INTRODUCTION

Rafael Lin’s work experiences in synaptics

Responsibility

- Developed application for touch controller, which is used by entire ecosystem. Key features include configuration tuning, diagnostic, performance evaluation and production test (WinForm/C# and C++)

- Designed/developed in-system firmware update and test application (C++)

- Provided customer support, such as performance/failure analysis and mass-production application (WinForm/C# and C++)

- Designed/developed windows library to communicate with touch controller firmware through Socket, I2C, SPI, HID and USB interface (C++)

Responsibility

Platform releases

Customer support

DS4	DS5	DS6	TSLite	Customer issues
Slim projects	LTDI LTS Wearable Proton	TDDI projects	LTS	All projects
DS4 3.5.5 DS4 3.5.6 DS4 4.1.0	DS5 7.0.0 DS5 7.1.0 DS5 7.2.0 DS5 9.1.0 DS5 15.3.0 DS5 17.1.0 DS5 17.2.0	DS6 1.0.0	TSLite 2.3.0.0 TSLite 3.1.0.0	DS4/5 X.X.X

DS5 Introduction

- The primary tool used from bring-up to mass production

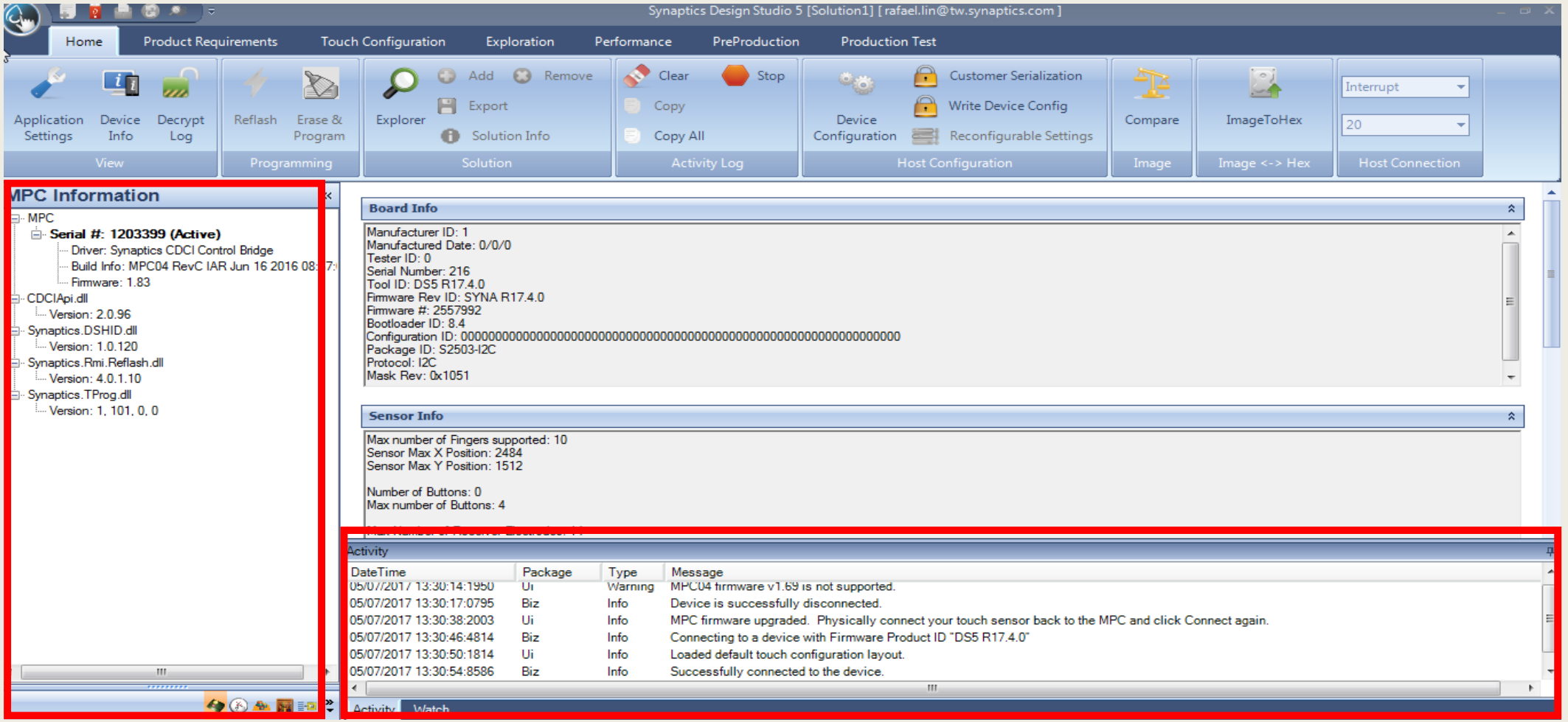
- Each component is a plugin
  - *Flexible and useful for customization*

