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Getting Started with the RFD77804 Simblee IoT 3D ToF Sensor Kit

The RFD77804 comes with 2 of Simblee's RFD77306 IoT 3D ToF Sensor Shield featuring the RFD77402 IoT 3D Time Of Flight Sensor Module. With this kit, we have included a ready to run pre-loaded application that will allow the user to get familiar with Simblee and the IoT 3D ToF Sensor Shields.

The ready to run application will show one Simblee sensor node read Time of Flight measurements and display that data on the user's mobile device using Simblee For Mobile.

In addition, the Simblee sensor node will also be able to communicate to a second Simblee node using SimbleeCOM alongside with mobile device with Simblee For Mobile simultaneously.

Let's get started.

Figure 1 - RFD77804 Kit

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RFD77804 Simblee IoT 3D ToF Sensor Kit Contents

The contents of the kits are as follows:

- 2pc RFD77201 Simblee RFduino Adapter
- 2pc RFD77306 IoT 3D ToF Sensor Shield
- 2pc RFD22121 USB Programming Shield
- 2pc RFD22122 RGB LED/Button Shield
- 2pc RFD22126 2xAAA Battery Shield

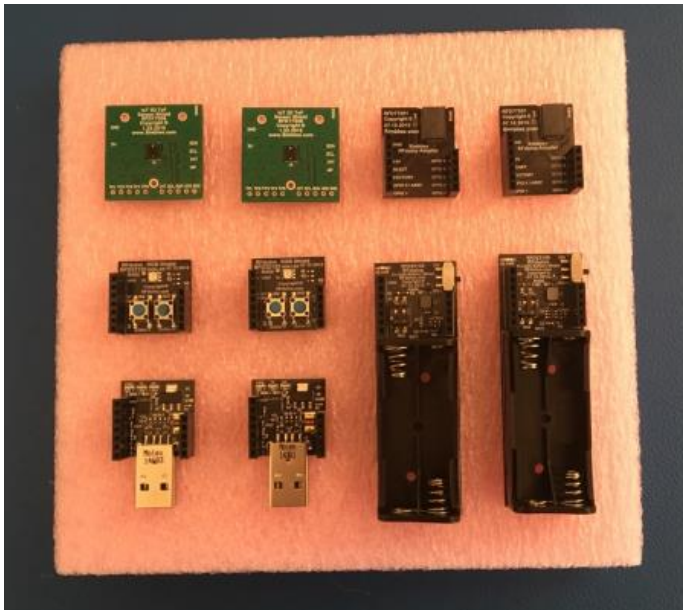

Figure 2 - Contents of RFD77804 Kit

Parts Needed for Ready to Run Application

For the Ready to Run Application, we will need

- 2pc RFD77201
- 1pc RFD77306
- 1pc RFD22122
- 2pc RFD22126

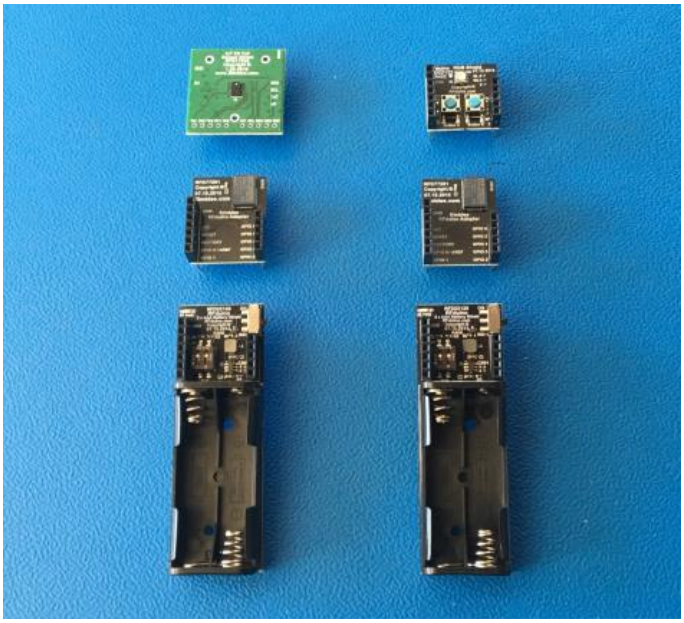

Figure 3 - Sensor Shields Necessary for Demo

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Assemble the First Node

To start, insert 2 AAA batteries into the RFD22126 battery shield. Then, place one of the RFD77201 and RFD77306 shield on top of the RFD22126. Then, power on the node using the RFD22126 Slide Switch.

