Find Me example project

1.0

Features

- BLE IAS Service GATT Server role operation
- DeepSleep mode demonstration.
- Reporting the workflow status through UART.
- LED status indication

General Description

This example project demonstrates Find Me Target operation. The Find Me Target utilizes BLE Find Me profile with one instance of Immediate Alert Service to display alerts on the device if Client configured device for alerting. Find Me Target operates with other devices which implement Find Me Locator profile role. Find Me Target uses Limited discovery mode during which it is visible for BLE Clients. Device remains in DeepSleep mode between BLE connection intervals.

Development kit configuration

<Following configuration is true for PSVP and will be updated prior BLE Chip ES10 with configuration for CY8CKIT-042 BLE Pioneer Kit>

Device has following configuration:

- UART RX pin is connected to port 0 pin 4.
- UART TX pin is connected to port 0 pin 5.
- Mechanical button (port 1 pin 1) used for wake up the device and start re-advertising.
- Green LED (port 0 pin 0) used to indicate advertising state.
- Red LED (port 0 pin 0) used to indicate BLE disconnection state.
- Gree LED (port 0 pin 0) used to indicate alerts.

Project configuration

The top design schematic is shown in Figure 1.

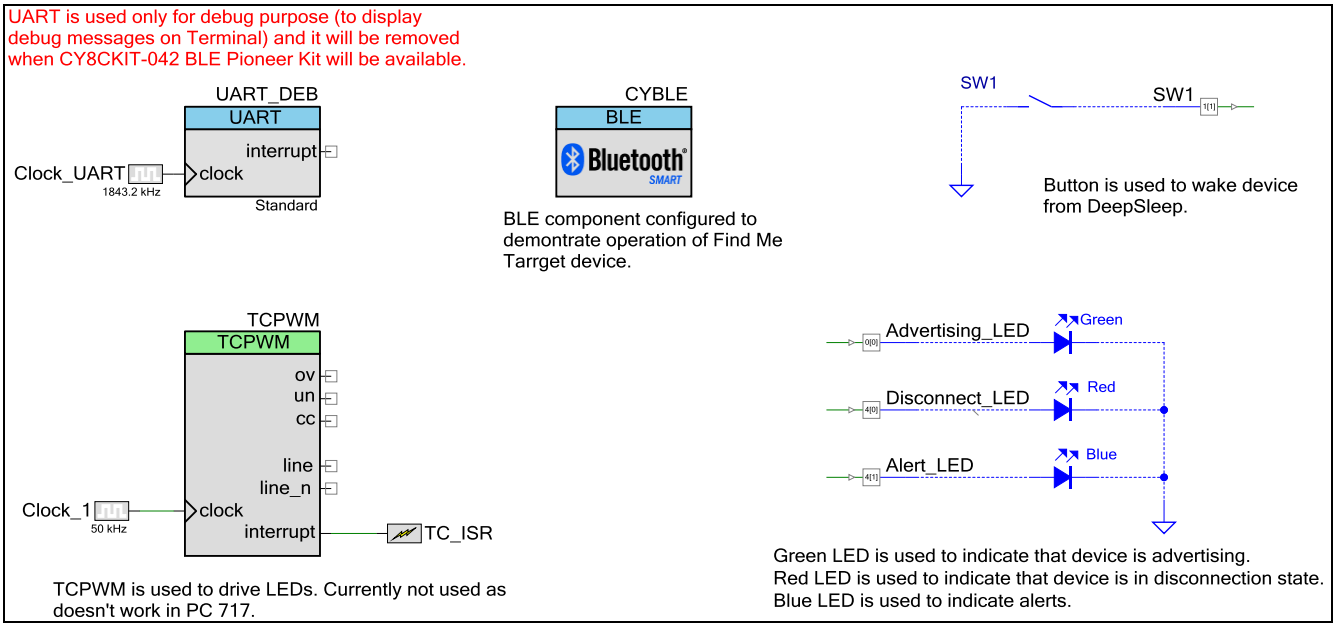

Figure 1. Top design schematic

The BLE component is configured as Find Me Target in GAP Peripheral role.

