

BLE Find Me Profile

1.0

Features

- BLE IAS Service GATT Server role operation
- DeepSleep mode support
- LED status indication

General Description

This example project demonstrates the Find Me Profile operation of the BLE PSoC Creator Component. The Find Me Target utilizes the Find Me Profile with one instance of Immediate Alert Service to display the alerts if the Client has configured the device for alerting. Find Me Target operates with other devices which implement the Find Me Locator Profile. The device switches to the DeepSleep mode between BLE connection intervals.

Development Kit Configuration

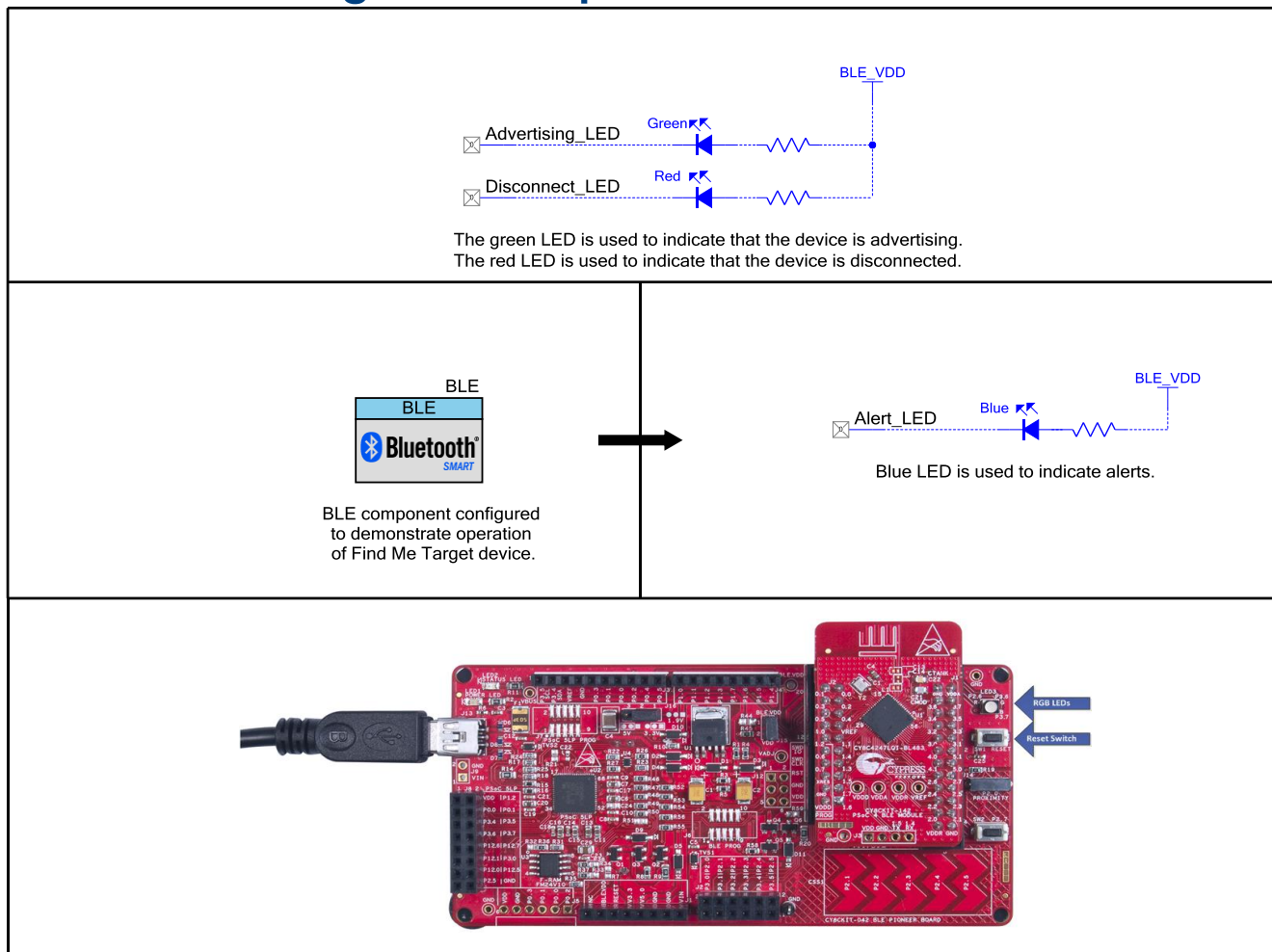
Configure your device as follows:

- Green LED (port 3 pin 6) is used to indicate advertising state.
- Red LED (port 2 pin 6) is used to indicate BLE disconnection state.
- Blue LED (port 3 pin 7) is used to indicate alerts.