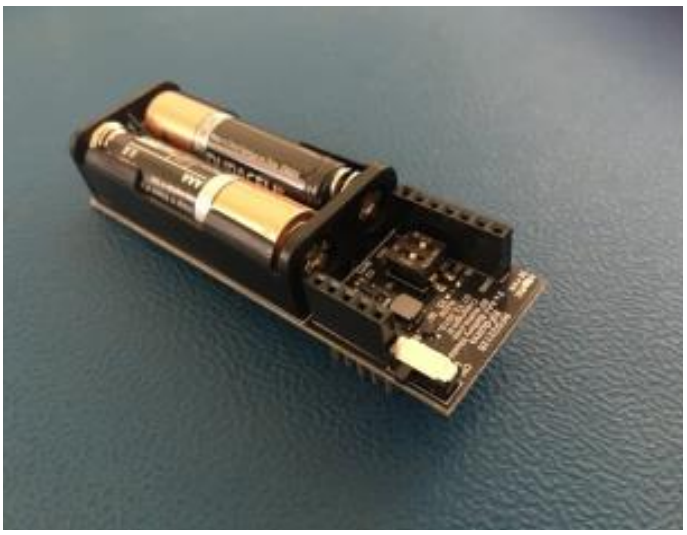

Figure 4 - RFD22126 with Batteries

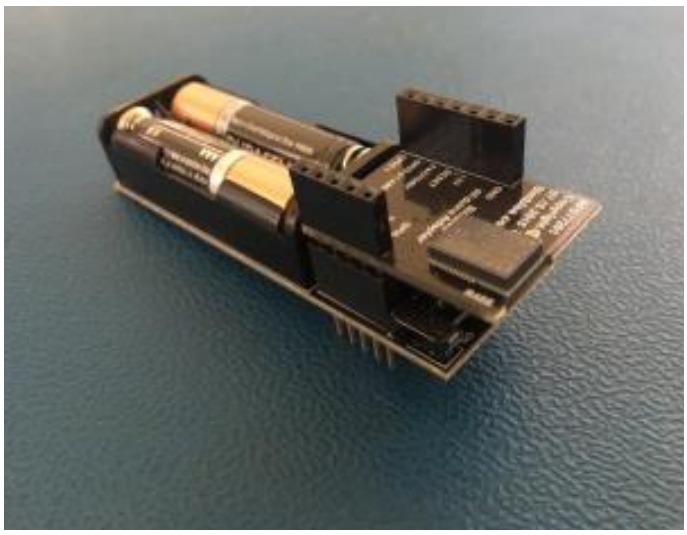

Figure 5 - RFD77201 on Battery Shield

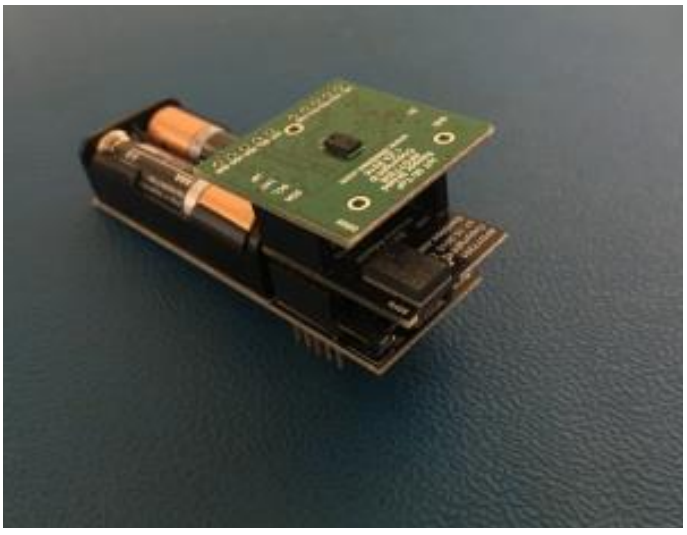

Figure 6 - RFD77306 on RFD77201

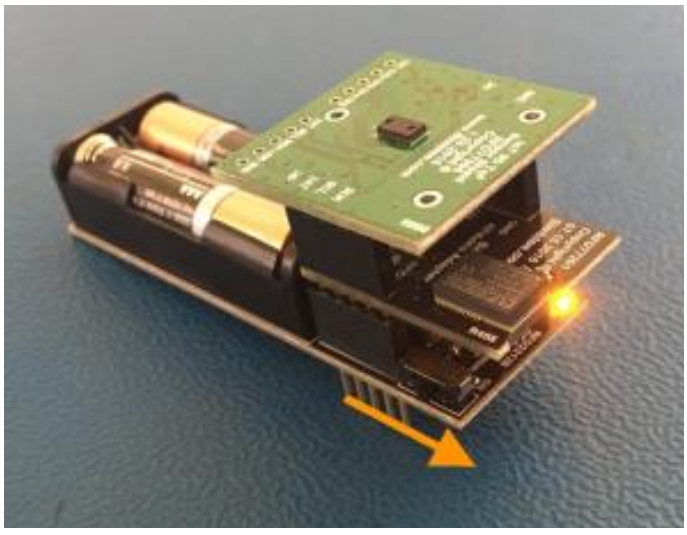

Figure 7 - Power On the Unit

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Connecting to the Simblee ToF Node Using Simblee For Mobile

Download the Simblee For Mobile app on the Apple App Store for iOS devices or the Google Play Store for Android devices. Open the Simblee For Mobile app on your device and enable Bluetooth on your mobile device
(Note: Android users will also need to enable the Location permission).

On the Found Simblees screen, the Simblee will show up on the screen with the device name “Simblee” and advertisement data “ToF Demo”. Click on the item. Wait for a moment while the Simblee Interface loads.

