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eGalaxWorks User Guide

PCAP Utility for EXC80HXXX/82HXXX Series



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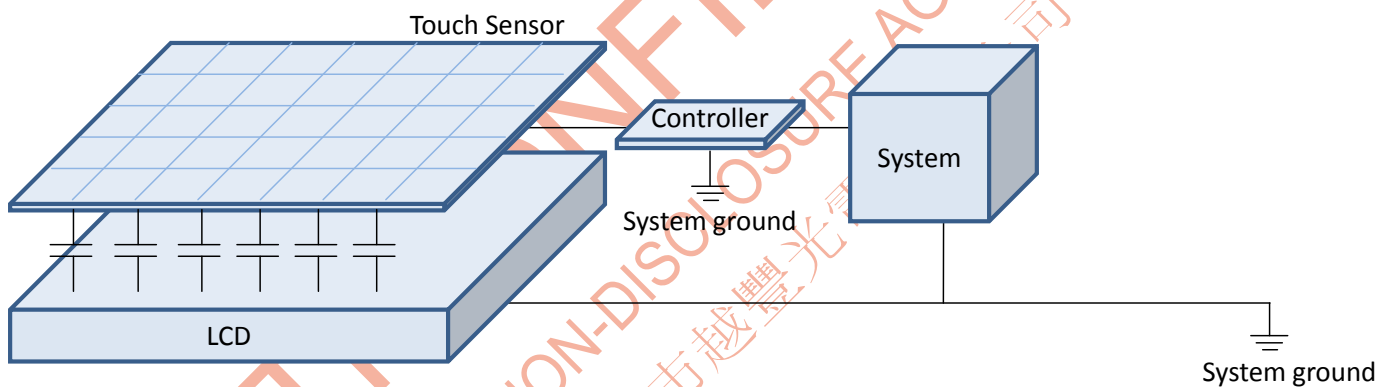
Introduction

EETI PCAP eGalaxWorks 80Hxxx contains EETI EXC80Hxxx related applications:











- Firmware update tool.
- PCAP module tester for hardware calibration and hardware defects.
- PCAP controller tester for open and short defect.
- Analyzer for touch performance, firmware information and raw data.

Environment Setup:

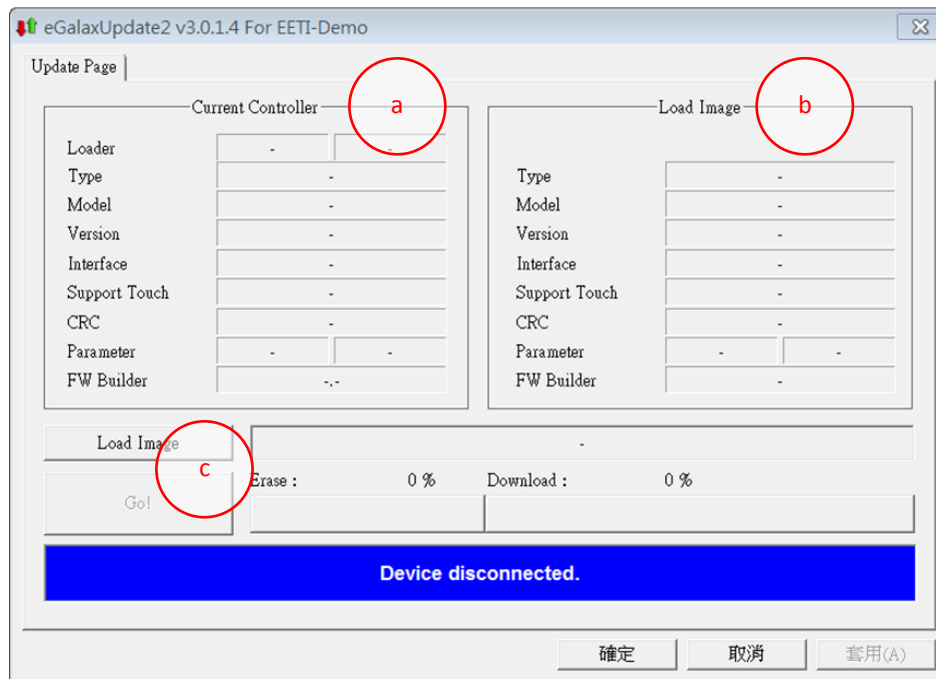
- EETI PCAP EXC80Hxxx series controller with sensing IC (USB interface)
- Windows XP and above.
- Please remove any EETI related driver. eGalaxWorks use Microsoft in-box HID driver.
- Connect EETI EXC80Hxxx controller to the computer.
- Please make sure there is no floating part in the system, all conductive parts should be ground to system ground. E.g. The shielding layer, back side steel behind COF.



Related Files

Items	Remark
 eGalaxUpdate2.exe EETI Firmware update tool eGalax_eMPIA Technology I...	Firmware update tool.
 eGalaxUpdate.ini 組態設定值 1 KB	Settings file for eGalaxUpdate2.exe.
 eGalaxSensorTester4.exe eGalaxSensorTester3 EETI	Diagnostic tool for touch module.
 eGalaxFPCTester.exe eGalaxFPCTester EETI	Diagnostic tool for controller.
 eGalaxFPCTester.ini 組態設定值 1 KB	Settings file for eGalaxFPCTester.exe.
 eGalaxTuner_80HXXX.exe eGalaxTuner_80HXXX Releas... EETI	Analyzer for touch performance, firmware information and raw data.
 eGalaxBuilder4.exe eGalaxBuilder4 Release Version eGalaxeMPIA Technology Inc.	Calibration tool for eGalaxSensorTester.exe.
 SensorTestDefault.ini INI 檔案 2.6 KB	Settings file for eGalaxTune80Hxxx.exe.
 eGalax5960Suite.exe eGalax5960Suite EETI	Calibration tool for eGalaxSensorTester.exe.
 HIDdAPI.dll 1.2.13.1209 HIDdAPI.DLL	EETI HID API.

1 eGalaxUpdate2



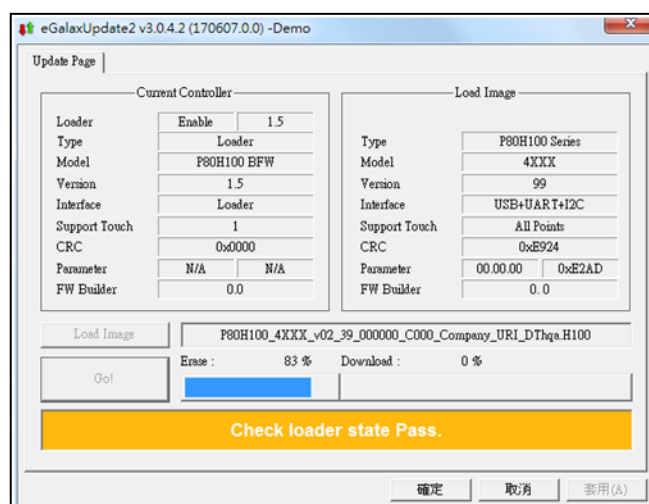
- a. Controller information will show on main windows if it is connected correctly. Otherwise the status information will show “Device disconnected”.
- b. Firmware file information
- c. **Load Image** to select firmware file, click **Go** button to start firmware update process.