Project Configuration

The top design schematic is shown in **Figure 1**.

Find Me Target Example For CY8CKIT-042 BLE



Note: This is a basic BLE example and it isn't optimized for power (LEDs, CPU power mode are not optimized for lower power consumption)

Figure 1. Top design schematic

The BLE component is configured as Find Me Target in the GAP Peripheral role with the settings shown in the figures below.

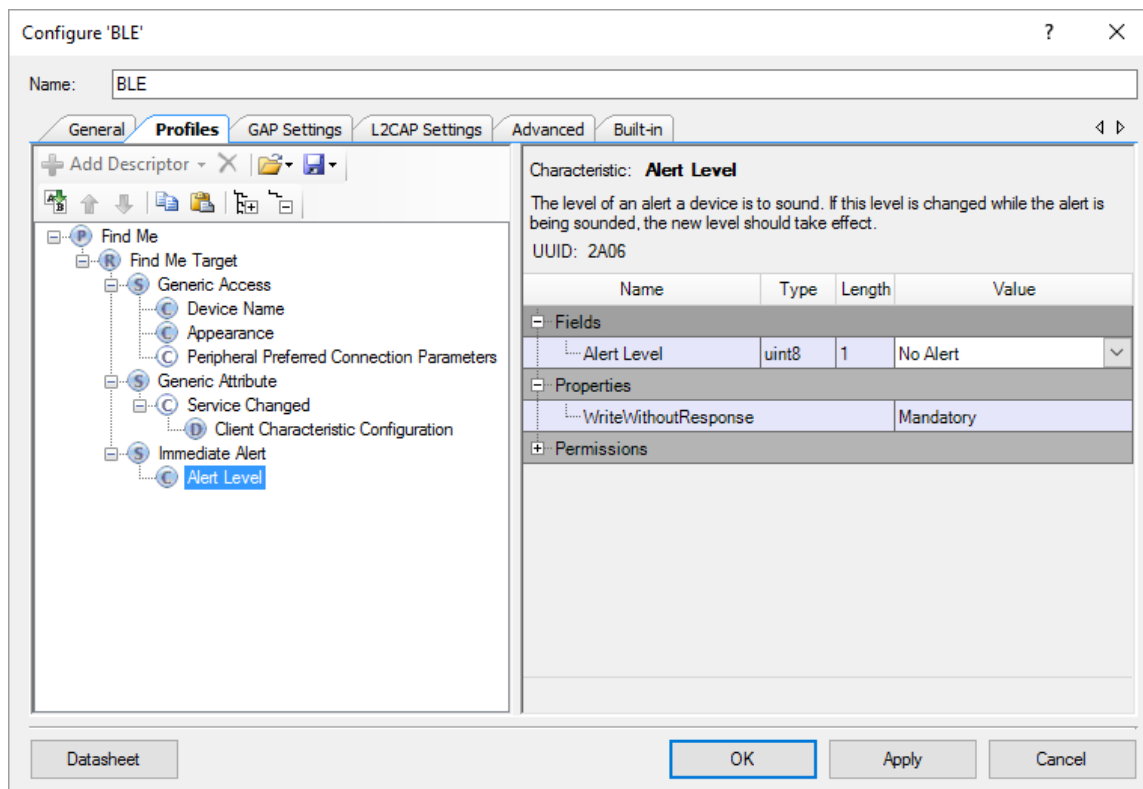


Figure 2. GATT settings

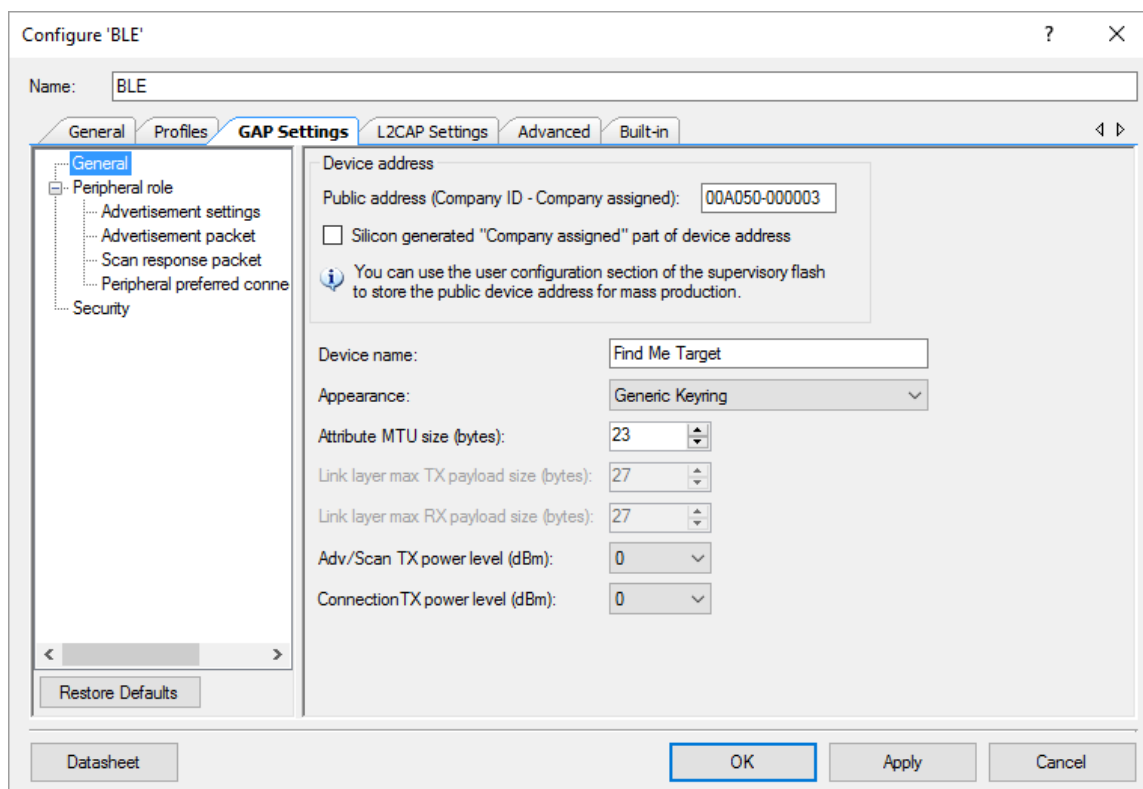


Figure 3. GAP settings

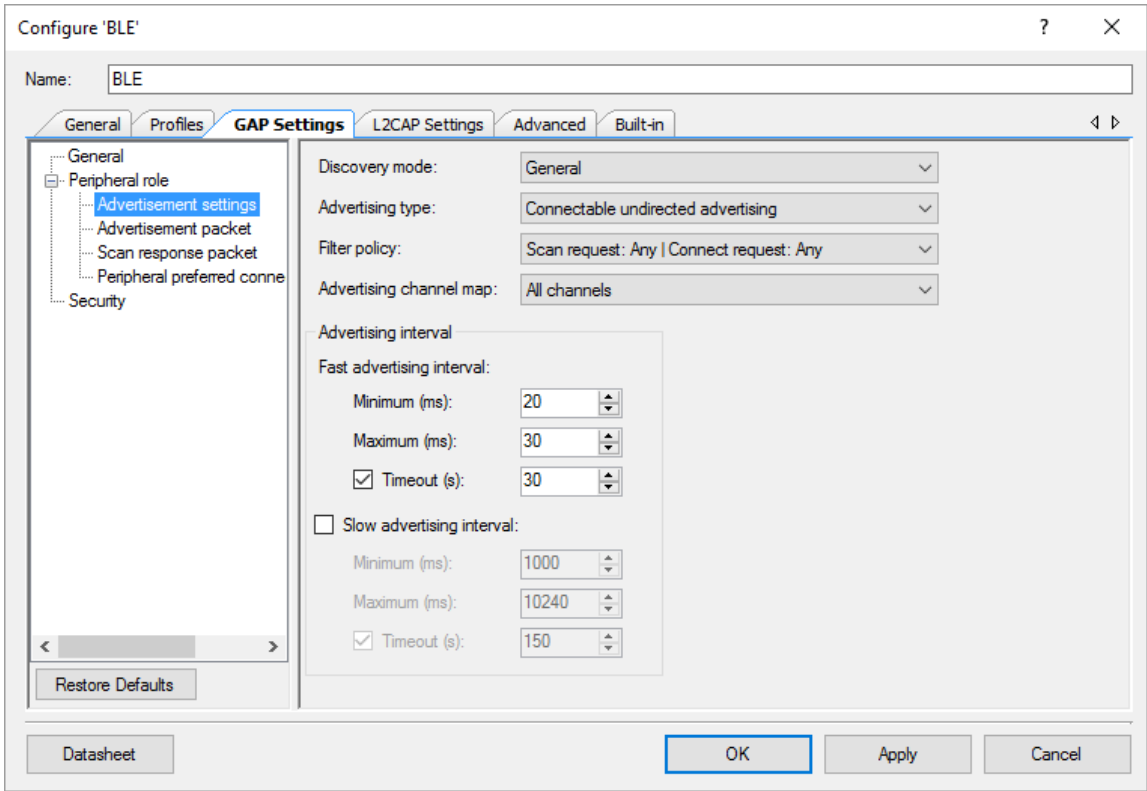


Figure 4. GAP settings -> Advertisement settings

