Developer World

Sony Smart Tennis Sensor SDK Developer's Guide

Version 1.0, September 22, 2016

First edition (September 2016)

Contents

1. Overview

The SDK allows developers to connect with the sensor and receive data from Sony's Smart Tennis Sensor.

This SDK works with Sony SSE-TN1W.

To access the SDK, please visit https://developer.sony.com/develop/smart-tennis-sensor.

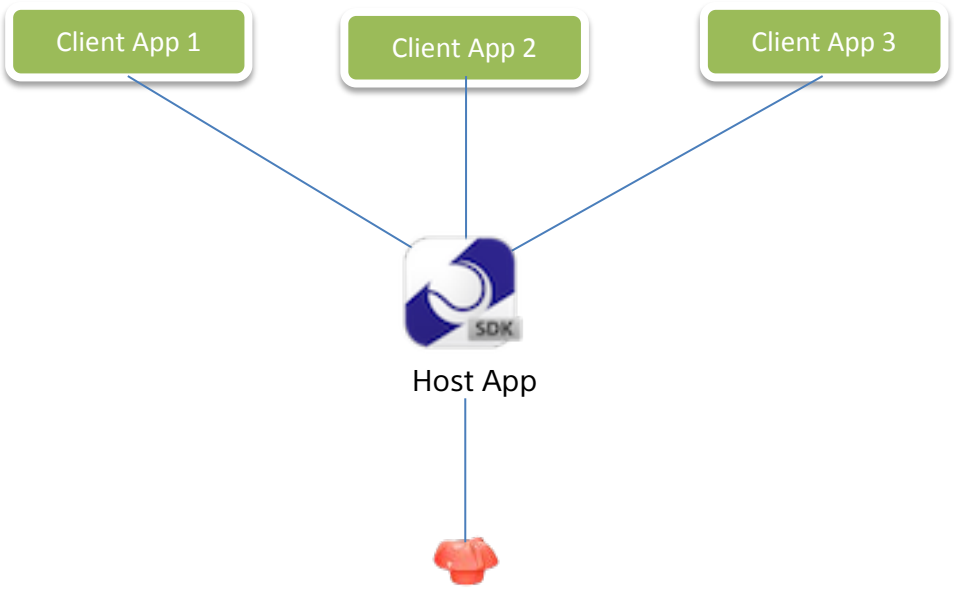
The sample code and documentation can be found on https://github.com/sony/smarttennissensorsdk.

2. Terminology

Host or Host App	The application released by Sony that talks to the sensor and interfaces with the client apps.
Client or Client App	The application that the reader of this document will be developing.
Sensor	The actual hardware that is attached to the racket: 
Smart Tennis Sensor App	https://play.google.com/store/apps/details?id=com.sony.smarttennissensor Note that Smart Tennis sensor app download from Google Play is limited to the countries, where the Smart tennis sensor is available.

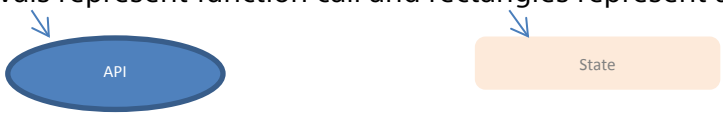
3. Diagrams

Sony's Host app acts as an intermediary app between the actual sensor hardware and client app(s).

