# BLE Weight Scale Profile

**1.0**

## Features

- BLE WSS Service Sensor (GATT Server) role operation
- Low Power mode
- LED status indication

## General Description

This example project demonstrates the Weight Scale Profile operation of the BLE PSoC Creator Component. The Weight Scale Sensor utilizes one instance of Weight Scale, Body Composition, User Data and Device Information Services to simulate weight measurements for up to four registered users. The Weight Scale Sensor operates with other devices that implement the Weight Scale Collector Profile. The device switches to the DeepSleep mode between BLE connection intervals. The BLE component supports the PSoC 4 BLE and PRoC BLE family devices.

## Development Kit Configuration

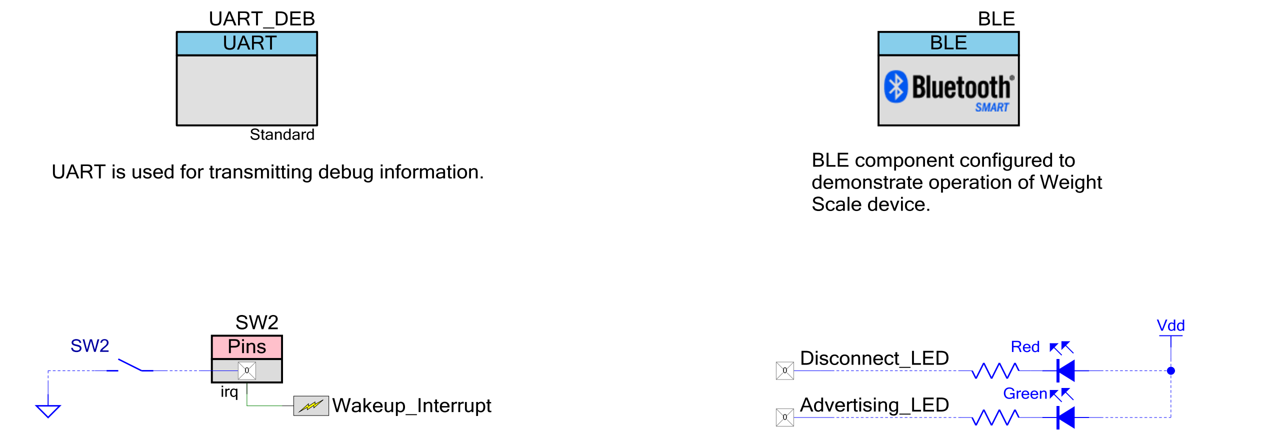
- Default CY8CKIT_042 BLE Pioneer Kit configuration

## Project Configuration

The top design schematic is shown in Figure 1.

**Figure 1. Top Design Schematic**

BLE Weight Scale Profile Example Project



UART is used for transmitting debug information.

BLE component configured to demonstrate operation of Weight Scale device.

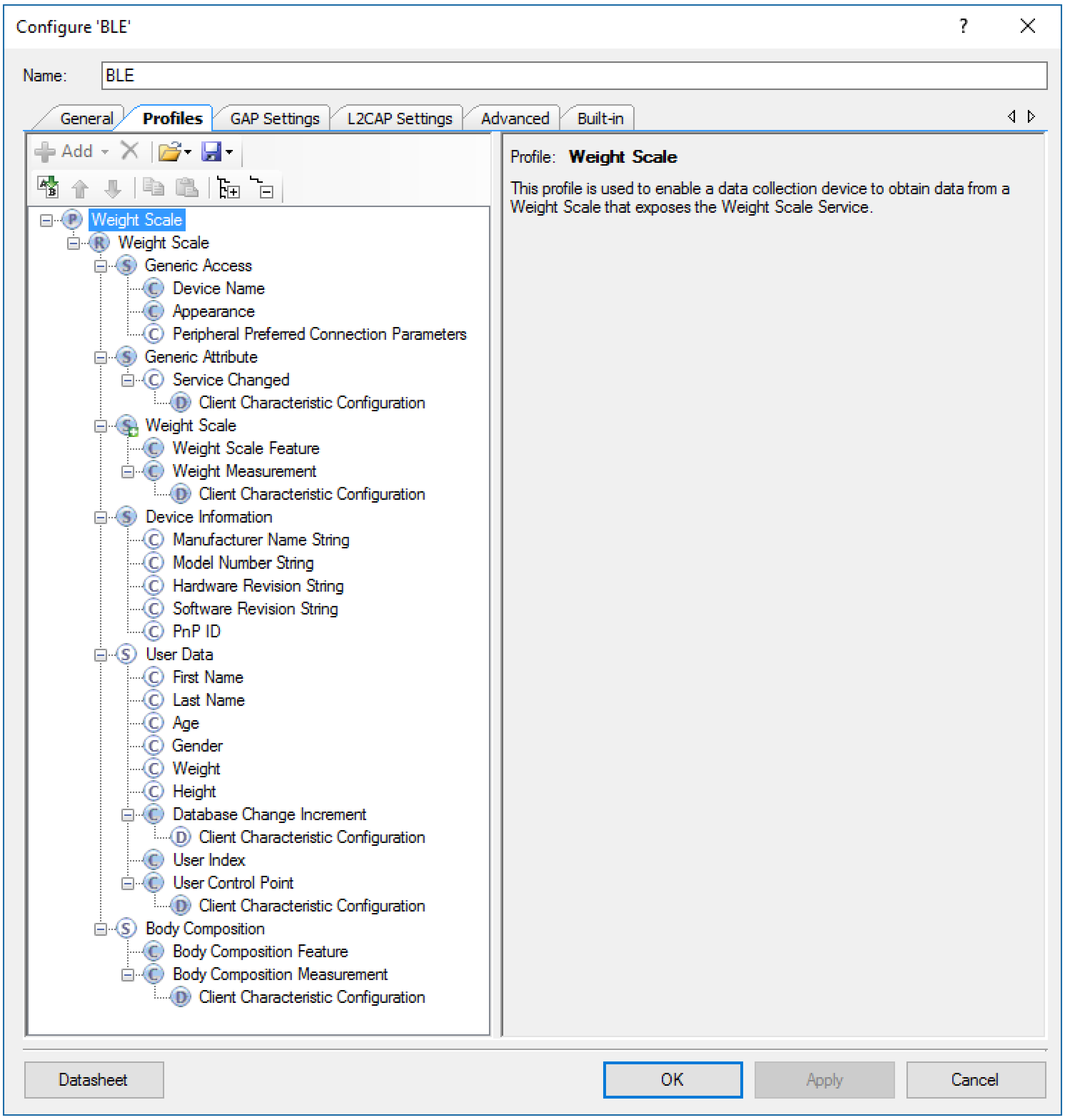
The button is used to wake the device up from hibernate mode and restart advertising.When in connected state it is used to switch between user records of the weight scale.

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

*Simple BLE example project that demonstrates how to configure and use Cypress's BLE component APIs and application layer callback for BLE weight scale application*

The BLE component is configured as a Weight Scale in the GAP Peripheral role with the settings shown in the figures below.

