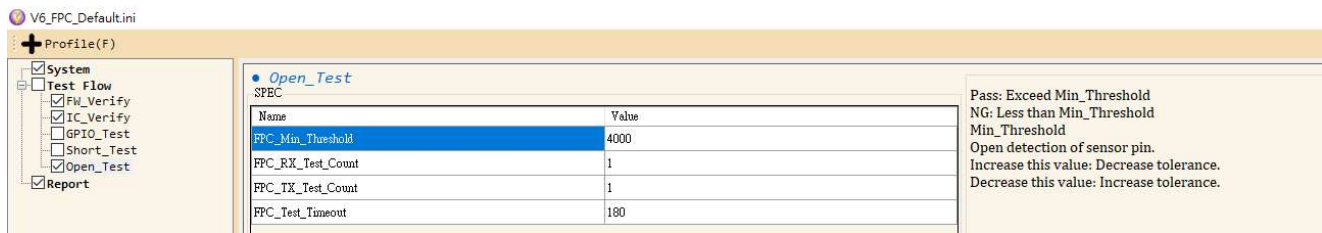


Fig 4-40 FPC Setting – Open Test

Name	Description
SPEC	<p>[FPC_Min_Threshold] Setting the lower limit of Threshold.</p> <p>[FPC_RX_Test_Count] Setting the test times for RX Test.</p> <p>[FPC_TX_Test_Count] Setting the test times for TX Test.</p> <p>[FPC_Test_Timeout] Setting the timeout values.</p>

Table 4-23 FPC Setting – Open Test description.

Starting the test will jump out the message statement, prompting the OP to press down the fixture. The text content displayed can be modified from the Put Down field in Setting..

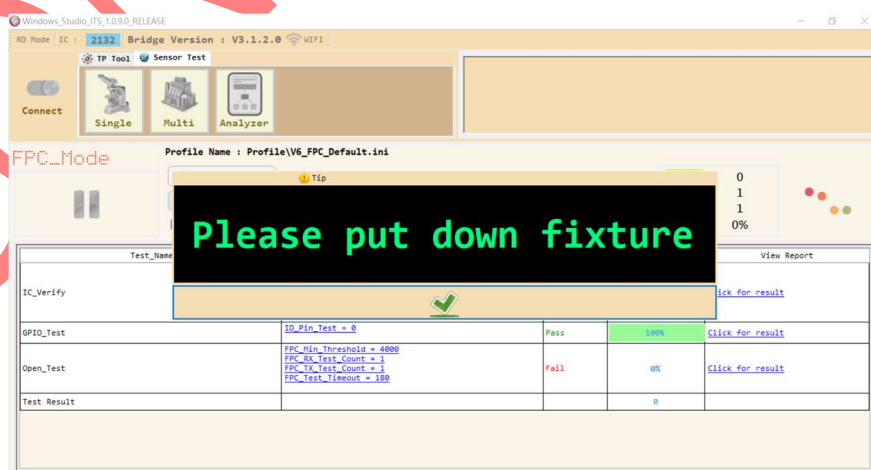


Fig 4-41 Schematic diagram of FPC test Start

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MP Result (OP mode)

When tool is op mode, you can turn on system->Operation->Show MP Result option, then show the MP Result.