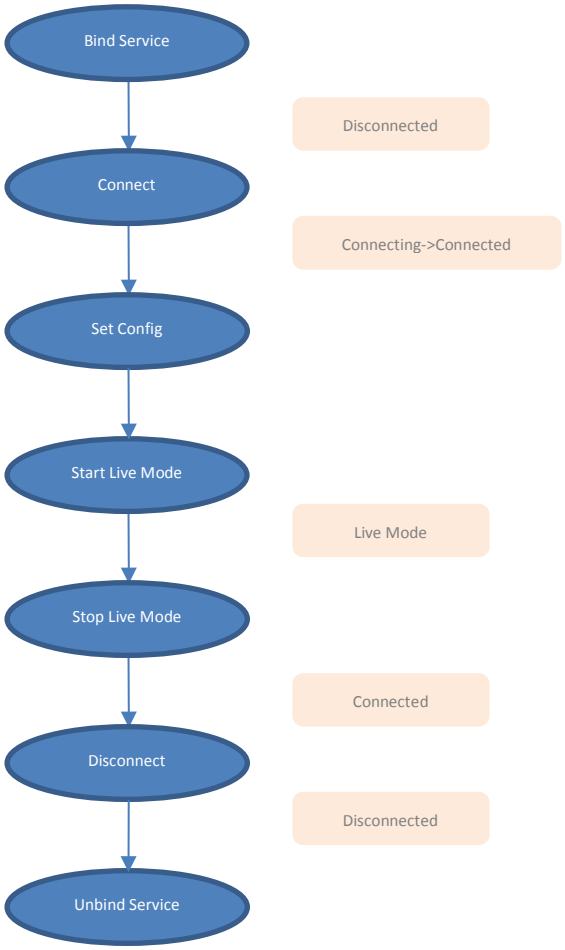


This is the sequence of steps to be followed in the client app. Please understand this in conjunction with the state diagram following it.

Ovals represent function call and rectangles represent app states.



Call Sequence



The host app exposes its functionality through an android service, therefore the client app will need to do a bind and unbind service.

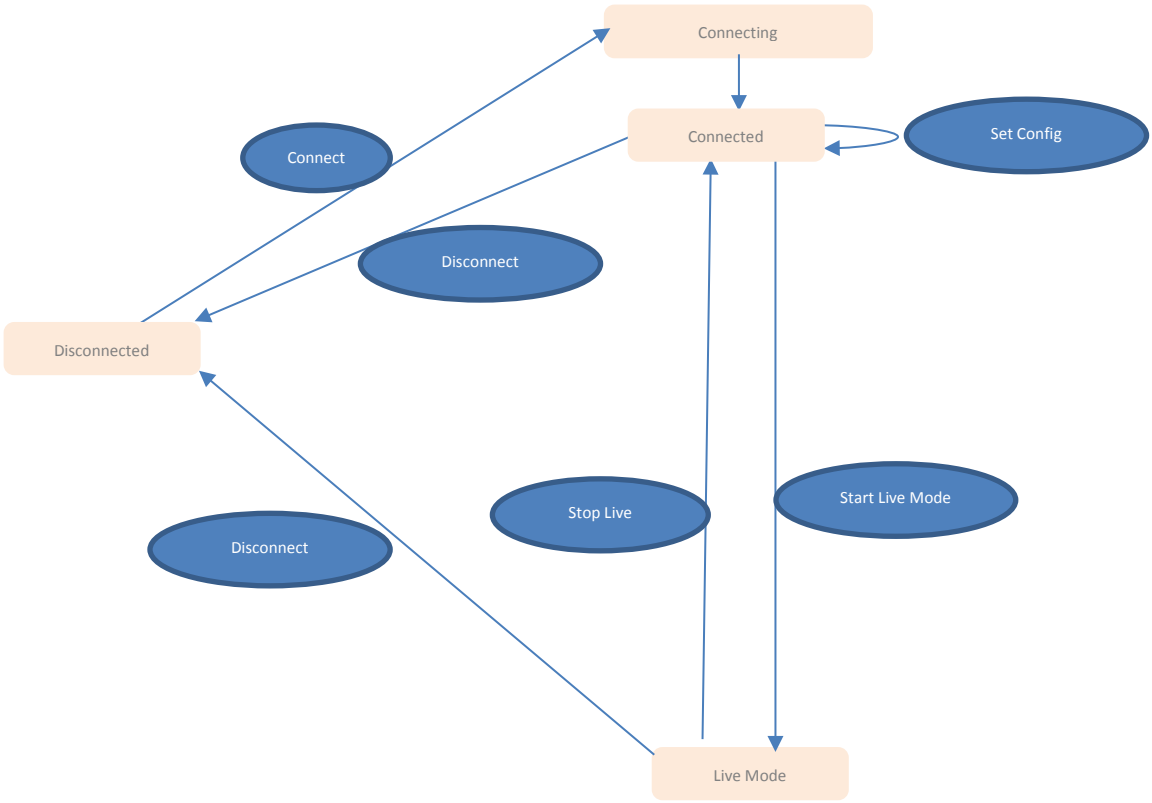
```
Intent intent = new Intent();
ComponentName cn = new ComponentName("com.sony.smarttennissensor.sdk.host",
"com.sony.smarttennissensor.service.AriakeService");
intent.setComponent(cn);

mBind = context.bindService(intent, mConnection, Service.BIND_AUTO_CREATE);
```

The diagram illustrates the states that the Host app will move to in response to api calls from a client. After a bind service, the host will be in disconnected state if it does not have any clients running.

