



# **WIMOTO – BLE SMART DEVICE USER GUIDE – VER 1.0.0**

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## 1 Introduction

Wimoto is developing a smart device which integrates many sensors for BLE climate profile (temperature, humidity, light level), Grow profile (light, temperature, soil moisture) and Sentry profile (passive infrared, accelerometer), Thermo profile (probe (NT) C temperature, thermopile temperature) and Water Profile (water presence, water level) on Nordic semiconductor nrf51822 based hardware platform. This device can be configured and managed by corresponding app on mobile devices like iPhone, Android and a proprietary gateway.

This document provides details on how to get the source code working on the target hardware. This also provides details on how the source code is organized and what is to be done in case of any problems.

## 2 Initial Setup

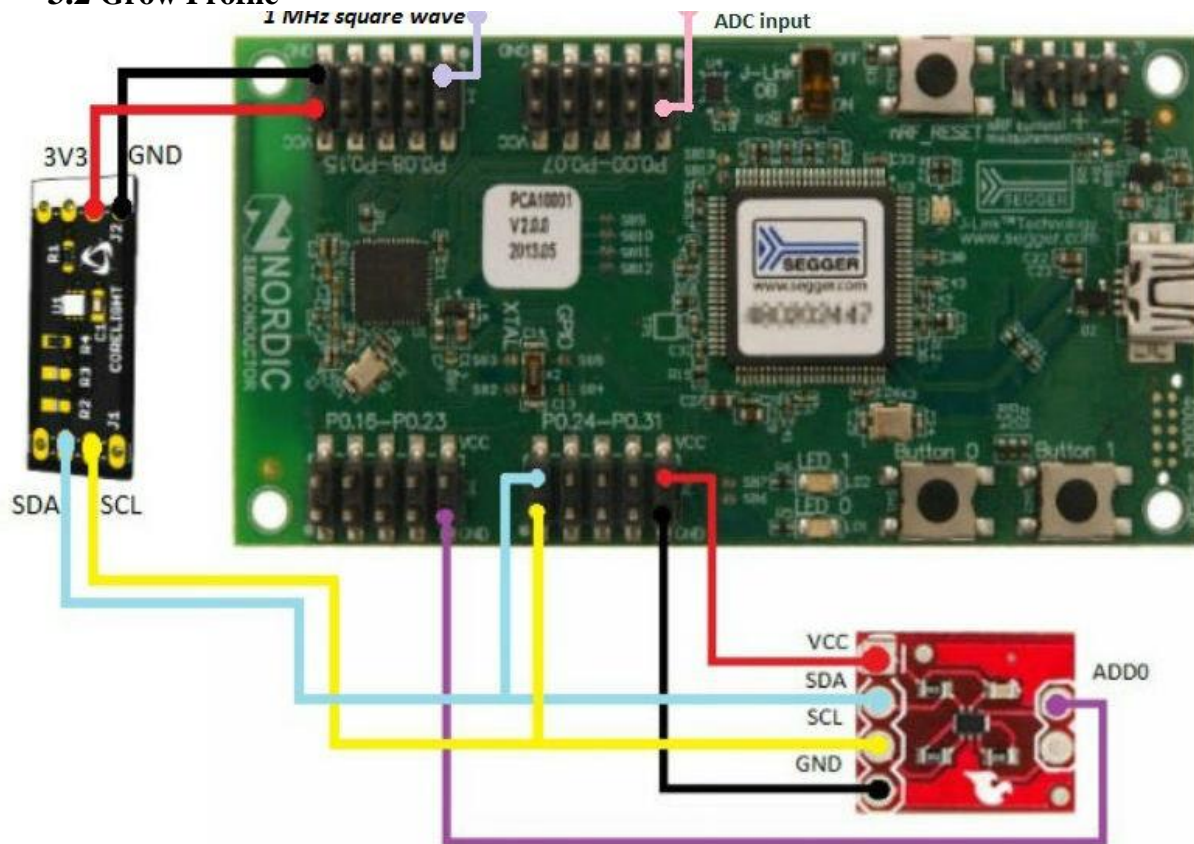
- Download the code from the folder WimotoBle
- Install the required software.
  - Keil uVision
  - J-Link drivers for JTAG interface.
  - nRF51822 software
    - nRFgo Studio
    - nRF51 Software Development Kit (SDK)
    - S110 nRF51822 Soft Device
    - Master Control Panel v3.5 ( v3.5 has support for DFU API)
- Copy the folder ble\_wimoto\_clim\_app / ble\_wimoto\_grow\_app / ble\_wimoto\_water\_app / ble\_wimoto\_thermo\_app/ to the nrf51822\Board\pca10001\ble folder in the nrf51\_sdk directory.
- Copy the device\_firmware\_updates to the nrf51822\Board\6310\ble folder in the nrf51\_sdk directory for setting up the bootloader
- Open the project in Keil uVision.
- Build the project.