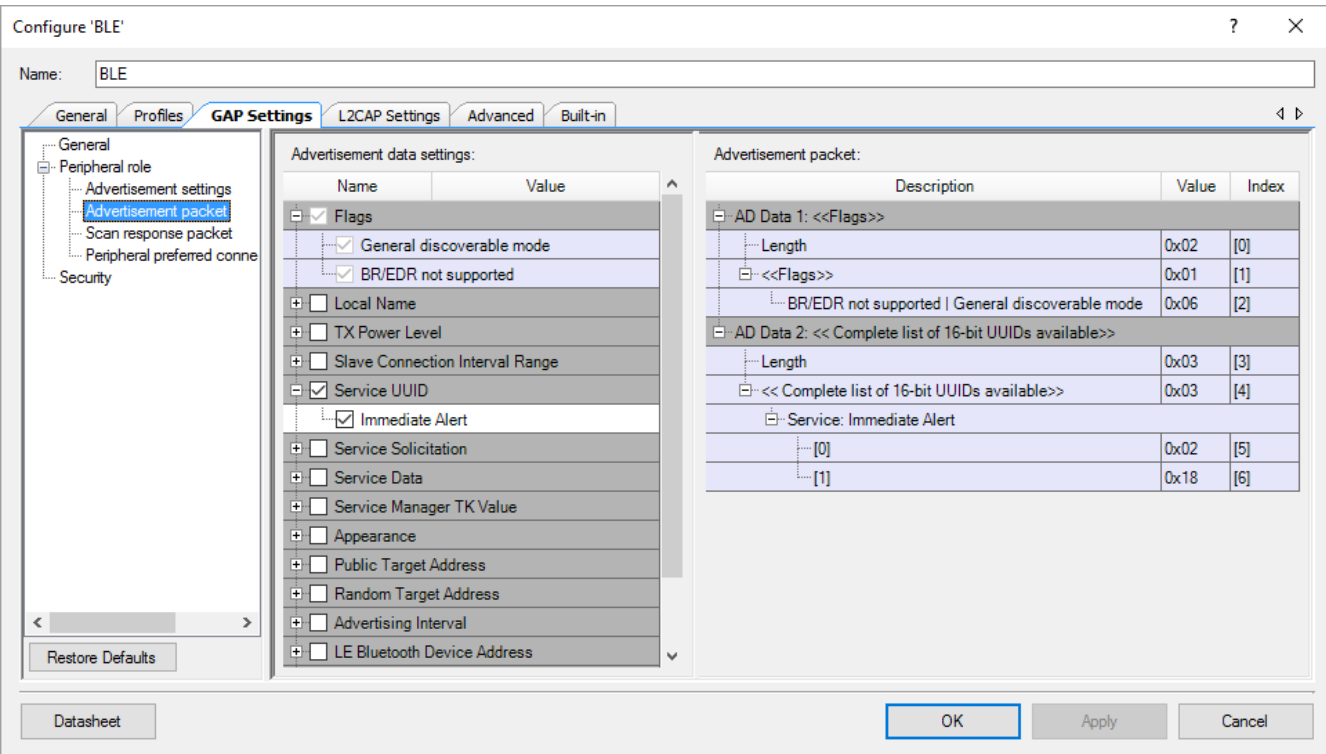


Figure 5. GAP settings -> Advertisement packet

Configure 'BLE'

Name: BLE

General Profiles **GAP Settings** L2CAP Settings Advanced Built-in

General

- Peripheral role
 - Advertisement settings
 - Advertisement packet
 - Scan response packet**
 - Peripheral preferred connection
- Security