Fig 4-42 turn on Show MP Result

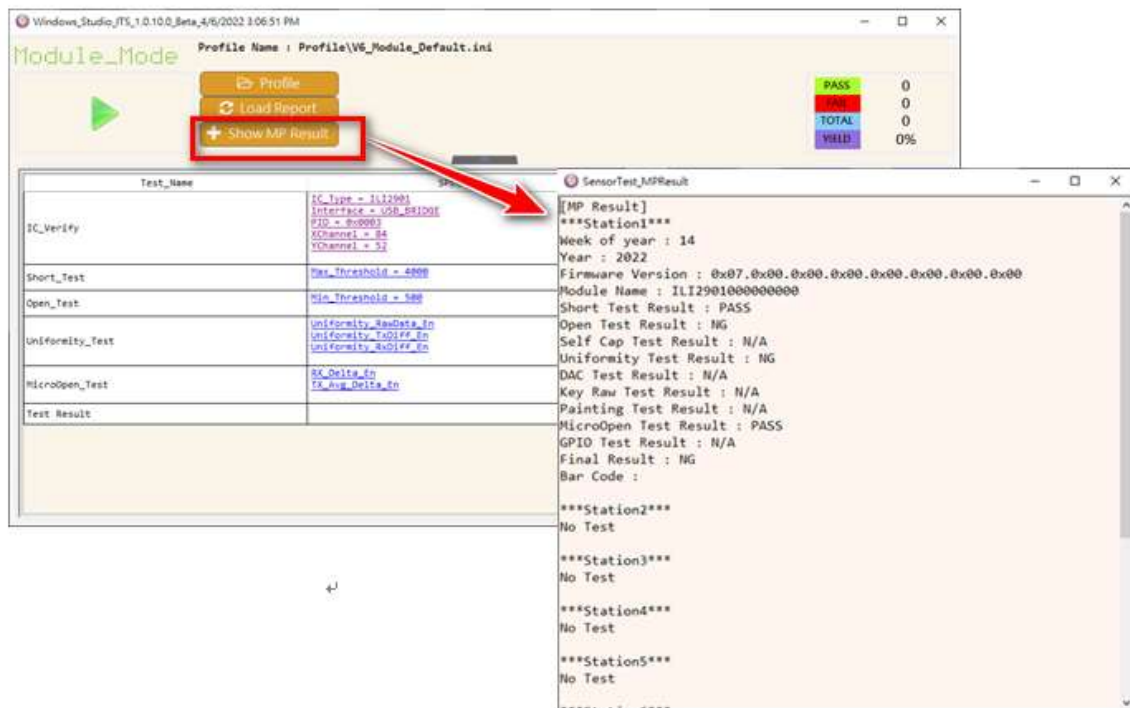


Fig 4-43 click the Show MP Result then pop-up the result window

5. Multi Sensor Test

RD/ Multi OP/OP Mode Switch

Pressing ALT+Z on the Home or Sensor Test page will launch the Password window,

The password is the Tool version number, such as V 1.0.0.14, then enter 10014 °



Fig 5-1 Password Window

After entering the correct password, press Enter again to open the Main Setting window °

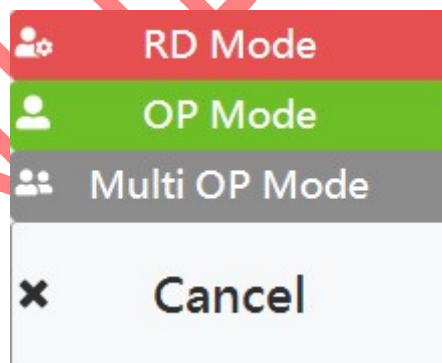


Fig 5-2 MainSetting Window

(Multi OP Mode) Only provide the tester to press the test button, the other settings need to enter a password to prevent the operator from misoperation °

Multi Sensor Test Main Screen

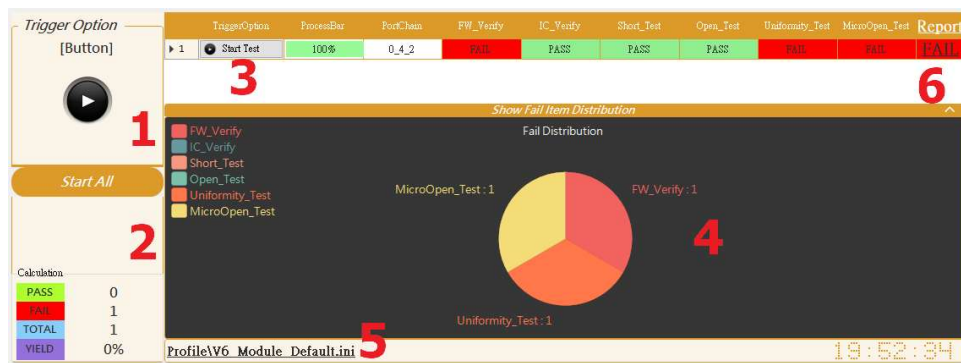


Fig 5-3 Multi sensor test Main Screen

Note: This SensorTest supports multi testing at the same time. At the same time, it can reach up to 32 devices online for multi programming, or multi testing. However, the current limitation is that Multi Line Drawing test not supported.

The profile setting method must be switched back to Single SensorTest to make adjustments before the profile settings can be read and used. Currently, profile adjustments here are not supported. °

Item	Name	Description
1	Trigger Option & All-Test button	Use pictures and text to show that the current test uses Button or Barcode to test. If you press StartAll, all device tests will be performed directly.
2	Test statistics	Record the number of Pass and Fail and the yield rate.
3	Independent test button	Independent testing of this device.
4	Fail Item statistical analysis	Count all the fail test items, and to analyze what item is the max counts current Fail projects are.
5	Profile Select	Display the currently used files, click to change files. °
6	Test Report	After the test, click to open the text file to view the Report. °

Table 5-1 Test item setting (Report) description

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6. Generate a Profile Automatically

This function is used to collect the result of several executed sensor test and send the results to the log analysis tool running in the background for data analysis to generate a new profile.

Profile Content Description

To support the “Auto Gen.” function, V1.0.3.4 or above is required.

[Auto Gen.]		
Key name	Value	Description
Enable	True / False	The switch of Auto Gen. function
PathRule	Relative Path / Absolute Path	The format of the specified collection path
CollectionPath	Collection	Set the collection path
NewProfileName	Test.ini	New profile name
Count	5	Set the number of logs to be collected, if the number is sufficient, it will do “Auto Gen.” automatically.
Uniformity_Judgement	True / False	

Table 6-1 Profile

```

[System]
Save_Date=11/30/2021
ProfileVersion=1.0.3.4
ITS_Tool_Ver=1.0.9.0
IC_Type=ILI2520
Interface=USB_BRIDGE
ProtocolVersion=6.0.5
Screen_Number=1
[Auto_Gen.]
Enable=True
PathRule=Relative Path
CollectionPath=Collection
NewProfileName=test.ini
Count=1
  
```

Fig. 6-1 Profile contents

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Auto Gen. Executive Page Description

If you load a profile with the “Auto Gen.” function enabled, you will see the following screen.

