



CySmart™ iOS App User Guide

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Contents



1. Introduction.....	4
1.1 App Features	4
1.2 Software and Hardware Requirements.....	4
1.2.1 Software Requirements	4
1.2.2 Hardware Requirements.....	5
1.3 Installing the App.....	5
1.4 Uninstalling the App.....	5
1.5 Getting Started	5
1.6 CySmart App GUI Overview.....	8
1.6.1 CySmart App Device List Screen.....	8
1.6.2 Graph.....	10
1.6.3 CySmart Carousel Screen	11
1.7 Pairing/Un-pairing.....	12
2. Features	13
2.1 Bluetooth LE Profiles and Services	13
2.1.1 Support for Adopted Bluetooth LE Services	13
2.1.2 Cypress Custom Bluetooth LE Profiles/Services	22
2.2 GATT DB Screen.....	28
Revision History.....	32

1. Introduction



CySmart™ is a Bluetooth® Low Energy (LE) app developed by Cypress Semiconductor Corporation.

CySmart iOS App can be used with the CY8CKIT-042-BLE Bluetooth LE Pioneer Kit www.cypress.com/CY8CKIT-042-BLE.

The CySmart iOS app can be used with the BLE example projects provided in PSoC® Creator™ 3.3. PSoC Creator can be downloaded from <http://www.cypress.com/psoccreator/>. To find an example project within PSoC Creator, click [here](#).

1.1 App Features

The CySmart iOS app supports the following adopted Bluetooth LE profiles and services:

- Heart Rate
- Battery Service
- Health Thermometer
- Blood Pressure
- Cycling Speed and Cadence
- Running Speed and Cadence
- Glucose
- Find Me
- Proximity
- Device Information

The CySmart app supports the following custom Cypress Bluetooth LE profiles:

- Cypress CapSense® Profile
- Cypress RGB LED Profile
- Cypress Bootloader Profile

CySmart also includes the following additional features:

- Data Logger
- GATT Database (GATT DB) Screen

1.2 Software and Hardware Requirements

1.2.1 Software Requirements

Table 1-1. Software Prerequisites

Software/Operating System Prerequisites	Minimum	Recommended
iOS	7.0	8.4

Refer to <https://developer.apple.com/bluetooth/> for details on Bluetooth Low Energy support in iOS.

1.2.2 Hardware Requirements

Table 1-2. Hardware Requirements

Hardware Requirements	Minimum	Recommended
iOS devices with Bluetooth LE	Bluetooth 4.0	Bluetooth 4.0

1.3 Installing the App

To install the CySmart app, perform the following steps:

1. From the iOS device, open App Store.
2. Search for CySmart in App Store.

Figure 1-1. Identifying CySmart App Using the App Icon



3. Select the CySmart app and proceed to install the app on your iOS device.

1.4 Uninstalling the App

To uninstall the CySmart app, perform following steps:

1. From the app drawer, long-press on the CySmart app.



2. Tap on the  icon to uninstall the app. Select **Delete** when promoted for confirmation.

1.5 Getting Started

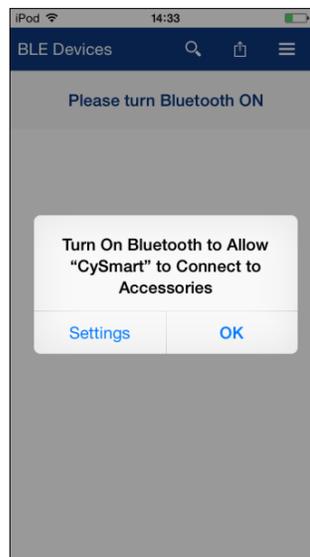
This section will help you to get started with the CySmart app. It briefly describes how to connect to a Bluetooth LE peripheral device. For the purpose of description, a CY8CKIT-042-BLE Pioneer Kit running a PSoC Creator 3.3 example project is used as the peripheral device.

1. Set up the CY8CKIT-042-BLE Pioneer Kit using the steps provided in the CY8CKIT-042 BLE Kit Guide, which is available at <http://www.cypress.com/cy8ckit-042-ble>. Ensure that the kit is advertising.
2. Launch CySmart App. A splash screen is displayed for a few seconds (Figure 1-2) before the app displays the Device List screen. If Bluetooth is turned OFF in the iOS device, iOS will prompt a message box to turn ON Bluetooth with the Setting and OK buttons. Press the **Setting** button to turn on Bluetooth in the Settings screen. Pressing the **OK** button will display the message "Please turn Bluetooth ON", which requires the standard iOS procedure to turn on Bluetooth. (Figure 1-3).

Figure 1-2. CySmart Splash Screen



Figure 1-3. Bluetooth Permission Request



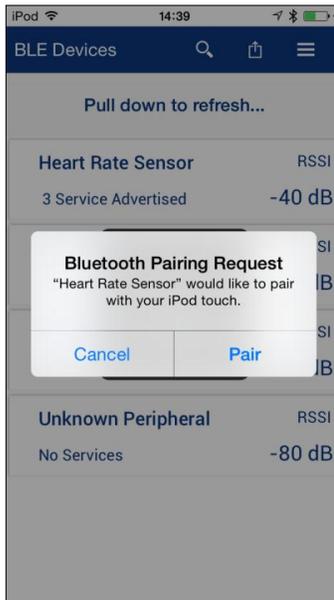
3. The CySmart app performs device discovery by default when the app is opened.
4. The app lists all discovered Bluetooth LE devices (Figure 1-4). If the Bluetooth LE device of interest does not appear in the list, check if it is powered ON and advertising.
5. Tap on the desired device displayed in the device list to connect to it.

Figure 1-4. Device List Screen



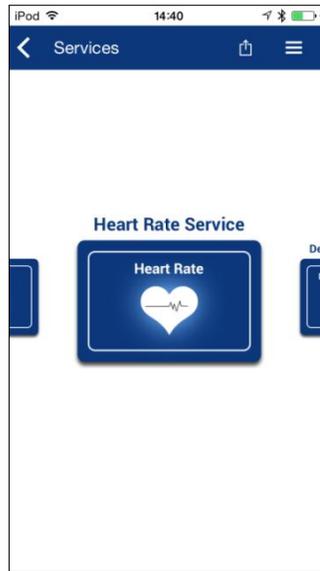
When a peripheral requires pairing, iOS will prompt you to accept the pairing request (Figure 1-5). After you accept the pairing request, the app will complete the connection. If you reject the pairing request, the services that do not require pairing will still be available.

Figure 1-5. Pairing Request



- When CySmart successfully connects to the peripheral device, the app will display a carousel screen of the services available in the device (Figure 1-6).

Figure 1-6. Carousel Screen



7. To view all the services available in the device, slide your finger across the carousel screen. Tapping on the desired service will take you to its corresponding service screen.
8. You can disconnect from a device by navigating back from the carousel screen to the Device List screen.

1.6 CySmart App GUI Overview

1.6.1 CySmart App Device List Screen

Figure 1-7. CySmart App Device List Screen



The main screen of the CySmart app consists of the following features:

-  Navigation Side Menu
-  Share
-  Device Filter

1.6.1.1 Navigation Side Menu

The **Navigation Side Menu** provides options to select the device list, data logger, Cypress BLE webpages, contact details, and version information of the app (Figure 1-8).

Figure 1-8. Navigation Side Menu

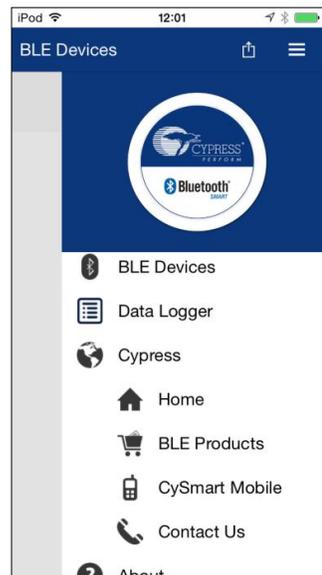


Table 1-3. Navigation Drawer Details

Navigation Drawer Item	Description
 BLE Devices	Refreshes the Bluetooth LE device list shown in the Device List screen of the app.
 Data Logger	The app logs all the Bluetooth LE related activities in a text file. The app automatically creates a log file with the current date as the name. The app creates one log file per day and stores the last seven days' logs. Logs older than seven days will be automatically deleted by the app. The Data Logger allows you to view the logs. It displays the current date's log file by default. You can select the 'History' button to view older logs. The Data Logger can be launched from all the screens in the app. The Data Logger allows you to share the logs through the 'Share' option.
 Cypress	Provides a set of Cypress related information as sub items. These sub items are links to Cypress's web pages that open in the internal web browser of the app, provided the iOS device is connected to the Internet.
 Home	Opens the home page of Cypress website, http://www.cypress.com/ .
 BLE Products	Opens the Cypress BLE Products webpage, http://www.cypress.com/ble .
 CySmart Mobile	Opens the CySmart Mobile App webpage, http://www.cypress.com/cysmartmobile . The CySmart iOS App User Guide is available in this page.
 Contact Us	Opens the Cypress Contact Us web page. When the iOS device is not connected to the Internet, it displays the contact and email address of Cypress customer care.
 About	Displays the version of the CySmart app and copyright details.