1.1 Load Firmware Image

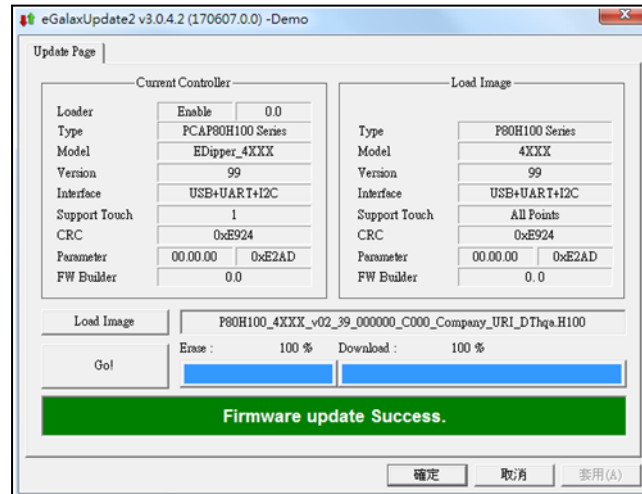
- a. Click **Load Image** Button
- b. Select the firmware image file which you want to update.

1.2 Start Firmware Update

- a. Click **GO** button and it will start update process: Erase, download firmware and hardware calibration. During the update process please do not use touch sensor.



- b. Firmware update success:



1.3 Firmware update result and log file

Firmware update will create a log file in the same folder. There is timestamps, update process and exit code in the log file.

```
[09:35:11] eGalaxUpdate2 v3.0.4.2 (170607.0.0) -Demo
[09:35:11] eGalaxUpdate2 Initialized.
[09:35:11] Find touch controller: P80H100
[09:35:11] - Model: EDipper_4XXX
[09:35:11] - Version: 99
[09:35:11] Touch controller connected.
[09:35:19] Image Type: P80H100.
[09:35:19] Load Image OK.
[09:35:21] Reset controller Pass.
[09:35:21] Wait controller disconnect.
[09:35:21] Device disconnected for PnP process.
[09:35:21] Wait controller disconnect success.
[09:35:21] Wait controller PnP process.
[09:35:22] Find touch controller: P80H100 Loader
[09:35:22] - Model: P80H100 BFW
[09:35:22] - Version: 1.5
[09:35:22] Touch controller PnP Success.
[09:35:22] Check loader state Pass.
[09:35:34] Erase firmware Pass.
[09:35:34] Download firmware.
[09:35:34] Downloading... 01%
[09:35:35] Downloading... 06%
[09:35:36] Downloading... 11%
[09:35:36] Downloading... 17%
[09:35:37] Downloading... 22%
[09:35:37] Downloading... 28%
[09:35:38] Downloading... 33%
[09:35:38] Downloading... 38%
[09:35:39] Downloading... 43%
[09:35:39] Downloading... 49%
[09:35:40] Downloading... 54%
[09:35:40] Downloading... 59%
```

1.4 eGalaxUpdate.ini

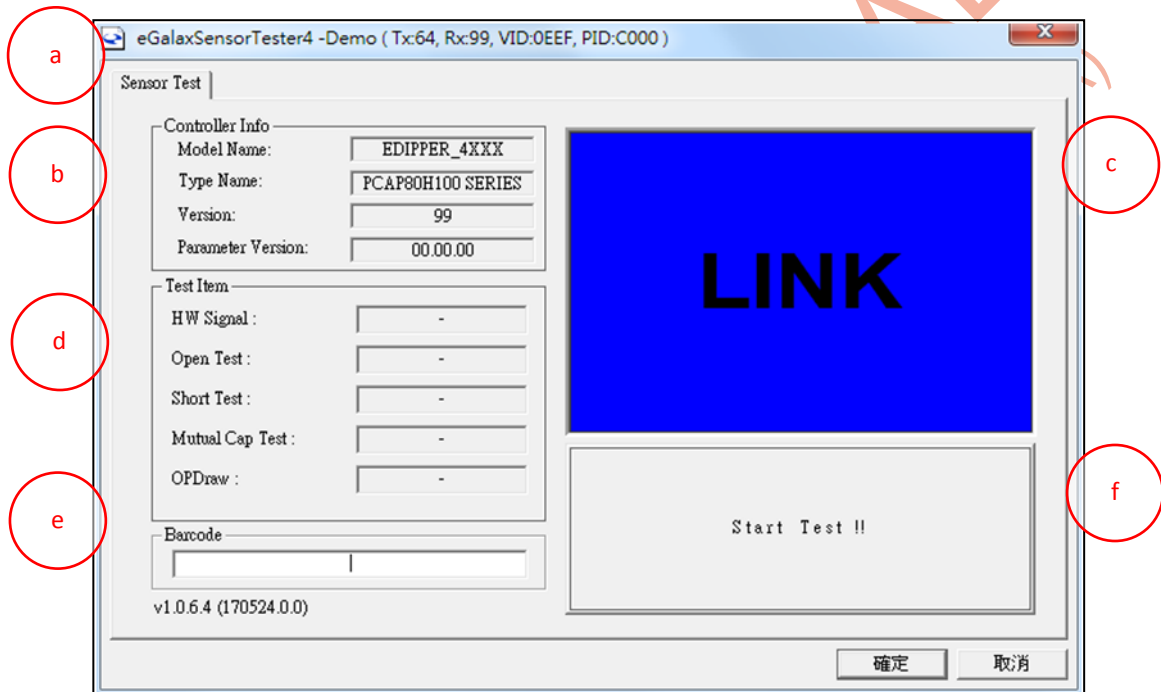
eGalaxUpdate.ini contains the setting parameters of firmware update operation.