**Figure 2. GATT Settings**

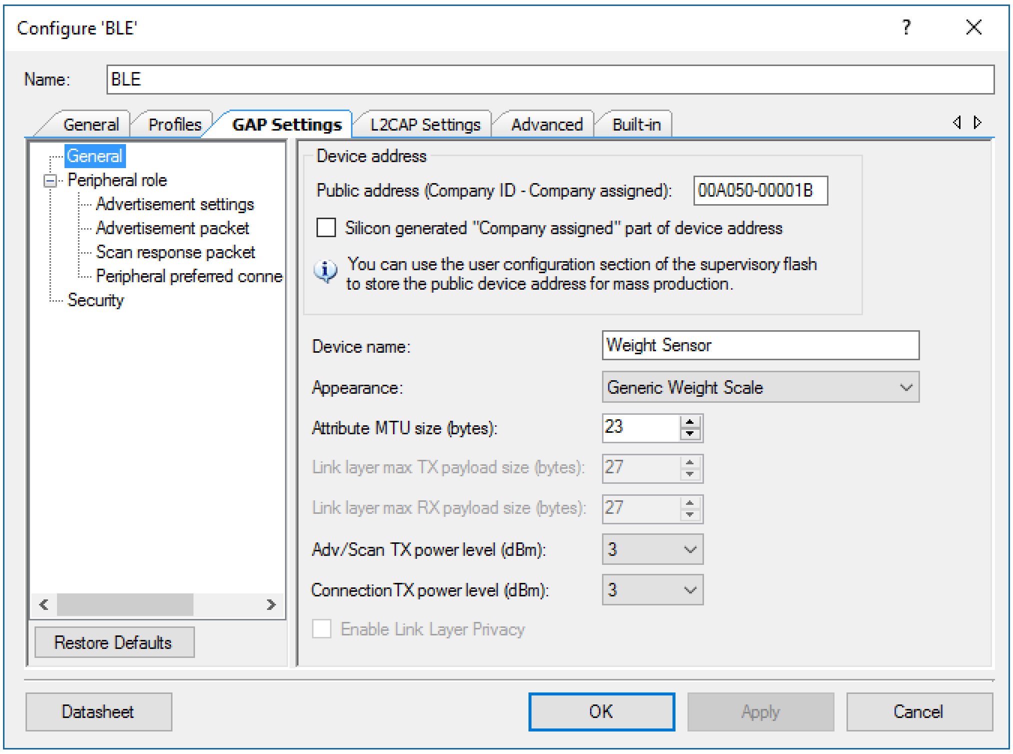


- P Weight Scale
  - R Weight Scale
    - S Generic Access
      - C Device Name
      - C Appearance
      - C Peripheral Preferred Connection Parameters
    - S Generic Attribute
      - C Service Changed
        - D Client Characteristic Configuration
    - S Weight Scale
      - C Weight Scale Feature
      - C Weight Measurement
        - D Client Characteristic Configuration
    - S Device Information
      - C Manufacturer Name String
      - C Model Number String
      - C Hardware Revision String
      - C Software Revision String
      - C PnP ID
    - S User Data
      - C First Name
      - C Last Name
      - C Age
      - C Gender
      - C Weight
      - C Height
      - C Database Change Increment
        - D Client Characteristic Configuration
      - C User Index
      - C User Control Point
        - D Client Characteristic Configuration
    - S Body Composition
      - C Body Composition Feature
      - C Body Composition Measurement
        - D Client Characteristic Configuration

Profile: **Weight Scale**

This profile is used to enable a data collection device to obtain data from a Weight Scale that exposes the Weight Scale Service.

### Figure 3. GAP Settings



Name: BLE

Device address

Public address (Company ID - Company assigned): 00A050-00001B

□ 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: Weight Sensor

Appearance: Generic Weight Scale

Attribute MTU size (bytes): 23

Link layer max TX payload size (bytes): 27

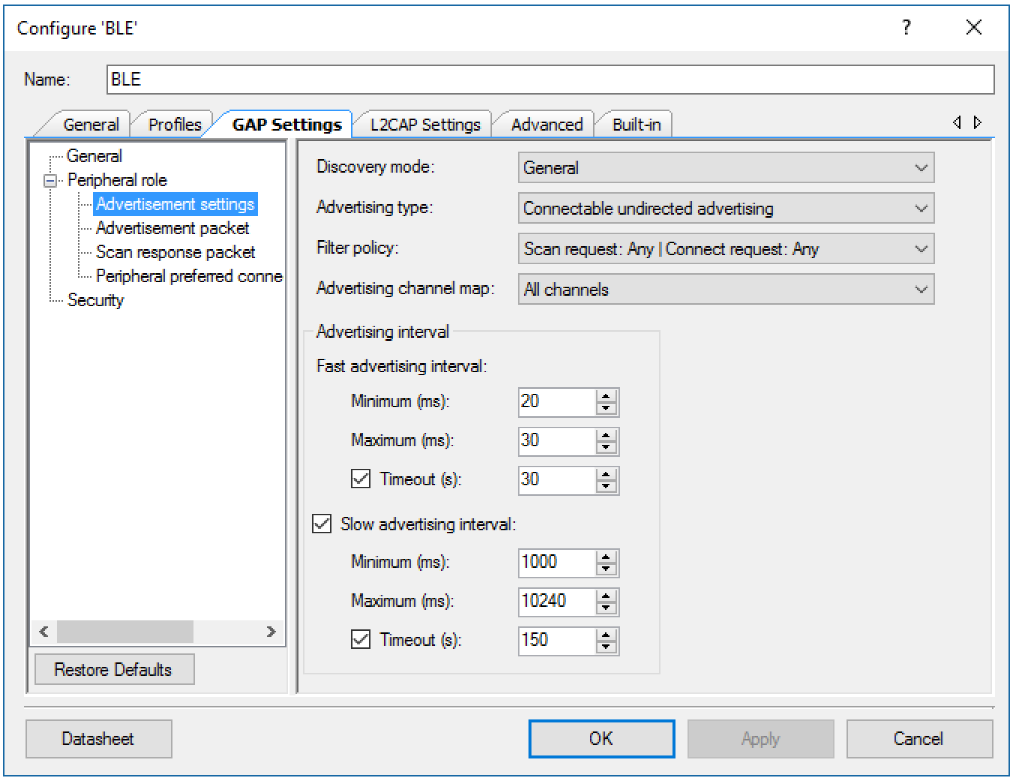
Link layer max RX payload size (bytes): 27

Adv/Scan TX power level (dBm): 3

Connection TX power level (dBm): 3

□ Enable Link Layer Privacy

### Figure 4. GAP Settings -> Advertisement Settings



Name: BLE

Discovery mode: General

Advertising type: Connectable undirected advertising

Filter policy: Scan request: Any | Connect request: Any

Advertising channel map: All channels

Advertising interval

Fast advertising interval:

Minimum (ms): 20

Maximum (ms): 30

☑ Timeout (s): 30

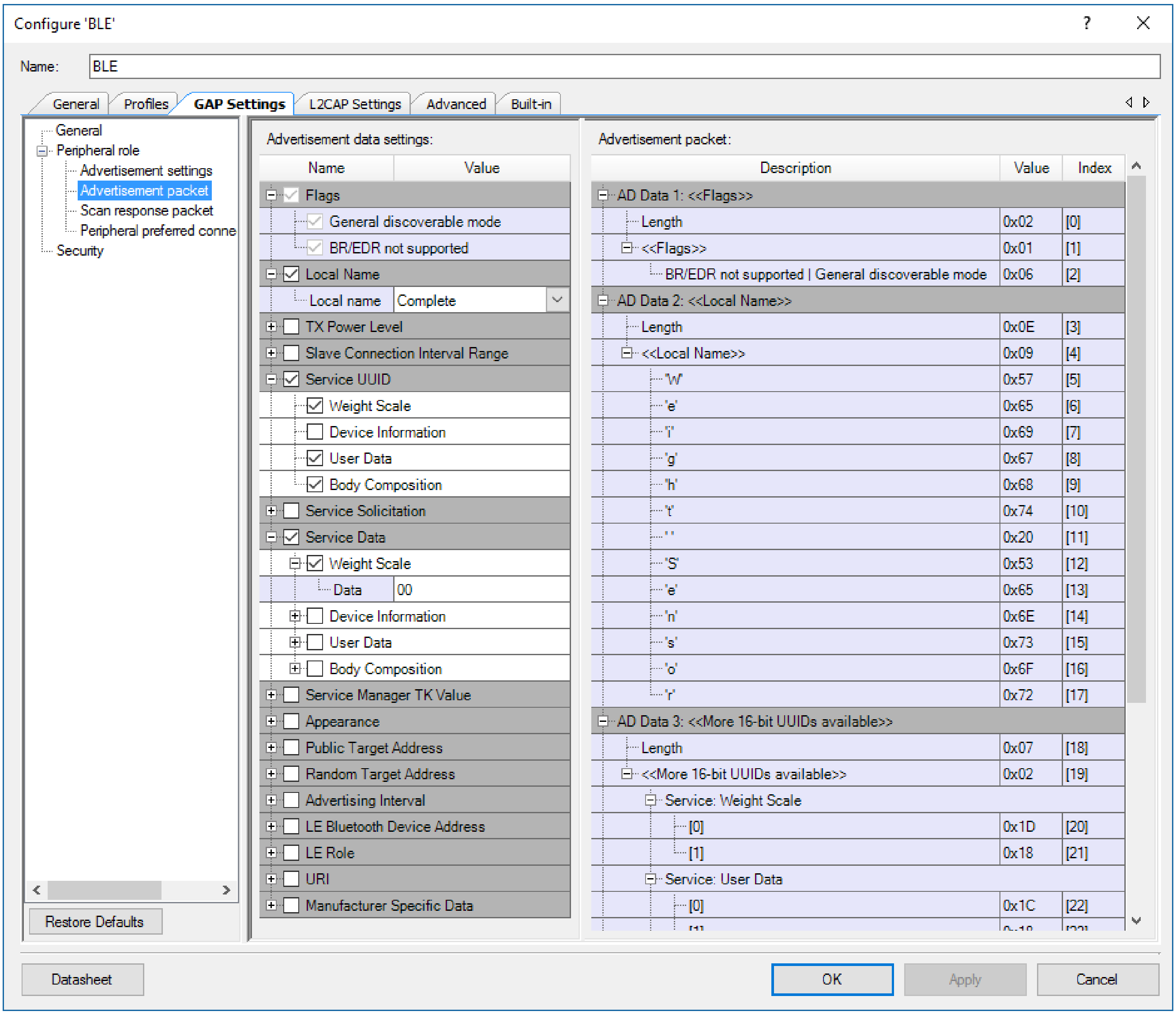
☑ Slow advertising interval:

Minimum (ms): 1000

Maximum (ms): 10240

☑ Timeout (s): 150

## Figure 5. GAP Settings -> Advertisement Packet



Name: BLE

- General
- Peripheral role
  - Advertisement settings
  - Advertisement packet
  - Scan response packet
  - Peripheral preferred conne
- Security

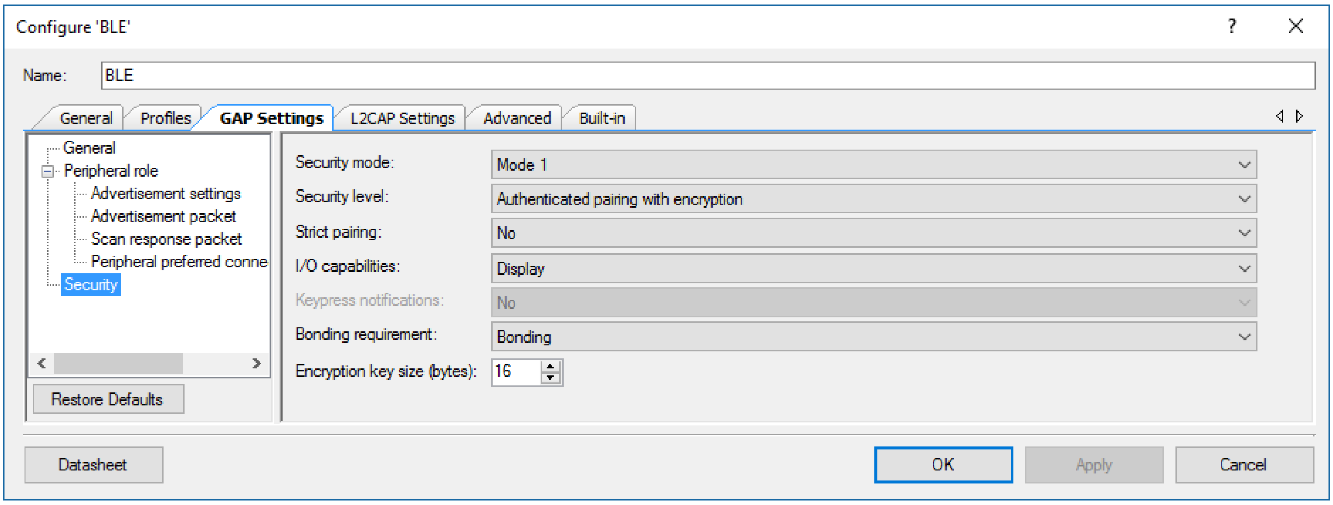
Advertisement data settings:

| Name | Value |
|---|---|
| ☑ Flags | |
| ☑ General discoverable mode | |
| ☑ BR/EDR not supported | |
| ☑ Local Name | |
| Local name | Complete |
| □ TX Power Level | |
| □ Slave Connection Interval Range | |
| ☑ Service UUID | |
| ☑ Weight Scale | |
| □ Device Information | |
| ☑ User Data | |
| ☑ Body Composition | |
| □ Service Solicitation | |
| ☑ Service Data | |
| ☑ Weight Scale | |
| Data | 00 |
| □ Device Information | |
| □ User Data | |
| □ Body Composition | |
| □ Service Manager TK Value | |
| □ Appearance | |
| □ Public Target Address | |
| □ Random Target Address | |
| □ Advertising Interval | |
| □ LE Bluetooth Device Address | |
| □ LE Role | |
| □ URI | |
| □ Manufacturer Specific Data | |

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 | 0x0E | [3] |
| <<Local Name>> | 0x09 | [4] |
| 'W' | 0x57 | [5] |
| 'e' | 0x65 | [6] |
| 'i' | 0x69 | [7] |
| 'g' | 0x67 | [8] |
| 'h' | 0x68 | [9] |
| 't' | 0x74 | [10] |
| ' ' | 0x20 | [11] |
| 'S' | 0x53 | [12] |
| 'e' | 0x65 | [13] |
| 'n' | 0x6E | [14] |
| 's' | 0x73 | [15] |
| 'o' | 0x6F | [16] |
| 'r' | 0x72 | [17] |
| AD Data 3: <<More 16-bit UUIDs available>> | | |
| Length | 0x07 | [18] |
| <<More 16-bit UUIDs available>> | 0x02 | [19] |
| Service: Weight Scale | | |
| [0] | 0x1D | [20] |
| [1] | 0x18 | [21] |
| Service: User Data | | |
| [0] | 0x1C | [22] |
| [1] | 0x18 | [23] |

## Figure 6. Security Settings



Name: BLE

- General
- Peripheral role
  - Advertisement settings
  - Advertisement packet
  - Scan response packet
  - Peripheral preferred conne
- Security

Security mode: Mode 1

Security level: Authenticated pairing with encryption

Strict pairing: No

I/O capabilities: Display

Keypress notifications: No

Bonding requirement: Bonding

Encryption key size (bytes): 16

# Project Description

The project demonstrates the core functionality of the BLE component configured as a Weight Scale.

Right after a startup the device performs initialization of the BLE component. For operation the component requires several callback functions in order to receive events from the BLE Stack. The AppCallBack() is used to receive the general events. Other callbacks (WssCallBack(), BcsCallBack() and UdsCallBack()) are used to receive events that are specific to the service's attribute operations.

The CYBLE_EVT_STACK_ON event indicates a successful initialization of the BLE Stack. After this event is received, the component starts fast advertising with the packet structure as configured in the BLE component customizer (see **Figure 5**). Once the 30-second advertising period expires, the component switches to the slow advertisement parameters. On an advertisement event timeout, if the Weight Scale is not connected to any Collector, the device goes to the Low Power mode (Hibernate mode) and waits for a SW2 button press to wake up the device again and start advertising.

You can connect to the Weight Scale device with a BLE 4.0 or BLE 4.1 compatible device configured in the GAP Central role and capable of discovering the Weight Scale and User Data Services. To connect to a Weight Scale device, send a connection request to the device when the device is advertising. The blinking green LED indicates that the device is advertising. If the Collector is connected to the Weight Scale, the green LED will stop blinking.

While connected to the Collector and between connection intervals, to save power, the device is put into DeepSleep mode.

A HyperTerminal program is required in the PC to receive debugging information. If you don't have a HyperTerminal program installed, download and install any serial port communication program. Freeware such as Bray's Terminal, Putty etc. are available on the web.

# Weight Scale Operation

The Weight Scale utilizes several BLE Services in its operation, such as Weight Scale, User Data, Body Composition, and Device Information. For simplicity, the simulation of Body Composition measurements are not implemented in the example project. The Weight Scale is configured to generate new weight measurements for the currently active user each 7 seconds. The measurements are sent with notifications. The measurement data includes Flags, Weight, Height and BMI. The simulation starts from the value of 70 kg (the project is configured to send only metric values) and is incremented by 0.5 kg each 7 seconds. When the weight reaches 80 kg, it is reset back to 70 kg.

The User Data Service is utilized for managing different user records. In the current example it allows managing up to 4 user records. Initially, the project has only one registered user, so other 3 user records need to be created if required. A new user can be created using "Register New User" command which needs to be sent to the User Control Point. UDS also supports "Consent" and "Delete User" commands. Refer to UDS specification for detailed description and commands format.