## 3 Hardware Setup

### 3.1 Climate Profile

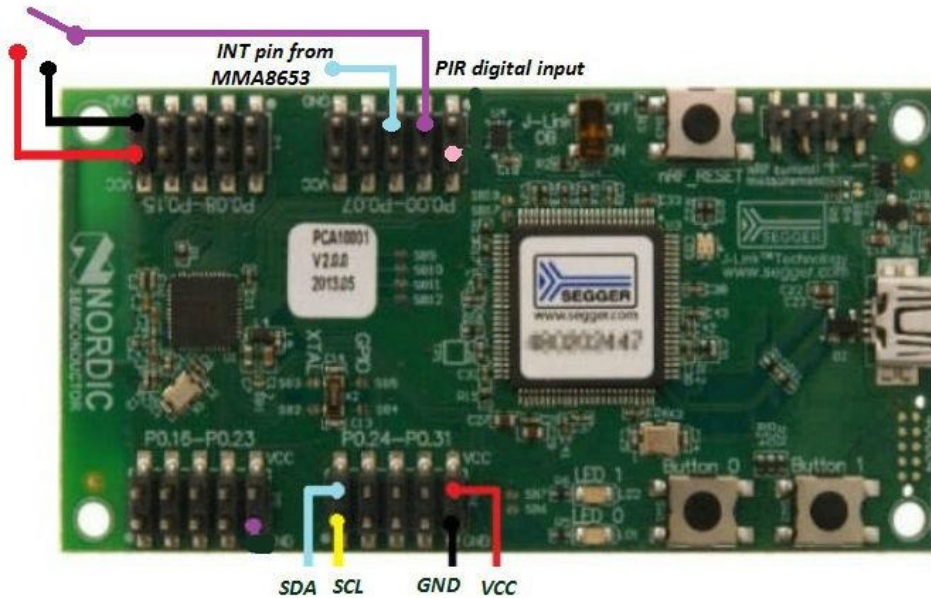
*Note: Since the HTU21D temperature and humidity sensor was not available, climate profile was not tested with sensors. However the embedded code was tested using hard coded values and the results were as expected and found to be working properly*

### 3.2 Grow Profile



- Interface the TMP102 module, ISL29023 module and analogue Soil Moisture sensor with nRF51822 Evaluation Kit board as shown below
- Power up the board from USB attached to Windows PC.
- Do-not connect nRF51822 Development Dongle while programming nRF51822 Evaluation Kit board
- Download the hex file created to the evaluation board.
-