After loading a profile,

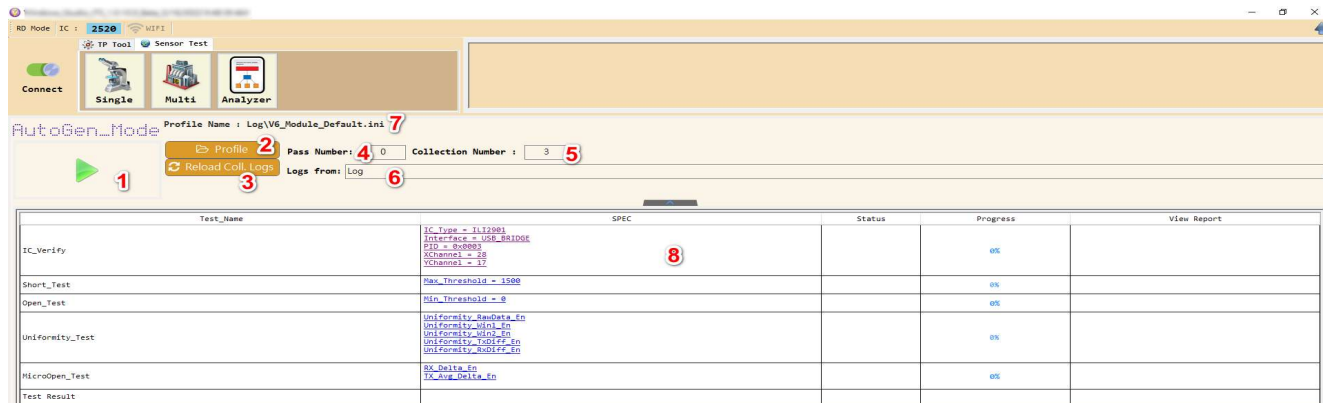


Fig. 6-2 executive page

Item	Name	Description				
1	Run	Execute the sensor test				
2	Load Profile	Select the currently running profile.				
3	Reload Coll. Logs	Change the log collection path of “Auto Gen.”. When this collection path is changed, the number of logs matching the current profile will be judged again and update the value of Pass Number.				
4	Pass Number	Show the number of logs that match the current profile.				
5	Target Number	Show the number of logs that need to be passed.				
6	Logs from:	Show the currently running log path.				
7	Profile Name:	The path to the currently running profile.				
8	Test Item List	<table><tr><td colspan="2">Current tests by Auto Gen.</td></tr><tr><td>Required Tests:</td><td>IC Verify Short Open Uniformity - raw data / win1 / win2 / rx diff / tx diff Micro Open - Tx Avg Delta</td></tr></table>	Current tests by Auto Gen.		Required Tests:	IC Verify Short Open Uniformity - raw data / win1 / win2 / rx diff / tx diff Micro Open - Tx Avg Delta
Current tests by Auto Gen.						
Required Tests:	IC Verify Short Open Uniformity - raw data / win1 / win2 / rx diff / tx diff Micro Open - Tx Avg Delta					

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		Option tests	FW Verify	
		No test	GPIO test / Drawing Test / Micro Test-Rx Delta	
		Test items that affect judgment results	IC Verify Uniformity - raw data Short Open	Only the test results on the left side is used to judge the test result (PASS or FAIL)

Table 6-2 executive page description

Auto Gen. Setting Page Description

After clicking the sensor test page, go to the profile setting page then click the “system->Sensor Test Station” option, you can see the following information and set the action of Auto Gen.

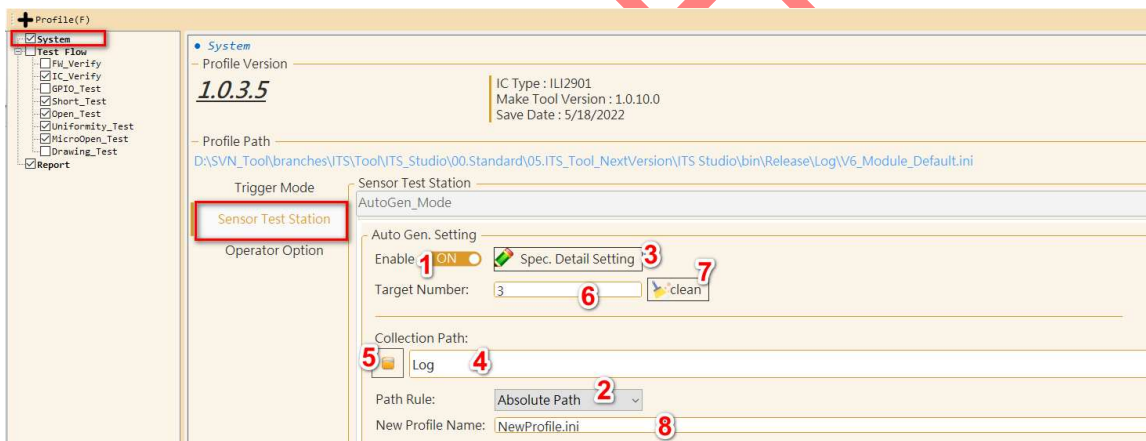


Fig. 6-3 setting page

Item	Name	Description
1	Enable	Whether to turn on the Auto Gen. function.
2	Path Rule	Relative Path / Absolute Path Whether to use the absolute path or the relative path for the specified collection path.