### Register a New User

As it was already mentioned, initially the project has only one registered user. The user record has the following default values:

*First name – John*
*Last Name – Smith*
*Age – 25*
*Gender – Male*
*Weight – 70 kg (14000 with resolution 0.005 kg)*
*Height – 1.7 m (1700 with resolution 0.01 kg)*

All newly registered users' records will be initialized with these default values. After a user is registered, any of these values (that are stored in UDS characteristics) are accessible for modification.

### Consent Code

The Consent Code is used to provide security of the user record. The Weight Scale doesn't grant an access to the user record that is initially present in the example. To get an access to the record, it is required to send a Consent command with a Consent Code of "0000". The Consent operation is also required when switching between the existing user records using SW2 button.

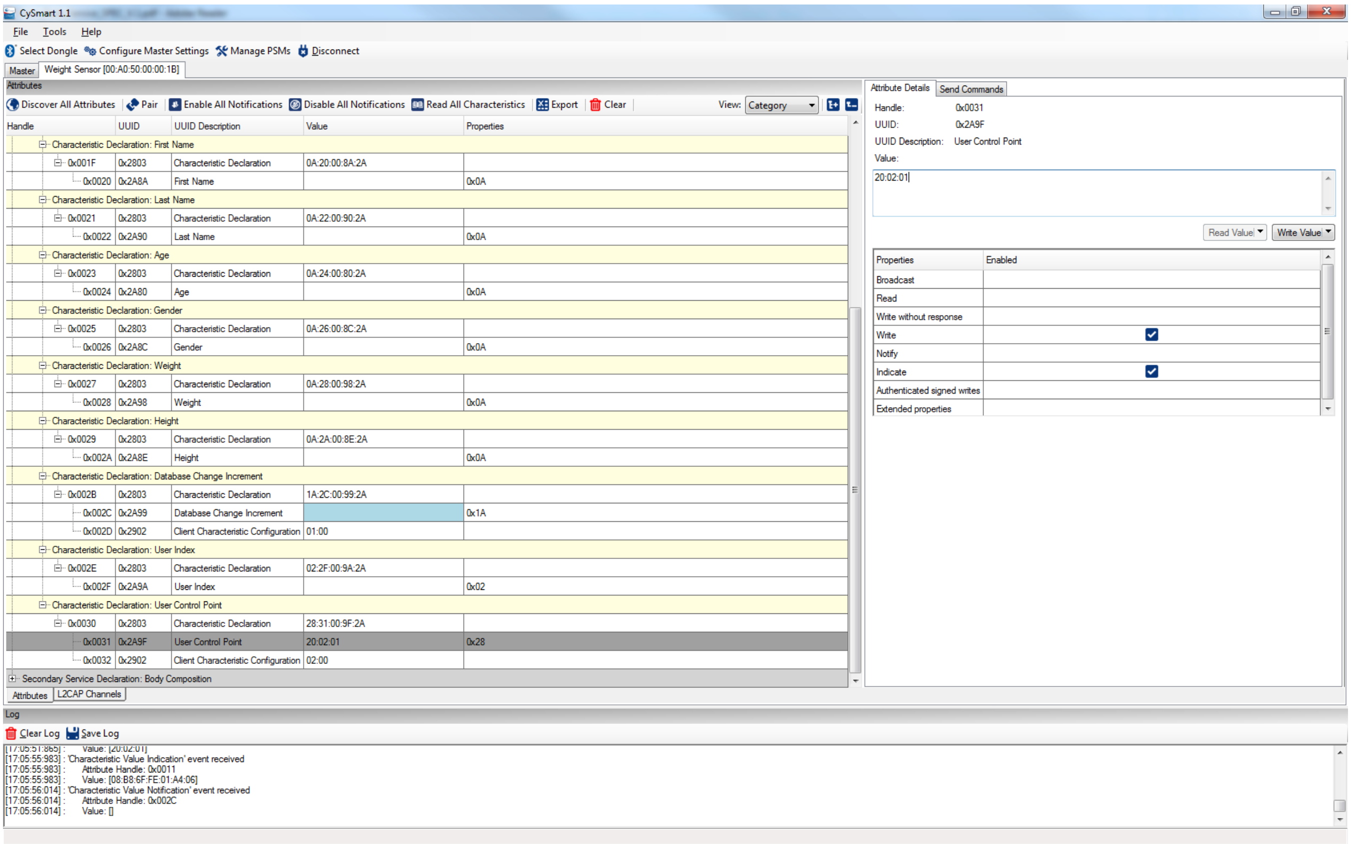
## Expected Results

You can use CySmart app on a Windows PC, Android or iOS BLE-compatible device as a Client for connection to the Weight Scale.

To use the CySmart Windows application as a Weight Scale Collector:

- Connect the CySmart BLE dongle to a USB port on the PC.
- Launch the CySmart app and select the connected dongle in the dialog window.
- Reset the development kit to start advertising by pressing the SW1 button.
- Click the **Start Scan** button to discover available devices.
- Select **Weight Sensor** in the list of available devices and connect to it.
- Click **Pair**, enter passkey displayed on HyperTerminal, then **Discover All Attributes**, and **Enable All Notifications** in the CySmart app.
- Select **User Control Point** of the **User Data Service** and write the following value to the characteristic: **02 00 00 00** (all the values that are written to the CySmart are in hexadecimal format)**.** The value represents **Consent** command **02** with user index of **00** and consent code **0000**.

## Figure 7. CySmart Windows app: User Control Point Indication – Successful execution of Consent Operation



| Handle | UUID | UUID Description | Value | Properties |
|---|---|---|---|---|
| Characteristic Declaration: First Name | | | | |
| 0x001F | 0x2803 | Characteristic Declaration | 0A:20:00:8A:2A | |
| 0x0020 | 0x2A8A | First Name | | 0x0A |
| Characteristic Declaration: Last Name | | | | |
| 0x0021 | 0x2803 | Characteristic Declaration | 0A:22:00:90:2A | |
| 0x0022 | 0x2A90 | Last Name | | 0x0A |
| Characteristic Declaration: Age | | | | |
| 0x0023 | 0x2803 | Characteristic Declaration | 0A:24:00:80:2A | |
| 0x0024 | 0x2A80 | Age | | 0x0A |
| Characteristic Declaration: Gender | | | | |
| 0x0025 | 0x2803 | Characteristic Declaration | 0A:26:00:8C:2A | |
| 0x0026 | 0x2A8C | Gender | | 0x0A |
| Characteristic Declaration: Weight | | | | |
| 0x0027 | 0x2803 | Characteristic Declaration | 0A:28:00:98:2A | |
| 0x0028 | 0x2A98 | Weight | | 0x0A |
| Characteristic Declaration: Height | | | | |
| 0x0029 | 0x2803 | Characteristic Declaration | 0A:2A:00:8E:2A | |
| 0x002A | 0x2A8E | Height | | 0x0A |
| Characteristic Declaration: Database Change Increment | | | | |
| 0x002B | 0x2803 | Characteristic Declaration | 1A:2C:00:99:2A | |
| 0x002C | 0x2A99 | Database Change Increment | | 0x1A |
| 0x002D | 0x2902 | Client Characteristic Configuration | 01:00 | |
| Characteristic Declaration: User Index | | | | |
| 0x002E | 0x2803 | Characteristic Declaration | 02:2F:00:9A:2A | |
| 0x002F | 0x2A9A | User Index | | 0x02 |
| Characteristic Declaration: User Control Point | | | | |
| 0x0030 | 0x2803 | Characteristic Declaration | 28:31:00:9F:2A | |
| 0x0031 | 0x2A9F | User Control Point | 20:02:01 | 0x28 |
| 0x0032 | 0x2902 | Client Characteristic Configuration | 02:00 | |
| Secondary Service Declaration: Body Composition | | | | |