Ovals represent function call and rectangles represent app states.

State Change



4. Getting Started

This sdk is for the Android platform. The Host App and sample code were built using Android Studio. For setting up the Android Development Environment, see the official Android developer website.

At the time of this writing, this SDK is built and tested with the following software versions.

Android Studio 1.5.1

Java Runtime Environment 1.7.0_79

Minimum API level 18

Target API level 19

Android SDK build tools version: 22.0.1

Android Gradle plugin version 2.1.0

Gradle version 2.11

5. SDK Contents

The SDK has this folder structure:

SimpleSampleApp	A sample code that shows how to talk to the Host App.
SDK	Contains SmartTennisSensor-client.jar & Javadoc. This is the jar file that clients will need to include in their app.

6. Setup & Installation

6.1 Sensor Pairing

Before using the SDK, the sensor needs to be paired with the device.

Charging the sensor

1) Please use the cradle that comes with the sensor.

   http://helpguide.sony.net/sports/tn1/v1/en/contents/TP0000599195.html

2) Turn on the sensor

   http://helpguide.sony.net/sports/tn1/v1/en/contents/TP0000599196.html

3) Put the sensor in Pairing mode and pair with the device

- Press and hold the ⏻ button of the sensor for about one second to turn on the power.
    - The red light turns on briefly, indicating that the sensor is on.
    - The blue light turns on slowly if the sensor is paired with the device for the first time. Please complete pairing before using the sensor.
- Press and hold the ᛒ button for about seven seconds.
    - The blue light blinks slowly.
    - Keep holding the ᛒ button if the blue light blinks while it is pulsating.
- Tap [Settings] - [Bluetooth] on your device to activate the BLUETOOTH function on the device.
    - The device starts searching devices to be paired and available devices will be listed.
- Tap the sensor name to be paired.

- Choose the sensor name whose last four digits match those of the sensor.
- When pairing is complete, the blue light blinks four times rapidly for Android devices and twice rapidly for iOS devices.

For the sensor LED please refer this link.

http://helpguide.sony.net/sports/tn1/v1/en/contents/TP0000599199.html

While running the host app, the sensor should be in the Bluetooth mode. After turning on a paired sensor, press and hold the Bluetooth button on the sensor for 2 to 3 seconds to shift the sensor to Bluetooth mode. The blue light will blink intermittently to denote that it is in Bluetooth mode. Please note, currently, memory mode is not supported by the SDK.

6.2 Host App

Please install the host app provided in this release. This is required as it connects with the sensor. To install any apk from the command line:

$ adb install <FileName>.apk

For example:

$ adb install Host.apk

6208 KB/s (3338500 bytes in 0.525s)

pkg: /data/local/tmp/Host.apk

Success

Minimum SDK version: 18

Permissions required by this app.

```
<uses-permission android:name="android.permission.BLUETOOTH" />
<uses-permission android:name="android.permission.BLUETOOTH_ADMIN" />
<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
<uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE" />
<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />
<uses-permission android:name="android.permission.INTERNET" />
```