The GATT settings:

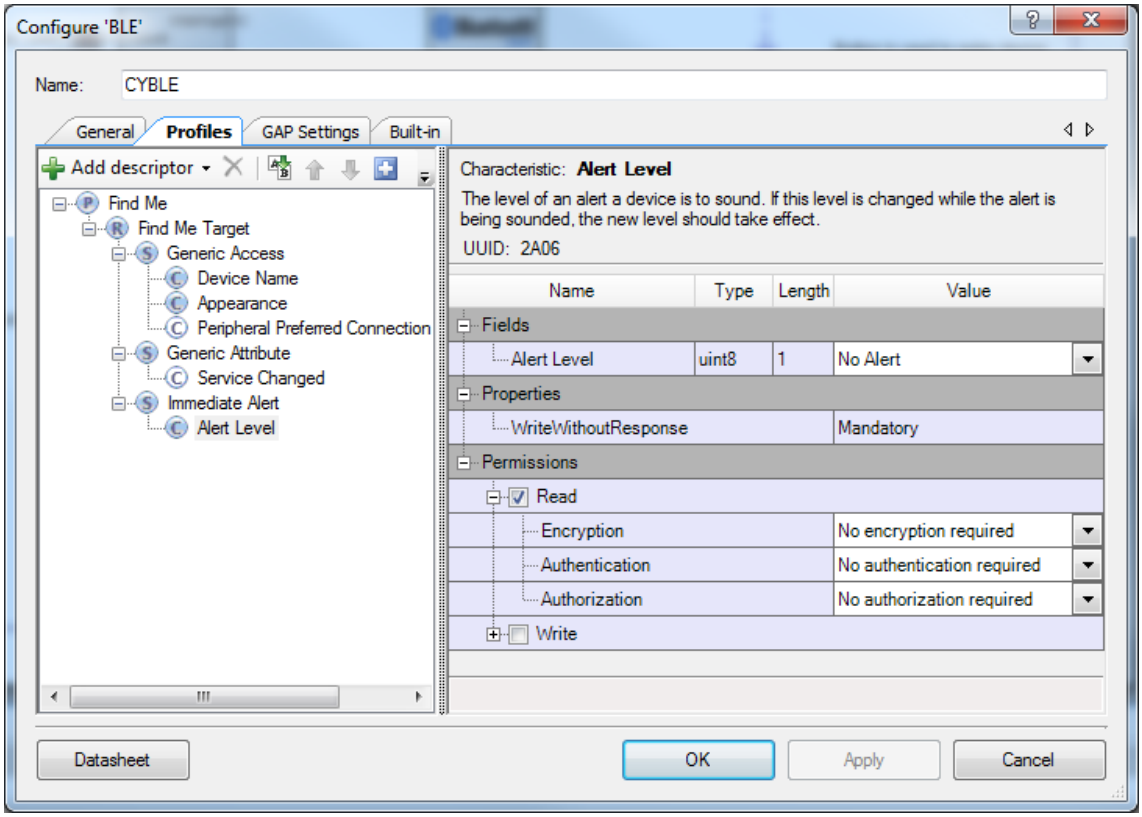

Figure 2. GATT settings

The GAP settings (Advertisement settings tab):