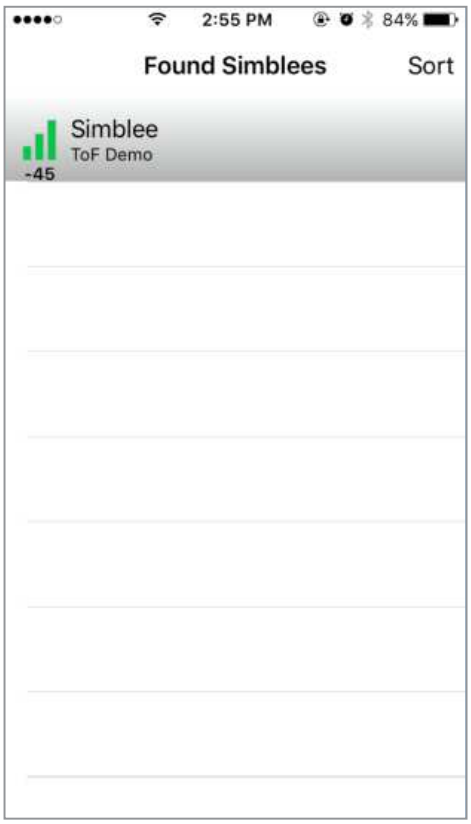

Figure 8 - iOS Simblee For Mobile Found Simblees Page

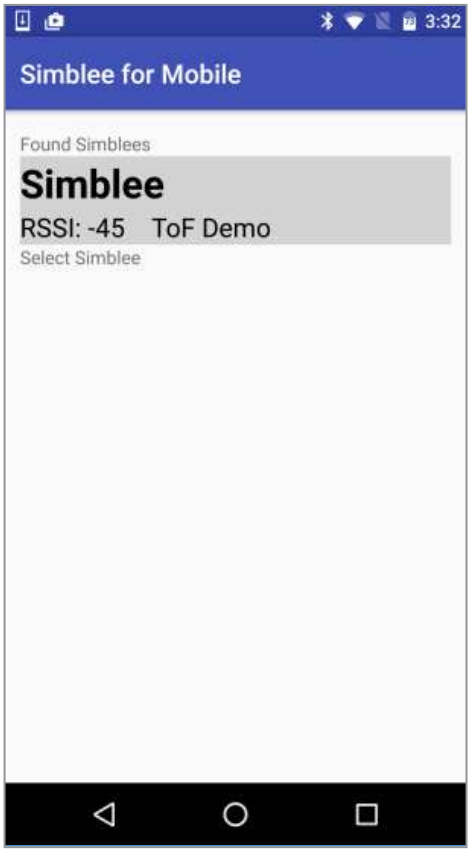

Figure 9 - Android Simblee For Mobile Found Simblees Page

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Simblee For Mobile Display for the ToF Demo

A running bar graph will appear on the mobile display corresponding to the distance measured by the RFD77306 Time of Flight sensor.

Figure 10 - Measuring a Short Distance

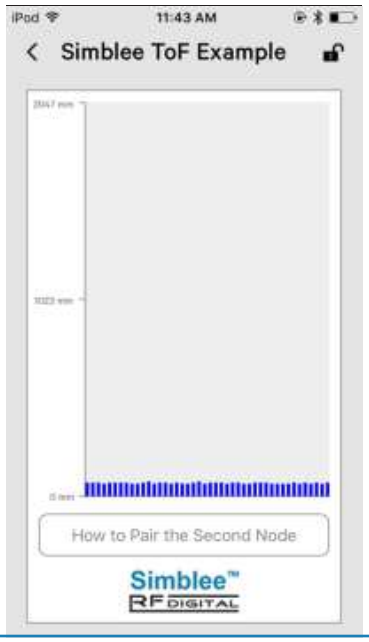

Figure 11 - Short ToF Measurement

Figure 12 - Measuring a Further Distance

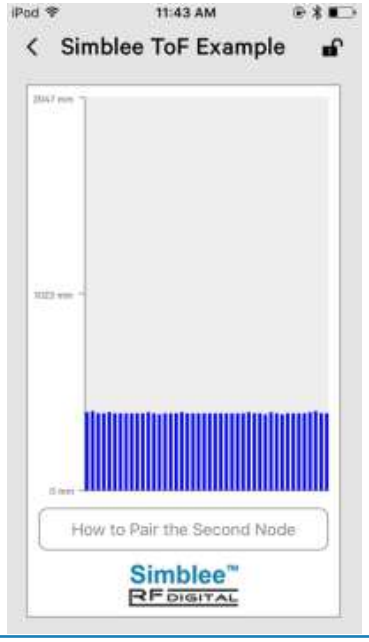

Figure 13 - Further ToF Measurement

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Assemble the Second Simblee Node

To start, insert 2 AAA batteries into the RFD22126 battery shield. Then, place the second RFD77201 and RFD22122 shield on top of the RFD22126. Then, power on the node using the RFD22126 Slide Switch. The LED will shine red, indicating that the node has not been paired yet.