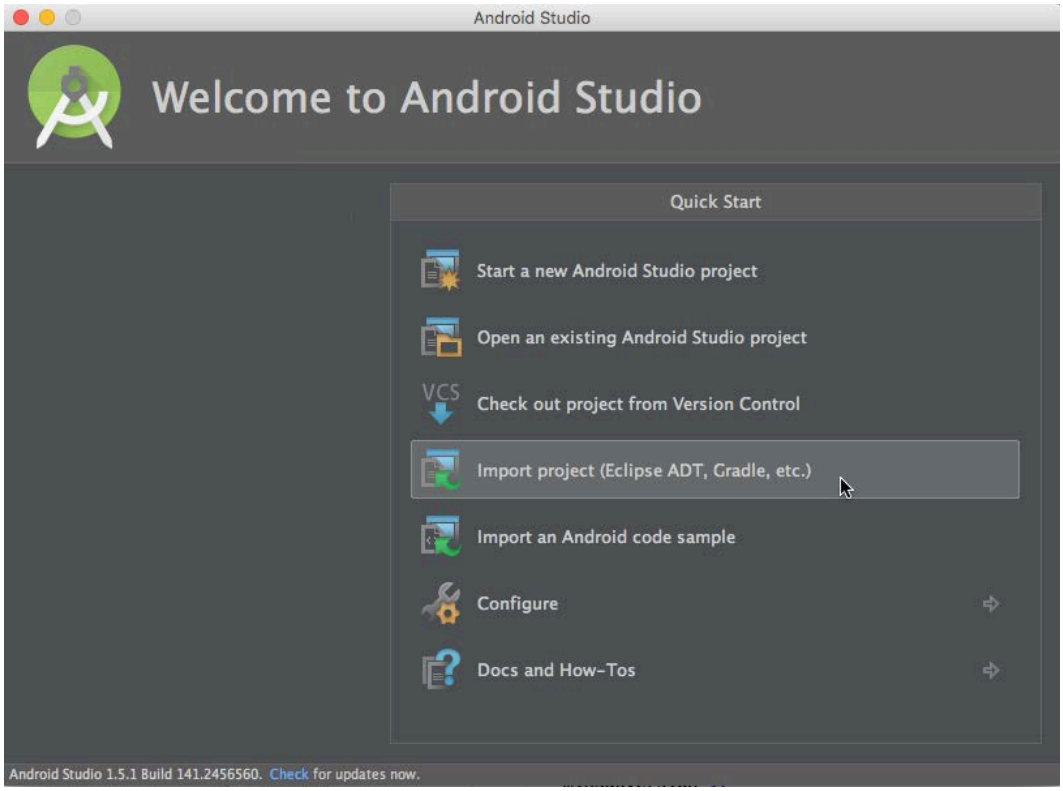
Please ensure that the android device has a working internet connection at the time of execution.

6.3 Setting up the Sample App

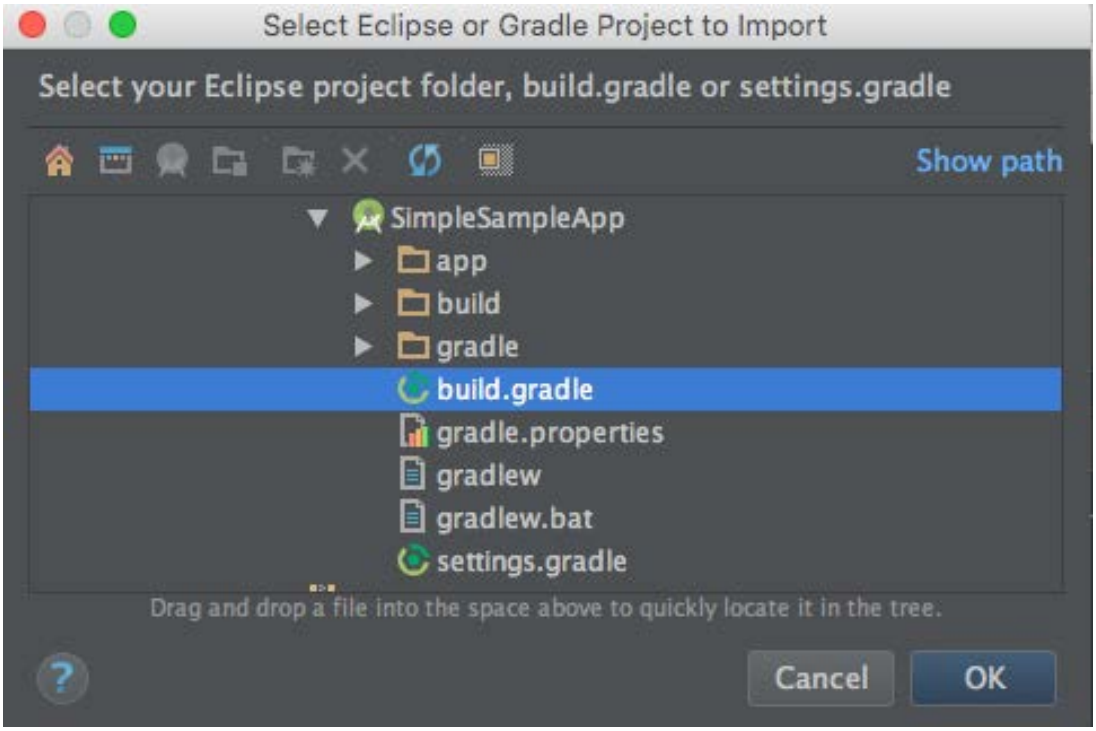
The sample app is available on https://github.com/sony/smarttennissensorsdk.