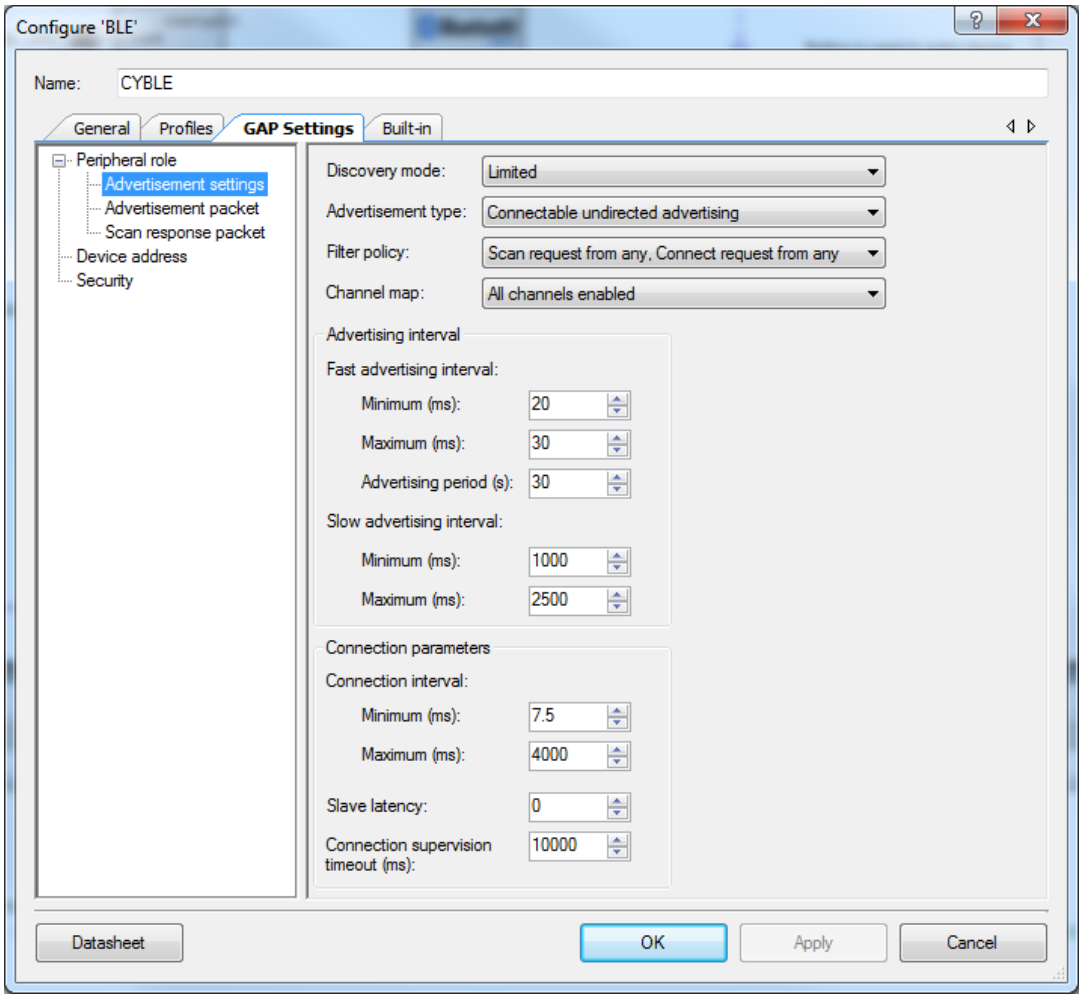

Figure 3. GAP settings

The GAP settings (Advertisement packet tab):