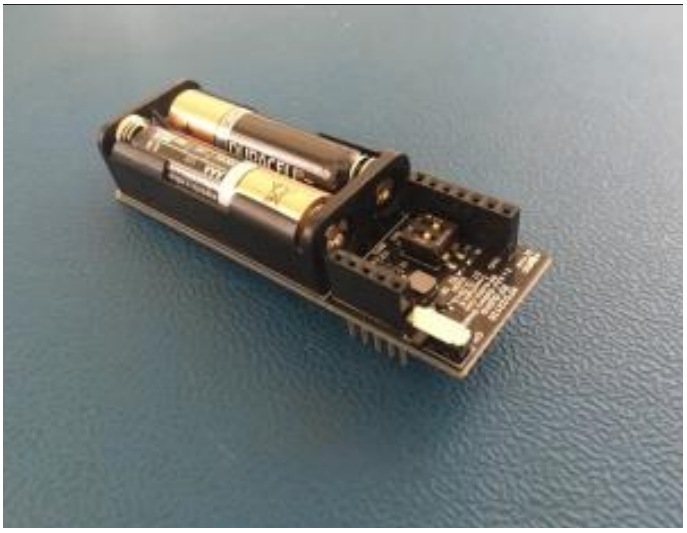

Figure 14 - RFD22126 with Batteries

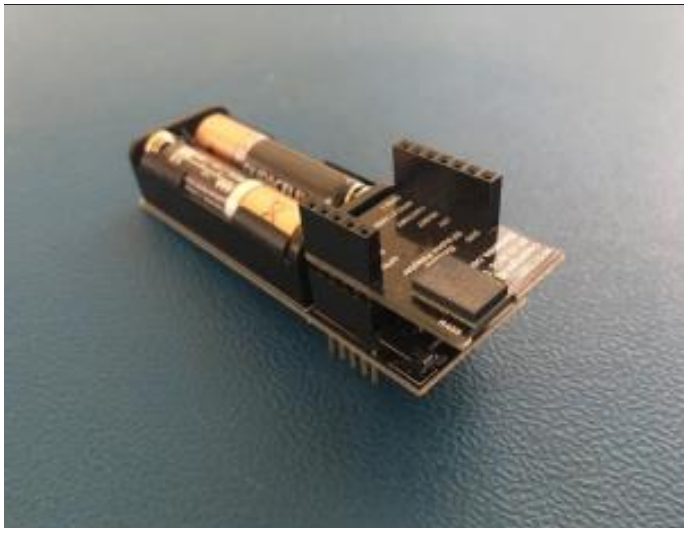

Figure 15 - RFD77201 on Battery Shield

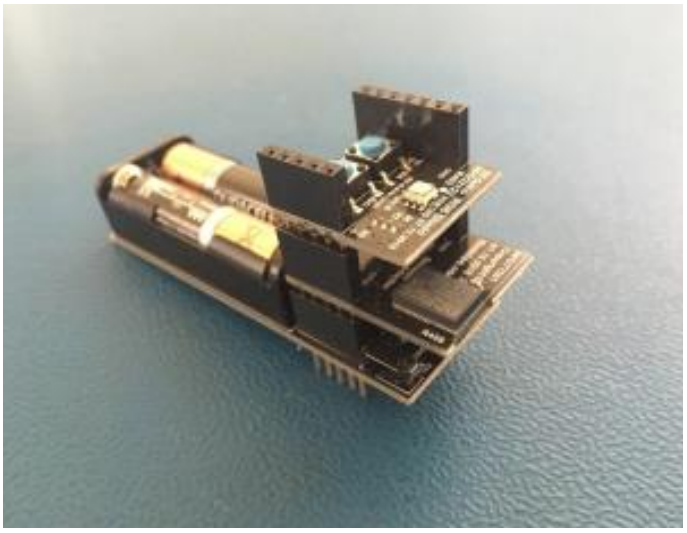

Figure 16 - RFD22122 on RFD77201

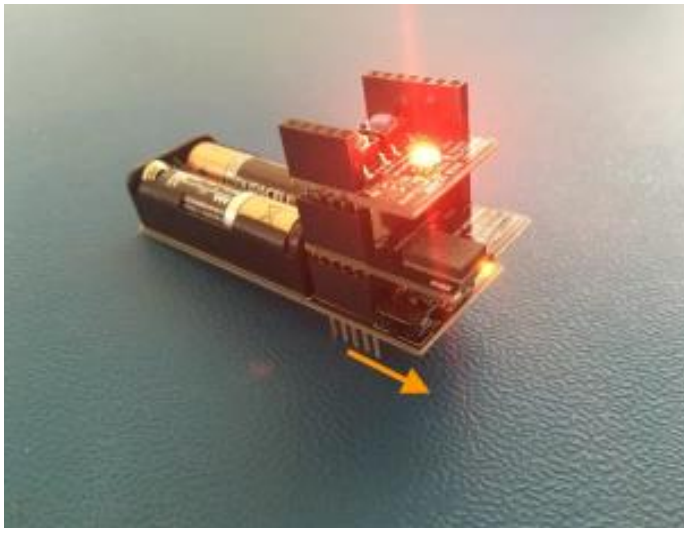

Figure 17 - Power on the Unit

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Pairing and Using the Second Simblee Node