6.3.1 Importing the Sample App Project to Android Studio

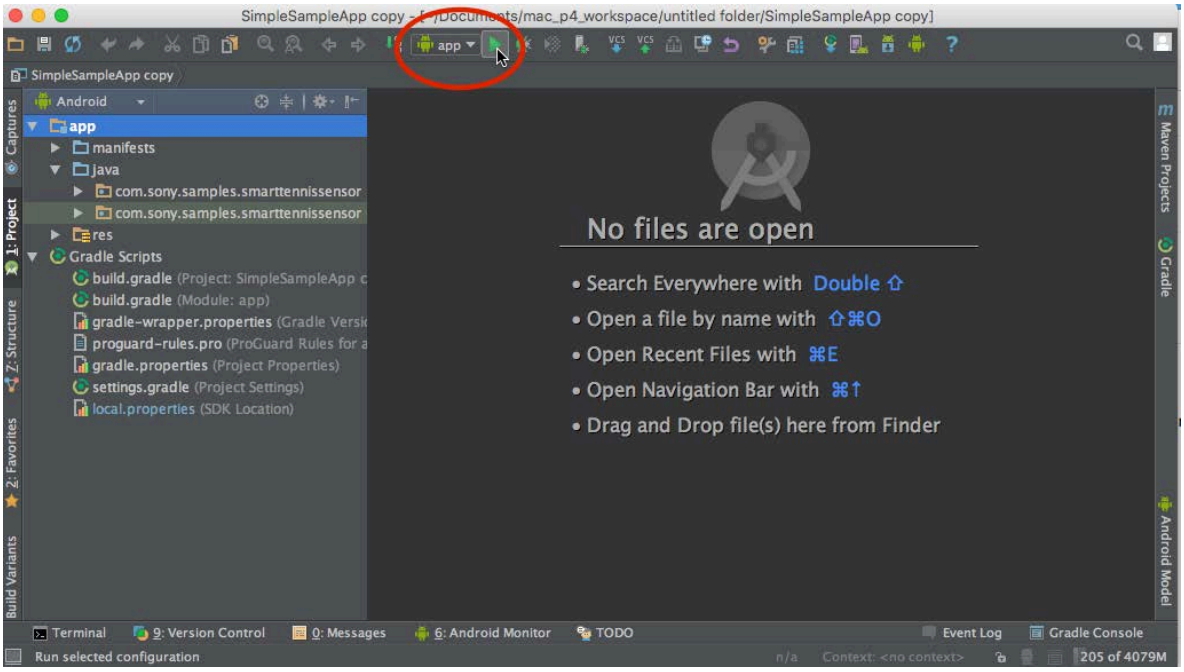
Select Import project in Android Studio



Navigate to the Sample app directory and select the build.gradle file.



