PSoC Academy: How to Create a PSoC BLE iOS App
Lesson 8: BLE Robot

00:00:09 Hello. I'm Alan Hawse and this is Cypress Academy. In the previous lessons I showed you a bunch of detail about writing firmware for BLE and building an app for iOS. Now I'm going to make my 11-year-old son happy by showing you his robot that we built together. I started by ordering from Digilent two motors with quadrature encoders. Some batteries from Radio Shack and a battery holder. An H-Bridge from Digilent, plus Cypress's PSoC 4

00:00:39 BLE CY8CKIT-042-BLE. So let me show you what I've got here. I started with the two Digilent motors. I've got a battery pack which I got from Radio Shack. I did a little switch to turn the batteries on and off. I connected the motors to an H-Bridge. And then there's two channels of the H-Bridge. There's one for the left motor and one for the right motor. I mapped those onto these ports in contiguous pins on the PSoC which I'll show you with the firmware.

00:01:15 I then built an app to control the thing. So when I start the app, it starts with nothing there because it doesn't recognize any BLE devices out there that match its service profile. I then turn on my device and then boom. There's the car. This is a scrolled list of things. It's a table view – a UI table view – that's got one row for each device that it recognizes. In this case, there's only this one here. When I press it, I get a segue away to my new remote control. I can then control the speed by turning up and down. And you can

now see that the right motor is turning 405 rpm in the negative direction.

00:02:07 And when I flip it the other way, the motor starts to turn the other way, 350, 390, 700 – all the way up to a max of 440. There are four characteristics that are interesting here. There's the tachometer for the left which I used the quadrature encoder for. There's the tachometer for the right which I used the other quadrature encoder for. And then there's two PWMs to drive the two motors. I put on

00:02:38 the iPhone two switches to turn on and off the motors quickly because the thing is crazy fast. Which my son thinks is pretty cool, but makes it a little bit hard to drive. So when I flip the switches, it turns the characteristics to zero. All right. Now I'm going to show you the schematic and the firmware, and then I'll walk you through the app.