1.6.1.2 Share



The **Share** option allows you to share the screenshot of current app screen to various apps listed in the iOS device. You can share the screenshots of the app through email or to nearby devices through apps such as AirDrop. You can also save or print the screenshot.

In the Data Logger screen, the share option will share the log as a text file instead of images.

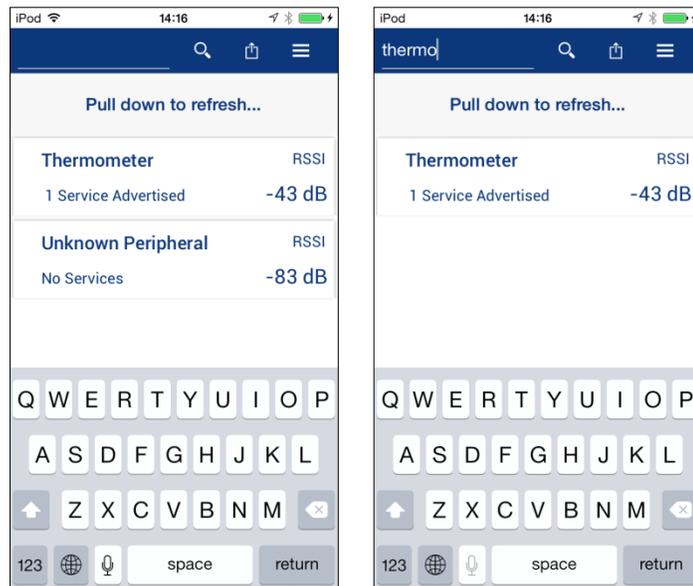
The share feature is available in all screens of the application.

1.6.1.3 Device Filter



The **Device Filter** option is available in the app's main screen. This option allows you to filter the devices based on name of the device (Figure 1-9).

Figure 1-9. Device Filter

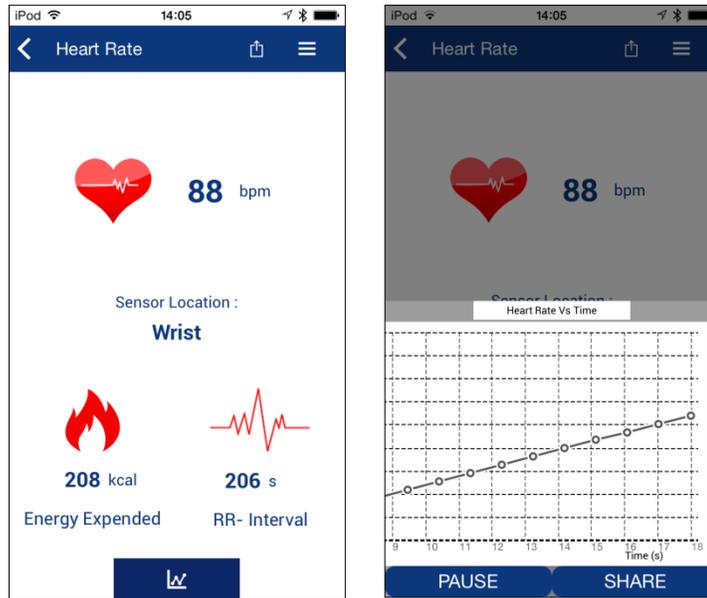


1.6.2 Graph

For some of the services such as the Heart Rate Measurement service, the app allows you to view the real-time values received from the peripheral device in a graph.

You can view the graph by selecting the Graph icon  at the bottom of the service screen (Figure 1-10). You can share the graph using the 'Share' option when the graph is displayed. Pressing 'Pause' will pause the plotting of the graph for incoming values.

Figure 1-10. Graph View Example



1.6.3 CySmart Carousel Screen

When a device is connected, the services supported by the peripheral are displayed in the Carousel Screen (Figure 1-11). You can swipe your fingers across the screen to view each available service. Selecting a service will display the service specific screen.

For a service that is not supported by the app, the carousel will display the service as shown in Figure 1-12. On selecting the service in the carousel, the app provides an option to view the service details in the GATT DB screen. For more details see the GATT DB Screen section.

Figure 1-11. Carousel Screen of Services

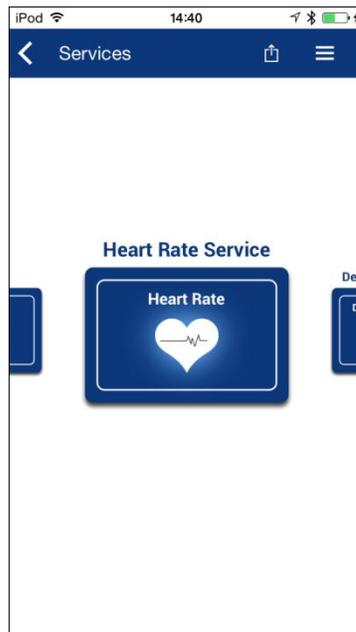
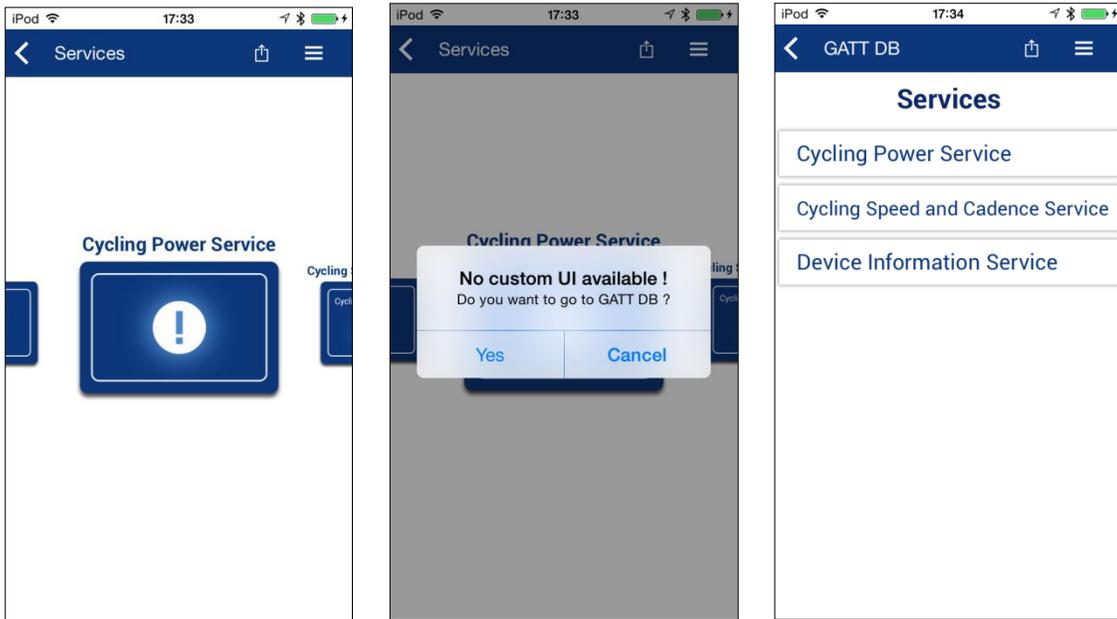


Figure 1-12. Unsupported Service Screen

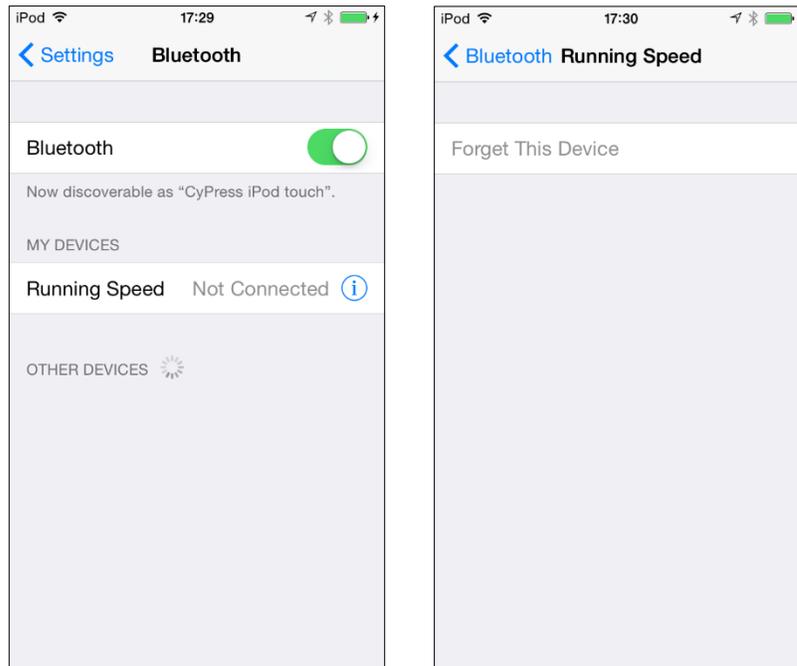


1.7 Pairing/Un-pairing

To check whether the devices are paired, in the iOS device, go to **Settings > Bluetooth**. If the peripheral device is listed under 'My Devices' along with the information ('i') icon next to the connection status, it is paired with the iOS device. To un-pair the device, select the information icon. In the subsequent screen, select **Forget This Device**.