### 3.5 Sentry Profile

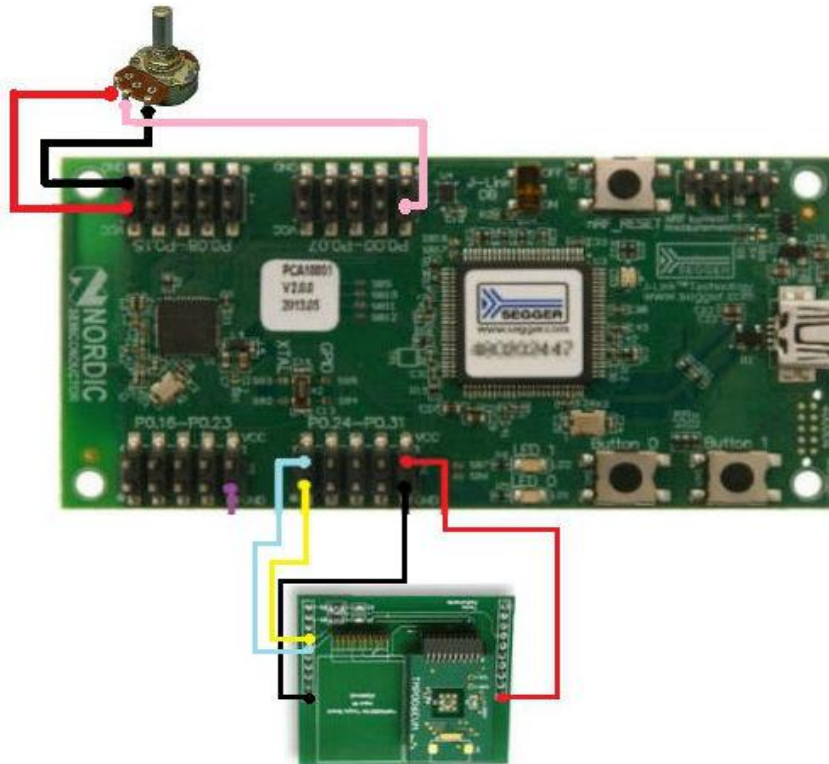


- Interface the sensors for the Sentry profile
- Power up the board from USB attached to Windows PC.
- Do-not connect nRF51822 Development Dongle while programming nRF51822 Evaluation Kit board
- Download the hex file created to the evaluation board.

**Note:** *Since the MMA8653 accelerometer sensor was not available, Sentry profile was not tested with sensors. However the embedded code was tested using hard coded values and the results were as expected and found to be working properly*

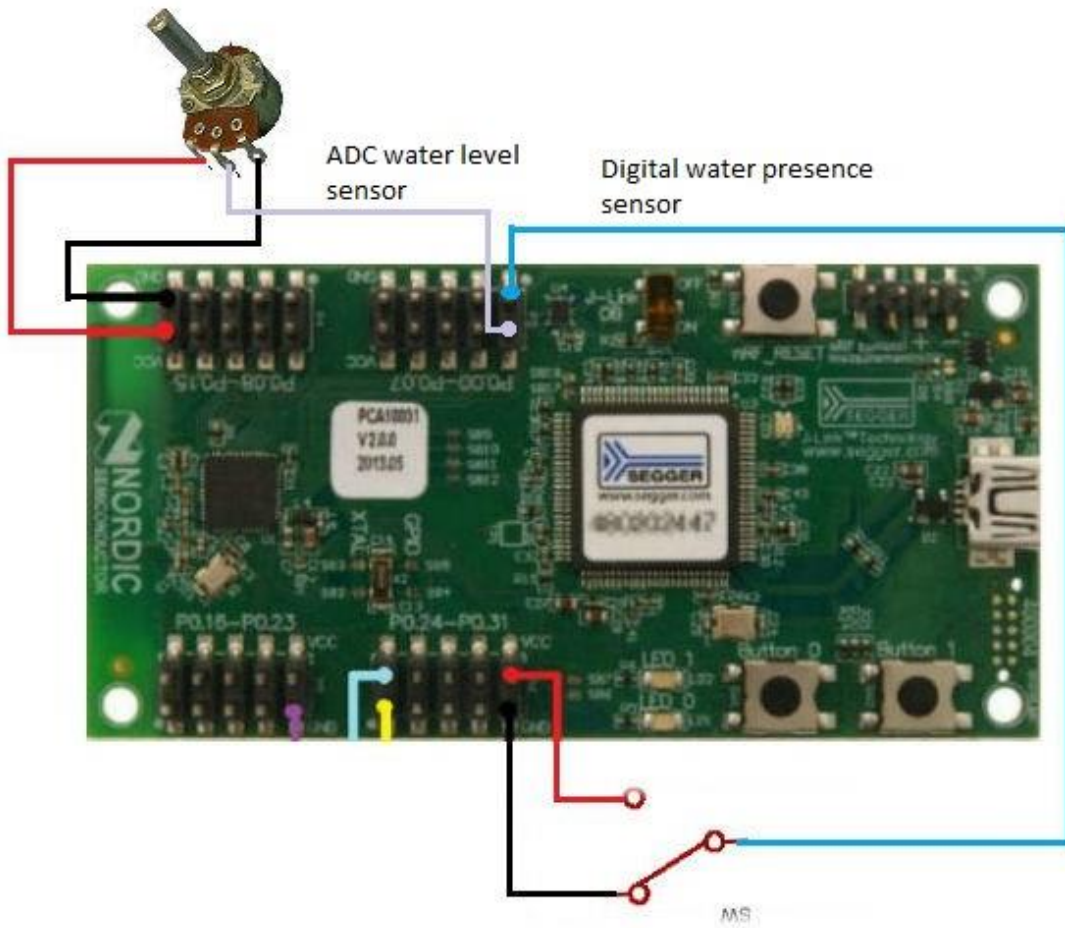
*In the code if the MMA8653 driver fails to initialize a LED blinking functionality has been added in order to notify the error situation while testing*

### 3.4 Thermo Profile



- Interface the sensors for the Thermo profile
- Power up the board from USB attached to Windows PC.
- Do-not connect nRF51822 Development Dongle while programming nRF51822 Evaluation Kit board
- Download the hex file created to the evaluation board.