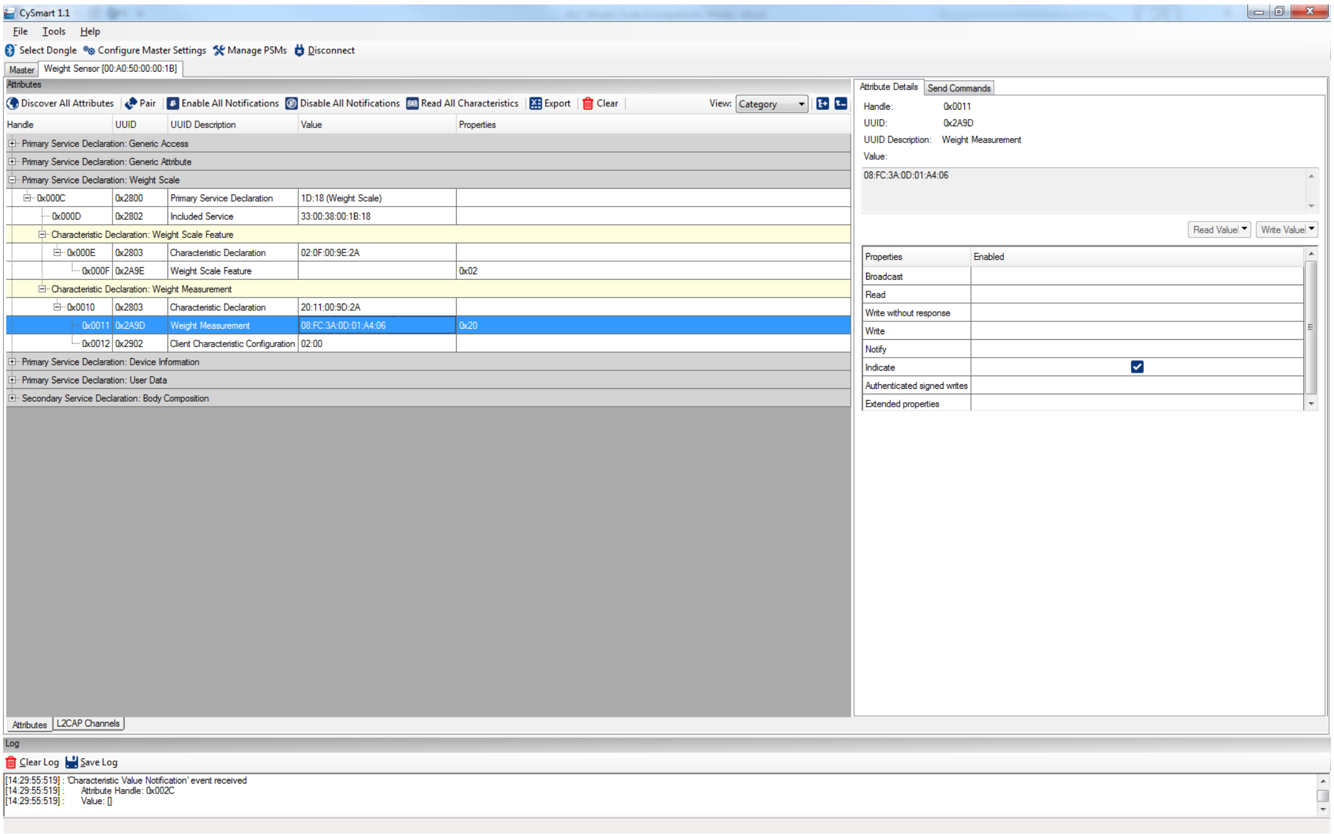
Handle: 0x0031
UUID: 0x2A9F
UUID Description: User Control Point
Value:
20:02:01

| Properties | Enabled |
|---|---|
| Broadcast | |
| Read | |
| Write without response | |
| Write | ☑ |
| Notify | |
| Indicate | ☑ |
| Authenticated signed writes | |
| Extended properties | |

```
[17:05:51:865] :      Value: [20:02:01]
[17:05:55:983] : 'Characteristic Value Indication' event received
[17:05:55:983] :      Attribute Handle: 0x0011
[17:05:55:983] :      Value: [08:B8:6F:FE:01:A4:06]
[17:05:56:014] : 'Characteristic Value Notification' event received
[17:05:56:014] :      Attribute Handle: 0x002C
[17:05:56:014] :      Value: []
```

- Observe the response indication from the **User Control Point**. The general format of a response is following: XX:YY:ZZ:PP, where XX - response Op Code, YY- requested Op Code, ZZ – response value, PP – response parameter. Response value field can be set to one of the following values: 01 – Success, 02 – Op Code is not supported, 03 – Invalid Parameter, 04 – Operation Failed, 05 – User Not Authorized.
- Select **Weight Measurement Characteristic** of the **Weight Scale Service** and observe notifications from the service.

**Figure 8. CySmart Windows app: Weight Measurement notification received**



| Handle | UUID | UUID Description | Value | Properties |
|---|---|---|---|---|
| Primary Service Declaration: Generic Access | | | | |
| Primary Service Declaration: Generic Attribute | | | | |
| Primary Service Declaration: Weight Scale | | | | |
| 0x000C | 0x2800 | Primary Service Declaration | 1D:18 (Weight Scale) | |
| 0x000D | 0x2802 | Included Service | 33:00:38:00:1B:18 | |
| Characteristic Declaration: Weight Scale Feature | | | | |
| 0x000E | 0x2803 | Characteristic Declaration | 02:0F:00:9E:2A | |
| 0x000F | 0x2A9E | Weight Scale Feature | | 0x02 |
| Characteristic Declaration: Weight Measurement | | | | |
| 0x0010 | 0x2803 | Characteristic Declaration | 20:11:00:9D:2A | |
| 0x0011 | 0x2A9D | Weight Measurement | 08:FC:3A:0D:01:A4:06 | 0x20 |
| 0x0012 | 0x2902 | Client Characteristic Configuration | 02:00 | |
| Primary Service Declaration: Device Information | | | | |
| Primary Service Declaration: User Data | | | | |
| Secondary Service Declaration: Body Composition | | | | |

Handle: 0x0011

UUID: 0x2A9D

UUID Description: Weight Measurement

Value:

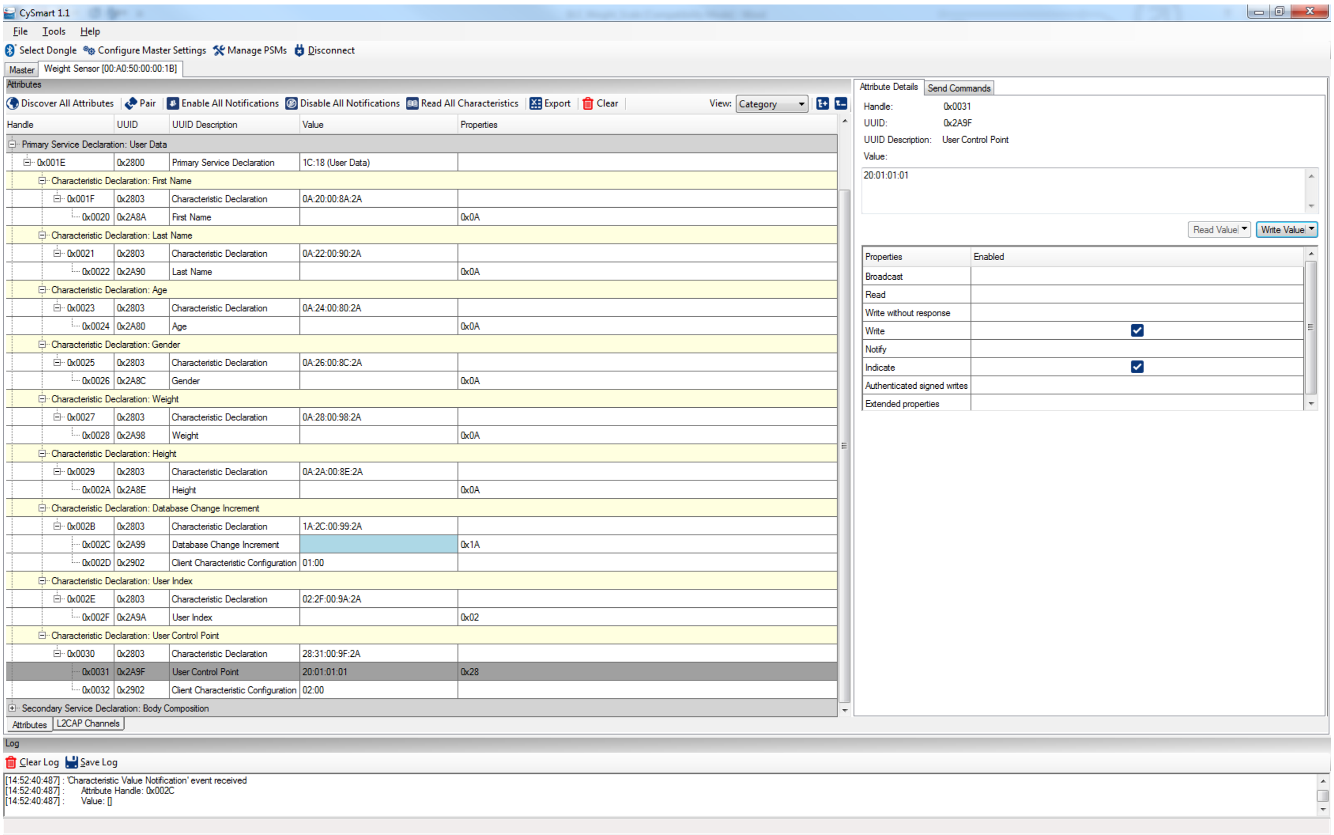
08:FC:3A:0D:01:A4:06

| Properties | Enabled |
|---|---|
| Broadcast | |
| Read | |
| Write without response | |
| Write | |
| Notify | |
| Indicate | ☑ |
| Authenticated signed writes | |
| Extended properties | |

```
[14:29:55:519] : 'Characteristic Value Notification' event received
[14:29:55:519] :      Attribute Handle: 0x002C
[14:29:55:519] :      Value: []
```

- The Consent command can also be used to switch between the user records of the Weight Scale. But to be able to switch between the user records, a user should be registered. To register a user please select **User Control Point** of the **User Data Service** and write the following value to the characteristic **– 01 XX XX.** The value represents **Register New User** command (01) with consent code of XXXX.