Press Button A (the Left Button) to start the pairing. The LED will change color to Blue indicating it is waiting to be paired. Bring the second node, within ~1ft. When in sufficient range, the LED will flash green indicating a successful pairing. The LED will then turn to white. The intensity of the white LED will change based on the distance measured by the Simblee Time of Flight sensor. Brighter light will indicate a father measured distance. Dimmer light will indicate a shorter measured distance.

Figure 18 - Press Button A to start Pairing

Figure 19 - Blue for Waiting to Pair

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Pairing and Using the Second Simblee Node (cont.)

For your convenience, these can be found on the Simblee For Mobile App. Press the “How to Pair the Second Node” button, and a new screen will display showing the instructions. To return back to the main screen, press the “Home” button.

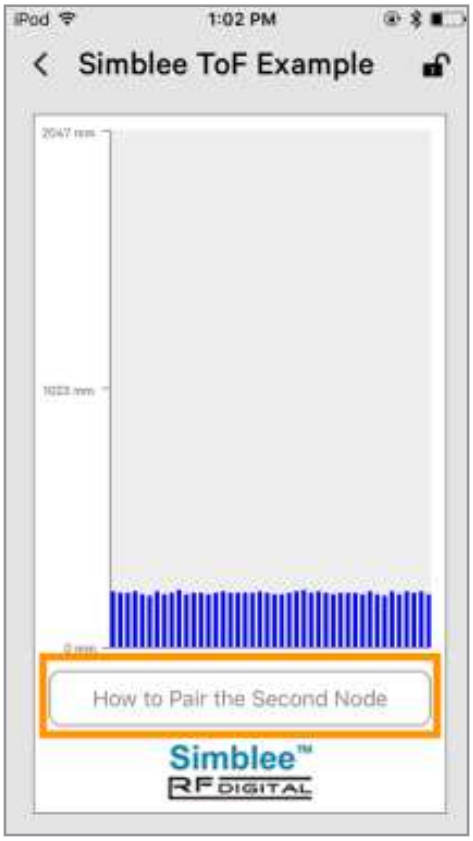

Figure 20 - Instructions Button

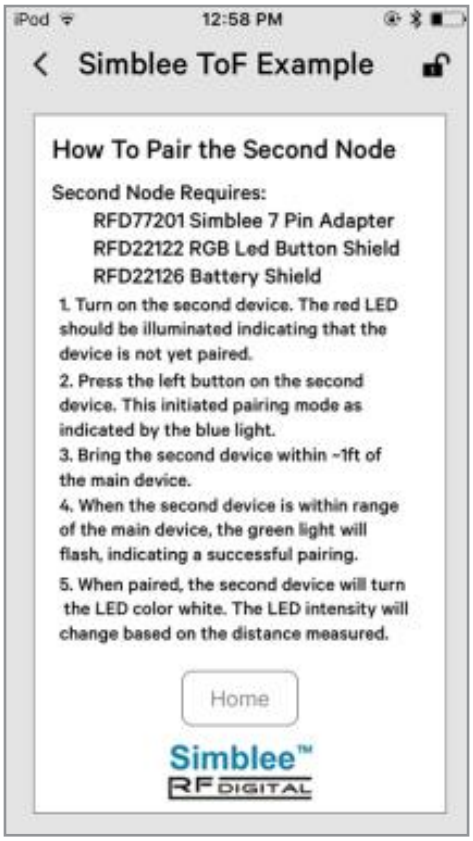

Figure 21 - Pairing Instructions

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Figure 22 - Waiting for Pairing