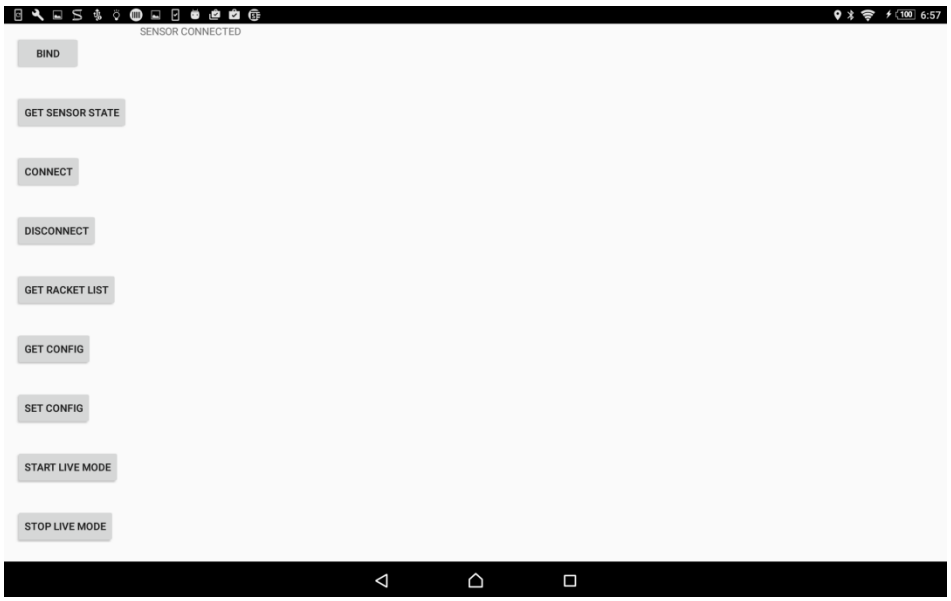
6.3.2 Run the Sample App



Make sure an android device is connected to the PC.

6.3.3 How to Operate

The sample app looks like this. Each api exposed in the Host app has a corresponding button.



1. Press the BIND button to bind this sample app to the Host app. Before this, the Host App should have been installed and the sensor should have been paired with the android device and in Bluetooth mode as described in section 6.1. Your android device must also have a working internet connection. The internet connection is needed to download the latest racket model as we change update the racket list when the new models are added.

2. Press the CONNECT and in the dialog that pops up, choose the sensor. The tennis sensor name is SSE-TN1 XXXX, where XXXX is number.

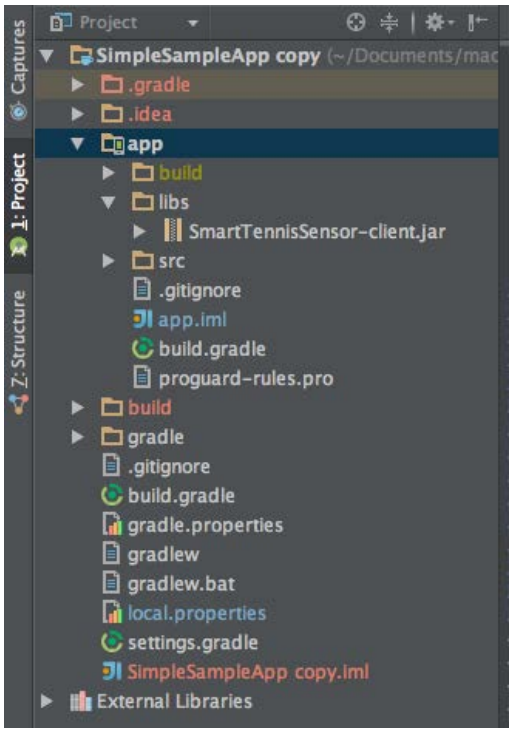
3. Press theGET RACKET LIST, this is essential before you can call setConfig. The sample app does not remember the racket list across launches, however, it remembers throughout a session.

4. Press SET CONFIG, and if you see a setConfig result =0, you're good. If you don't see the result = 0, most likely you don't have internet connection at the time of GET RACKET LIST.

5. “START LIVE MODE”, In Live Mode, you can hit shots and see the shot parameters being displayed on screen in text.
6. Press “STOP LIVE MODE”, disconnect and turn off sensor when done. Please refer section 3 for the state of the sample app (client app).

6.4 SDK Jar

The jar file contains the interfaces and classes required to access the Host App. You will need to include this into the app that you're building.



Drop the jar file in the libs folder under your app and make sure that gradle is looking for jar files in that directory--your build.gradle file should have something like this:

```
dependencies {
   compile fileTree(dir: 'libs', include: ['*.jar'])
}
```

7. Clearing Memory on the Sensor

While using the sensor with the SDK, the shot data is saved on the sensor. While the sensor can save up to 12000 shots, time to time, you need to release the shot data from the sensor.

To release the shot data from the sensor, you will need to install Smart Tennis sensor app. Please install Smart Tennis Sensor app from Google Play.

Set up the Smart tennis sensor app,

http://helpguide.sony.net/sports/tn1/v1/en/cover/level1_04.html

Connect the sensor with the app.