**Figure 9. CySmart Windows app: User Control Point Indication – Successful execution of Register New User operation**



| Handle | UUID | UUID Description | Value | Properties |
|---|---|---|---|---|
| Primary Service Declaration: User Data | | | | |
| 0x001E | 0x2800 | Primary Service Declaration | 1C:18 (User Data) | |
| Characteristic Declaration: First Name | | | | |
| 0x001F | 0x2803 | Characteristic Declaration | 0A:20:00:8A:2A | |
| 0x0020 | 0x2A8A | First Name | | 0x0A |
| Characteristic Declaration: Last Name | | | | |
| 0x0021 | 0x2803 | Characteristic Declaration | 0A:22:00:90:2A | |
| 0x0022 | 0x2A90 | Last Name | | 0x0A |
| Characteristic Declaration: Age | | | | |
| 0x0023 | 0x2803 | Characteristic Declaration | 0A:24:00:80:2A | |
| 0x0024 | 0x2A80 | Age | | 0x0A |
| Characteristic Declaration: Gender | | | | |
| 0x0025 | 0x2803 | Characteristic Declaration | 0A:26:00:8C:2A | |
| 0x0026 | 0x2A8C | Gender | | 0x0A |
| Characteristic Declaration: Weight | | | | |
| 0x0027 | 0x2803 | Characteristic Declaration | 0A:28:00:98:2A | |
| 0x0028 | 0x2A98 | Weight | | 0x0A |
| Characteristic Declaration: Height | | | | |
| 0x0029 | 0x2803 | Characteristic Declaration | 0A:2A:00:8E:2A | |
| 0x002A | 0x2A8E | Height | | 0x0A |
| Characteristic Declaration: Database Change Increment | | | | |
| 0x002B | 0x2803 | Characteristic Declaration | 1A:2C:00:99:2A | |
| 0x002C | 0x2A99 | Database Change Increment | | 0x1A |
| 0x002D | 0x2902 | Client Characteristic Configuration | 01:00 | |
| Characteristic Declaration: User Index | | | | |
| 0x002E | 0x2803 | Characteristic Declaration | 02:2F:00:9A:2A | |
| 0x002F | 0x2A9A | User Index | | 0x02 |
| Characteristic Declaration: User Control Point | | | | |
| 0x0030 | 0x2803 | Characteristic Declaration | 28:31:00:9F:2A | |
| 0x0031 | 0x2A9F | User Control Point | 20:01:01:01 | 0x28 |
| 0x0032 | 0x2902 | Client Characteristic Configuration | 02:00 | |
| Secondary Service Declaration: Body Composition | | | | |

Handle: 0x0031

UUID: 0x2A9F

UUID Description: User Control Point

Value:

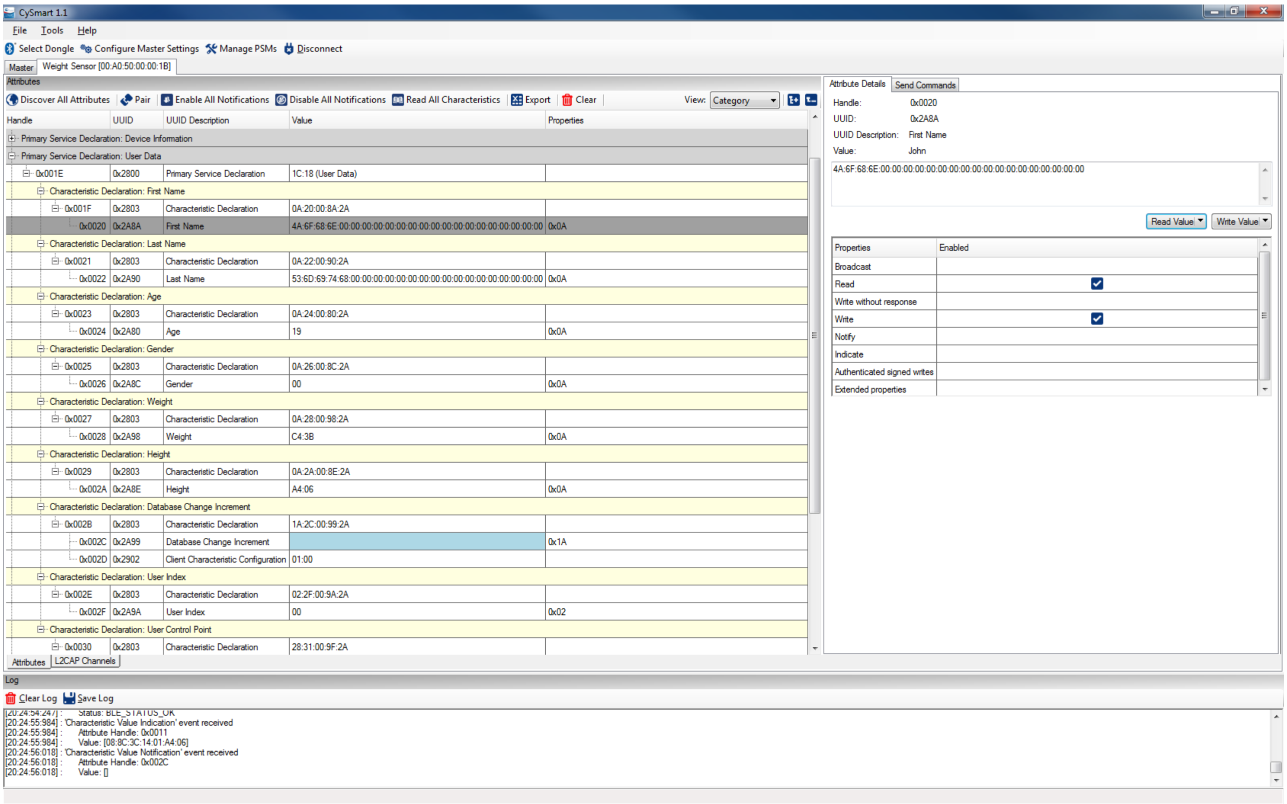
20:01:01:01

| Properties | Enabled |
|---|---|
| Broadcast | |
| Read | |
| Write without response | |
| Write | ☑ |
| Notify | |
| Indicate | ☑ |
| Authenticated signed writes | |
| Extended properties | |

```
[14:52:40:487] : 'Characteristic Value Notification' event received
[14:52:40:487] :     Attribute Handle: 0x002C
[14:52:40:487] :     Value: []
```

- After indication of successful execution of the **Consent** or **Register New User** operation the UDS characteristics are accessible for read/write. Select **First Name** Characteristic and click **Read Value**.