### 3.3 Water Profile



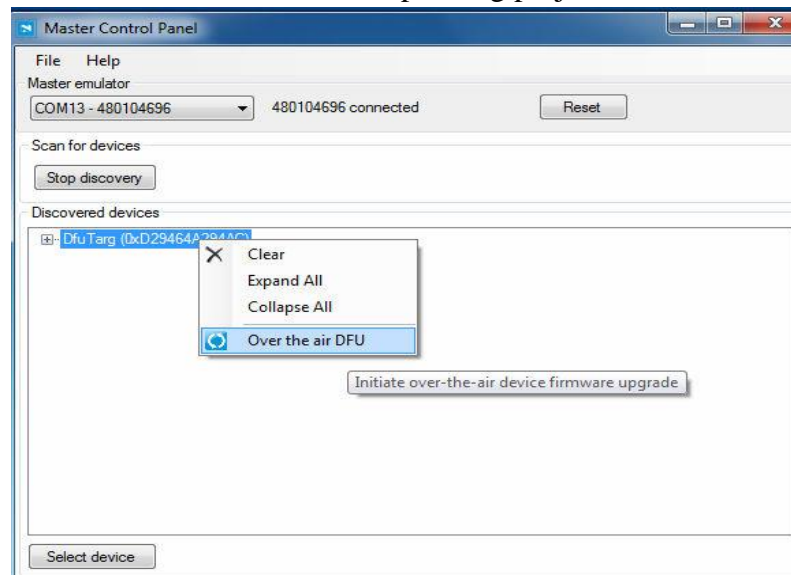
- Interface the sensors for the Water profile
- Power up the board from USB attached to Windows PC.
- Do-not connect nRF51822 Development Dongle while programming nRF51822 Evaluation Kit board
- Download the hex file created to the evaluation board.



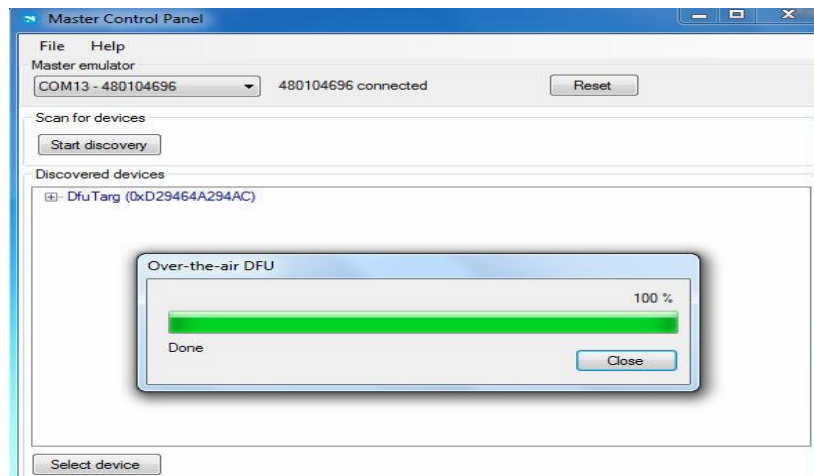
## 4 Execution

### 4.1 Bootloader

- Power up the board from USB attached to Windows PC.
- Do-not connect nRF51822 Development Dongle while programming nRF51822 Evaluation Kit board
- Download the hex file created to the evaluation board
- For DFU right click on the master and select the option “Over the air DFU” , then from the new window select the ‘hex’ file of the new firmware to be uploaded. The hex files can be found in the build folder in the corresponding project file after a successful build.



- After 100% done response close the DFU window and start the discovery so the Master Control Panel shows the new image updated





## 4.2 Climate Profile

- Connect the nRF51822 Development Dongle to USB of the PC. Power up the evaluation board.
- Open the Master Control Panel version 3.5 in PC.(Provides the API for device firmware update)
- From the option 'Master Emulator', select the segger serial number of the development dongle and click 'Start Discovery'.
- Master control panel will show the Climate profile alarm service continuously
- To connect to the alarm service, select the device Wimoto\_Clim and click 'Select device'.
- Click 'Service discovery'. All the characteristics in the service will be displayed. Click 'Enable services'.
- In the first primary service with Uuid E0035608 - EC48 - 4ED0 - 9F3B - 5419C00A94FD, six characteristic fields will be displayed.