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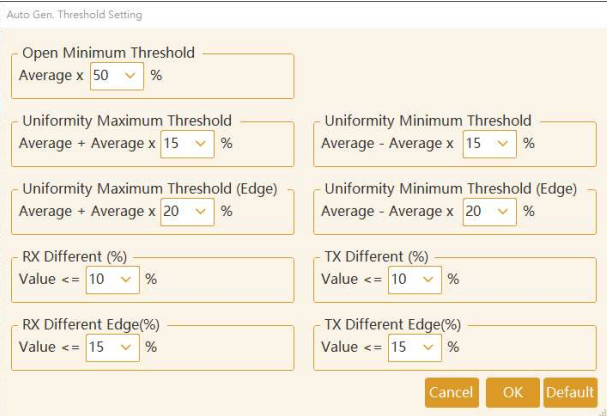
3	Spec.Detail Setting	 <p>Set the spec. value of the new profile, each item has a drop-down menu that you can use, you can't enter the value by yourself.</p> <p>If the setting is wrong, you can press Default button to set the default value.</p>
4	Collection Path	Set the path of the collection logs, the path can't be empty. If the path is empty, the Auto Gen. function will be dis-able.
5	Folder Selection	You can use dialog method to assign the path of the collection logs.
6	The number of collected files	You can set the number of collection logs, and the tool will analyze the data automatically when the number is matched this value.
7	Clean	To clear all logs under the path specified to collection logs.
8	New Profile Name	The name of the new profile.

Fig. 6-3 setting page description

Auto Gen.

Step1: start to run Auto Gen. Function, press the Run button, the result will be displayed at the bottom of the status. If the result is pass, then the pass number will be count automatically.

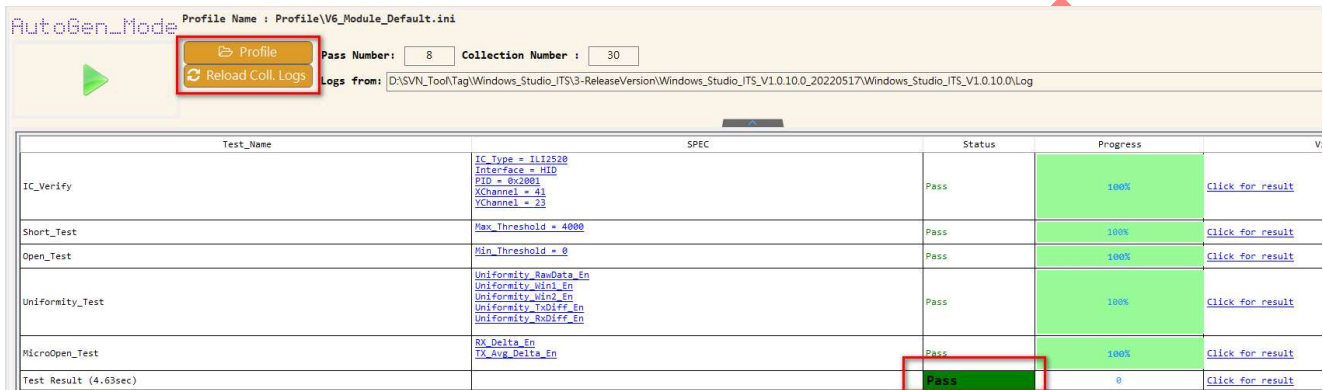


Fig. 6-4 setting page

Step2: Run the Auto Gen. Function, if this status is passed, and the number of collection logs is matched, the following window will pop up, it means that Auto Gen. Function is in progress.

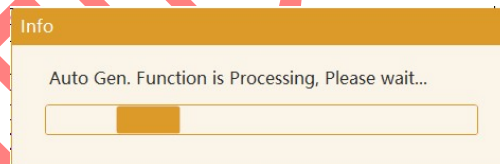
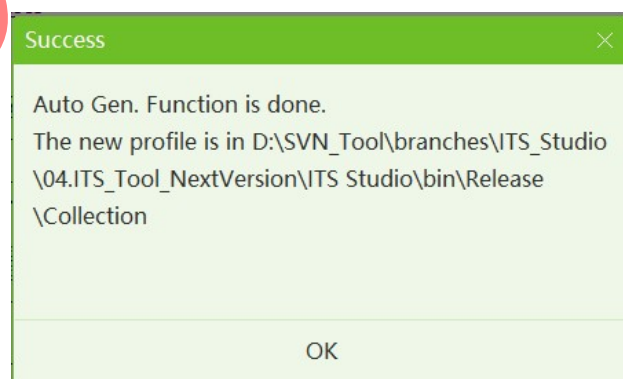


Fig. 6-5 Auto Gen. Function is in progress.

Step3: to show that the Auto Gen. Function is completed correctly.



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Fig. 6-6 the successful information

Step4: Auto Gen. Function is done , the main page will change to the following page automatically and specify the profile which generates after Auto Gen. is finished.

Module_Mode

Profile Name : Collection\test.ini

Load Profile

Load Report

PASS0

FAIL0

TOTAL0

YIELD0%

Test_Name	SPEC	Status	Progress	View Report
IC_Verify	IC_Type = ILI2380 Interface = I2C-8bitSSC PID = 0x0003 Channel = 01 VChannel = 21		0%	
Short_Test	Max_Threshold = 4000		0%	
Open_Test	Min_Threshold = 0		0%	
Uniformity_Test	Uniformity_Min1_En Uniformity_Min2_En Uniformity_T0Diff_En Uniformity_StdDiff_En		0%	
MicroOpen_Test	Bx_Delta_En TX_Avg_Delta_En		0%	

Fig. 6-7 jump back to the page of general execution of sensor test.

Collection Log Process Description

In the setup page (Fig.6-3), after specifying the path of the collected folder, the program will detect the existence of the folder when the Auto Gen. action is executed in the first time, and if it is not, the program will generate the folder itself and add the AutoGenPass\ folder under the folder.