- Transfer data through multiple protocols
  - *Integrated CDCIAPI to communicate with Bridge Board(MPC04)*
    - I2C, SPI, WIFI, HID2USB

- RMI (register map interface)
  - *communication interface with touch controller*
  - *1) Function01 : control and configure touch controller*
  - *2) Function12 : 2D touch position*
  - *3) Function34 : Flash memory management*
  - *4) Function54 : test reporting and analog diagnostic*

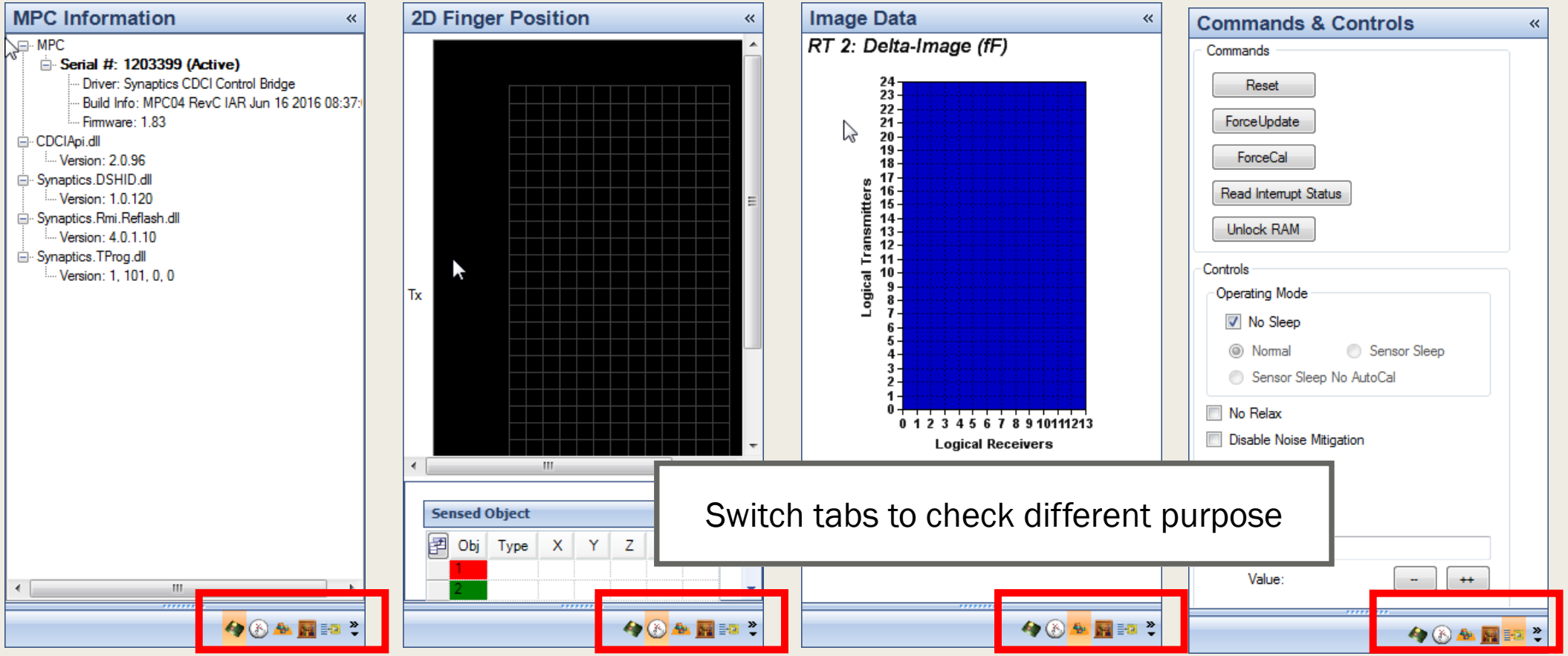
The look of DS5

- **Side** : control panel ; **buttom** : activity panel ; **main** : major functionality



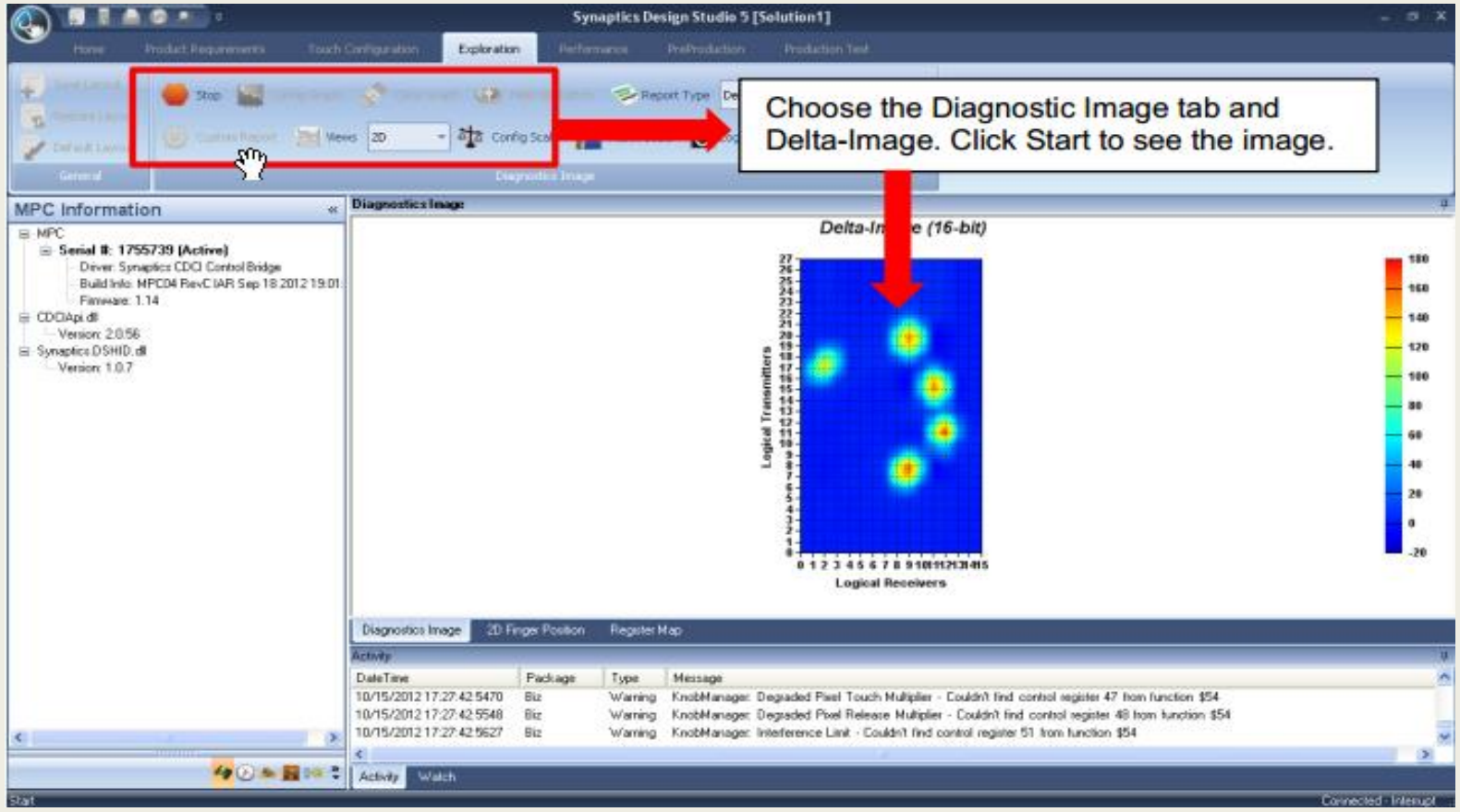
Control panel in DS5

- Provide connection status, control and basic diagnostic capacity.