Uuid E0035609 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Current Temperature

Uuid E003560A - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Temperature low value (for alarm)

Uuid E003560B - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Temperature high value (for alarm)

Uuid E003560C - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Temperature Alarm set

Uuid E003560D - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Temperature Alarm

- In the second primary service with Uuid E003560E - EC48 - 4ED0 - 9F3B - 5419C00A94FD, five characteristic fields will be displayed.

Uuid E003560F - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Current Light level

Uuid E0035610 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Light level low value (for alarm)

Uuid E0035611 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Light level high value (for alarm)

Uuid E0035612 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Light level Alarm set

Uuid E0035613 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Light level Alarm

- In the third primary service with Uuid E0035614 - EC48 - 4ED0 - 9F3B - 5419C00A94FD, five characteristic fields will be displayed.

Uuid E0035615 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Current Humidity level

Uuid E0035616 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Humidity low value (for alarm)

Uuid E0035617 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Humidity high value (for alarm)

Uuid E0035618 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Humidity Alarm set

Uuid E0035619 - EC48 - 4ED0 - 9F3B - 5419C00A94FD - Humidity Alarm

- In the fourth primary service with UUID E003561A - EC48 - 4ED0 - 9F3B - 5419C00A94FD the Data logger service is advertised. It contains three characteristic fields.

Uuid E003561B-EC48-4ED0-9F3B-5419C00A94FD - Enable data logger service

Uuid E003561C-EC48-4ED0-9F3B-5419C00A94FD - The data displayed when read

Uuid E003561D -EC48-4ED0-9F3B-5419C00A94FD - Read the logged data, set

- In the fifth primary service will Uuid E003561E - EC48 - 4ED0 - 9F3B - 5419C00A94FD, two characteristic fields will be displayed.

Uuid E003561F-EC48-4ED0-9F3B-5419C00A94FD - Device Firmware Update Mode Set

Uuid E0035620-EC48-4ED0-9F3B-5419C00A94FD - Switch Mode Set

Uuid 1805- Time Stamp

- In the Sixth primary service with Uuid 180A, three characteristic fields will be displayed.

Uuid 2A29- Manufacturer Name

Uuid 2A24- Model Number

Uuid 2A23- System ID

- In the Seventh primary service with Uuid 180F, characteristic field will be displayed.

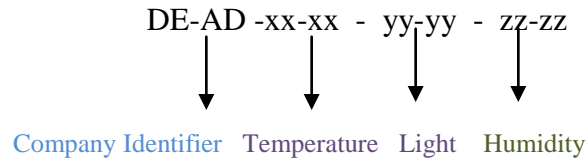
Uuid 2A19- Battery Level

- The High and Low values for checking alarm condition in Temperature low/high, Light level low/high and Humidity low/high values can be set by, clicking on the corresponding characteristic field (UUID), enter a new value in the “**value box**” shown below the characteristics and click on 'Send update'
- To set alarm, change the Alarm set value (UUID E003560C-EC48-4ED0-9F3B- 5419C00A94FD - temperature/ E0035612-EC48-4ED0-9F3B-5419C00A94FD -light level/ E0035618-EC48-4ED0-9F3B-5419C00A94FD -humidity) to 01. If the current value read from the sensor is less than the low value, the Alarm field to the corresponding service (UUID E003560D-EC48-4ED0-9F3B-5419C00A94FD - temperature/ E0035613-EC48-4ED0-9F3B-5419C00A94FD -light level/ E0035619-EC48-4ED0-9F3B- 5419C00A94FD -humidity) will show 0x01. If the value read from the sensor is greater than the high value, the alarm field will show 0x02.
- To turn off the alarm, update the Alarm set field to 0x00 of the corresponding services.
- To go to the Device Firmware Update mode, set DFU Mode set value to 0x01 (UUID E003561F-EC48-4ED0-9F3B-5419C00A94FD) in Device management service and click 'disconnect', click 'back' and start discovery by clicking 'start discovery' . Then the boot loader gets loaded and by right clicking in the panel select the option “Over the air DFU” and browse for the new firmware to be loaded and update. The new firmware is the ‘hex’ file found in the ‘build’ folder of corresponding project. After 100% completion message the new

firmware gets loaded on the device

- To go to the Broadcast mode, set Mode Switch set value to 0x01 (UUID E0035620-EC48-4ED0-9F3B-5419C00A94FD) in Device management service and click 'disconnect', click 'back' and start discovery by clicking 'start discovery'.
- In the Broadcast mode the data is advertised as manufacturing data since the custom services are not tied to any standard UUID. The battery service is advertised with UUID 0x180F. The battery level is shown as percentage value (100% is shown as 0x64)