Pairing can be performed as described in the [Getting Started](#) section.

Figure 1-13 Un-pairing a Device



2. Features



2.1 Bluetooth LE Profiles and Services

2.1.1 Support for Adopted Bluetooth LE Services

2.1.1.1 Heart Rate Service

The Heart Rate Service screen is shown in Figure 2-1. Notifications are enabled by default and values are displayed as soon as you enter the screen.

It displays the following characteristic fields:

Table 2-1. Heart Rate Service Characteristic Fields

Characteristic Field	Description
Heart Rate Measurement	Heart rate measurement in beats per minute (bpm).
Energy Expended	Accumulated energy expended in kilo joules since the last time it was reset.
RR – Interval	Represents the time between two consecutive R waves in an Electrocardiogram (ECG) waveform.

Figure 2-1. Heart Rate Service

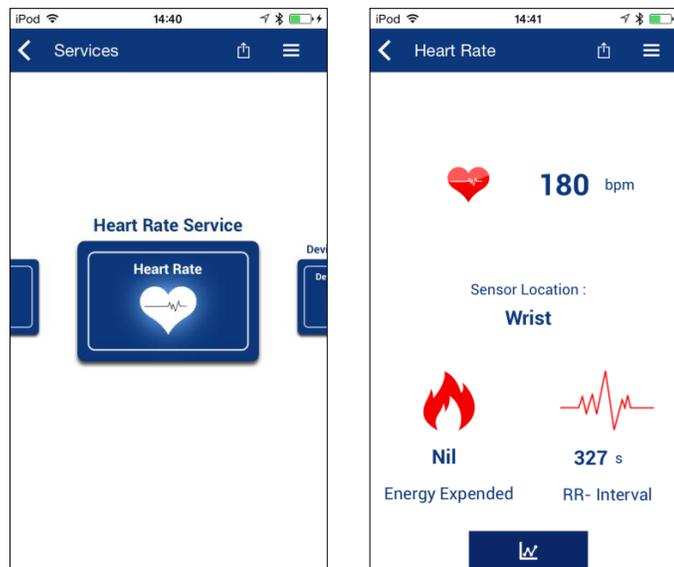


Table 2-2. Heart Rate Service Details

PSoC Creator Example	BLE_Heart_Rate_Sensor
Bluetooth SIG References	GATT specification: https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.heart_rate.xml

2.1.1.2 Battery Service

The Battery Service screen is shown in [Figure 2-2](#). It displays information regarding the state of the battery within the device. There are two buttons –Read and Start Notify. When you enter the screen, it reads the value and displays it. When the Start Notify button is pressed, notifications are enabled.

Figure 2-2. Battery Service

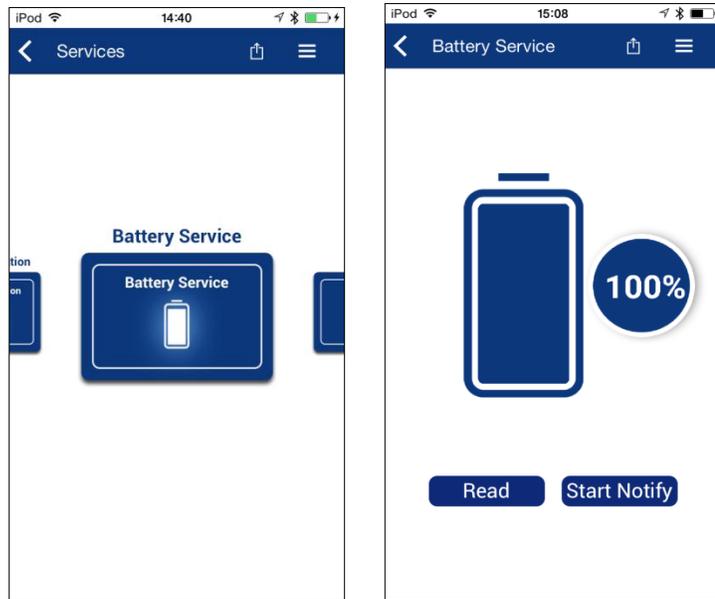


Table 2-3. Battery Service Details

PSoC Creator Example	BLE_Battery_Level
Bluetooth SIG References	GATT specification: https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.battery_service.xml

2.1.1.3 Health Thermometer

The Health Thermometer service screen is shown in [Figure 2-3](#). Notifications are enabled by default. It displays the following characteristic fields:

Table 2-4. Health Thermometer Characteristic Fields

Characteristic Field	Description
Temperature Measurement	Measured temperature value in Celsius/Fahrenheit depending on the temperature unit configured in the peripheral device
Sensor Location	Describes the type of temperature measurement in relation to the location on the human body at which the temperature was measured

Figure 2-3. Health Thermometer

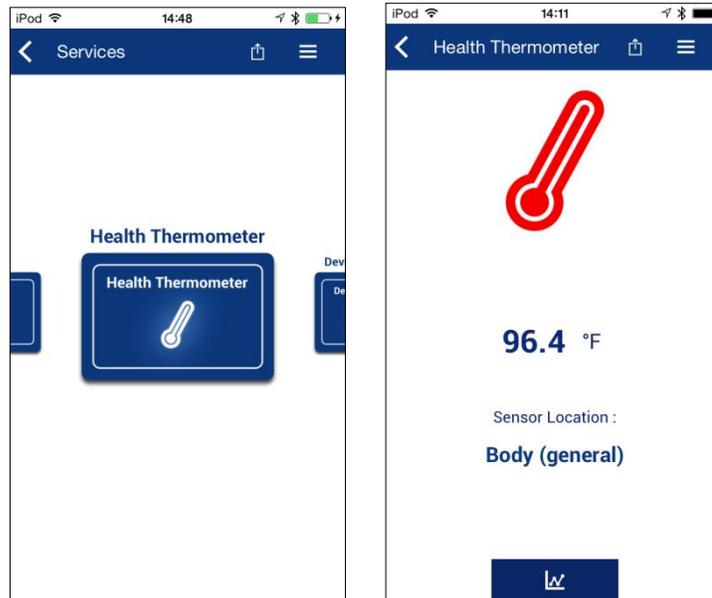


Table 2-5. Health Thermometer Service Details

PSoC Creator Example	BLE_Temperature_Measurement
Bluetooth SIG References	GATT specification: https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.health_thermometer.xml

2.1.1.4 Blood Pressure

The Blood Pressure screen is shown in [Figure 2-4](#). This screen receives data from the Bluetooth LE device over the Blood Pressure profile. It provides a button to start or stop the blood pressure evaluation. It displays the following characteristic fields.