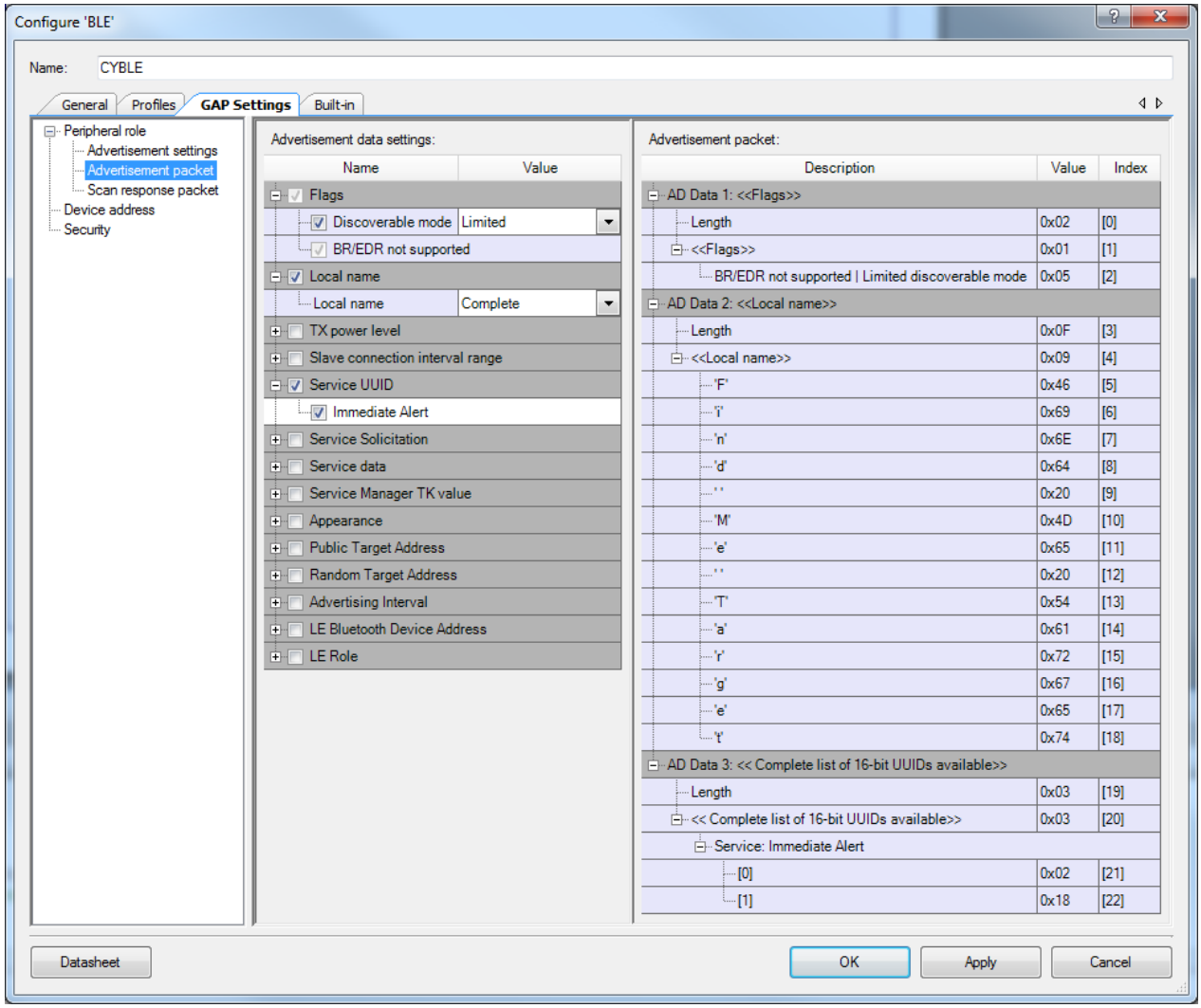

Figure 4. GAP settings->Advertisement Packet

The GAP settings (Scan response packet tab):