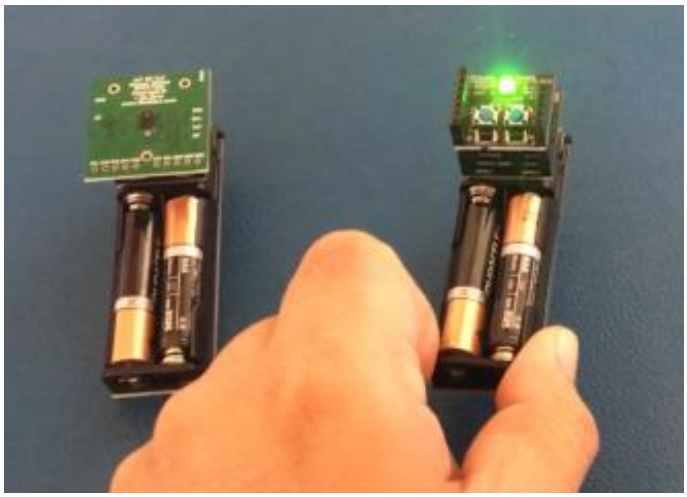

Figure 23 - Green Light flashes to indicate pairing is successful

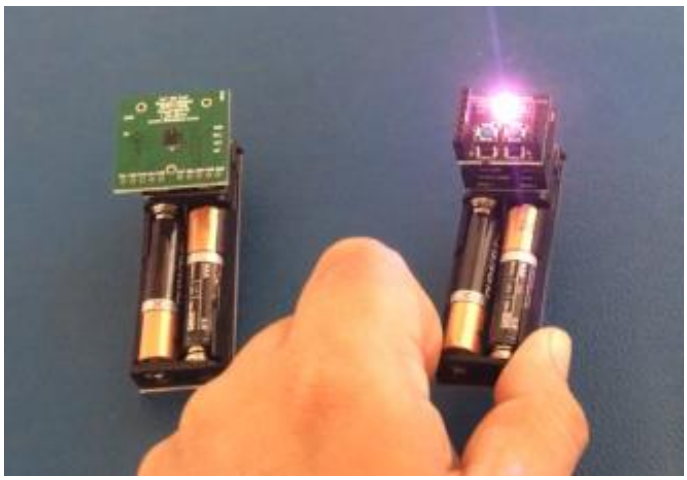

Figure 24 - Pairing Successful

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Pairing and Using the Second Simblee Node (cont.)

The Simblee nodes can communicate with each other independently, without the Simblee For Mobile app.