Table 2-6. Blood Pressure Characteristic Fields

Characteristic Field	Description
SYS	Systolic blood pressure value
DIA	Diastolic blood pressure value

Figure 2-4. Blood Pressure Service

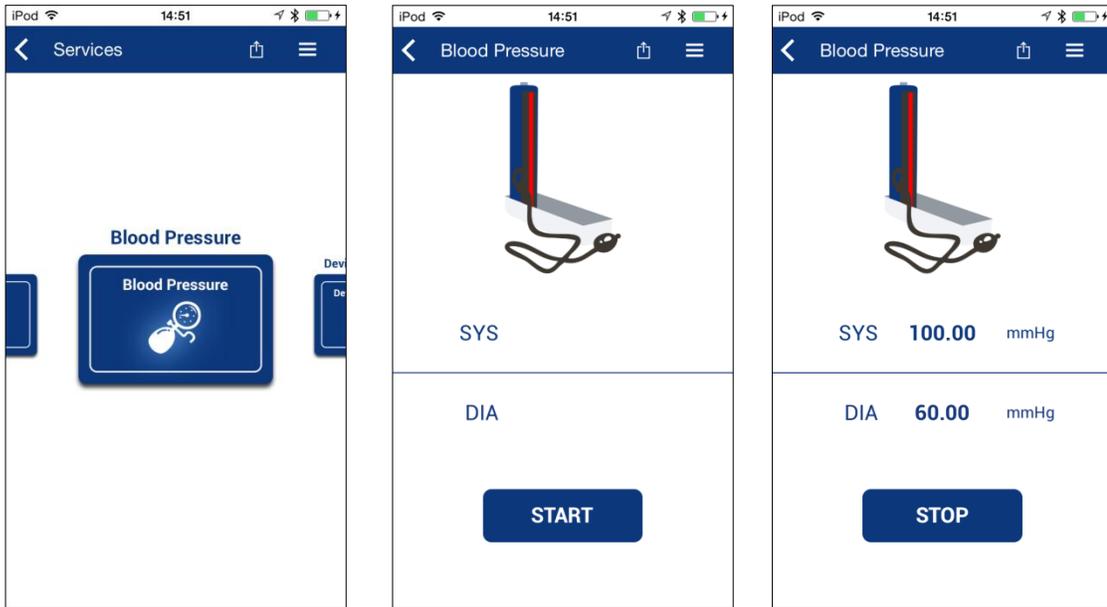


Table 2-7. Blood Pressure Service Details

PSoC Creator Example	BLE_Blood_Pressure_Sensor
Bluetooth SIG References	GATT specification: https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.blood_pressure.xml

2.1.1.5 Cycling Speed and Cadence

The Cycling Speed and Cadence screen is shown in Figure 2-5. You need to enter a value for weight of the person (in kg) and radius of the cycle's wheel (in mm), which will be used to measure the calories burned during the cycling activity. It displays the following characteristics fields:

Table 2-8. Cycling Speed and Cadence Characteristic Fields

Characteristic Field	Description
Cadence	Number of wheel rotations per minute
Distance Covered	Total distance covered in the given time
Calories Burned	Calories burned in the given time

Figure 2-5 Cycling Speed and Cadence

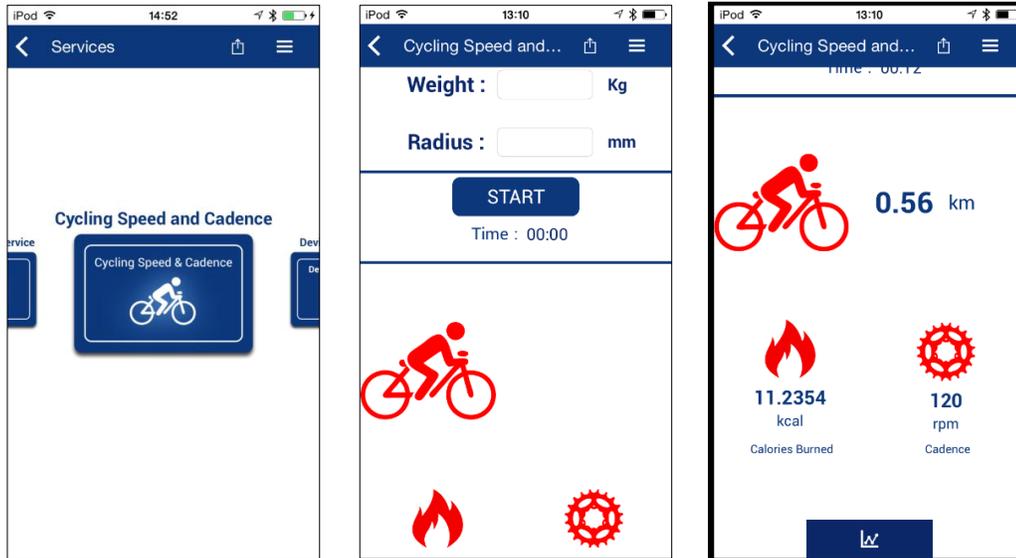


Table 2-9. Cycling Speed and Cadence Service Details

PSoC Creator Example	BLE_Cycling_Sensor
Bluetooth SIG References	GATT specification: https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.cycling_speed_and_cadence.xml

2.1.1.6 Running Speed and Cadence

The Running Speed and Cadence service screen is shown in Figure 2-6. You need to enter a value for weight that will be used to measure the calories burned during the running activity. It displays the following characteristic fields:

Table 2-10. Running Speed and Cadence Characteristic Fields

Characteristic Field	Description
Instantaneous Speed	Instantaneous speed of running
Distance Covered	Total distance covered in the given time
Calories Burned	Calories burned in the given time

Figure 2-6. Running Speed and Cadence

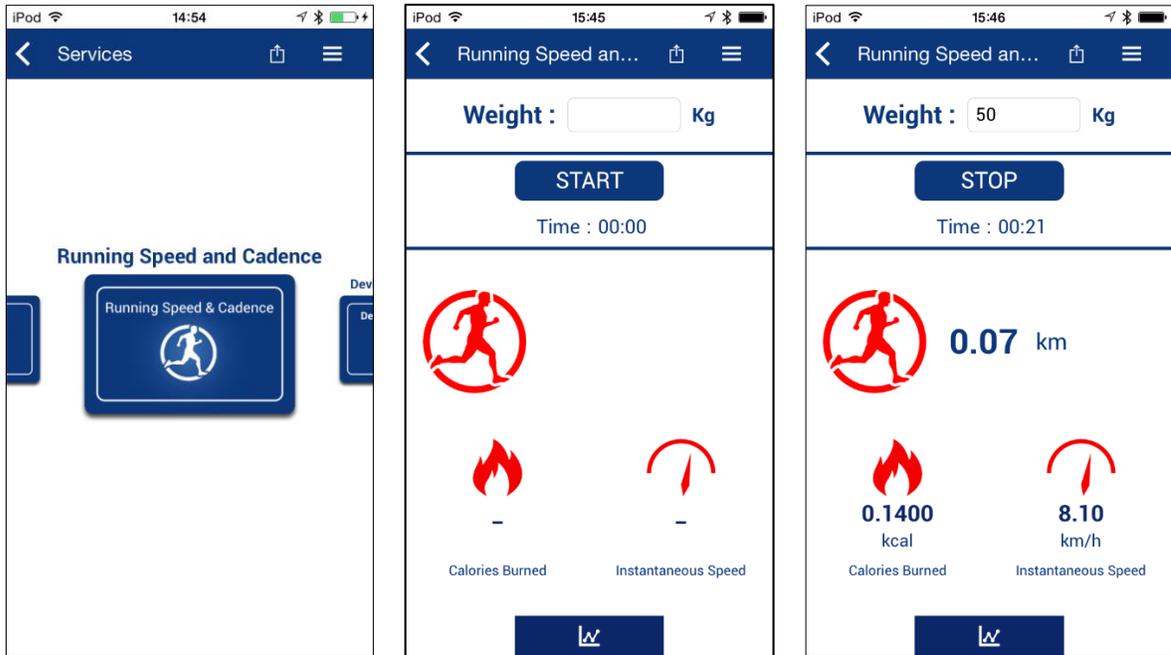


Table 2-11. Running Speed and Cadence Service Details

PSoC Creator Example	BLE_Running_Speed_Cadence
Bluetooth SIG References	GATT specification: https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.running_speed_and_cadence.xml

2.1.1.7 Glucose

The Glucose Service screen is shown in Figure 2-7. The app allows you to retrieve patient records from the peripheral device and view them. Retrieve records using the 'Read Last' or 'Read All' option. 'Read Last' fetches only the last record, whereas, 'Read All' fetches all records from the peripheral device and displays the last record by default. View a record, by selecting the record from the drop-down list.

Selecting 'Delete All' will delete the records stored on the peripheral device. Select this only if you want to permanently delete the records.

Select 'Clear' to clear the values displayed on the screen. This will only clear the view. It will not delete the records in the peripheral.

The drop-down list displays "No Record" when no record is retrieved or when the retrieved records are removed by selecting 'Delete All' or 'Clear'.

In some records, if there is more information that can be retrieved, a small 'i' icon will be displayed on the top right below the drop-down list. Pressing the icon will open a new screen that displays the context information; see Figure 2-8.