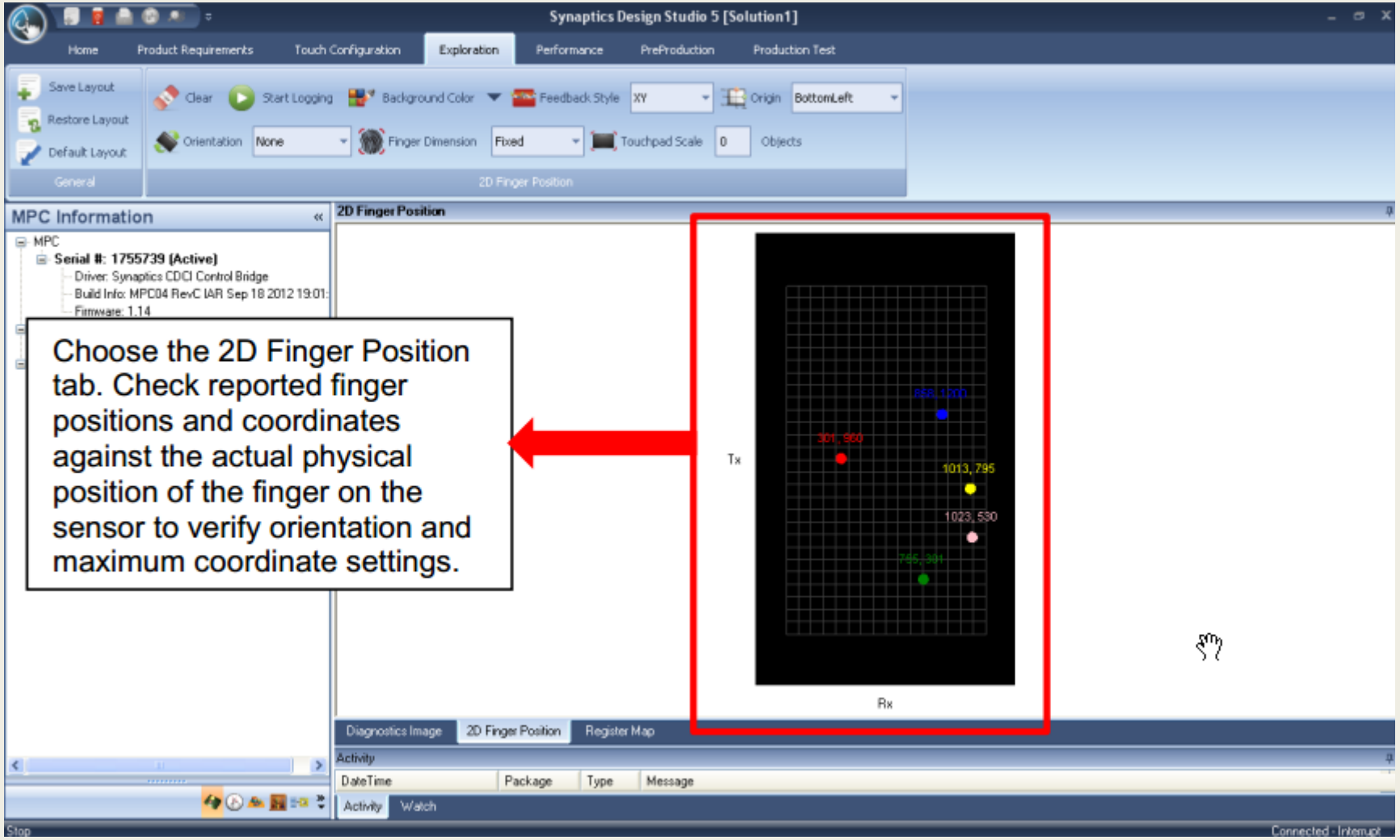
Raw Data Observation

- Get report data from Function 54 through polling mode



