

# BLE Device Information Service

1.0

## Features

- Custom Server in Peripheral Role operation
- Device Information Service usage
- DeepSleep mode demonstration
- LED status indication

## General Description

This is a simple BLE example project that demonstrates how to configure and use BLE component APIs and an application layer callback. The Device Information Service is used as an example to demonstrate how to configure the BLE service characteristics in the BLE component.

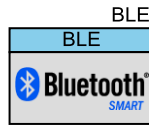
## Development Kit Configuration

Build the project and program the hex file onto the PSoC4 CY8CKIT-042 BLE Pioneer Kit.

## Project Configuration

The example project consists of the following components: BLE and digital output pin. The input pin is configured to the resistive pull up mode and used to wake the device from low power hibernate mode. The top design schematic is shown in **Figure 1**.

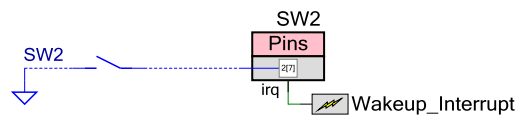
## BLE Device Information Service Example Project



BLE component contains Device Information Service.



The red LED is used to indicate that the device is disconnected.  
The green LED is used to indicate that the device is advertising.



The button is used to wake the device up from the hibernate mode.

Figure 1. Top design schematic

The BLE component is configured as the Custom Profile in Peripheral Role. Device Information Service is added with all the characteristics.

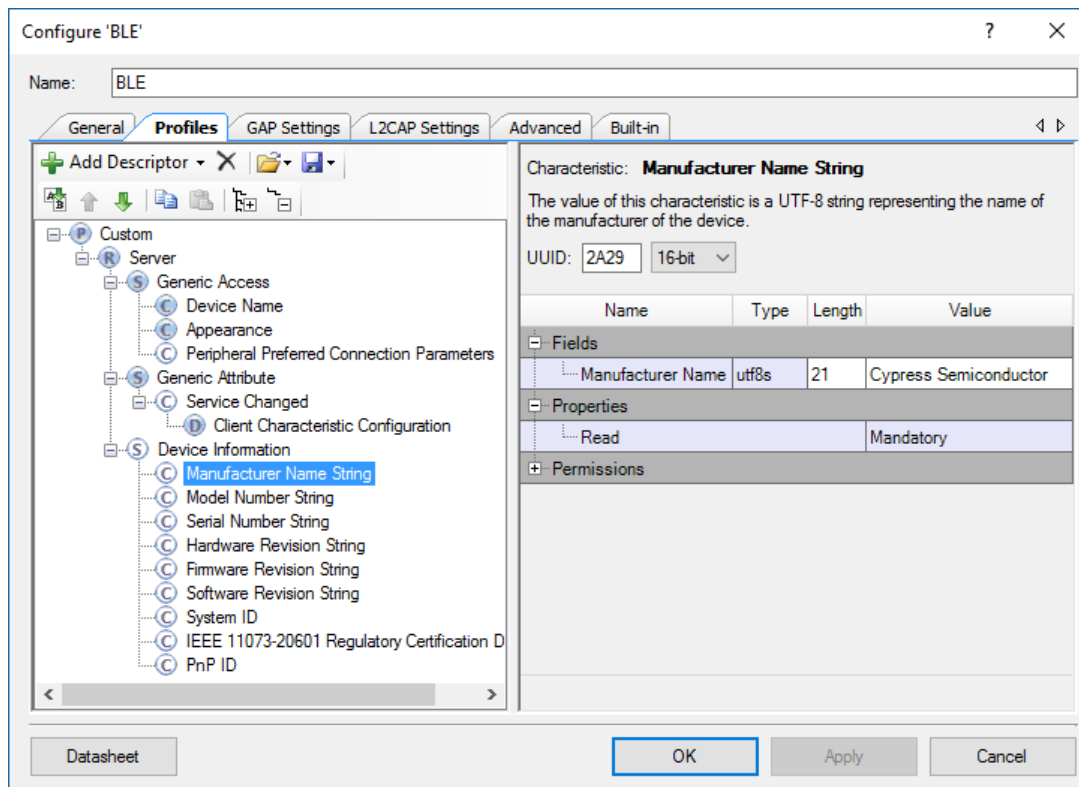


Figure 2. GATT settings

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

Device address

Public address (Company ID - Company assigned): 00A050-000001

☐ Silicon generated "Company assigned" part of device address

*You can use the user configuration section of the supervisory flash to store the public device address for mass production.*

Device name: Device Info Example

Appearance: Generic Tag

Attribute MTU size (bytes): 23

Link layer max TX payload size (bytes): 27

Link layer max RX payload size (bytes): 27

Adv/Scan TX power level (dBm): 0

Connection TX power level (dBm): 0

☐ Enable Link Layer Privacy

Restore Defaults

Datasheet OK Apply Cancel

Figure 3. GAP settings

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

Advertisement data settings:

Name	Value
<input checked="" type="checkbox"/> Flags	
<input checked="" type="checkbox"/> General discoverable mode	
<input checked="" type="checkbox"/> BR/EDR not supported	
<input checked="" type="checkbox"/> Local Name	
Local name	Complete
<input type="checkbox"/> TX Power Level	
<input type="checkbox"/> Slave Connection Interval Range	
<input checked="" type="checkbox"/> Service UUID	
<input checked="" type="checkbox"/> Device Information	
<input type="checkbox"/> Service Solicitation	
<input type="checkbox"/> Service Data	
<input type="checkbox"/> Service Manager TK Value	
<input type="checkbox"/> Appearance	
<input type="checkbox"/> Public Target Address	
<input type="checkbox"/> Random Target Address	
<input type="checkbox"/> Advertising Interval	
<input type="checkbox"/> LE Bluetooth Device Address	

Advertisement packet:

Description	Value	Index
AD Data 1: <<Flags>>		
Length	0x02	[0]
<<Flags>>	0x01	[1]
BR/EDR not supported   General discoverable mode	0x06	[2]
AD Data 2: <<Local Name>>		
Length	0x14	[3]
<<Local Name>>	0x09	[4]
'D'	0x44	[5]
'e'	0x65	[6]
'v'	0x76	[7]
'i'	0x69	[8]
'c'	0x63	[9]
'e'	0x65	[10]
'.'	0x20	[11]
'I'	0x49	[12]
'n'	0x6E	[13]
'f'	0x66	[14]

Restore Defaults

Datasheet OK Apply Cancel

Figure 4. GAP settings -&gt; Advertisement packet

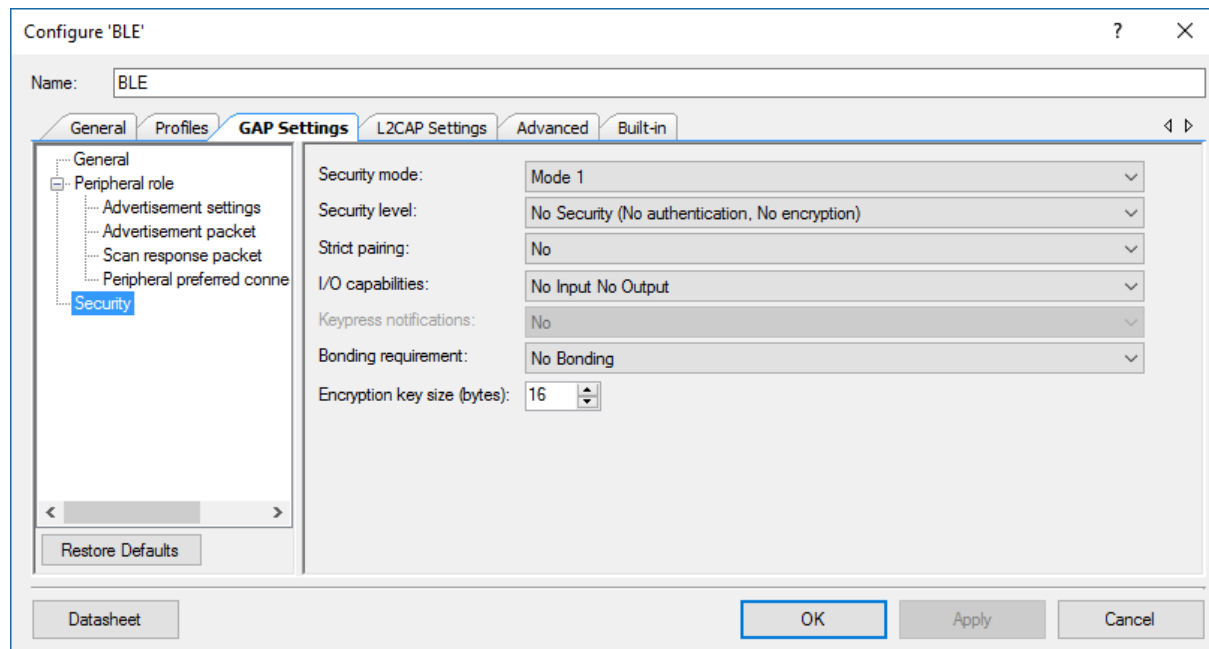


Figure 5. Security settings

## Project Description

One callback function (AppCallBack()) is required to receive generic events from BLE Stack.

CyBle\_GappStartAdvertisement() API is called after the CYBLE\_EVT\_STACK\_ON event to start advertising with the packet shown in **Figure 4**.

To indicate that the device is advertising, the green LED is blinking. The red LED will be lighted on to indicate that no Client is connected to the device. When a Client is connected successfully, both red and green LEDs will turn off.