The Glucose Service screen displays the following characteristic fields:

Table 2-12 Glucose Service Characteristic Fields

Characteristic Field	Description
Glucose Measurement	Measurement of glucose level in kg/L
Recording Time	Timestamp including date and time at which the glucose measurement was recorded
Type	Type of glucose measurement (for example, capillary whole blood)
Sample Location	Location from where the blood sample was taken to measure glucose level

Figure 2-7 Glucose Service

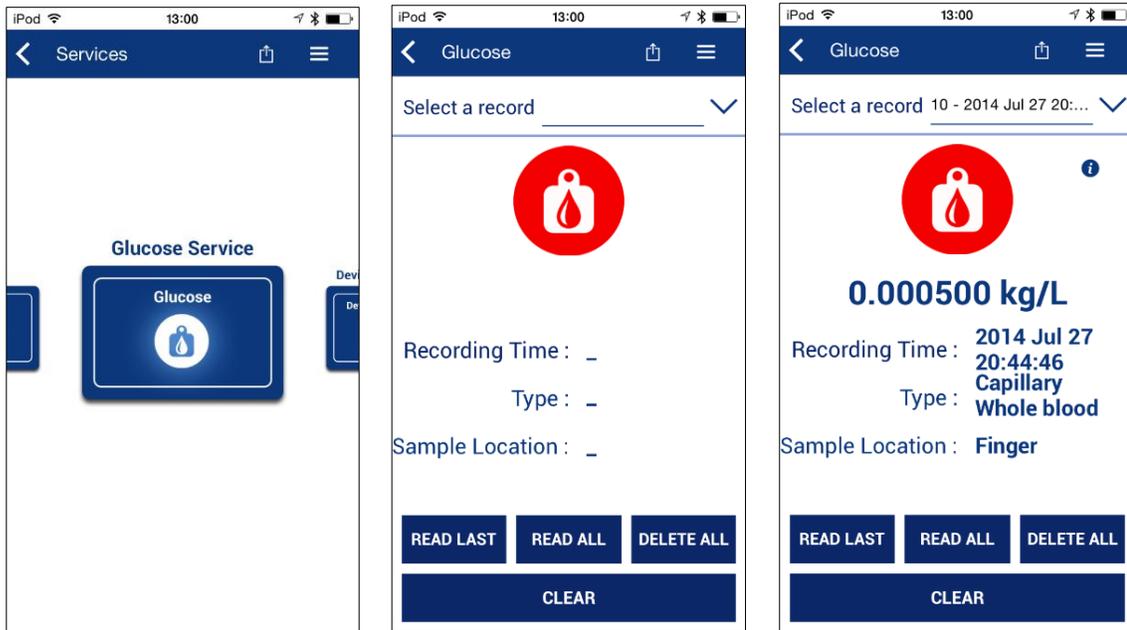


Figure 2-8 Glucose Context Information

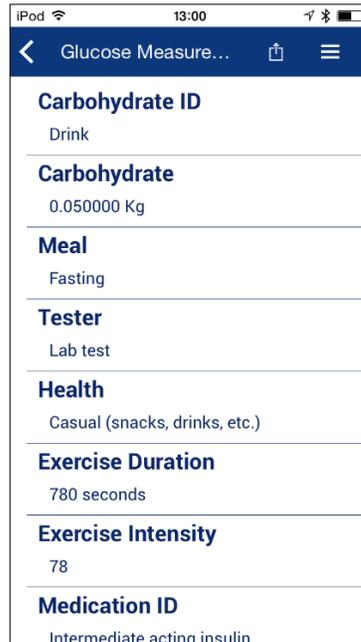


Table 2-13. Glucose Service Details

PSoC Creator Example	BLE_Glucose_Meter
Bluetooth SIG References	GATT specification: https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.glucose.xml

2.1.1.8 Immediate Alert, Link Loss, and Transmission Power

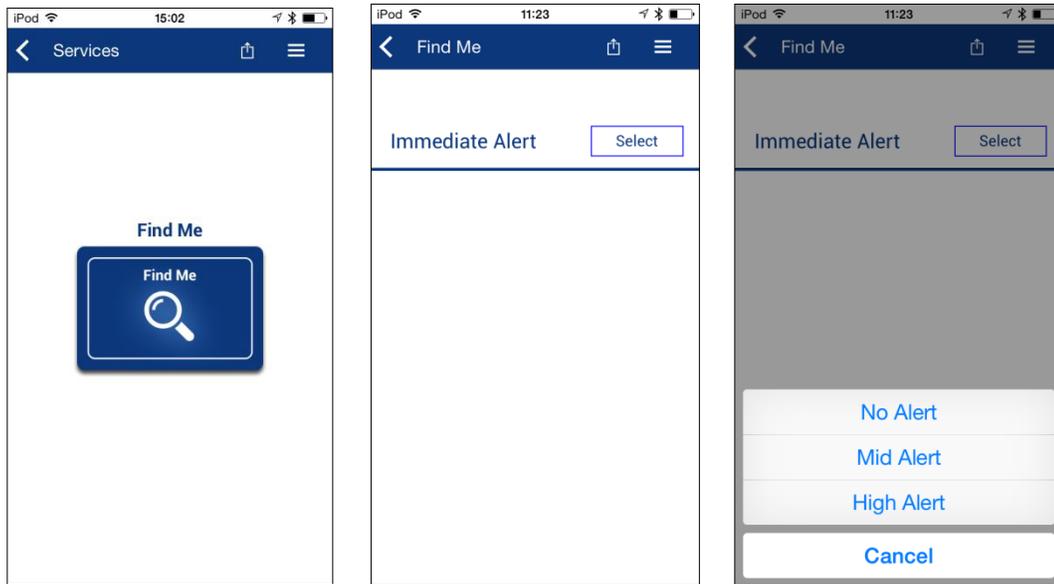
2.1.1.8.1 Find Me Service

Immediate Alert Service (IAS) is displayed as 'Find Me' service as shown in [Figure 2-9](#). The Find Me Service screen allows you to select an Alert Level. The peripheral device will respond according to the alert type selected.

Table 2-14. Immediate Alert Characteristics

Characteristic	Allowed Values
Alert Level	No Alert, Mid Alert, High Alert

Figure 2-9. Find Me - Immediate Alert Service



2.1.1.8.2 Proximity Service

Link Loss and Tx Power services are combined under the 'Proximity' service, as shown in [Figure 2-10](#). The Proximity screen allows you to select the type of Alert Level for Link Loss service.

Table 2-15. Link Loss Service Characteristics

Characteristic	Allowed Values
Alert Level	No Alert, Mid Alert, High Alert

For the Tx Power service, the Proximity screen displays the value of Tx Power Level characteristic. The Tx Power Level value is also displayed graphically as shown in [Figure 2-10](#).

Table 2-16 Tx Power Characteristic

Characteristic	Description
Tx Power	Current transmit power level in dBm.

Figure 2-10. Proximity - Link Loss and Tx Power Service

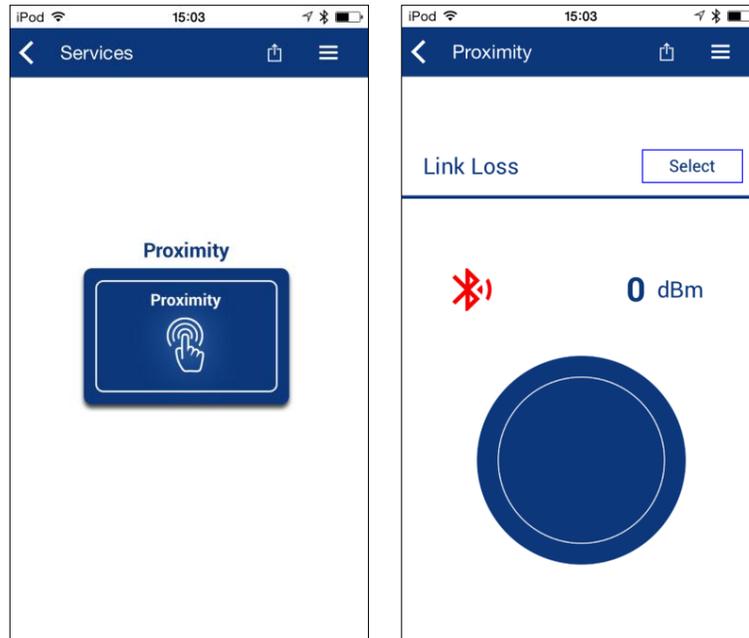


Table 2-17. Find Me and Proximity Profile Details

PSoC Creator Example	BLE_FindMe, BLE_Proximity
Bluetooth SIG References	<p>GATT specification: Immediate Alert https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.immediate_alert.xml Link Loss: https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.link_loss.xml Tx Power: https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.tx_power.xml</p>

2.1.1.9 Device Information

Device Information screen (Figure 2-11) displays the value of the following the characteristics in the Device Information service:

- Manufacturer Name
- Model Number
- Serial Number
- Hardware Revision
- Software Revision
- Firmware Revision
- System ID
- Regulatory Certification Data List
- PnP ID

If a characteristic value is not available in the peer device, then the corresponding field in the Device Information screen will be empty.