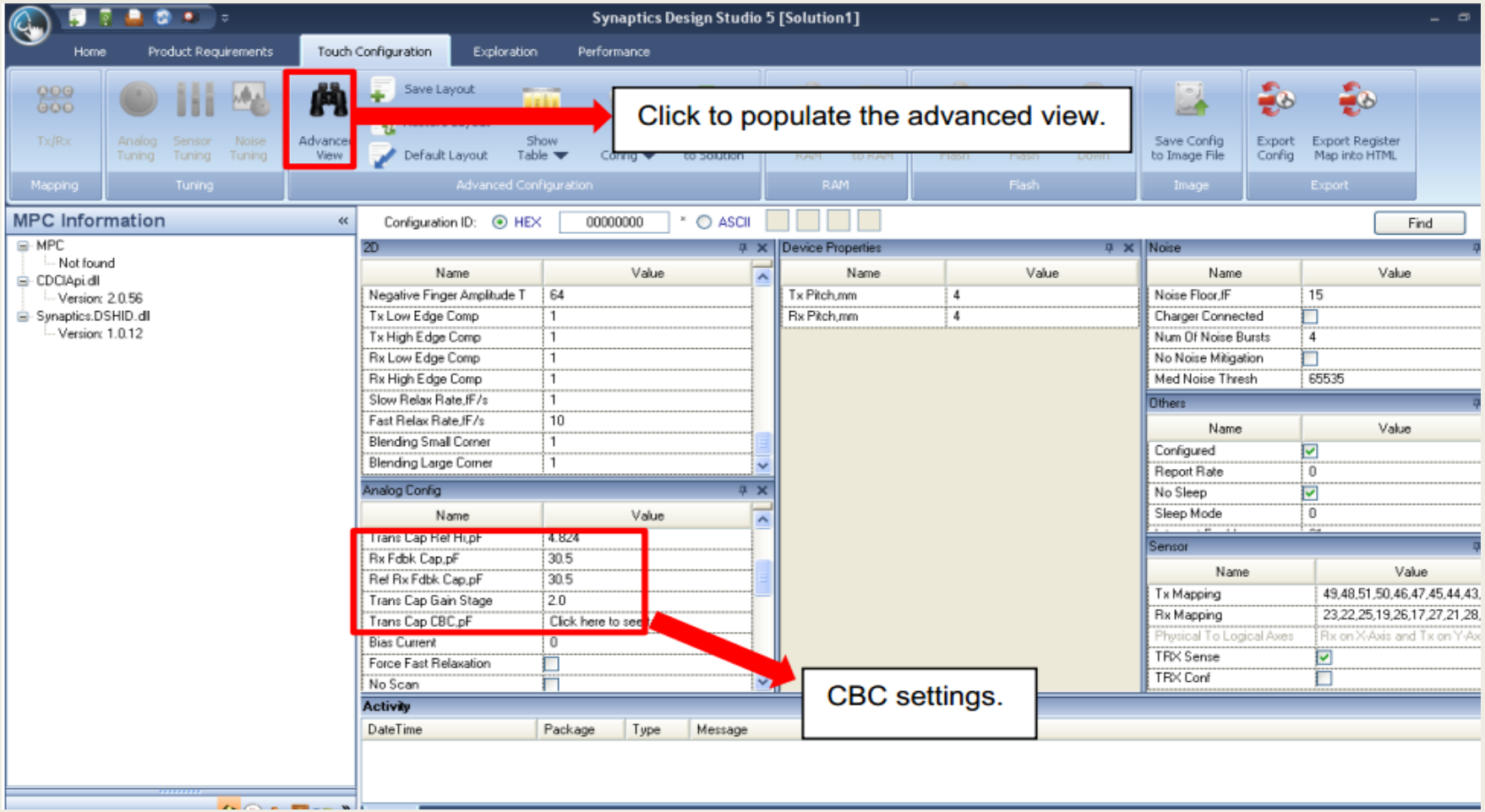
2D Finger position

- Get 2D finger touch position from