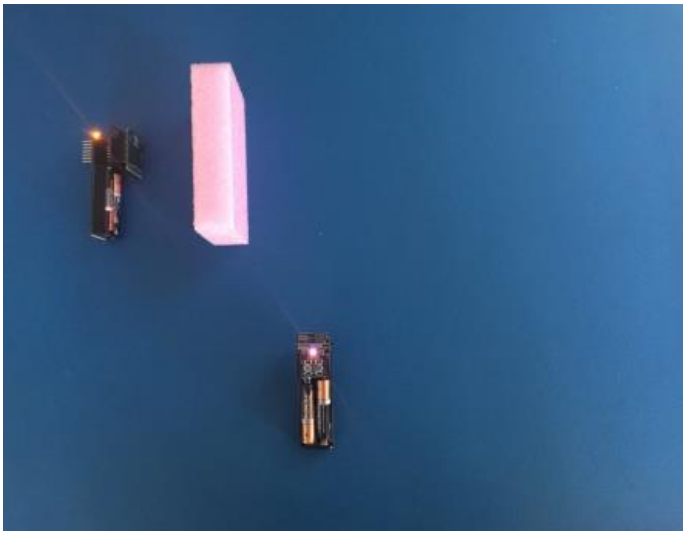

Figure 25 - Measuring Short Distance

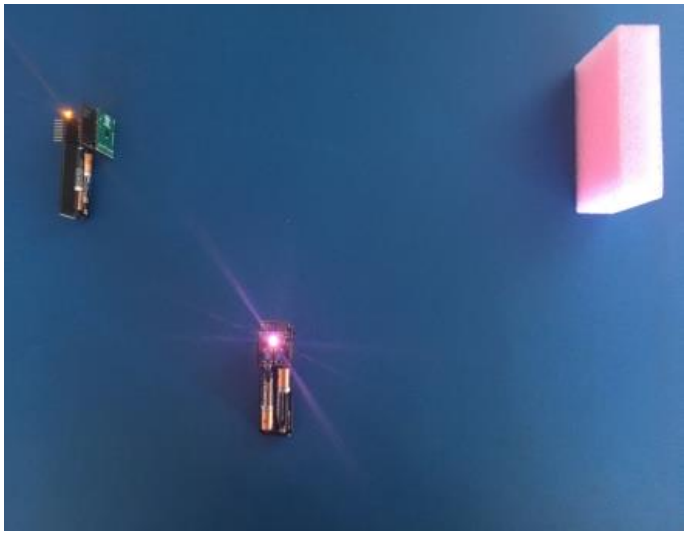

Figure 26 - Measuring Farther Distance

The Simblee Sensor node can also communicate with the Simblee For Mobile app and Simblee node simultaneously.

Figure 27 - ToF measurement with SimbleeForMobile and Paired Node – Short Distance

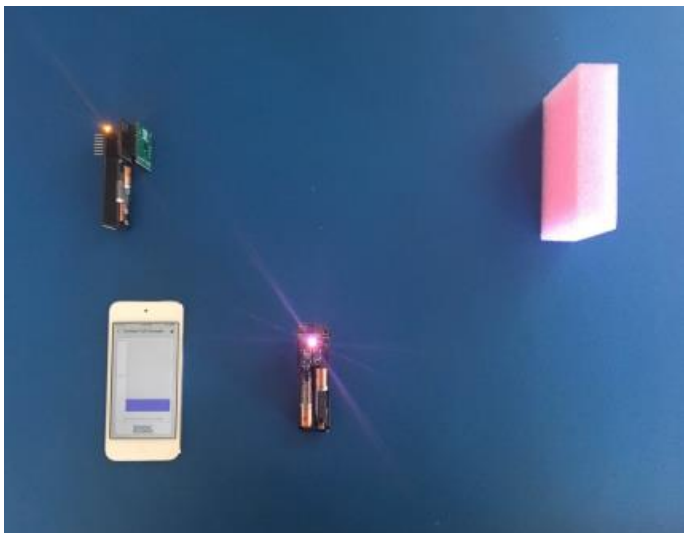

Figure 28 - ToF measurement with SimbleeForMobile and Paired Node – Farther Distance