Parameter	Comment	Default	Remark
CaseName	Customer Case Name	Demo	User can fill out case name for identification
AutoRun	Set auto start firmware update	0	Auto update steps: <ol style="list-style-type: none"> 1. Enable AutoRun parameter 2. Fill out Firmware with target firmware file name 3. Fill out Version with target firmware version When auto run enabled, firmware update tool will pre-load target firmware file and download when the controller version is different with Version , and stop update when the controller firmware version equal to Version .
CheckModel	Compare host and target model name	0	0: Disable host and target model name checking of AutoRun 1: Enable host and target model name checking of AutoRun
CheckVersion	Compare host and target version	0	0: Disable host and target version checking of AutoRun

			1: Enable host and target version checking of AutoRun
CheckCRC	Compare host and target CRC	0	0: Disable host and target CRC checking of AutoRun 1: Enable host and target CRC checking of AutoRun
Model[1~3]	Host model name	PCAP7200	The host model name of AutoRun There are most 3 models to compare
Version[1~3]	Host version	1.000	The host version of AutoRun There are most 3 models to compare
CRC[1~3]	Host CRC	0xFFFF	The host CRC of AutoRun There are most 3 models to compare
ForceUpdate	Force run update firmware	0	When open AutoRun mode, force update FW.
AutoExit	Auto exit when update finish, no matter update success or failed.	0	When enable it, firmware update tool will auto exit when update process is done.
AutoRetry	Retry update when update failed.	1	When enable it, firmware update tool will retry the update process when there is any error.
RetryCnt	Retry times.	3	Times of retry.
CheckImageType	Firmware type checking	1	Check image type when image type is different to controller type or loader type
CheckImageInterface	Firmware interface checking	1	Check image interface when image interface is different to current controller
TargetVersion[1~3]	Target firmware version	1.000	Target firmware version for auto update, when controller version and model are same as the target information, auto update process will stop.
TargetModel[1~3]	Target firmware model name	PCAP7200	Target firmware model name for auto update, when controller version and model are same as the target information, auto update process will stop.
TargetCRC[1~3]	Target firmware CRC	0xFFFF	Target firmware model CRC for auto update, when controller version and model are same as the target information, auto update process will stop.
TargetFirmware[1~3]	Firmware file name	FirmwareName.egxp	Target firmware file for auto update, the file have to put in the same folder with Updater.exe
RunHWCal	Hardware calibration setting	1	Run Hardware Calibration
CreateUniformityTable	Uniformity table setting	1	Create Uniformity Table
UniformityThreshold	Uniformity threshold setting	15	Set Uniformity Threshold
UniformityLog	Uniformity log setting	0	Set Enable Log for Uniformity Table
WaitingForAutoTune	Autotune waiting time setting	60	Set Time for Waiting Autotune

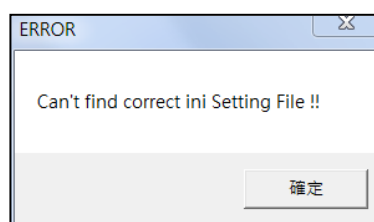
2 eGalaxSensorTester4

eGalaxSensorTester4 is a diagnostic tool for touch module and touch system. We recommend running eGalaxSensorTester4 on different stage of manufacturing for QC (Quality Control) and hardware calibration. Please make sure there is no floating part in the system, all conductive parts should be ground to system ground. E.g. Shielding layer, back side steel behind COF...etc. **Before running the tool, please make sure there is no object on or above the touch panel. For notebooks, ensure the lid remains open.**



- a. Test tool Version and the customer case name. It will also show the total number of X and Y channels in firmware.
- b. Controller information will show on main windows if it is connected correctly. Otherwise the controller information will show "Unknown".
- c. Controller link status.
- d. Sensor test item. If there is no error, it will show PASS. If there is an error, it will show FAIL.
- e. Barcode information
- f. Click this button will start the test

If below message pops out on execution, please add the Model Name in the SupportModel of setting file (SensorTestDefault.ini) and execute program again.



2.1 Test Items

There are two parts of eGalaxSensorTester4: **Auto test** and **Manual test**.

In auto tests eGalaxSensorTest4.exe measures the RC value of touch sensor in several ways (Open/ Short/ Mutual test), the target of eGalaxSensorTester4 is to find out the abnormal RC locations where may caused by hardware defects (Open, Short, Mutual, Hardware saturation or ITO process issue). The RC value of each test item will be stored in test log. By reference the log files, it can tell defect locations and narrow down possible root causes.

HW Signal Test: It calibrates the hardware variance of controller and touch sensor.

Open Test: It checks the RC value which might be related to Open Defects.

Short Test: It checks the RC value which might be related to Short Defects.

Mutual Cap Test: It checks the RC value which might be related to Mutual Capacitance Defects.

We evaluate the possible defects by calculate the RC value of touch sensor that sensed by EXC80Hxxx controller. There may have some possibility that test result does not match to the real root cause. For example, some abnormal RC value caused by open or short defects may not be detected by the Open Test and Short Test, but detected in Mutual Cap test.

In manual test it combined with EETI OPDraw.exe, which provides several kinds of drawing tests (Channel test, Accuracy test, Linearity test and reporting rate test, etc), it is an optional test if additional accuracy and linearity verification is required. For the detail settings of OPDraw.exe, please reference to EETI document: **EUG-002-eGalaxOPDraw_User_Guide**.

2.2 HW Signal Test

After EXC80Hxxx controller connect with touch sensor, it needs to calibrate the hardware variation of whole touch system, the HW Signal Test will eliminate the hardware offset and provide a stable environment for signal sensing.

2.3 HW Bias Test

HW bias test is identified by checking the RX channel signal stability.

2.4 Open Test

Open Test is done via eGalaxTouch solution with EX59100 or later solution by using mutual capacitance method. After touch sensor is bonded/ connected with the touch controller, we drive the AC signal at the near TX channel and measure the signal S1 at RX channel. Then, drive the AC signal at far TX channel and measure the signal S2 at RX channel. The measured signal means the signal coupled from the TX channel to RX channel. If there is any open defect in the path from the sensing pattern to the controller, the measured signal S1 or S2 should be relatively small. Then, we can do the defect inspection according to this S1, S2 reading value. User has to set the proper threshold setting for open detection. According to this working principle, the following defects can be detected.

a. IC Pin Open

When the IC pins either on TX channel or RX channel can be detected. When the defect is because of IC pin open, both S1 and S2 should be small

b. Sensor bonding open

If the defect is caused by sensor bonding open, both S1 and S2 should be small.

c. Signal trace broken

If the defect is caused by trace broken on the controller PCB or trace wires on the sensor, both S1 and S2 measured values should be small.

d. Sensor pattern broken

If the defect is caused by broken sensing pattern, either S1 or S2 should be small.

e. Sensor RC or touch signal abnormal

With “compare mode”, the utility can compare with golden sample data and detects abnormal sensor RC which may cause abnormal touch signal.

Because this open phenomenon detection is identified by measuring the signal coupled from TX to RX, some factors may affect this measured value. Below are factors may affect Open detection

- **Background capacitance environment**

Since Open detection is done by measuring the signal coupled from TX to RX signal, if the sensor does not have good ITO uniformity, the measured values may vary. In addition, if there are noises around the sensor and controller, such noises may also cause inaccurate measured data. In order to achieve optimal identifying result, the user should keep the environment of the DUT (device under test) the same. Particularly, the background capacitance should be kept at the same level, so that the test tool can get the accurate measured data thus to judge the failure.