Restore Defaults

Scan response data settings:

Name	Value
<input checked="" type="checkbox"/> Local Name	
Local name	Complete
<input checked="" type="checkbox"/> TX Power Level	
Value (dBm)	0
<input type="checkbox"/> Slave Connection Interval Range	
<input type="checkbox"/> Service UUID	
<input type="checkbox"/> Service Solicitation	
<input type="checkbox"/> Service Data	
<input type="checkbox"/> Service Manager TK Value	
<input checked="" type="checkbox"/> Appearance	
Data	Generic Keyring
<input type="checkbox"/> Public Target Address	
<input type="checkbox"/> Random Target Address	
<input type="checkbox"/> Advertising Interval	
<input type="checkbox"/> LE Bluetooth Device Address	

Scan response packet:

Description	Value	Index
AD Data 1: <<Local Name>>		
Length	0x0F	[0]
<<Local Name>>	0x09	[1]
'F'	0x46	[2]
'i'	0x69	[3]
'n'	0x6E	[4]
'd'	0x64	[5]
' '	0x20	[6]
'M'	0x4D	[7]
'e'	0x65	[8]
' '	0x20	[9]
'T'	0x54	[10]
'a'	0x61	[11]
'r'	0x72	[12]
'g'	0x67	[13]

Datasheet OK Apply Cancel

Figure 6. GAP settings -> Scan response packet

Configure 'BLE'

Name: BLE

General Profiles **GAP Settings** L2CAP Settings Advanced Built-in

General

- Peripheral role
 - Advertisement settings
 - Advertisement packet
 - Scan response packet
 - Peripheral preferred connection
- Security**

Restore Defaults

Security mode: Mode 1

Security level: No Security (No authentication, No encryption)

Strict pairing: No

Keypress notifications: No

I/O capabilities: No Input No Output

Bonding requirement: No Bonding

Maximum bonded devices: 4

☒ Auto populate whitelist with bonded devices

Maximum whitelist size (hardware): 8

☐ Enable Link Layer Privacy

Maximum resolvable devices: 8

Encryption key size (bytes): 16

Datasheet OK Apply Cancel

Figure 7. Security settings

Project Description

The project demonstrates the core functionality of BLE component configured as a Find Me Target.

Right after startup the device performs initialization of the BLE component. In this project two callback functions are used for BLE operation. One callback function (StackEventHandler()) is required for receiving generic events from the BLE, and the other (IasEventHandler()) is required for receiving events from the Immediate Alert Service. The CYBLE_EVT_STACK_ON event indicates a successful initialization of the BLE Stack. After this event is received, the component starts advertising with the packet structure as configured in BLE component customizer (see **Figure 5**). The BLE stops advertising once the 30 seconds advertising period expires. On advertisement event timed out the device will go to low power mode (Stop mode) and wait for device reset event to wake up the device again.

You can connect to the Find Me Target device with BLE 4.0 or BLE 4.1 compatible device configured in GAP Central role and capable of discovering Immediate Alert service and Alert Level characteristic. To connect to Find Me Target device, send a connection request to the device when the device is advertising. The green LED is turned on while the device is advertising. If the Client is connected to the Find Me Target, then the Alert Level Characteristic can be written to trigger alerts on the remote device. If the Alert Level is set to CYBLE_MILD_ALERT, then the blue LED starts blinking. If the Alert Level is set to CYBLE_HIGH_ALERT, then the blue LED is turned on. To clear the alerts, send a request from the Client to set the Alert Level Characteristic to CYBLE_NO_ALERT. The alerts are also cleared when the connection with the Client is canceled or lost.

While connected to a Client and between connection intervals, the device is put into DeepSleep Mode.

You can use CySmart mobile app ([Android](#) / [iOS](#)) to switch Alert Level between **Low**, **Mild** and **High** states:



Figure 8. CySmart Android app discovered Find Me service

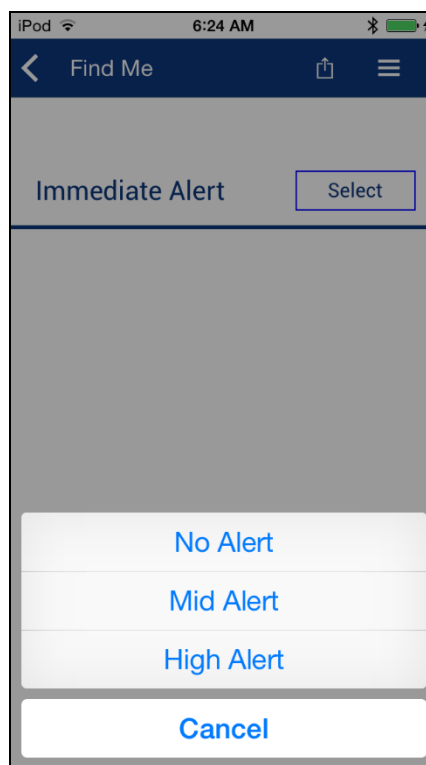


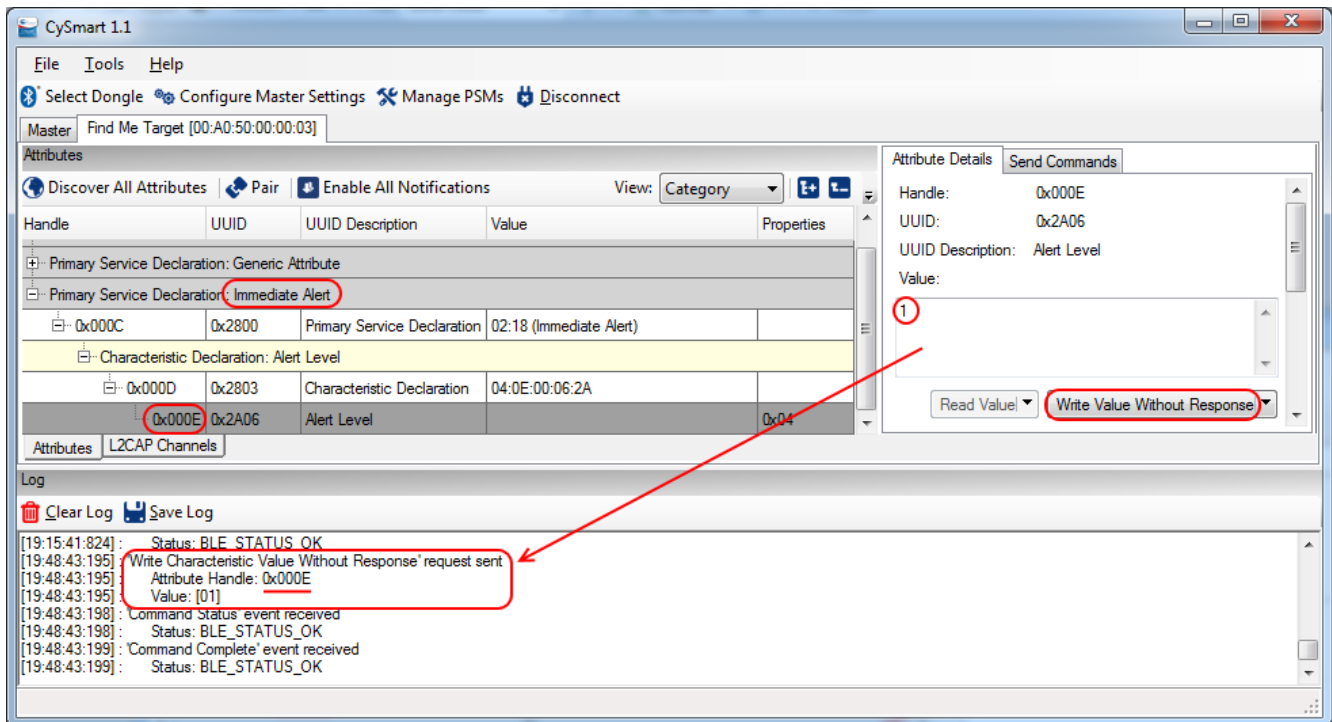
Figure 9. CySmart iOS app is changing Immediate Alert Level

Expected Results

Green LED is turned on when the device is advertising.
Red LED is turned on when the device is in hibernate mode.
Blue LED is blinking or turned on when the device is alerting.

The simple example how to use CySmart Windows application as Find Me profile client is the next:

- Connect the CySmart BLE dongle to a USB port on the PC.
- Launch **CySmart** app and select connected dongle in the dialog window.
- Reset the development kit to start advertising by pressing **SW1** button.
- Click **Start Scan** button to discover available devices.
- Select **Find Me Target** in the list of available devices and connect to it.
- Click **Discover All Attributes**, select the **Alert Level** characteristic value and write "1" value in it (mild alert):



- Observe the blue LED is blinking.

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