When executed, the result (*.csv) will be placed in the specified folder, and if the action is passed, a copy will be made to the AutoGenPass\ folder.

Q: When will Auto Gen. be performed?

A: Once the number of logs in the AutoGenPass\ folder is matched the target number of logs, the Auto Gen. action will be performed.

Q: Where is the Auto Gen. generated profile located?

A: it will be under the specified folder. If the test result is successful, it will also be copied to the AutoGenPass\ folder.

Q: Does running the Auto Gen. profile generate a copy to the specified folder?

A: Yes, it will be copied to the AutoGenPass\ folder as well.

Q: Which folder do you want to clean up using the empty folder button on the settings page?

A: Deletes all files and subfolders under the specified folder.

Q: What else does AutoGenPass\ have to offer?

A: If you want to know which logs the new profile is based on, you can pack this folder, which contains the profile where the auto gen. was performed, the newly generated profile, and the pass logs.

機 > 本機磁碟 (D:) > SVN_Tool > branches > ITS_Studio > 04.ITS_Tool_NextVersion > ITS Studio > bin > Release > Collection

名稱	修改日期	類型	大小
AutoGenPass	2021/12/29 下午 01:16	檔案資料夾	
20211229_131525_.csv	2021/12/29 下午 01:15	Microsoft Excel ...	152 KB
20211229_131532_.csv	2021/12/29 下午 01:15	Microsoft Excel ...	152 KB
20211229_131539_.csv	2021/12/29 下午 01:15	Microsoft Excel ...	152 KB
20211229_131546_.csv	2021/12/29 下午 01:15	Microsoft Excel ...	152 KB
20211229_131553_.csv	2021/12/29 下午 01:15	Microsoft Excel ...	152 KB
20211229_131559_.csv	2021/12/29 下午 01:15	Microsoft Excel ...	152 KB
20211229_131605_.csv	2021/12/29 下午 01:16	Microsoft Excel ...	152 KB
20211229_131612_.csv	2021/12/29 下午 01:16	Microsoft Excel ...	152 KB
20211229_131619_.csv	2021/12/29 下午 01:16	Microsoft Excel ...	152 KB
20211229_131625_.csv	2021/12/29 下午 01:16	Microsoft Excel ...	152 KB
test.ini	2021/12/29 下午 01:16	組態設定	68 KB
V6_Module_Default.ini	2021/12/28 下午 08:29	組態設定	73 KB

Fig. 6-8 folder structure

7. Report Mode

This feature can import Test Log and show data from the Log into the UI display.

Step 1: Click the Load Report button on the Sensor Test Tool screen.

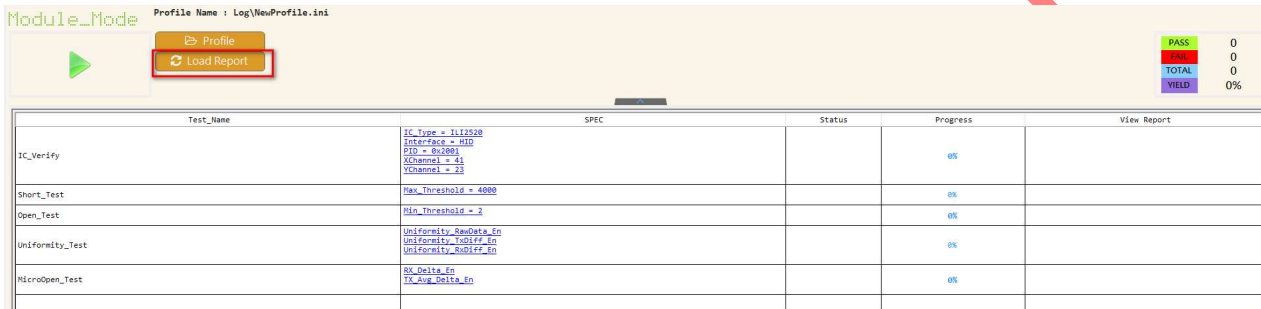


Figure 7-1 Report mode UI °

Step 2: Select the Log which you want to analyze and press Open.

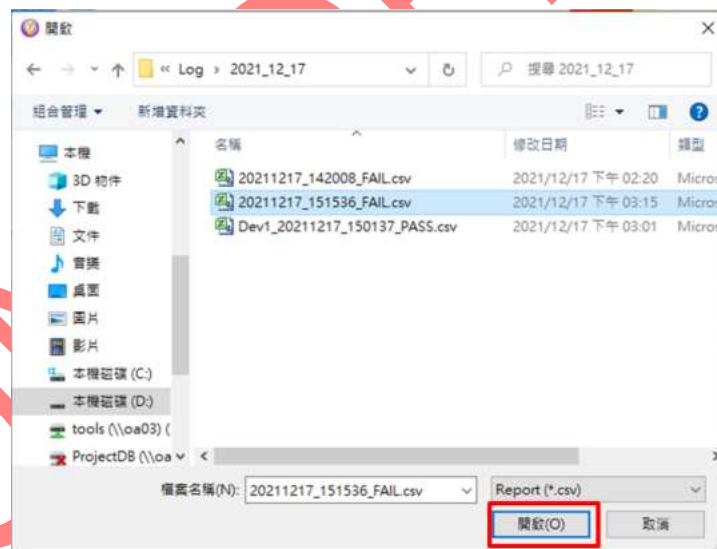


Figure 7-2 The Form that log selection °

Step 3: The Sensor Test Tool will display Report_Mode in the upper left corner, and the middle display area will be the Test Log data just imported. You can click “Check for result” to check test data.