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How to Unpair the Second Simblee Node

If the user wishes to unpair the Simblee Node, press the right button, Button B, which will immediately unpair the node. The LED will shine red to indicate it has been unpaired.

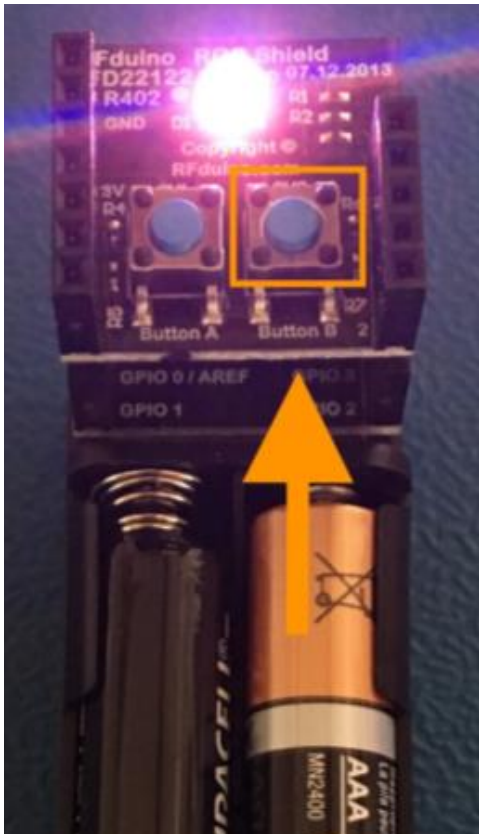

Figure 29 - Press Button B to Unpair

Figure 30 - Simblee Node is Unpaired

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