Figure 2-11. Device Information

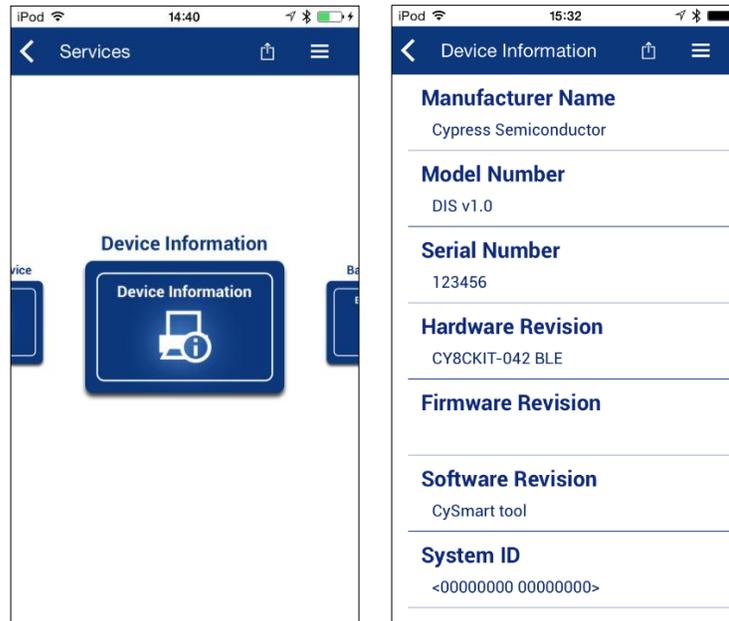


Table 2-18. Device Information Service Details

PSoC Creator Example	BLE_Device_Information_Service
Bluetooth SIG References	GATT specification https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml

2.1.2 Cypress Custom Bluetooth LE Profiles/Services

2.1.2.1 CapSense Profile (CapSense Service)

The Cypress CapSense Profile is used to send the CapSense data over a Bluetooth LE link. CapSense service defines a separate characteristic for each CapSense widget. The app provides a separate screen and carousel image for each characteristic supported by it.

The following characteristics are supported under the CapSense Service in the app:

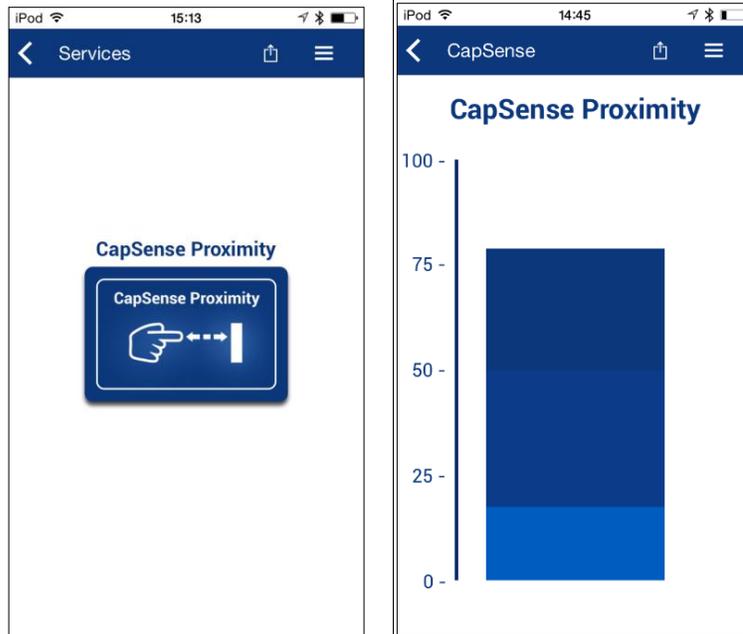
- CapSense Proximity
- CapSense Slider
- CapSense Button

The example projects for the Cypress CapSense profile is provided along with the [CY8CKIT-042-BLE Pioneer Kit](#) installer.

1. CapSense Proximity

The CapSense Proximity screen ([Figure 2-12](#)) shows the proximity level notified by the CapSense Proximity characteristic as a bar graph. The app beeps when the proximity value exceeds 50 percent.

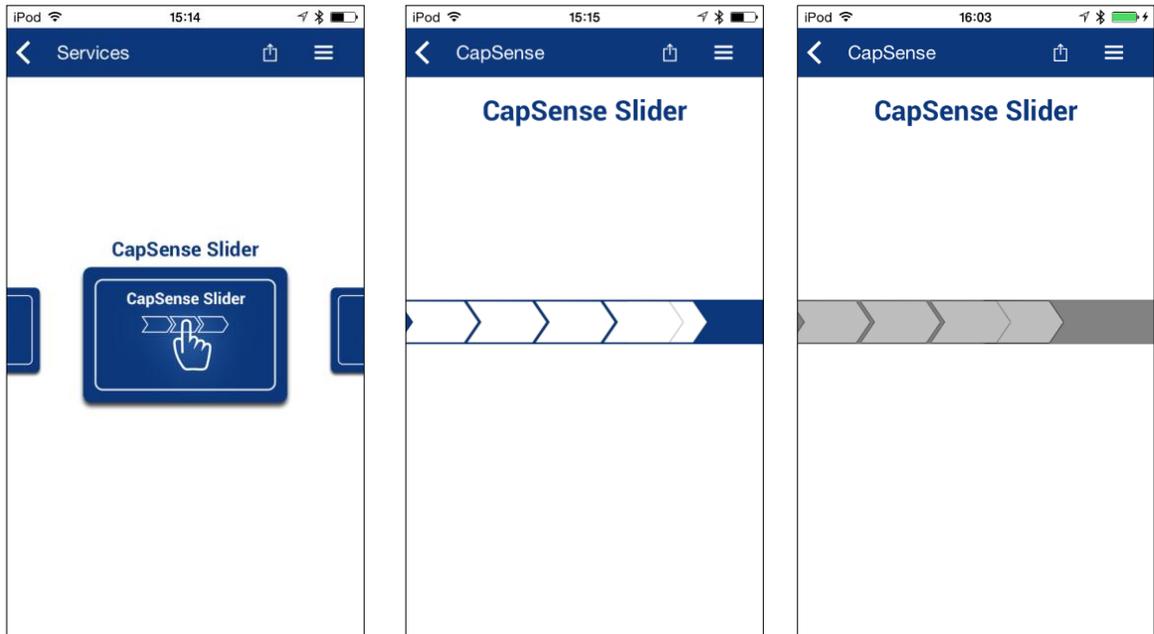
Figure 2-12. CapSense Proximity Service



2. CapSense Slider

The CapSense Slider screen (Figure 2-13) shows the finger position on the CapSense slider as notified by the CapSense Slider characteristic. When there is no contact of the finger with the slider, the slider image on the screen greys out.

Figure 2-13. CapSense Slider Service



3. CapSense Buttons

The CapSense Button screen (Figure 2-14) shows the ON/OFF states of the CapSense button as notified by the CapSense Button characteristic. The ON state is indicated in green and the OFF state is indicated in blue.

Figure 2-14. CapSense Buttons Service

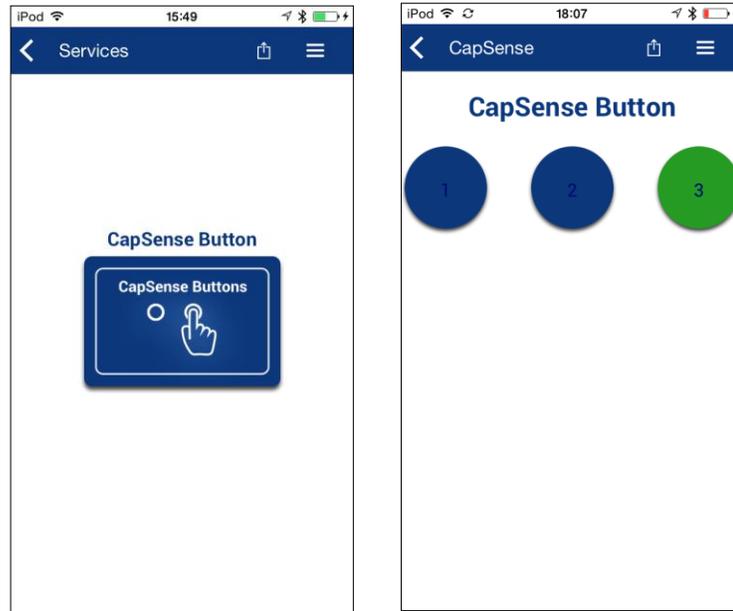


Table 2-19. CapSense Buttons Service Details

PSoC Creator Example	PSoC_4_BLE_CapSense_Proximity, PSoC_4_BLE_CapSense_Slider_LED
References	Cypress CapSense Profile www.cypress.com/CypressCustomProfiles

2.1.2.2 RGB LED

The RGB LED screen is shown in Figure 2-15. It displays the Color Gamut for choosing the color of the LED. To choose a color, place your finger on the Color Gamut and drag the pointer to the desired color. The RGB components of the selected color are displayed in a table. The RGB LED will change its color based on the color pointed to in the Color Gamut.