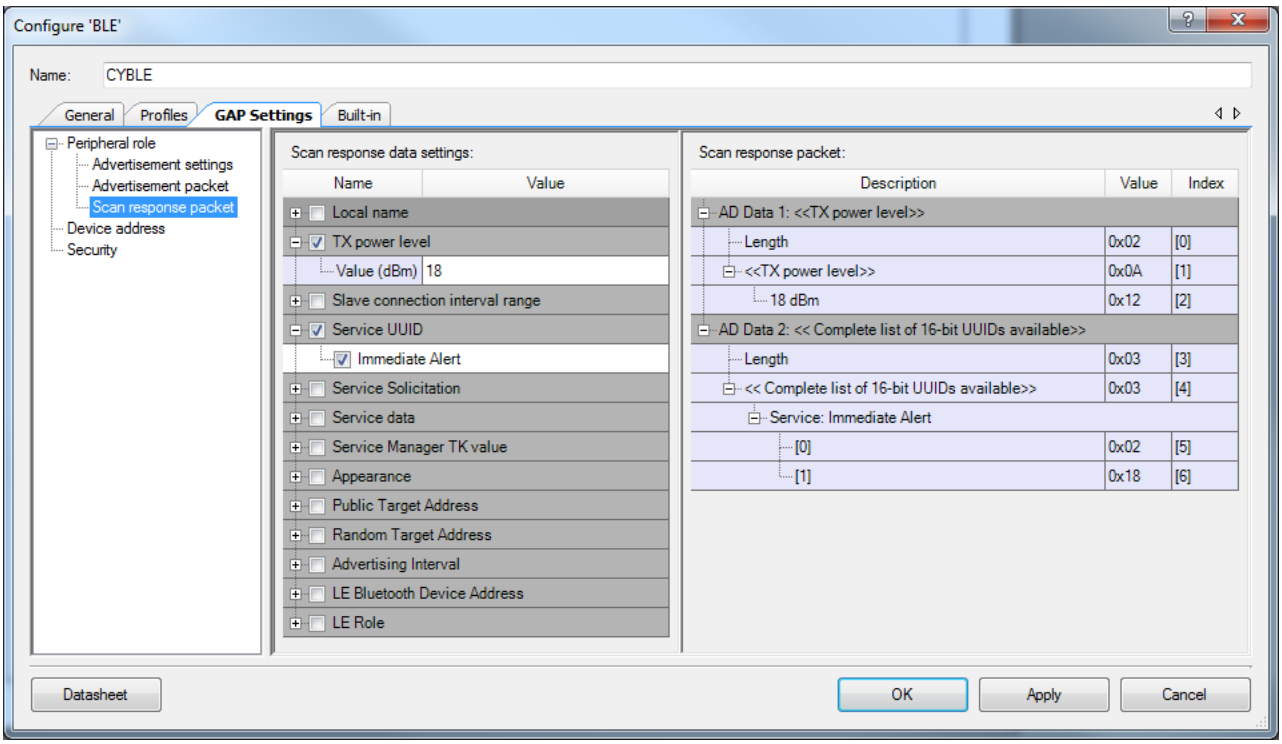

Figure 5. GAP settings->Scan response Packet

Device address is set to **123456-789ab**.

Security settings:

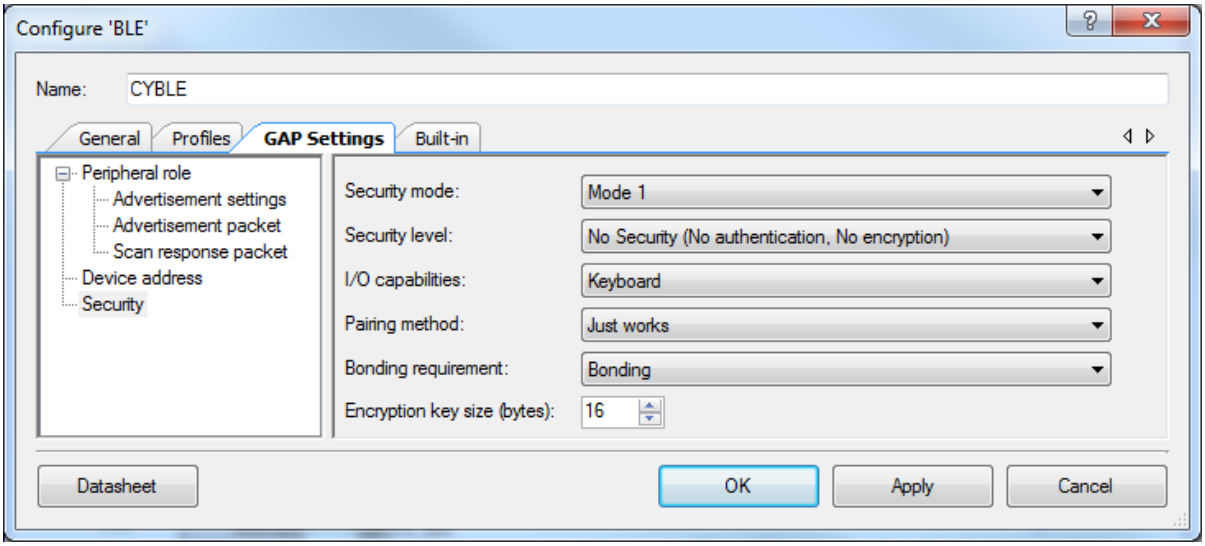

Figure 6 Security settings

Project Description

<Following description is true for PSVP and will be updated prior BLE Chip ES10 with configuration for CY8CKIT-042 BLE Pioneer Kit>

The project demonstrates the core functionality of BLE component configured as a Find Me Target.
Right after device is started it performs BLE component initialization as also initialization of TCPWM and ISR components. In this project two callback functions are required for BLE operation. One callback functions (GenericAppEventHandler()) is required to receive generic events from BLE Stack and the other (ServiceAppEventHandler()) required for receiving events from Immediate Alert Service. Component also has buried call to CyBle_GappStartAdvertisement() on execution of which device will start advertisement with advertisement packet shown on Figure 4. GAP settings->Advertisement Packet. As BLE component is configured for Limited Discovery mode it will stop advertising after advertisement period of 30 seconds will expire. To resume advertisement send character ‘a’ to PSVP via UART. This simulates mechanical button press which will resume Advertisement for another 30 seconds.

You can connect to the Find Me Target device using BLE 4.0 or BLE 4.1 compatible device Configured for GAP Central role and capable of discovering Immediate Alert service and Alert level characteristic (Later there should be some description of CYSmart like steps how to send requests to Find Me Target). To connect to Find Me Target device send a connection request to device when device advertises. To indicate that device advertises the blue LED (LED D2 on PSVP) will be blinking. Red LED will be lighted on to indicate that no Client connected to the device within 30 seconds Limited Discovery period. When client will be connected successfully both red and blue LEDs will be turned off. When Client is connected to Find Me Target the Alert Level Characteristic can be written to start alerts on the device. When Alert Level is set to CYBLE_MILD_ALERT the blue LED will begin to blink which demonstrates “Mild Alert”. When Alert Level is set to CYBLE_HIGH_ALERT the blue LED will continuously turned on – that is “High Alert”. Once device started alerting there are three options to disable alerts. First option is to send a request from Client to set Alert Level

Characteristic to CYBLE_NO_ALERT. For the second option the alert will stop after timeout. The timeout is set to 30 seconds. The third option when the device will stop alerting is when the connection with Client is lost or disabled.

When the device is connected to a Client it will be put into Sleep Mode (Change it to DeepSleep when CY8CKIT-042 BLE Pioneer Kit is available) between connection intervals.

Expected results

PSVP version of the working project sends the messages through UART.
The example log captured on UART with Find Me Target is shown below:

>Bluetooth On, Start Advertisement with addr: 1234567890ab
>Advertisement is enabled
>Advertisement timeout occurred. Advertisement will be disabled.
>Advertisement is disabled
>Device is entered Limited Discovery mode
>Advertisement is enabled
>CYBLE_EVT_GATT_CONNECT_IND: 0
>CYBLE_EVT_DEVICE_CONNECTED: 0
>Write Alert Level command received
>Alert Level is set to "Mild Alert"
>EVT_GATT_DISCONNECT_IND:
>CYBLE_EVT_DEVICE_DISCONNECTED
>Advertisement is enabled