- **Parasitic capacitance due to PCB layout and sensor trace layout**

Because the open detection identifies the signal coupled from TX to RX, if a bigger stray capacitance exists between TX and RX path, the measured signal coupled from TX to RX may not be small enough. In this case, the open defects on the sensing patterns may not be detected. In order to prevent such problem, and have a higher accuracy, the sensor layout design and controller layout design should minimize the parasitic capacitance between TX and RX.

2.5 Short Test

Short Test is identified by driving signal on one channel with different voltage level from RX channel, and measure the signal on RX channel by channel. If there is no short defect on this RX, the measured signal is small. If there are short defects on this RX, the measured signal would be very high. User has to set the proper threshold setting for testing.

2.6 Mutual Cap Test

Mutual Capacitance Test is identified by checking the stray signal uniformity. The signal uniformity of the sensor may be an indicator of potential defects like ITO broken, bridge defects, etc, which may cause inaccuracy and reliability problem.

Mutual Capacitance Test is identified by checking the raw stray and to see if there is any discontinuous signal distribution. A normal sensor signal distribution should be in a continuous way. There should be no discontinuous or jumping signal image distribution. Some factors may also affect on the mutual issue identification. User has to set the proper threshold setting for testing.

a. PCB and Sensor Layout

Because the mutual defect is identified by measuring the signal coupled from TX to RX, the parasitic capacitance may affect the measured data greatly. When doing sensor layout design and PCB layout design, the parasitic capacitance between TX and RX channels should be kept minimized to avoid the signal uniformity defect.

b. Background Stray Capacitance.

Since this mutual defect is identified by measuring the weak coupled signal from TX to RX, the noise and background stray capacitance may affect the measured result. The DUT and the background mechanism (e.g. LCD module) should be in same ground condition for getting the accurate test result.

c. Protection Film & Bubbles

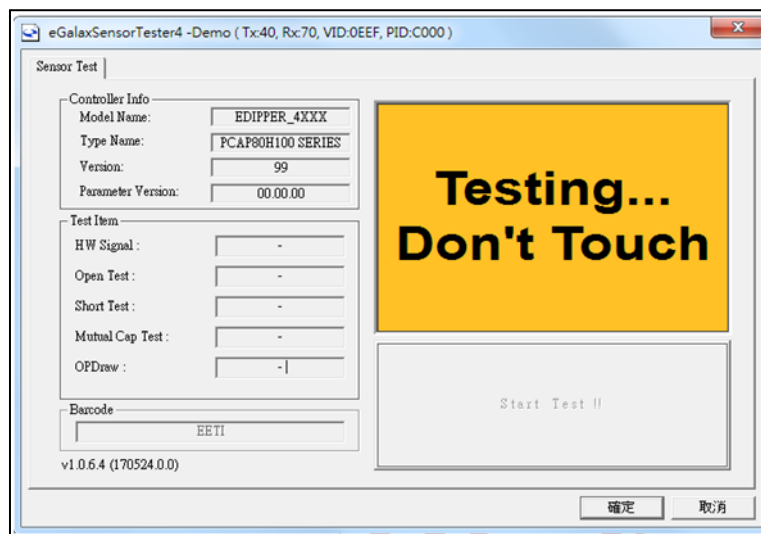
For the protection purpose, there may be protection films adhered on either or both side of the sensor. A conductive protection film may cause incorrect measured data, in this case, the protection film shall be removed before the test if it is conductive. In addition, the bubble between the protection film and touch sensor may also cause signal variation during the test, so the bubble shall be removed beforehand as well.

2.7 OPDraw Test

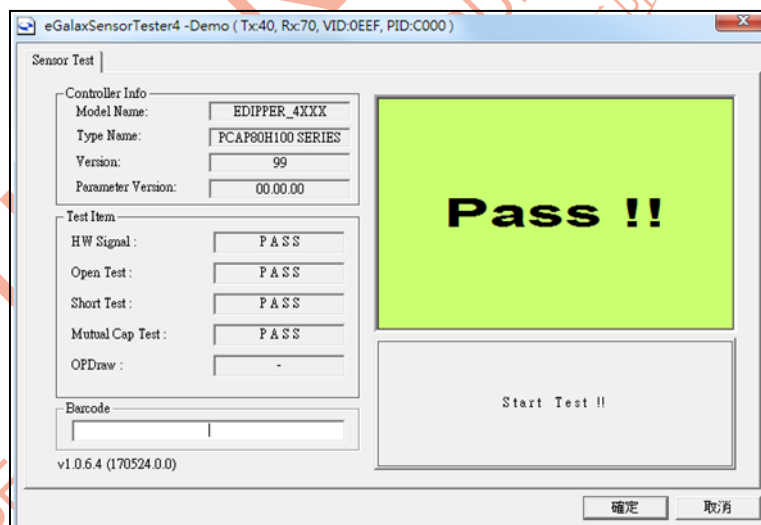
OPDraw.exe is an optional drawing utility for users to verify the touch drawing performance, for the detail settings of OPDraw.exe, please reference to OPDraw User Guide.pdf.

2.8 eGalaxSensorTester4 Working Flow

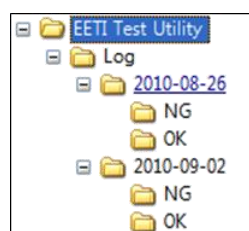
- a. Click Start Test Button
- b. When the test is running, it will show “Testing”, and Start Test button is disabled.



- c. When the test is completed, it will show test result “Pass” or “Fail”, and enable Start Test button again.

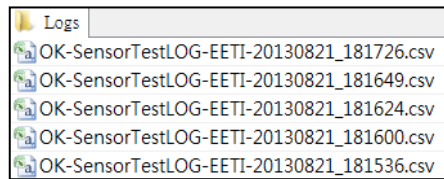


- d. All the test results will be saved in the “Log” folder, which is in the same folder with eGalaxSensorTester4.exe. The log files will be saved and separated by “Date”, and categorized in “OK” or “NG” subfolder. Log file will be named by [Test Result]-SensorTestLOG-[Barcode]-[Time].csv.

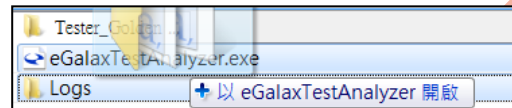


e. If you need to set a proper open test reference value, please follow below instructions:

- Collect the test logs (SensorTestLOG.csv) which need to be parsed in a directory (for example: Logs).