Figure 2-15. RGB LED Service

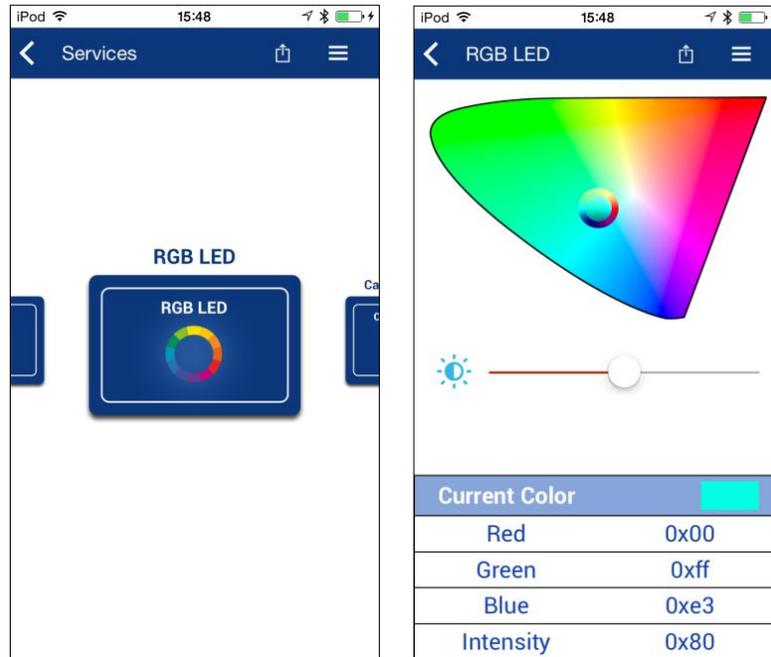


Table 2-20. RGB LED Service Details

PSoC Creator Example	PSoC_4_BLE_CapSense_Slider_LED (provided along with the CY8CKIT-042-BLE Pioneer Kit installer)
References	Cypress RGB LED Profile www.cypress.com/CypressCustomProfiles

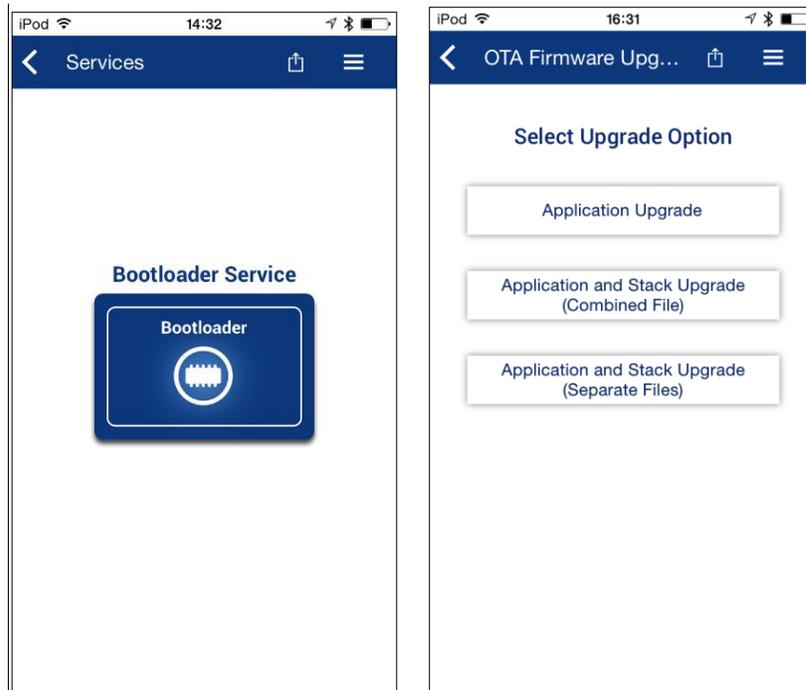
2.1.2.3 Cypress Bootloader Service

The Bootloader service is shown in [Figure 2-16](#). This service allows you to upgrade the firmware on Bluetooth LE devices that implement Cypress Bootloader service.

The CySmart App supports three types of upgrades:

- Application Only Upgrade
- Application and Stack Upgrade - using a single combined file
- Application and Stack Upgrade - using two separate files

Figure 2-16. OTA Firmware Upgrade Service



To perform firmware upgrade, follow these steps:

1. Before connecting to the peripheral device, ensure that it is not paired with the iOS device.
2. Connect to the peripheral device and select the Bootloader Service in the carousel.
3. Select the type of upgrade in the 'Select Upgrade Option' screen (Figure 2-16). This will take you to the 'Select Firmware Upgrade files' screen.
4. In the 'Select Firmware Upgrade files' screen, a list of available CYACD files will be displayed (Figure 2-19).
If the desired CYACD file is not present in the list, place it in the 'CySmart' app folder:
 - a. Connect your iOS device to a Mac computer.
 - b. Open iTunes on the Mac and select your iOS device.
 - c. Click **Apps** (Figure 2-17).
 - d. Under File Sharing, select the CySmart app from the list and click **Add** (Figure 2-18).
 - e. In the subsequent window, select the desired CYACD file to transfer and click **Open**.

If the CYACD file is available in another location on the iOS device or in applications such as mail/Dropbox, go to the file location, select the file, and press the **Share** button. This will show a list of applications to share the file with. Select **Open with app** and subsequently select **CySmart** from the list. This will place the CYACD file into the 'Documents' folder and open the CySmart app.

Figure 2-17. Selecting Apps in iOS Device Using iTunes

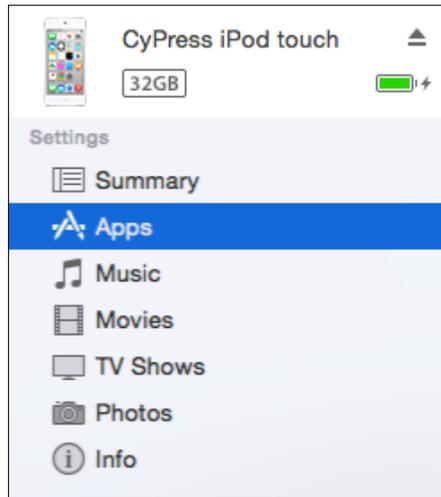
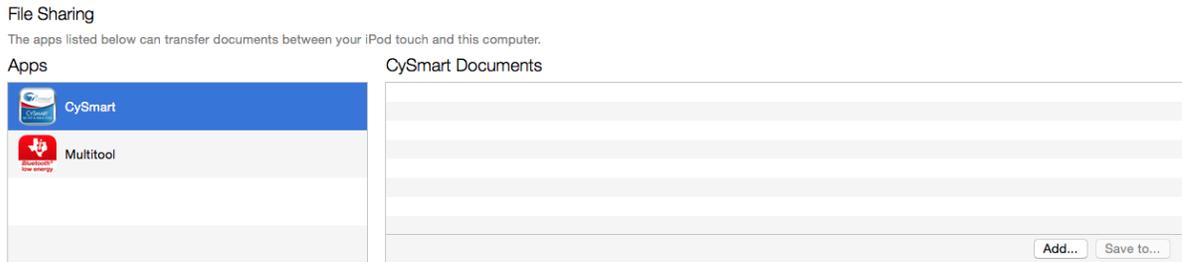
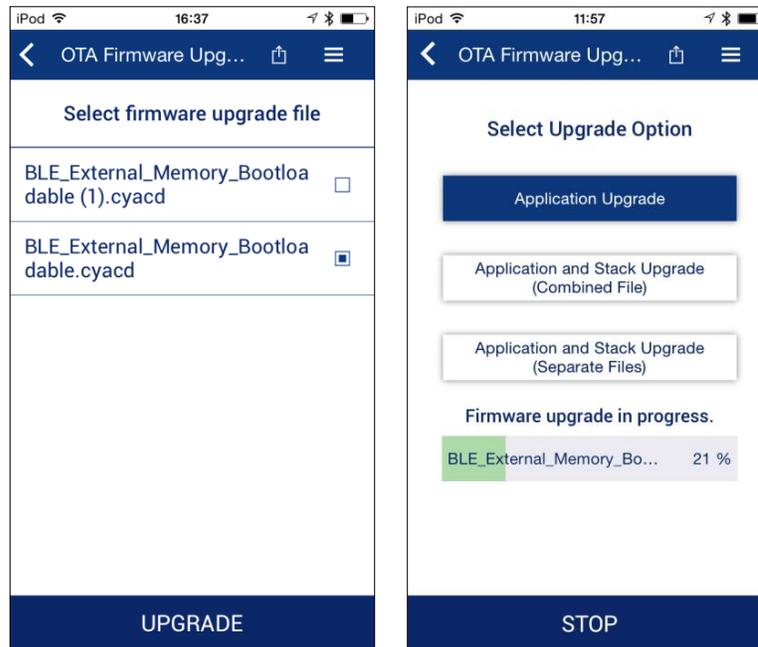


Figure 2-18. Transferring File to CySmart app using iTunes



After the file is successfully transferred, you should be able to view the file in the 'Select Firmware Upgrade files' screen (Figure 2-19). Select the file and press the **Upgrade** button.