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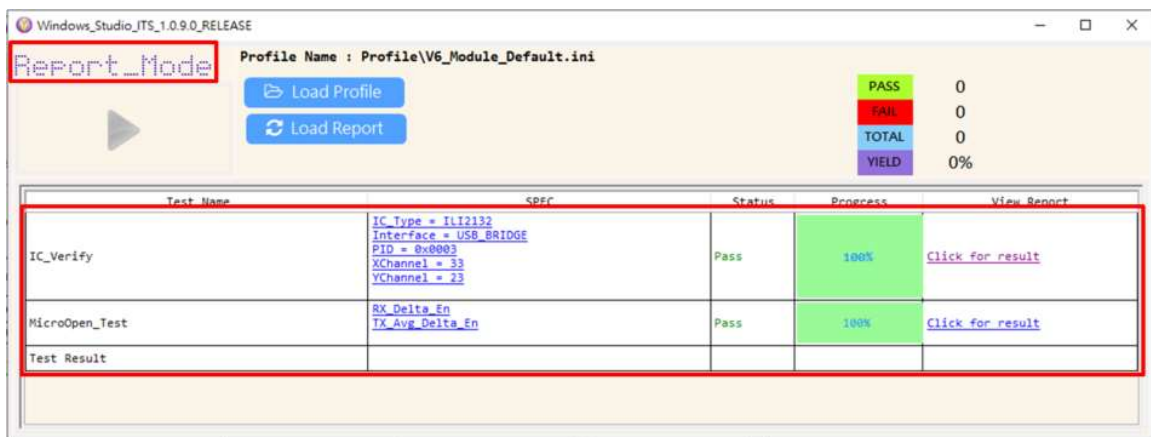


Figure 7-3 Report Mode - schematic diagram of the execution result °

Hint: the test result window is frozen; you must reload the profile before setting the detail of sensor test.

8. Sensor Test Setting Flow

Step 1: choose the profile related to IC to set, there are two type (FPC and Module), please refer to Fig 3-5.

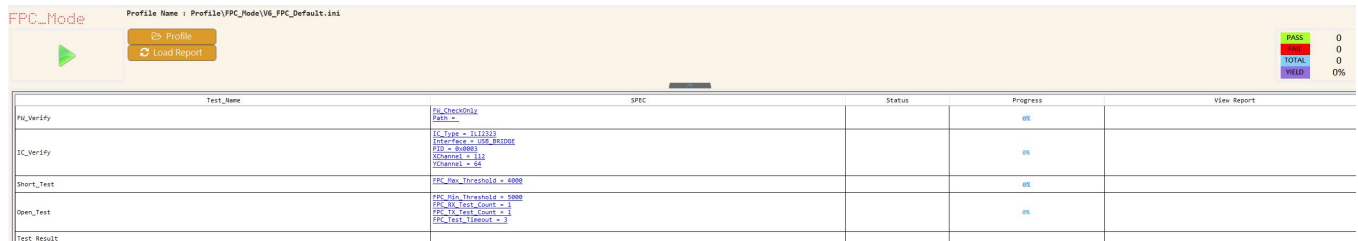


Figure 8-1 FPC setting °

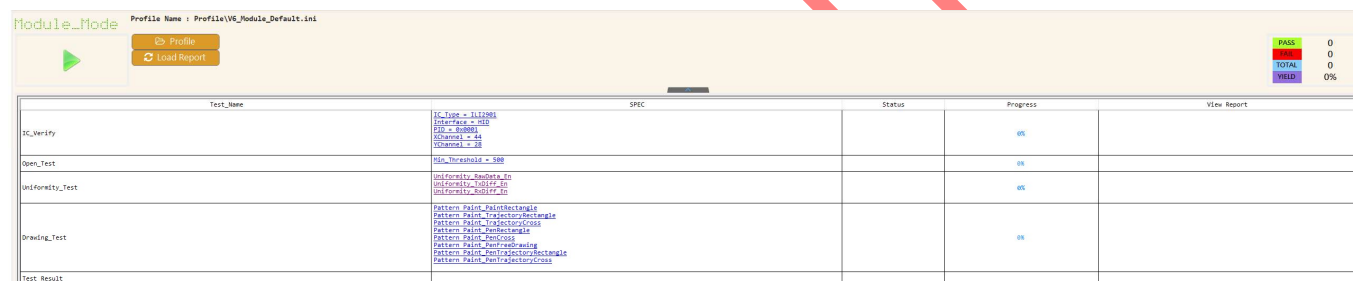


Figure 8-2 Module setting °

Step 2: click the SPEC item and set the related setting.

Step 3: click “system” to set to OP mode · two types(button and barcode)can be chosen · please refer to Fig 3-2.

Step 4: click ”Load Panel Information ” to get the newest IC information before executing Step 5 °

Step 5: switch to “FW_Verify” to check the FW version, if wants to update the FW, please set the Hex file path, please refer to section 3-8.

Step 6: settle other test items clearly. (Short_Test \ GPIO Test \ Open_Text \ Uniformity_Test \ Drawing_Test \ MicroOpen_Test)

Step 7: switch to “Report” to set the report path and the format of the file name.