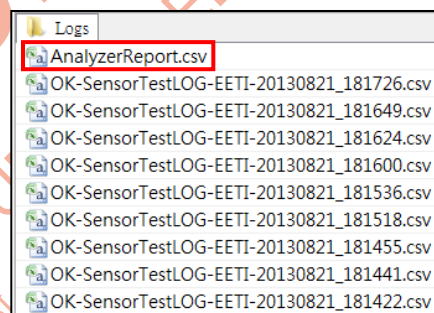


- Drag the directory to eGalaxWorks80Hxxx\eGalaxTestAnalyzer.exe.



- Get the reference value for open test and detail report (AnalyzerReport.csv) in the Logs directory.

```
Version: v1.0.1.3
Start calculate...
OK-SensorTestLOG-EETI-20130821_181422.CSV... OK. Min Value:2996
OK-SensorTestLOG-EETI-20130821_181441.CSV... OK. Min Value:2996
OK-SensorTestLOG-EETI-20130821_181455.CSV... OK. Min Value:2996
OK-SensorTestLOG-EETI-20130821_181518.CSV... OK. Min Value:2996
OK-SensorTestLOG-EETI-20130821_181536.CSV... OK. Min Value:2996
OK-SensorTestLOG-EETI-20130821_181600.CSV... OK. Min Value:2996
OK-SensorTestLOG-EETI-20130821_181624.CSV... OK. Min Value:2996
OK-SensorTestLOG-EETI-20130821_181649.CSV... OK. Min Value:2996
OK-SensorTestLOG-EETI-20130821_181726.CSV... OK. Min Value:3032
Open Data Min Value :2996
Total: 9 log files done.
```



2.9 SensorTestDefault.ini

SensorTestDefault.ini contains the setting parameters of SensorTester operation.

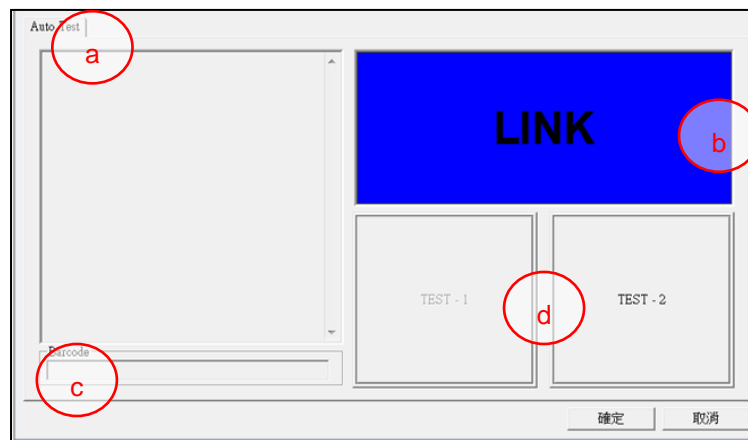
Parameter	Comment	Default	Remark
SupportModel	Customer ModelNum	3XXX	User can fill out the sensor model number.
CaseName	Customer case name	Demo	User can fill out case name for identification.
RunFWUpdate	Run FW Update Tool	0	0: Do not run firmware update tool. 1: Run firmware update tool. Firmware information needs to be recorded in [eGalaxUpdate Tool Parameter] in SensorTestDefault.ini.
MonitorOff	Close monitor when testing.	0	0: Do not turn off monitor. 1: Turn off monitor. Turn off monitor when testing can reduce interference from LCD module.
BlackScreen	Show Black Screen during testing	0	0: Disable black screen during eGalaxSensorTester4 testing. 1: Enable black screen during eGalaxSensorTester4 testing.
AutoRun	Auto start SensorTester process	0	0: Disable auto start sensortester process. 1: Enable auto start sensortester process.
AutoExit	Auto Exit Tool	0	0: Auto close tool. 1: Do not auto close tool. When enable it, sensortester tool test done, will auto close tool.
AutoExitEvenFail	Auto Exit Tool Even Test Fail	0	0: Disable auto exit tool when test failed. 1: Enable auto exit tool when test failed.
CheckVersion	Check firmware version.	0	0: Check firmware version. 1: Do not check firmware version. When enable it, sensortester tool will check firmware version.
FWVersion	Test firmware version name.	00_Test01	If "CheckVersion" enable, sensortester tool will check "FWVersion" to conform firmware version name.
CheckFWVID	Check the Firmware VID	0	0: Disable Firmware VID Checking . 1: Enable Firmware VID Checking.
TargetVID	Target VID Setting	0eef	Default EETI VID.
CheckFWPID	Check the Firmware PID	0	0: Disable Firmware PID Checking. 1: Enable Firmware PID Checking.
TargetPID	Target PID Setting	A100	Default EETI PID.
WorkingFrequency	Set Working Frequency	0	Set working frequency index for eGalaxSensorTester4 testing.
RunHWCali	Run Hardware Calibration	1	0: Disable Hardware Calibration. 1: Enable Hardware Calibration.
RunOpenTest	Run Open Test	1	0: Disable open test. 1: Enable open test.
OpenTestMode	Set Open Test Mode	0	0: Use default threshold. 1: Use golden sample tolerance (AnalyzerReport.csv).
RunShortTest	Run Short Test	1	0: Disable short test. 1: Enable short test.
RunMutualCapTest	Run Mutual Capacitance Tests	1	0: Disable mutual capacitance tests. 1: Enable mutual capacitance tests.
RunOPDraw	Run OPDraw Test	0	0: Do not run OPDraw.exe. 1: Lunch OPDraw.exe.
CreateUniformityThreshold	Create Uniformity Table	1	0: Disable creating uniformity table. 1: Enable creating uniformity table.

