

PSoC Academy: How to Create a PSoC BLE Android App

Lesson 5: Debug the Firmware

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Hi. I'm Alan Hawse. This is Cypress Academy. Let's get going. In the last lessons, we created the schematic, set the pins, and wrote the firmware for a CapSense LED PSoC 4 BLE project. Now we'll program it into the board. OK, it's doing the erasing and then it says program flash. As soon as it finishes, the blue light starts blinking. The blue LED blinking indicates that the stack has gotten going, and inside of the stack event handler we've turned on the PWM to drive the blinking process in the LED.

In this next couple of minutes, I'm going to show you how to debug your project. We're going to debug it two different ways using two different tools. The first one is the CySmart BLE Dongle. So, the first thing I'll do is I'll plug it into my computer. Then I'm going to run the program CySmart. There it is. I'll connect to the Dongle. It's found the Dongle, I've connected to it. This brings up a screenfull of options.

The first thing I'm going to do is I'm going to start scanning. This will scan the entire universe of everything that this dongle can hear. The first one I see is called capled, so I'll click on capled and press Connect. When I connect, the light stops blinking on the board, and I can then tell the CySmart utility to read the GATT database. I'll do Discover All Attributes. As soon as that is done I'll see that I've got a complete screen full of attributes. I can see that I've got the service – the primary service declaration – that's got blah, blah, blah, blah

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F1. I've got blah, blah, blah, F2. The first thing I'll do is I'll enable all notifications. This will turn on the ability for the CapSense I can see that when I move to one side I get lower numbers, when I move to the other side I get bigger numbers.

So now I've shown that the CapSense slider works correctly. I'm going to try the LED. First I can click the Read Value button and I can see that it's currently 00 which we know is off – see the light is off. So I'll do a Write Value and I will write a 1, click Write Value, the LED turns on – that's cool.

OK, so the CapSense works, the CCCD works, I can read and write the LED. All that's good. So, I'll put the LED back to 0 – OK, Write Value. And then I will disconnect from the device and the blue LED will start blinking again.

The next thing I'm going to do is I'm going to use the CySmart application that comes with Android. You can get this from the Google Play store, and it's called CySmart. The first thing I'll do is I'll click on CySmart, I'll have it refresh and it looks around me. Currently it can see the board called capled. It also sees something else called Charge HR which is somebody's heart rate monitor that's in this room.

I'll click on the capled. As soon as I click on the capled the light stops blinking

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– OK, that’s good. When I look on the screen I see the GATT DB which is the GATT database browser – alright, that’s nice. So, I click on the GATT database browser. I see Unknown Service. I click on Unknown Service and I see there’s two characteristics – one of them is blah, blah, blah, blah, F1, the other one is blah, blah, blah, blah, F2.

You’ll recall that the first one – the one ending in F1 – is the red LED, so let’s see here, I’ll click on the red LED, and I’ll press the Read. It’s currently 00. Remember just a minute ago using the PC application I had written a 00 so that turned the LED off. Now I’m going to write a 01, so I click Write, I type 0, 1, and hit Go. The red LED turns on – nice. Then I’m going to write a 00 to turn it back off. I click on the 00, it goes off – that’s good.

Now I’ll test the CapSense one. So I press on CapSense – that’s good. If I do a read I can see that it’s currently FFFF. FF is no touch. Alright, that’s cool. Then I click the Notify button which turns on notifications, which remember sends out a broadcast message any time the CapSense value has been read. I press on the screen and I get a number that runs from 64 hex on one side – 64 hex is also known as 100 – you remember I set up the CapSense to go from 0 to 100. So on one side of the board I get 64, on the other side of the board I get 0, in the middle I get 32 hex which is half way, and if I move my finger up and down the board I can see it ranges from 0 on one side back up to 64 on the other

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side.

So, cool. The CapSense is working - I showed it working inside the PC application. The CapSense is working - I showed it CySmart on the phone which has got the GATT browser which lets you look through GATT databases on GAP peripherals.

Then I can stop notifications - that turns off - and then if I hit the back button, and another back, and another back, and another back, then I disconnect from the device. The blue light starts blinking, and everything is good.

So, we provide CySmart that comes with the 042 BLE kit, it comes with this dongle. This dongle lets you search around and see all of the BLE devices, it will let you attach to them, and then surf through their GATT database, and read, and write, and notify, and all of the different GATT functions to find out what's going on in the peripheral. We also provide the same software for your Android phone - CySmart - it's available from the Google Play store. You can read and write GATT databases, you can attach to different peripherals, you can turn on notifications, etc.

That's it. In the next video, I'm going to start telling you about how to build the Android app.