Step 8: confirm to save the result to flash after testing, check the item ”Save Block Box”

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Step 9: finish · click the “save close” to record this setting value.

Step 10: start to test.

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9. Console Tool Command Description

The functions provided by the ITS tool are performed by giving commands, and when they are performed, there is no UI display at all.

Type	Name	Desc.
Execution File	Windows_Studio_ITS.exe	Main code
Library	CommonDefine.dll FuncMethodCmd.dll GDI_32.dll Ilitek_HID.dll ITSToolLib.dll ThirdPartyTool.dll	Shared with ITS Tool's underlying library
setting	Config/Setting.ini	The initial configuration file of the program, you can specify the device's VID

Table 9-1

Parameter description - independent command

CMD	Description	Example
<code>/log</code>	Generate a log file under the current path at the end of the execution · its file name is ITS_Log_yyyy_MM_dd_THHmss.txt · you can use “/path=” to assign the save path	
<code>/show</code>	Whether to display information in the console	
<code>/p</code>	If it is not set, the console will turn off automatically.	
<code>/hide</code>	Minimize the console	
<code>/i</code>	Shows the ic information	
<code>/c</code>	Check if the FW of the current IC is the same as the hex file you want to compare, if it is not, the error code is -13	
<code>/s</code>	Perform FW burning and only burn CRC different programs.	
<code>/f</code>	Force to burn programs.	
<code>/chkic=</code>	Check if the IC model number is the same as the specified one	<code>/chkic=2510</code> , if IC is not 2510, then console tool will terminate the program
<code>xxx.hex</code>	Specify the hex file, usually used with <code>/s /f</code>	

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<code>/path=</code>	Specify the output path of the log file. The default path is the current path.	
<code>/setmode=</code>	Switch the tuning mode · it only support 0~2	<code>/setmode=0</code> <code>/setmode=1</code> <code>/setmode=2</code>
<code>/getmode</code>	Get the current tuning mode.	
<code>/sw_rst</code>	Execute “software reset” .	
<code>/touch=</code>	Support on or off to control whether to turn on the touch function	<code>/touch=on</code> <code>/touch=off</code>
<code>/delay=</code>	Set the delay time, you can set how long between the command and the command need to be executed, the unit is ms	<code>/delay=100</code>
<code>/cmd=</code>	Support SET REPORT command, you can input 0x for hexadecimal, you need to add "" to include all parameters.	<code>/cmd="0x03 0xA3 0x01 0x04 0x43"</code>
<code>/sensortest=</code>	Run the sensor test function, = with the edited profile at the back	<code>/sensortest="default.ini"</code> <code>/sensortest="default.ini,12345"</code>

Table 9-2

Parameter description - CDC

CMD	Description										
/cdc=	Get the CDC data, format is										
	/cdc="{cnt} {type} {fmt} {record}"										
	Ex: /cdc="10 open ori r"										
	<table><tr><th>Para.</th><th>Data</th><th>Description</th></tr><tr><td>cnt</td><td>0~65535</td><td>Get frame count</td></tr><tr><td>type</td><td><div>[Non-pen]</div><div>raw_bk open raw_nbk se_bk dac_p dac_n short</div><div>[Pen]</div><div>MPP :</div><div>mpp_BeaconLF mpp_DigitalLF mpp_PortTypeHF</div><div>mpp_DigitalHF mpp_Presure mpp_BeaconHF</div><div>USI :</div><div>usi_ACK usi_Tip_0 usi_Tip_1 usi_Tip_2</div><div>usi_ST</div><div>WGP :</div><div>wgp_TipRing0 wgp_TipRing1 wgp_TipRing2</div><div>wgp_TipRing3 wgp_ST</div></td><td>type</td></tr></table>	Para.	Data	Description	cnt	0~65535	Get frame count	type	<div>[Non-pen]</div> <div>raw_bk open raw_nbk se_bk dac_p dac_n short</div> <div>[Pen]</div> <div>MPP :</div> <div>mpp_BeaconLF mpp_DigitalLF mpp_PortTypeHF</div> <div>mpp_DigitalHF mpp_Presure mpp_BeaconHF</div> <div>USI :</div> <div>usi_ACK usi_Tip_0 usi_Tip_1 usi_Tip_2</div> <div>usi_ST</div> <div>WGP :</div> <div>wgp_TipRing0 wgp_TipRing1 wgp_TipRing2</div> <div>wgp_TipRing3 wgp_ST</div>	type	
Para.	Data	Description									
cnt	0~65535	Get frame count									
type	<div>[Non-pen]</div> <div>raw_bk open raw_nbk se_bk dac_p dac_n short</div> <div>[Pen]</div> <div>MPP :</div> <div>mpp_BeaconLF mpp_DigitalLF mpp_PortTypeHF</div> <div>mpp_DigitalHF mpp_Presure mpp_BeaconHF</div> <div>USI :</div> <div>usi_ACK usi_Tip_0 usi_Tip_1 usi_Tip_2</div> <div>usi_ST</div> <div>WGP :</div> <div>wgp_TipRing0 wgp_TipRing1 wgp_TipRing2</div> <div>wgp_TipRing3 wgp_ST</div>	type									

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	fmt	Ori max min delta signal	format
	record	r: start to record n/a	
The above parameters need to be included with " "			