UniformityThreshold	Uniformity Threshold	15	Default uniformity threshold.
OpenTxThreshold	Open Test Threshold for Tx	2700	If open test value of Tx channel greater than "OpenTxThreshold" is PASS.
OpenRxThreshold	Open Test Threshold for Rx	2700	If open test value of Rx channel greater than "OpenRxThreshold" is PASS.
OpenTestDiffOptionTH	Threshold for adjacent channels difference threshold	0	If any adjacent channels difference is greater than OpenTestDiffOptionTH, then execute Open Test for Tx and Rx channels.
OpenTxDiffThreshold	Threshold for Tx adjacent channels difference	9999	Any Tx adjacent channels difference lesser than OpenTxDiffThreshold is PASS.
ShortTestThreshold	Short Test Threshold	30	If absolute of Short Test value less than "ShortTestThreshold" is PASS.
MutualCapTestThreshold	Mutual Cap Test Threshold	35	If absolute of Mutual Cap value less than "MutualCapTestThreshold" is PASS.
SaturationL2TestThreshold	SaturationL2 threshold setting	100	Threshold for SaturationL2 Test
LogCSVFile	Log Test Result Data	1	0: Disable log test result. 1: Enable log test result.
MutualCapTestCornerTolerance	Set Mutual Cap Test Corner Tolerance	0	Adjust Mutual Cap Corner Threshold.
MutualCapTestLastRxTolerance	Set Mutual Cap Test Last Rx	0	Adjust Mutual Cap last Rx Threshold.
AutoStartAfterEnterKeyDown	Auto Start Test After 'Enter' Key Down	1	0: Disable auto start test once the barcode information is filled in and the 'Enter' key is pressed. 1: Auto start test once the barcode information is filled in and the 'Enter' key is pressed.
CheckBarcodeLength	Set Check Barcode Length	0	0: Disable barcode length checking. 1: Enable barcode length checking.
BarcodeLength	Set Barcode Length	4	The length of barcode.
SaveBarcodeInfo	Save Barcode Information	0	0: Disable saving barcode information. 1: Enable saving barcode information.
AnalyzeLog	Analyze Log which test fail	1	0: Disable Log Analysis. 1: Enable Log Analysis.
OpenScaling	Open scaling setting	0	Set OpenScaling.
MutualScaling	Mutual scaling setting	0	Set MutualScaling.
GoldenSampleTolerance	Open Test Golden Sample Tolerance (%)	10	Open Test Golden Sample Tolerance (%).
DisablePreRecordData	Recording previous data setting	0	0: Record previous data in csv file. 1: Disable record previous data in csv file.
CheckHWDiagParam	Check HW Parameter for Diag setting	0	0: Disable HW parameter for Diag setting. 1: Use EXC3062 setting. 2: Use EXC32 setting.
ModifyFolderName	Log file folder name modification setting	0	Modify log file folder name, 0: Disable modify folder name. 1: Enable modify folder name.
LogFolderName	Log folder name setting	LOG_XXXX	Set Log file folder Name

[eGalaxUpdate Tool Parameter]			
CheckModel	Check model name	0	0: Disable check model name. 1: Enable check model name.
CurrentModel	Controller model name	SIRIUS_XXXX	When enable check model name, controller model name need same with the parameter. And allow start update firmware process.
TargetModel	Check controller information	SIRIUS_XXXX	After update firmware process, controller model name should same with the parameter. Otherwise update tool will show error message.
TargetVersion	Check controller information	00	After update firmware process, controller version should same with the parameter. Otherwise update tool will show error message.
TargetCRC	Check controller information	0xFFFF	After update firmware process, controller CRC should same with the parameter. Otherwise update tool will show error message.
TargetParameterVersion	Check controller information	00.00	After update firmware process, controller Parameter Version should same with the parameter. Otherwise update tool will show error message.
TargetParameterCRC	Check controller information	0xFFFF	After update firmware process, controller Parameter CRC should same with the parameter. Otherwise update tool will show error message.
TargetFirmware	Firmware file name	firmwarename.32p	Firmware file name.
[Sensor Test]			
OpenTestGetTimes	Get times for open test	1	The number of times to get image data for open test.
ShortTestGetTimes	Get times for short test	1	The number of times to get image data for short test.
MutualCapTestGetTimes	Get times for mutual capacitance test	1	The number of times to get image data for mutual capacitance test.

3 eGalaxFPCTester

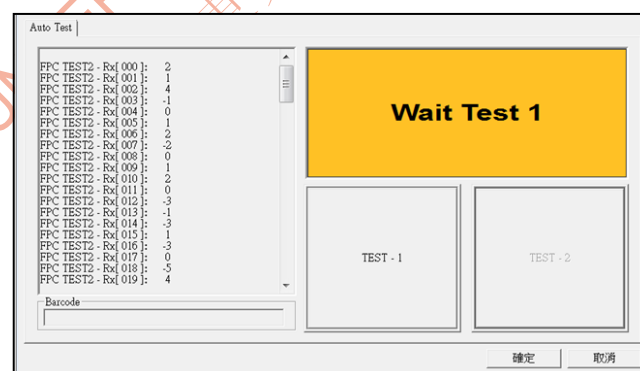
eGalaxFPCTester is a self-test utility for checking if there is any open and short on the EETI controller. Connect EETI PCAP controller with EXC80Hxxx sensing IC to the computer. Then, execute eGalaxFPCTester.exe.



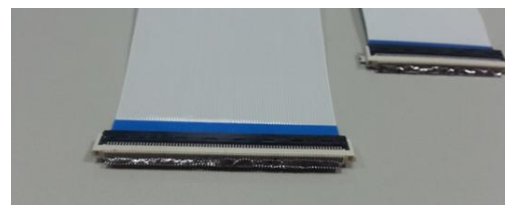
- a. The test results will be shown in the Auto Test window
- b. Controller information will be shown on status window:
 NO-LINK: Controller is disconnected with system.
 LINK-USB/ LINL-UART: Controller is connected with the system via USB or RS232 interface.
 PASS: Test result PASS.
 FAIL: Test result FAIL.
- c. Barcode information
- d. Click the Test-2 button will start test; Click the Test-1 button will start test

3.1 eGalaxFPCTester Testing Flow

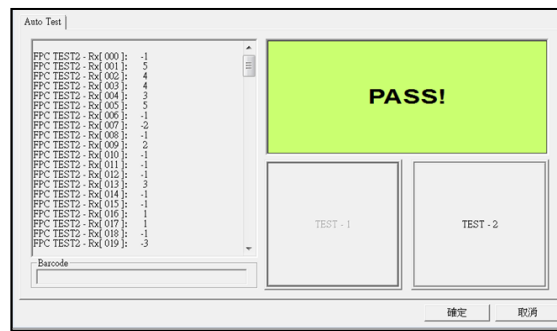
- a. Click the TEST-2 button first. When Test 2 is done, Test 1 button will be enabled.



- b. Please use flat cables that fit with the controller connectors, and have all the pins on the other side shorted (as shown in the picture), then connect the flat cables to the controller.



- c. Then click the TEST-1 button. When the test is completed, it will show the test result “PASS” or “FAIL”.



- d. When Test 1 is done, Test 2 will be enabled again.
e. When the Short and Open Tests are done, a log 「CSV」 file will be generated in the working directory.