## Figure 10. CySmart Windows app: Read UDS Characteristics – Read First Name



| Handle | UUID | UUID Description | Value | Properties |
|---|---|---|---|---|
| Primary Service Declaration: Device Information | | | | |
| Primary Service Declaration: User Data | | | | |
| 0x001E | 0x2800 | Primary Service Declaration | 1C:18 (User Data) | |
| Characteristic Declaration: First Name | | | | |
| 0x001F | 0x2803 | Characteristic Declaration | 0A:20:00:8A:2A | |
| 0x0020 | 0x2A8A | First Name | 4A:6F:68:6E:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00 | 0x0A |
| Characteristic Declaration: Last Name | | | | |
| 0x0021 | 0x2803 | Characteristic Declaration | 0A:22:00:90:2A | |
| 0x0022 | 0x2A90 | Last Name | 53:6D:69:74:68:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00 | 0x0A |
| Characteristic Declaration: Age | | | | |
| 0x0023 | 0x2803 | Characteristic Declaration | 0A:24:00:80:2A | |
| 0x0024 | 0x2A80 | Age | 19 | 0x0A |
| Characteristic Declaration: Gender | | | | |
| 0x0025 | 0x2803 | Characteristic Declaration | 0A:26:00:8C:2A | |
| 0x0026 | 0x2A8C | Gender | 00 | 0x0A |
| Characteristic Declaration: Weight | | | | |
| 0x0027 | 0x2803 | Characteristic Declaration | 0A:28:00:98:2A | |
| 0x0028 | 0x2A98 | Weight | C4:3B | 0x0A |
| Characteristic Declaration: Height | | | | |
| 0x0029 | 0x2803 | Characteristic Declaration | 0A:2A:00:8E:2A | |
| 0x002A | 0x2A8E | Height | A4:06 | 0x0A |
| Characteristic Declaration: Database Change Increment | | | | |
| 0x002B | 0x2803 | Characteristic Declaration | 1A:2C:00:99:2A | |
| 0x002C | 0x2A99 | Database Change Increment | | 0x1A |
| 0x002D | 0x2902 | Client Characteristic Configuration | 01:00 | |
| Characteristic Declaration: User Index | | | | |
| 0x002E | 0x2803 | Characteristic Declaration | 02:2F:00:9A:2A | |
| 0x002F | 0x2A9A | User Index | 00 | 0x02 |
| Characteristic Declaration: User Control Point | | | | |
| 0x0030 | 0x2803 | Characteristic Declaration | 28:31:00:9F:2A | |

Handle: 0x0020

UUID: 0x2A8A

UUID Description: First Name

Value: John

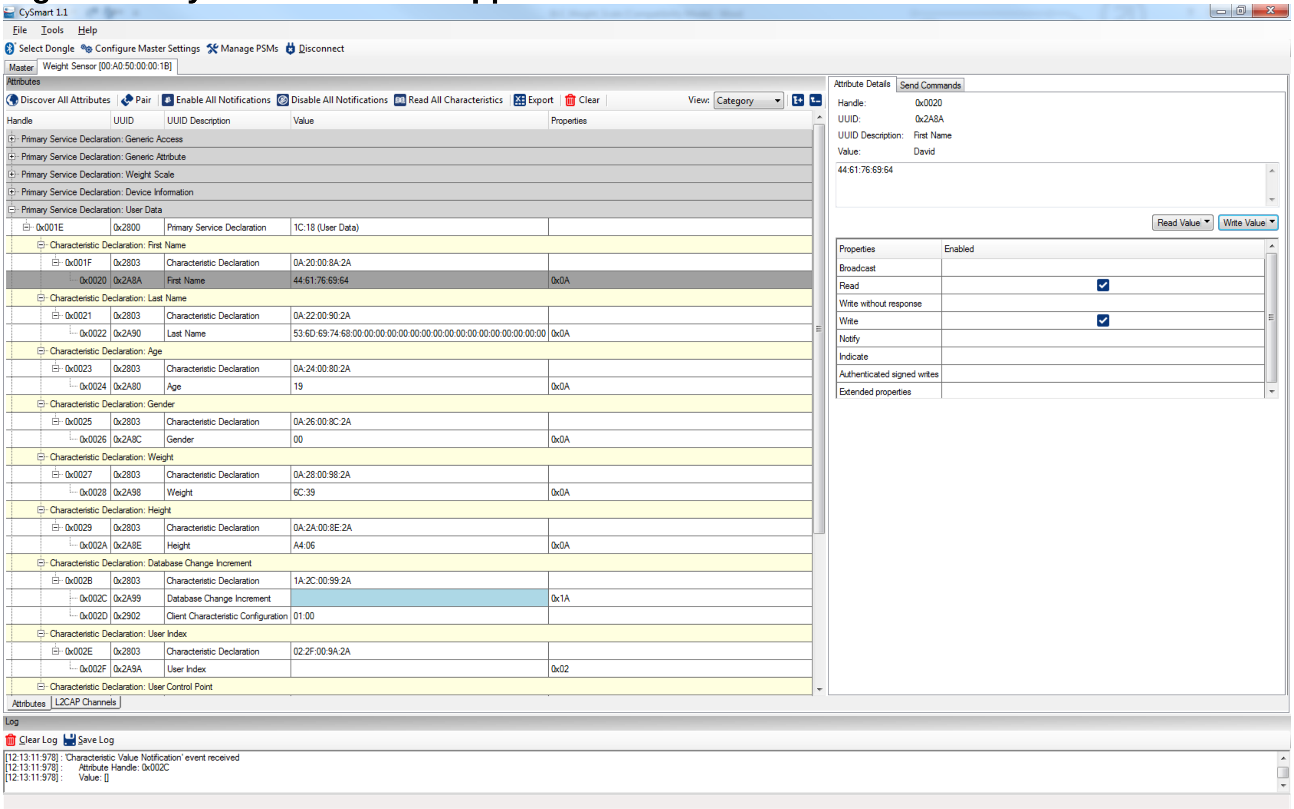
4A:6F:68:6E:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00

| Properties | Enabled |
|---|---|
| Broadcast | |
| Read | ☑ |
| Write without response | |
| Write | ☑ |
| Notify | |
| Indicate | |
| Authenticated signed writes | |
| Extended properties | |

```
[20:24:54:247] :      Status: BLE_STATUS_OK
[20:24:55:984] : 'Characteristic Value Indication' event received
[20:24:55:984] :      Attribute Handle: 0x0011
[20:24:55:984] :      Value: [08:8C:3C:14:01:A4:06]
[20:24:56:018] : 'Characteristic Value Notification' event received
[20:24:56:018] :      Attribute Handle: 0x002C
[20:24:56:018] :      Value: []
```

- Any of the UDS Characteristics can be written to modify default values. To modify the **First Name** Characteristic, select it in the app., type the name converted to ASCII format (e.g. “David” – **4461766964**).

### Figure 11. CySmart Windows app: Write UDS Characteristics – Read First Name



| Handle | UUID | UUID Description | Value | Properties |
|---|---|---|---|---|
| Primary Service Declaration: Generic Access | | | | |
| Primary Service Declaration: Generic Attribute | | | | |
| Primary Service Declaration: Weight Scale | | | | |
| Primary Service Declaration: Device Information | | | | |
| Primary Service Declaration: User Data | | | | |
| 0x001E | 0x2800 | Primary Service Declaration | 1C:18 (User Data) | |
| Characteristic Declaration: First Name | | | | |
| 0x001F | 0x2803 | Characteristic Declaration | 0A:20:00:8A:2A | |
| 0x0020 | 0x2A8A | First Name | 44:61:76:69:64 | 0x0A |
| Characteristic Declaration: Last Name | | | | |
| 0x0021 | 0x2803 | Characteristic Declaration | 0A:22:00:90:2A | |
| 0x0022 | 0x2A90 | Last Name | 53:6D:69:74:68:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00 | 0x0A |
| Characteristic Declaration: Age | | | | |
| 0x0023 | 0x2803 | Characteristic Declaration | 0A:24:00:80:2A | |
| 0x0024 | 0x2A80 | Age | 19 | 0x0A |
| Characteristic Declaration: Gender | | | | |
| 0x0025 | 0x2803 | Characteristic Declaration | 0A:26:00:8C:2A | |
| 0x0026 | 0x2A8C | Gender | 00 | 0x0A |
| Characteristic Declaration: Weight | | | | |
| 0x0027 | 0x2803 | Characteristic Declaration | 0A:28:00:98:2A | |
| 0x0028 | 0x2A98 | Weight | 6C:39 | 0x0A |
| Characteristic Declaration: Height | | | | |
| 0x0029 | 0x2803 | Characteristic Declaration | 0A:2A:00:8E:2A | |
| 0x002A | 0x2A8E | Height | A4:06 | 0x0A |
| Characteristic Declaration: Database Change Increment | | | | |
| 0x002B | 0x2803 | Characteristic Declaration | 1A:2C:00:99:2A | |
| 0x002C | 0x2A99 | Database Change Increment | | 0x1A |
| 0x002D | 0x2902 | Client Characteristic Configuration | 01:00 | |
| Characteristic Declaration: User Index | | | | |
| 0x002E | 0x2803 | Characteristic Declaration | 02:2F:00:9A:2A | |
| 0x002F | 0x2A9A | User Index | | 0x02 |
| Characteristic Declaration: User Control Point | | | | |