Figure 2-19. OTAUFU - Service Upgrade Process



5. The progress of the upgrade is shown in the subsequent screen. If any errors are identified, they are reported by the app. While the upgrade is in progress, it can be stopped using the **Stop** button.
6. On completion of the upgrade, the app will disconnect from the peer device.

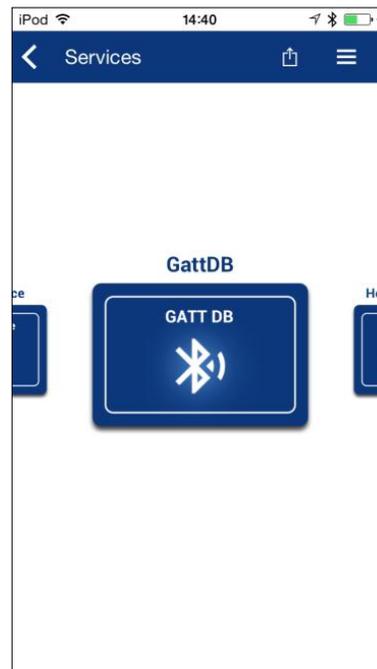
Table 2-21. OTA Firmware Upgrade Service Details

PSoC Creator Example	BLE_External_Memory_Bootloadble, BLE_External_Memory_Bootloader
References	Cypress Bootloader Profile www.cypress.com/CypressCustomProfiles

2.2 GATT DB Screen

The GATT Database (GATT DB) screen allows you to view the GATT database of the device to which the CySmart app is connected. The GATT DB screen option is always available in carousel screen as shown in [Figure 2-20](#).

Figure 2-20. GATT DB Selector in Carousel Screen

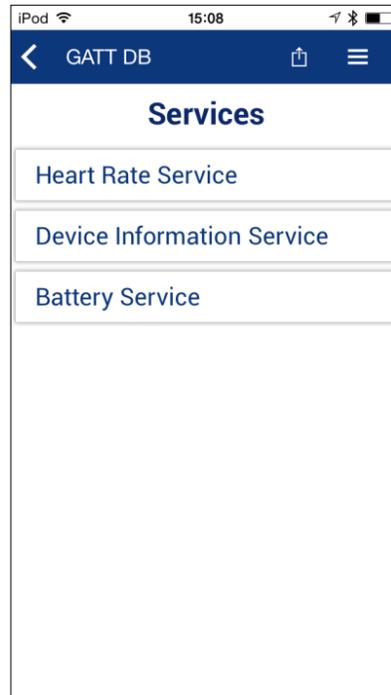


The GATT DB screen allows you to view the following details of the GATT DB of the peripheral device:

- Services
- Characteristics and Characteristic Details
- Characteristic Descriptors and Characteristic Descriptors Details

The GATT DB screen will display the Read, Write, Notify, or Indicate button based on the property of the current characteristic being viewed.

Figure 2-21. GATT DB Services



The GATT DB Services screen (Figure 2-21) lists all the services supported by the device. Selecting a service will take you to the GATT DB Characteristics screen (Figure 2-22).

Figure 2-22. GATT DB Characteristics

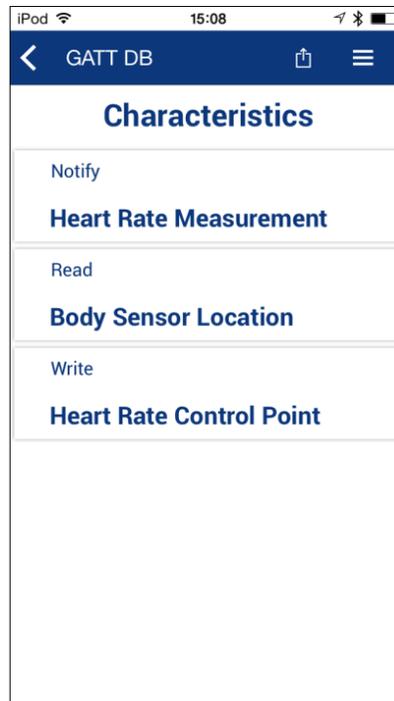
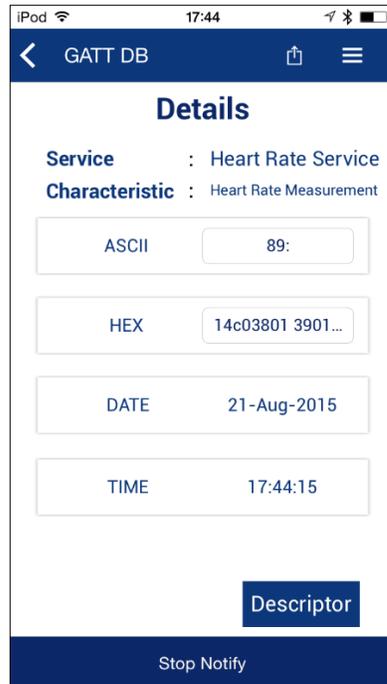


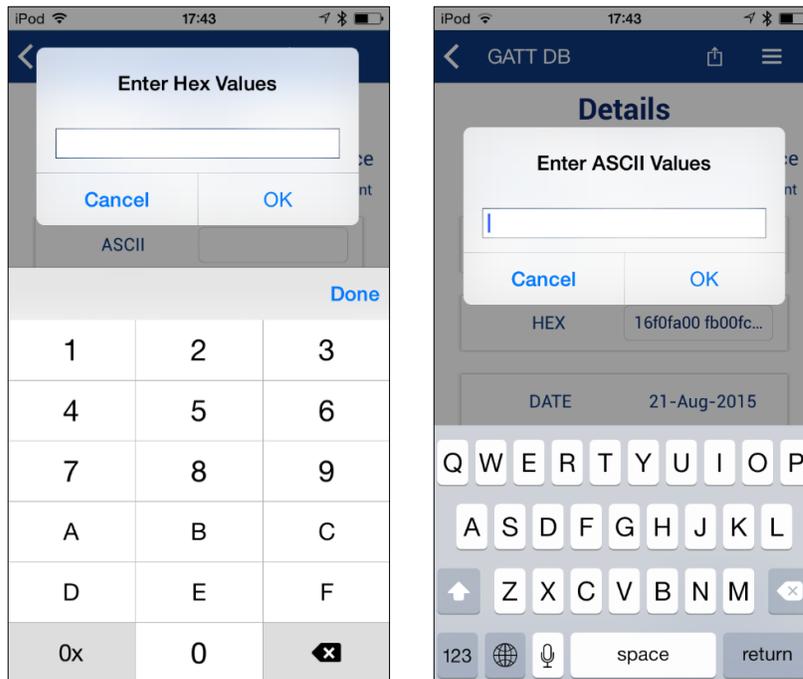
Figure 2-23. GATT DB Characteristics Details



The GATT DB Characteristics screen lists all the characteristics associated with the selected service. Selecting a characteristic will take you to the GATT DB Characteristic Details screen (Figure 2-23). The GATT DB Characteristic Details screen allows you to perform actions supported by the characteristics.

If the characteristic supports 'Write', you will be allowed to write a value. The app accepts both Hex input as well as ASCII input for the value (Figure 2-24).

Figure 2-24 GATT DB Hex and ASCII Input



If the characteristic has one or more associated descriptors, this screen will display a 'Descriptor' button. Selecting the 'Descriptor' button takes you to the GATT DB Characteristic Descriptor screen (Figure 2-25).

Figure 2-25. GATT DB Characteristic Descriptors



Figure 2-26. Characteristic Descriptor Details



The GATT DB Characteristic Descriptor screen displays the list of descriptors associated with the characteristic. Selecting a descriptor will take you to the GATT DB Characteristic Descriptor Details screen (Figure 2-26). This screen provides an option to read, write, enable/disable notification, and indication of the characteristic when supported.

Revision History



Document Revision History

Document Title: CySmart™ iOS App User Guide			
Document Number: 001-97476			
Revision	Issue Date	Origin of Change	Description of Change
**	05/07/2015	VARB	New iOS App User Guide Documentation
*A	05/26/2015	VARB	Updated screenshots Updated sections Navigation Side Menu and Cypress Bootloader Service
*B	09/02/2015	VARB	Added Glucose section Updated screenshots for Cycling Speed and Cadence, Running Speed and Cadence, OTA Bootloader , Capsense Proximity Service Updated PSoC Creator version to 3.3