Function12 through interrupt mode

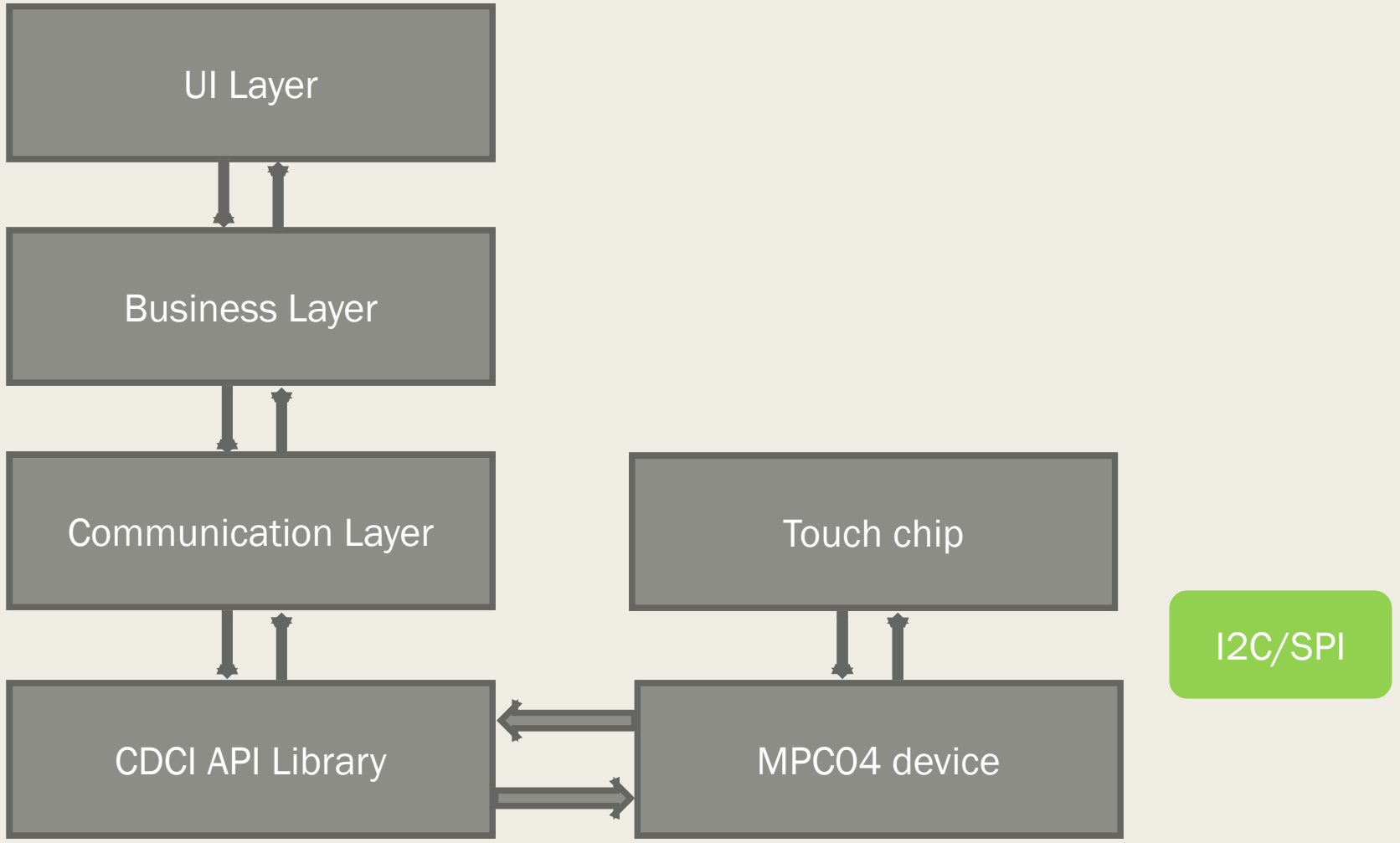


Touch Configuration – Advance View