3.2 eGalaxFPCTester.ini

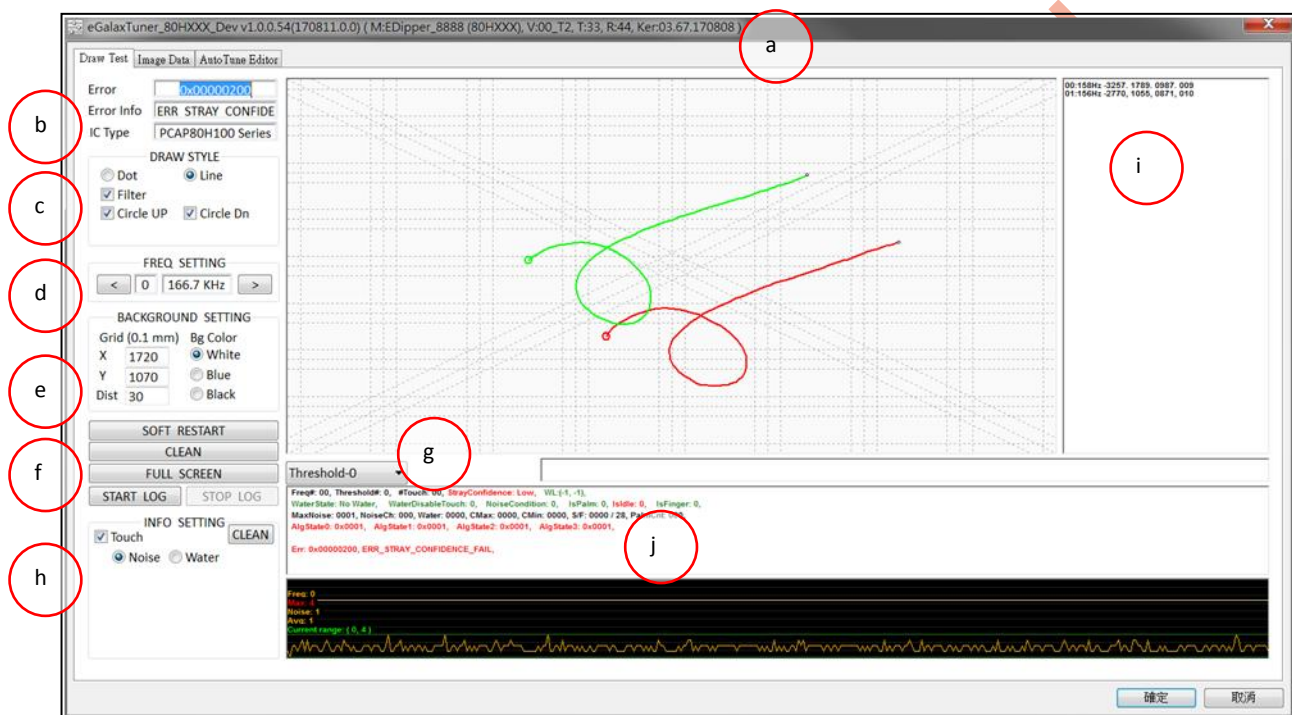
eGalaxFPCTester.ini contains the setting parameters of the FPCTester operation.

Parameter	Comment	Default	Remark
CaseName	Customer case name	Demo	User can fill out case name for identification.
AutoExit	Auto Exit Tool	0	0: Auto close tool. 1: Do not auto close tool When enable it, FPCTester tool test done, will auto close tool.
RunFWUpdate	Run FW Update Tool	0	0: Do not run firmware update tool process. 1: Run firmware update tool process
CheckFWModel	Check the Firmware Model	0	0: Disable Firmware Model Checking. 1: Enable Firmware Model Checking
TargetFWModel	Target Firmware Model Name	SIRIUS_XXXX	Default firmware model name setting.
CheckFWPID	Check the Firmware PID	0	0: Disable Firmware PID Checking. 1: Enable Firmware PID Checking
TargetFWPID	Target Firmware PID	XXXX	Default firmware PID setting.
CheckFWVersion	Check firmware version.	0	0: Check firmware version. 1: Do not check firmware version When enable it, FPCTester tool will check firmware version.
TargetFWVersion	Test firmware version name.	00_XX	If “CheckVersion” is enabled, FPCTester tool will check “FWVersion” to conform firmware version name.
FPCTest1Threshold	FPC Test-1 Threshold	-70	If the test-1 result is smaller than “FPCTest1Threshold”, it is a PASS.
FPCTest2Threshold	FPC Test-2 Threshold	15	If the test-2 result is smaller than “FPCTest2Threshold”, it is a PASS.
LogCSVFile	Log Test Result Data	1	0: Disable Log File Result. 1: Enable Log File Result
RunHWCALibrate	Run Hardware Calibration	1	0: Disable hardware calibration. 1: Enable hardware calibration
EnableBarcode	Set Barcode Function	0	0: Do not enable barcode information. 1: Enable barcode information
KeepWorkMode	Set Keep Working Mode	1	0: Do not enable keep working mode. 1: Enable keep working mode
ShortTestIgnoreChannel	Ignore channel for short test.	NA	eg. [Tx1][Rx5]

4 eGalaxTuner80Hxxx

eGalaxTuner80Hxxx is the debugging tool for EETI EXC80Hxxx controller, it provides draw function, image data diagnosing, raw signal data analyzing.