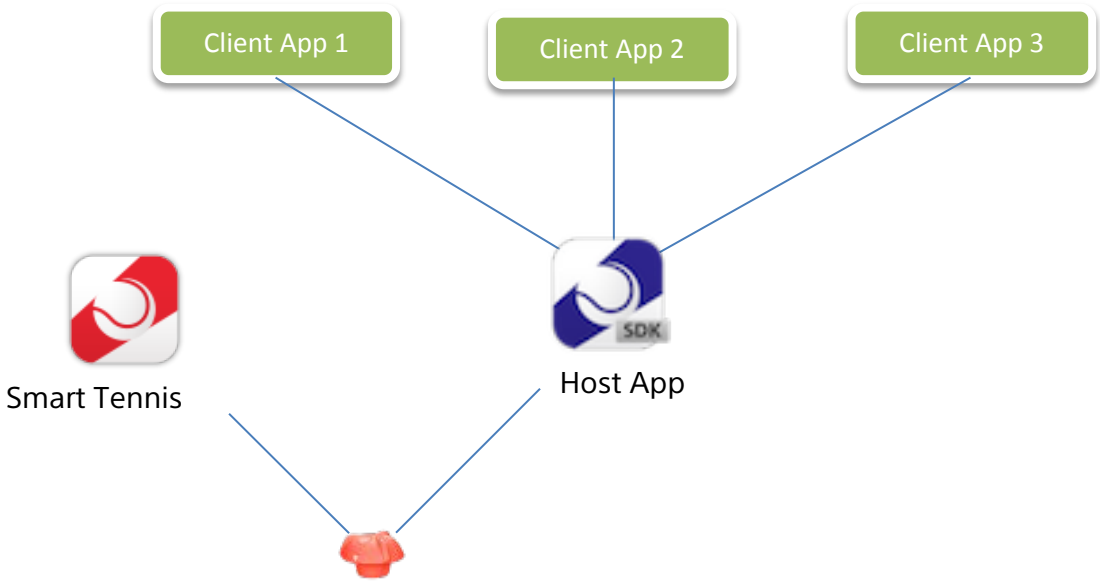
http://helpguide.sony.net/sports/tn1/v1/en/contents/TP0000599204.html

Import the data with the sensor.

http://helpguide.sony.net/sports/tn1/v1/en/contents/TP0000599168.html

After importing the data from the sensor, the shot data in the sensor is cleard.

8. Running the App from PlayStore and the SDK Host Simultaneously

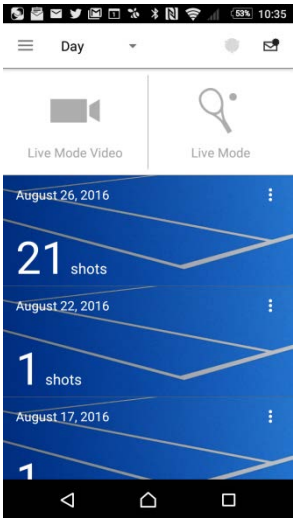


The Smart Tennis Sensor app from the Play Store and the Host App from the SDK, both access the sensor independently. To run the Host App, the installation of the Smart Tennis Sensor is not required. If you do install both the Smart Tennis Sensor and Host onto the same device, the sensor will be able to only talk to either of them at a time. Restarting the sensor will cause the sensor to toggle between the Smart Tennis Sensor app and the Host app.

9. Validating the Shot Data

The Host app uses the same shot detection algorithms as the Smart Tennis Sensor app. If you would like to validate the shots received by your app through the host or view them in the Smart Tennis Sensor Apps', you can import the data from the sensor into the Smart Tennis Sensor app as described in section 7 and section 8.

After importing the data to the Smart Tennis Sensor app, select the date that you made a shot using your app.



In this screen, you can see summary of August 21 shots that you made on your app.

Select one of the swing type to see the detail

Use  and  to zoom in/out on the shot timeline, you can see the particular shot data by zooming in. Compare the data with your app's data.

While this is not necessary step to develop your app, you can always use the Smart Tennis Sensor app as a reference.

Please note, that the selected racket in the Smart Tennis Sensor App and your app must be the same to prevent erroneous results.