## Expected Results

You can use CySmart mobile app as a Device Information Service client:

- Launch CySmart mobile app (Android/iOS), and swipe down to refresh list of found BLE devices.
- Connect to “Device Info Example” service and open “Device Information Service” service.
- Explore information about device:

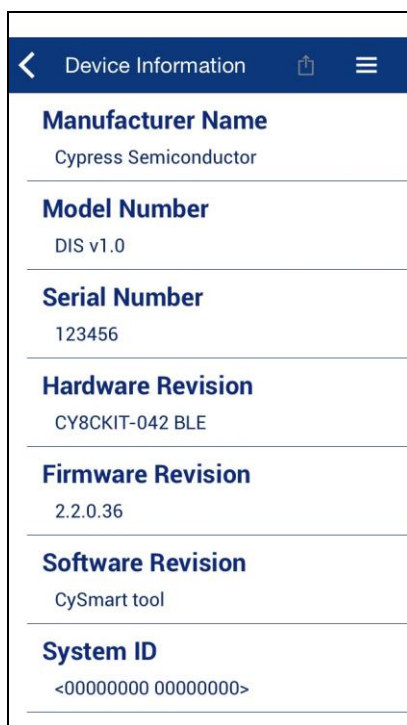


Figure 6. CySmart iOS app

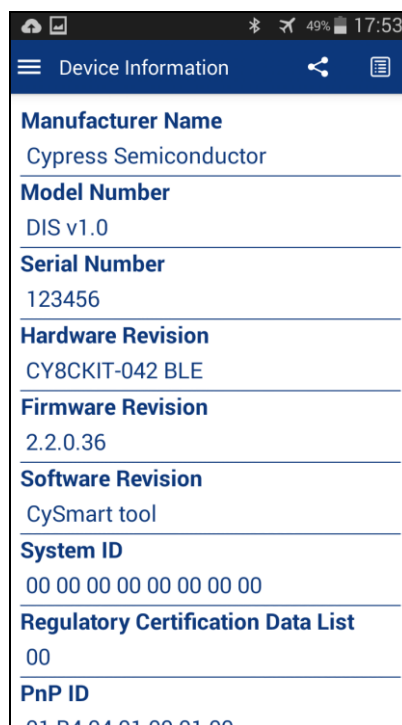


Figure 7. CySmart Android app

Also, the Device Information Service Example can be used together with [CySmart app for Windows](#). No security procedures (pairing) required. For further instructions on how to use CySmart application, see [CySmart User Guide](#).

The simple example how to use CySmart Windows application as Device Information Service 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 **Device Info Example** in the list of available devices and connect to it.
- Click **Discover All Attributes**, and **Read All Characteristics** in CySmart app.

Observe the Device Information Service characteristics values read with example data:

Select Dongle    Configure Master Settings    Manage PSMs    Disconnect				
Master	Device Info Example [00:A0:50:00:00:01]			
Attributes				
Discover All Attributes    Pair    Enable All Notifications    Disable All Notifications			View: Category	+
Handle	UUID	UUID Description	Value	Properties
Primary Service Declaration: Device Information				
0x000C	0x2800	Primary Service Declaration	0A:18 (Device Information)	
Characteristic Declaration: Manufacturer Name String				
0x000D	0x2803	Characteristic Declaration	02:0E:00:29:2A	
0x000E	0x2A29	Manufacturer Name String	43:79:70:72:65:73:73:20:53:65:6D:69:63:6F:6E:64:75:63:74:6F:72	0x02
Characteristic Declaration: Model Number String				
0x000F	0x2803	Characteristic Declaration	02:10:00:24:2A	
0x0010	0x2A24	Model Number String	44:49:53:20:76:31:2E:30	0x02
Characteristic Declaration: Serial Number String				
0x0011	0x2803	Characteristic Declaration	02:12:00:25:2A	
0x0012	0x2A25	Serial Number String	31:32:33:34:35:36:00:00:00:00	0x02
Characteristic Declaration: Hardware Revision String				
0x0013	0x2803	Characteristic Declaration	02:14:00:27:2A	
0x0014	0x2A27	Hardware Revision String	43:59:38:43:4B:49:54:2D:30:34:32:20:42:4C:45	0x02
Characteristic Declaration: Firmware Revision String				
0x0015	0x2803	Characteristic Declaration	02:16:00:26:2A	
0x0016	0x2A26	Firmware Revision String	00:00:00:00:00:00:00:00:00	0x02
Characteristic Declaration: Software Revision String				
0x0017	0x2803	Characteristic Declaration	02:18:00:28:2A	
0x0018	0x2A28	Software Revision String	43:79:53:6D:61:72:74:20:74:6F:6F:6C	0x02
Characteristic Declaration: System ID				
0x0019	0x2803	Characteristic Declaration	02:1A:00:23:2A	
0x001A	0x2A23	System ID	00:00:00:00:00:00:00:00	0x02
Characteristic Declaration: IEEE 11073-20601 Regulatory Certification Data List				
0x001B	0x2803	Characteristic Declaration	02:1C:00:2A:2A	
0x001C	0x2A2A	IEEE 11073-20601 Regulatory Certification Data List	00	0x02
Characteristic Declaration: PnP ID				
0x001D	0x2803	Characteristic Declaration	02:1E:00:50:2A	
0x001E	0x2A50	PnP ID	01:84:04:01:00:01:00	0x02

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