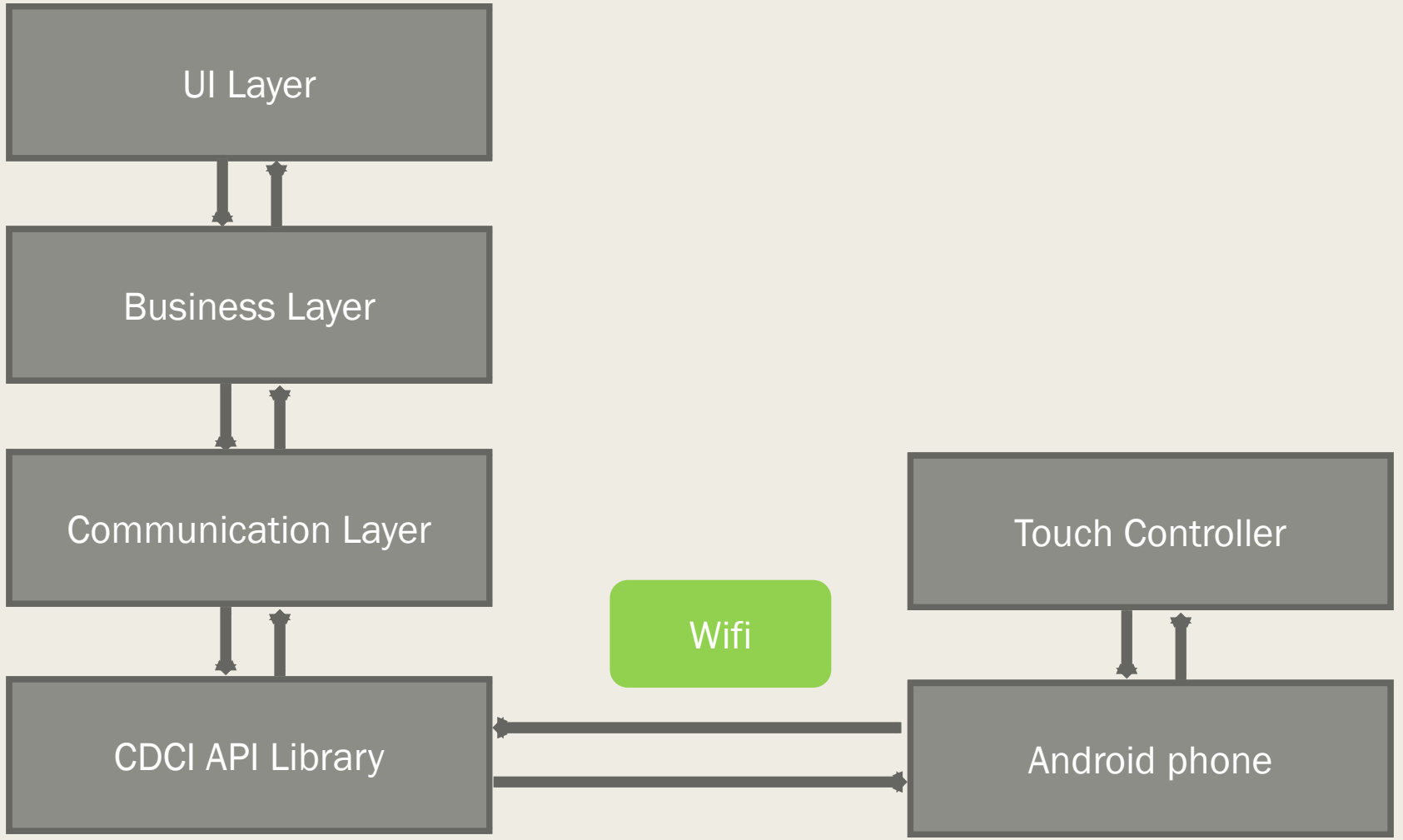
- Tune specific knobs and save it by “WriteToRam” or “WriteToFlash”