Table 9-3

Parameter description - Noise Frequency

CMD	Description	example												
/nf	<p>Scan the frequency · format is</p> <p>/nf="{Sine} {SWCAP} {Self}"</p> <table> <tr> <th>Para.</th><th>format</th><th>Desc.</th></tr> <tr> <td>Sine</td><td> {start_frq}:start {end_frq}:end {gap}:gap {minimum level}:minimum level · 0~7 </td><td>30 90 5 7</td></tr> <tr> <td>SWCAP</td><td> {start_frq}: start {end_frq}: end {gap}: gap {minimum level}: minimum level · 0~7 </td><td>4 300 2 7</td></tr> <tr> <td>Self</td><td> {start_frq}:start {end_frq}:end {gap}:gap {minimum level}: minimum level · 0~7 </td><td>4 30 2 7</td></tr> </table> <p>The above parameters need to be included with " "</p>	Para.	format	Desc.	Sine	{start_frq}:start {end_frq}:end {gap}:gap {minimum level}:minimum level · 0~7	30 90 5 7	SWCAP	{start_frq}: start {end_frq}: end {gap}: gap {minimum level}: minimum level · 0~7	4 300 2 7	Self	{start_frq}:start {end_frq}:end {gap}:gap {minimum level}: minimum level · 0~7	4 30 2 7	/nf="30 90 5 7 4 300 2 7 4 30 2 7"
Para.	format	Desc.												
Sine	{start_frq}:start {end_frq}:end {gap}:gap {minimum level}:minimum level · 0~7	30 90 5 7												
SWCAP	{start_frq}: start {end_frq}: end {gap}: gap {minimum level}: minimum level · 0~7	4 300 2 7												
Self	{start_frq}:start {end_frq}:end {gap}:gap {minimum level}: minimum level · 0~7	4 30 2 7												

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/nf_cnt=	only available in V6, Set how many frames you get.	/nf_cnt=10																																
/nf_type=	<div>only available in V6, uses bit form to set the type</div> <table><thead><tr><th>frame count</th><th>average</th><th>maximum</th><th>value</th></tr></thead><tbody><tr><td><input type="radio"/></td><td><input type="radio"/></td><td><input checked="" type="radio"/></td><td>1</td></tr><tr><td><input type="radio"/></td><td><input checked="" type="radio"/></td><td><input type="radio"/></td><td>2</td></tr><tr><td><input type="radio"/></td><td><input checked="" type="radio"/></td><td><input checked="" type="radio"/></td><td>3</td></tr><tr><td><input checked="" type="radio"/></td><td><input type="radio"/></td><td><input type="radio"/></td><td>4</td></tr><tr><td><input checked="" type="radio"/></td><td><input type="radio"/></td><td><input checked="" type="radio"/></td><td>5</td></tr><tr><td><input checked="" type="radio"/></td><td><input checked="" type="radio"/></td><td><input type="radio"/></td><td>6</td></tr><tr><td><input checked="" type="radio"/></td><td><input checked="" type="radio"/></td><td><input checked="" type="radio"/></td><td>7</td></tr></tbody></table>	frame count	average	maximum	value	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	1	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	2	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	3	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	5	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	6	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	7	/nf_type=7
frame count	average	maximum	value																															
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	1																															
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	2																															
<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	3																															
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	4																															
<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	5																															
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	6																															
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	7																															
/pen	wgp mpp usi																																	
/pen_signal	<div>"[frequency,threshold]; [frequency,threshold]..."</div> <div>/pen_signal="10,10;300,10"</div>	Set the threshold of frequency.																																

Table 9-4

Example

Action	Command
ShowICInfo.bat	/i /show /log
GetMode.bat	/getmode /show /log /p
CheckIC.bat	/chkic=2520 /show /log /p
CheckFW.bat	/c "ILI2132_7.0.0.8_0.0.0.7.hex" /show /log /p
Enable_touch.bat	/touch=on /show /log /p
Disable_touch.bat	/touch=off /show /log /p
Mode0.bat	/setmode=0 /show /log /p
Mode1.bat	/setmode=1 /show /log /p
Mode2.bat	/setmode=2 /show /log /p
UpgradeFW.bat	"ILI2520_3mode_Release_rev18646.hex" /s /show /log /p /hide
Force_UpgradeFW.bat	"LI2520_3mode_Release_rev18646.hex" /f /show /log /p
NoiseFrequency_V3.bat	/nf="30 90 5 7" /show /log
NoiseFrequency_V6.bat	/nf="30 90 5 7 4 300 2 7 4 30 2 7" /nf_cnt=10 /nf_type=7 /show /log
NoiseFrequency_V6_pen.bat	/nf="30 90 5 7 4 300 2 7 4 30 2 7" /pen=Mpp /pen_signal="10,10;300,10" /nf_cnt=10 /nf_type=7

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SensorTest.bat	/sensortest="Default.ini" /show /log
CDC_V3_Record.bat	/cdc="100 open ori r" /show /log
CDC_V3_NoRecord.bat	/cdc="100 open ori" /show /log /p
CDC_V6_Record.bat	/cdc="10 raw_bk delta r" /show /log /p
CDC_V6_NoRecord.bat	/cdc="10 raw_bk delta" /show /log /p
CDC_V6_noRecord_pen.bat	/cdc="10 mpp_BeaconHF ori" /show /log /p
CDC_V6_Record_pen.bat	/cdc="10 mpp_DigitalLF ori r" /show /log /p

Table 9-5

Error Code

Error Code	Desc.
0	success
-5	Firmware update was failed
-13	IC version inconsistency
others	Ambiguous errors

Table 9-6