4.1 Draw Test Page

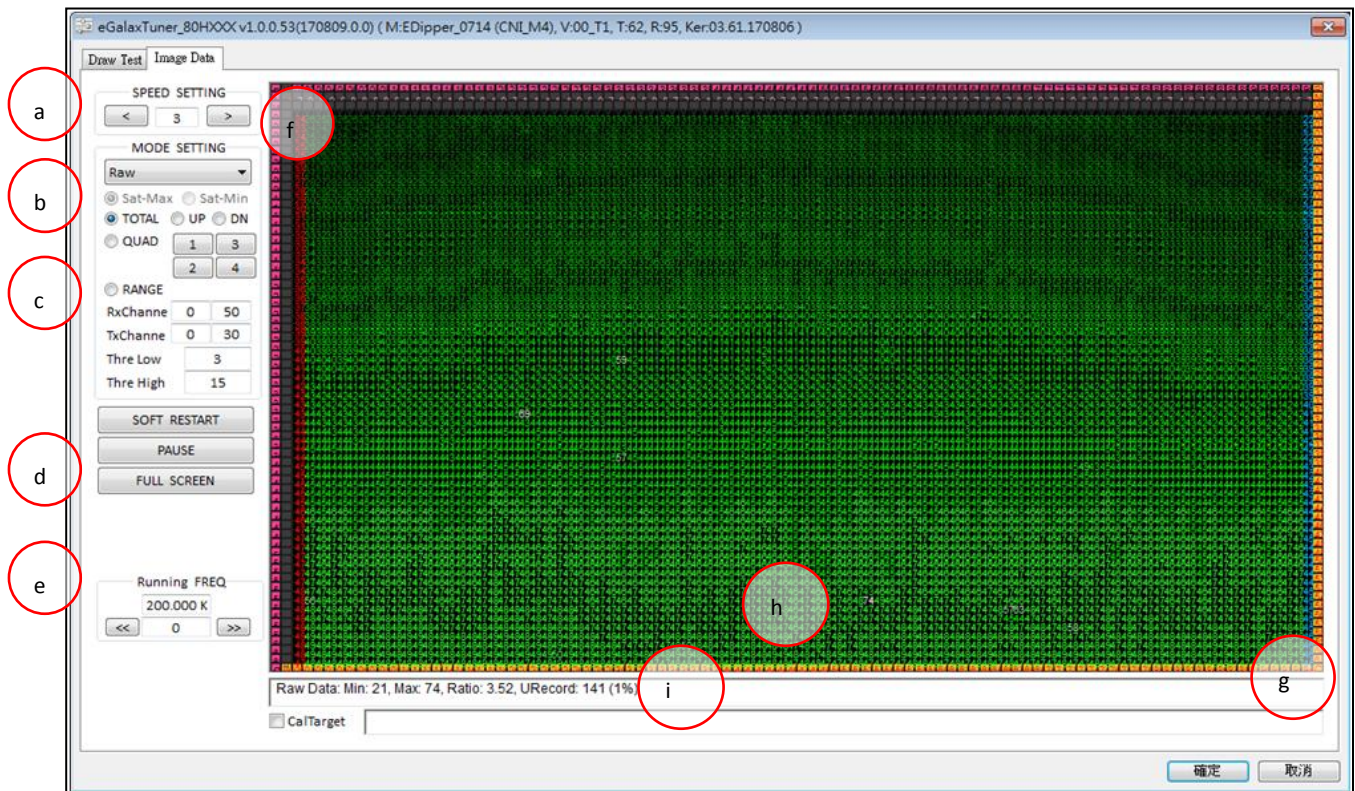


- a. eGalaxTuner Title will show the controller information:
 - Application version
 - Controller model / model information
 - Controller firmware version / Kernel version
 - The number of Tx and Rx channel
- b. Touch information window:
 - Error code information and IC type
- c. Drawing Style:
 - **Filter:** Show touch positions with filter.
 - **Dot mode/ Line mode:** Show touch positions in dots or line.
 - **Circle Down/ Circle Up:** Show finger down and up state with a circle.
- d. Freq Setting:
 - **Index:** Working frequency index and current working frequency (kHz).
- e. Background Setting:
 - X: X dimension of the active area. [unit: 0.1mm]
 - Y: Y dimension of the active area. [unit: 0.1mm]
 - Dist: The tolerance line gap (dot line) for each grid line[unit: 0.1mm]
 - Background color: White, blue and black.
- f. Function buttons:

- **Soft Restart:** Make the controller software restart to reset touch function.
 - **Clean:** Clean the draw data window.
 - **Full Screen:** View the draw data window in full screen mode.
 - **Start/Stop Log:** Save/Stop all the X/Y coordinates in a log file.
- g. **Threshold-#:** Index of current threshold setting.
- h. Info Setting
- Touch: show firmware status.
 - Noise: show noise status information at monitor window.
 - **Freq:** Current working frequency index.
 - **Max:** Maxima noise value of the environment.
 - **Noise:** Current noise value of the environment.
 - **Avg:** Average noise value of the environment.
 - **Current range:** Current noise range inside the noise monitor window.
 - Water: show water status information at monitor window.
 - **Water- History Max:** Maximum water value of the environment.
 - **Water- Val:** Current water value of the environment.
 - **Water- Current:** Current water value range inside the monitor window
 - Clean button: Clean information records.
- i. Touch position and report rate.
- j. Firmware status:
- Freq#: Index of current working frequency.
 - Threshold#: Index of current threshold setting.
 - #Touch: Total number of valid touches.
 - StrayConfidence: State of baseline. If the baseline is incorrect, the "StrayConfidence" will be set to 0.
 - WaterState: State of water condition including no water, single touch in water and dual touch in water.
 - WaterDisableTouch: Water condition and touch is disabled.
 - NoiseCondition: Show noise condition state.
 - IsPalm: Show palm rejection state.
 - IsIdle: Show touch or idle condition.
 - MaxNoise: Maxima noise value of the environment.
 - NoiseCh: The index of Rx channel which has maxima noise value.
 - Water: Water quantity of water detect algorithm.
 - CMax: Maximal value in Cooked Data image data page.
 - CMin: Minimal value in Cooked Data image data page.
 - S/F: Value for speed and filter level.
 - PalmCnt: Count of palm objects.

4.2 Image Data Page

This page shows EXC80Hxxx sensing data and hardware status which are very important for controller status checking.



a. Speed Setting

Refresh rate of the raw data. Default setting is to refresh the window every 3 frames. Decrease this value will make the image data to refresh faster.

b. Mode Setting

There are several modes for EETI PCAP controller sensing data:

- **Raw:** Raw data of EXC80Hxxx controller.
- **Touch Signal:** The intensity of a contact which is calculated from Raw data and Cooked Data.
- **Touch %:** The percentage of mutual capacitance variation of the touch sensor. For a PCAP touch system, a proper variation of a finger touch in a mutual capacitance touch system is around 10%~20%. Higher percentage means higher SNR. This percentage will be very depends on sensor design.
- **AFE AD% / ADC AD%:** Signal strength of the **analog frontend / after analog to digital convertor**. The higher AD LEVEL % value, the higher risk to suffer signal saturation.
- **Cooked Data:** The signal difference between Raw data and the baseline.
- **Unifor Cook:** The uniformity value after hardware calibration. If there is large value in Unifor Cook page, that means the current uniformity state is different to the state when hardware calibration is made, it can be damage or distortion of the touch system.

c. Image range

- **TOTAL:** Display complete image data.
- **UP:** Display upper half part of image data.
- **DN:** Display lower half part of image data.
- **QUAD:** Display quarter part of image data.
- **RANGE:** Display specified numbers of Rx/Tx range of image data.
- **Thre Low:** Highlight the value if the absolute value is larger than **Threshold Low**.
- **Thre High:** Highlight the value if the absolute value is larger than **Threshold High**.

d. Display function buttons:

- **Soft Restart:** Refresh the baseline, controller will go back to default working state.
- **Pause:** Freeze the image signal in the signal window.
- **Full Screen:** enlarge the signal window to full screen.

e. Running Freq

- **Frequency:** Current working frequency (kHz).
- **Index:** Working frequency index.

f. The up side and left side index is the IC pin number of each channel. Different color means different IC.

g. The right side and down side index is the Tx/ Rx index of each channel.

h. Raw Data Information: Displays the max and min raw data, the max/min ratio, and the number and the usage of system offset data.

i. Raw Data Information: Displays the max and min raw data, the max/min ratio, and the number and the usage of system offset data.

4.3 Hotkey table

a. Draw Test Page

Hotkey	Function
L	Start/ Stop log.
F	Full screen
R	Soft Restart
T	Enable/ Disable touch info window
+	Increase working frequency index
-	Decrease working frequency index
Space bar	Clean draw window
ESC	Exit full screen mode

b. Image Data Page

Hotkey	Function
P	Pause
F	Full screen
Z	Zoom in (Switch to "Range display mode")
X	Zoom out (Switch to "Total display mode")
Up/ Down/ Left/ Right	Move display range in zoom in mode
+	Increase font size
-	Decrease font size



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