Handle: 0x0020
UUID: 0x2A8A
UUID Description: First Name
Value: David

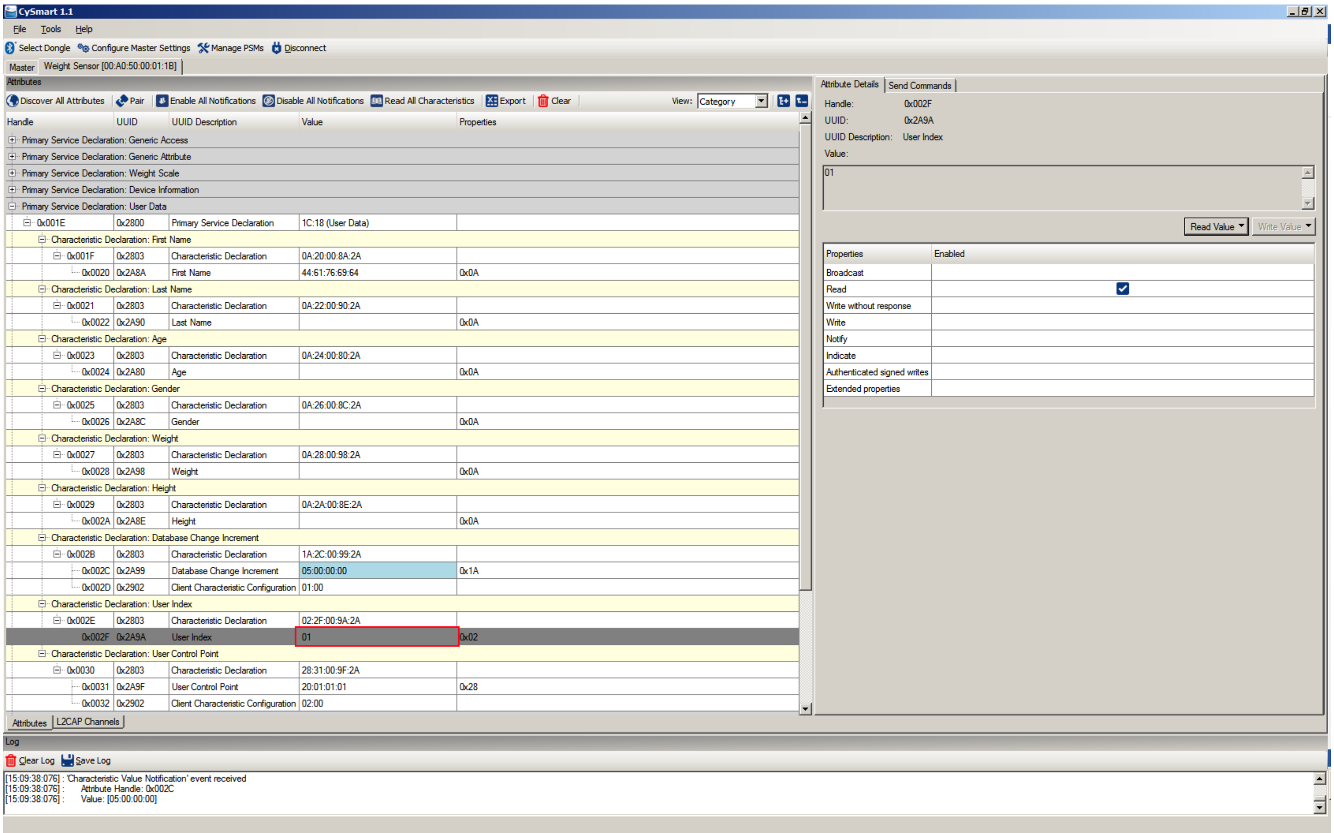
44:61:76:69:64

| Properties | Enabled |
|---|---|
| Broadcast | |
| Read | ☑ |
| Write without response | |
| Write | ☑ |
| Notify | |
| Indicate | |
| Authenticated signed writes | |
| Extended properties | |

```
[12:13:11:978] : 'Characteristic Value Notification' event received
[12:13:11:978] :      Attribute Handle: 0x002C
[12:13:11:978] :      Value: []
```

- Select **User Index Characteristic** and click **Read Value**. This will return the active user index whose record is currently active in the Weight Scale.

### Figure 12. CySmart Windows app: Read Database Change Increment and User Index Characteristics


CySmart 1.1
File Tools Help
Select Dongle Configure Master Settings Manage PSMs Disconnect
Master
Weight Sensor [00:A0:50:00:01:1B]
Attributes
Discover All Attributes Pair Enable All Notifications Disable All Notifications Read All Characteristics Export Clear
View: Category
Attribute Details Send Commands
Read Value Write Value
Attributes L2CAP Channels
Log
Clear Log Save Log

| Handle | UUID | UUID Description | Value | Properties |
|---|---|---|---|---|
| Primary Service Declaration: Generic Access | | | | |
| Primary Service Declaration: Generic Attribute | | | | |
| Primary Service Declaration: Weight Scale | | | | |
| Primary Service Declaration: Device Information | | | | |
| Primary Service Declaration: User Data | | | | |
| 0x001E | 0x2800 | Primary Service Declaration | 1C:18 (User Data) | |
| Characteristic Declaration: First Name | | | | |
| 0x001F | 0x2803 | Characteristic Declaration | 0A:20:00:8A:2A | |
| 0x0020 | 0x2A8A | First Name | 44:61:76:69:64 | 0x0A |
| Characteristic Declaration: Last Name | | | | |
| 0x0021 | 0x2803 | Characteristic Declaration | 0A:22:00:90:2A | |
| 0x0022 | 0x2A90 | Last Name | | 0x0A |
| Characteristic Declaration: Age | | | | |
| 0x0023 | 0x2803 | Characteristic Declaration | 0A:24:00:80:2A | |
| 0x0024 | 0x2A80 | Age | | 0x0A |
| Characteristic Declaration: Gender | | | | |
| 0x0025 | 0x2803 | Characteristic Declaration | 0A:26:00:8C:2A | |
| 0x0026 | 0x2A8C | Gender | | 0x0A |
| Characteristic Declaration: Weight | | | | |
| 0x0027 | 0x2803 | Characteristic Declaration | 0A:28:00:98:2A | |
| 0x0028 | 0x2A98 | Weight | | 0x0A |
| Characteristic Declaration: Height | | | | |
| 0x0029 | 0x2803 | Characteristic Declaration | 0A:2A:00:8E:2A | |
| 0x002A | 0x2A8E | Height | | 0x0A |
| Characteristic Declaration: Database Change Increment | | | | |
| 0x002B | 0x2803 | Characteristic Declaration | 1A:2C:00:99:2A | |
| 0x002C | 0x2A99 | Database Change Increment | 05:00:00:00 | 0x1A |
| 0x002D | 0x2902 | Client Characteristic Configuration | 01:00 | |
| Characteristic Declaration: User Index | | | | |
| 0x002E | 0x2803 | Characteristic Declaration | 02:2F:00:9A:2A | |
| 0x002F | 0x2A9A | User Index | 01 | 0x02 |
| Characteristic Declaration: User Control Point | | | | |
| 0x0030 | 0x2803 | Characteristic Declaration | 28:31:00:9F:2A | |
| 0x0031 | 0x2A9F | User Control Point | 20:01:01:01 | 0x28 |
| 0x0032 | 0x2902 | Client Characteristic Configuration | 02:00 | |

Handle: 0x002F
UUID: 0x2A9A
UUID Description: User Index
Value:
01

| Properties | Enabled |
|---|---|
| Broadcast | |
| Read | ☑ |
| Write without response | |
| Write | |
| Notify | |
| Indicate | |
| Authenticated signed writes | |
| Extended properties | |

```
[15:09:38:076] : 'Characteristic Value Notification' event received
[15:09:38:076] :      Attribute Handle: 0x002C
[15:09:38:076] :      Value: [05:00:00:00]
```

- Press SW2 button on the CY8CKIT_042 BLE Pioneer Kit and read the value of **User Index Characteristic** again to see that the active user index was changed (you need to have at least two registered users).

If you have problems with usage of the CySmart app, please, refer to CySmart User Guide.

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