System Diagram (I2C/SPI)

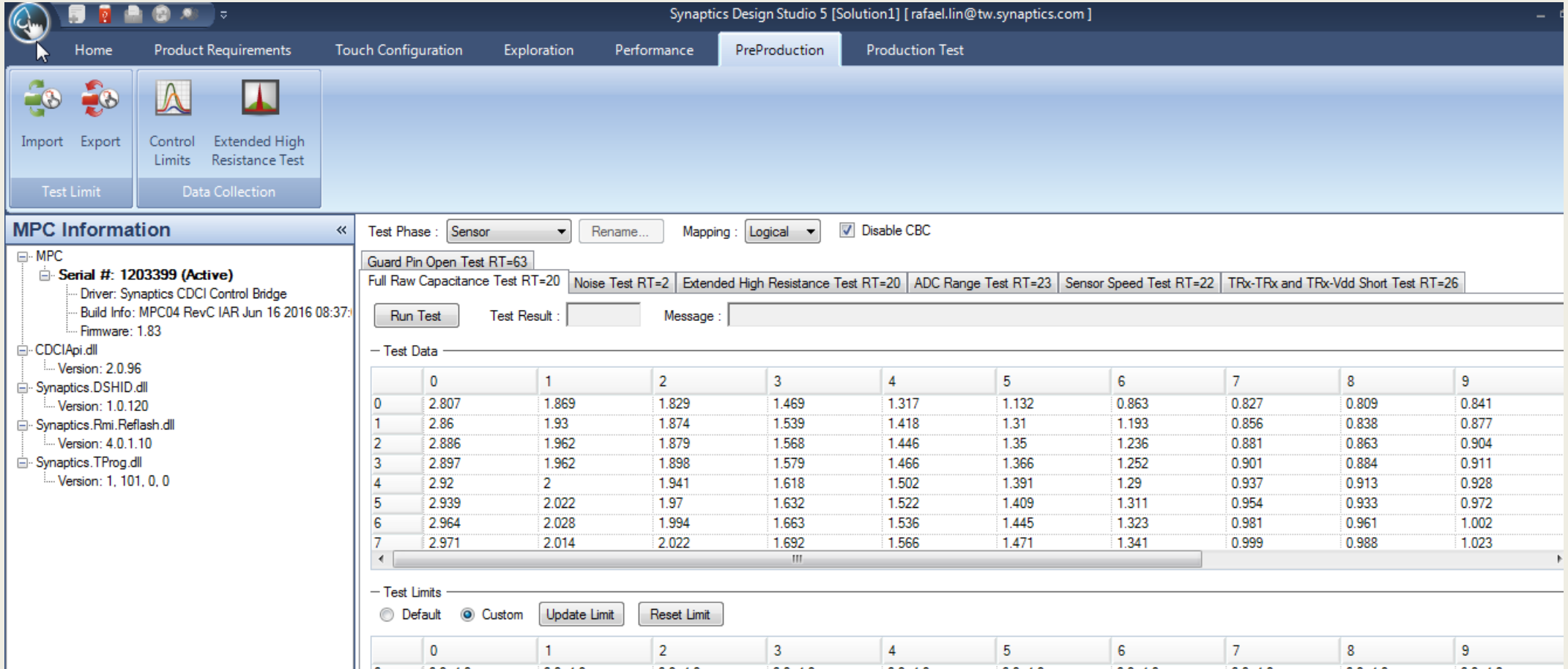


System Diagram (Wifi)



Preproduction

- Make the recipe which comsists of a list of customized test items.
- Save it into Solution and used for TestStudio5 in factory.



Misc. functionality

- Test Studio 5 (Production Test)
- Tuning Wizard
  - *Analog, TRX mapping,*
- Performance Tuning Wizard
  - *SNR, Linearity, Jitter*

Auxiliary tools

1) jenkins : CI/CD (continuous integration/continuous delivery)

2) jira : issues tracking system

3) setupfactory : installer-maker for customers to install new tool

4) packrat server : download FW and provide RMI information

6) infragistic : unique, outstanding and useful framework