The data format of custom data is



- Time Stamp characteristic is used for real time tracking (Uuid 1805). This characteristic gets started when the device power up itself. User can also set the values for current time, year, day, month for so that the time tracking resumes from the user set value. The data format of time stamp is as flows

yy-yy - mm - dd - hr - min - sec

- The embedded application code stays in the Broadcast mode until a power on reset is incurred

### ○ **Data Logger Service**

To enable data logger service, set the characteristics E003561B-EC48-4ED0-9F3B-5419C00A94FD to 0x01. The application will start logging data to the flash. To download data from the peripheral, set the characteristics E003561D-EC48-4ED0-9F3B-5419C00A94FD to 0x01. The application will stop data logging and starts to send data to the connected central device. The data field is an unsigned integer array of size 16. The data format is as given below.

The 1<sup>st</sup> 2 bytes contains the year.

The 3<sup>rd</sup> byte contains the month.

The 4<sup>th</sup> byte contains day.

The 5<sup>th</sup> and 6<sup>th</sup> byte contains Hour.

The 7<sup>th</sup> byte contains Minutes.

The 8<sup>th</sup> byte contains Seconds.

The 9<sup>th</sup> and 10<sup>th</sup> bytes contains the temperature.

The 11<sup>th</sup> and 12<sup>th</sup> bytes contains light level.

The last 4 bytes contains the humidity level.

An example of the data array received in master control panel is 07DD0B15000B32000101020200000055 which is arranged as shown below

07DD	0B	15	000B	32	00	0101	0202	00000055
↓	↓	↓	↓	↓	↓	↓	↓	↓
2013	11	21	11	50	00	temperature	light level	Humidity Level

### 4.3 Grow Profile

- Connect the nRF51822 Development Dongle to USB of the PC. Power up the evaluation board.
- Open the Master Control Panel in PC.
- From the option 'Master Emulator', select the segger serial number of the development dongle and click 'Start Discovery'.
- Master control panel will show the Grow profile alarm service continuously
- To connect to the alarm service, select the device Wimoto\_Grow and click 'Select device'.
- Click 'Service discovery'. All the characteristics in the service will be displayed. Click 'Enable services'.
- In the first primary service with Uuid DAF44706-BFB0-4DD8-9293-62AF5F545E31, six characteristic fields will be displayed.

Uuid DAF44707-BFB0-4DD8-9293-62AF5F545E31 - Current Temperature

Uuid DAF44708-BFB0-4DD8-9293-62AF5F545E31 - Temperature low value (for alarm)

Uuid DAF44709-BFB0-4DD8-9293-62AF5F545E31 - Temperature high value (for alarm)

Uuid DAF4470A-BFB0-4DD8-9293-62AF5F545E31 - Temperature Alarm set

Uuid DAF4470B-BFB0-4DD8-9293-62AF5F545E31 - Temperature Alarm

- In the second primary service with Uuid DAF4470C-BFB0-4DD8-9293-62AF5F545E31, five characteristic fields will be displayed.

Uuid DAF4470D-BFB0-4DD8-9293-62AF5F545E31 - Current Light level

Uuid DAF4470E-BFB0-4DD8-9293-62AF5F545E31 - Light level low value (for alarm)

Uuid DAF4470F-BFB0-4DD8-9293-62AF5F545E31 - Light level high value (for alarm)

Uuid DAF44710-BFB0-4DD8-9293-62AF5F545E31 - Light level Alarm set

Uuid DAF44711-BFB0-4DD8-9293-62AF5F545E31 - Light level Alarm

- In the third primary service with Uuid DAF44712-BFB0-4DD8-9293-62AF5F545E31, five characteristic fields will be displayed.

Uuid DAF44713-BFB0-4DD8-9293-62AF5F545E31 - Current soil moisture level

Uuid DAF44714-BFB0-4DD8-9293-62AF5F545E31 - Soil moisture low value (for alarm)

Uuid DAF44715-BFB0-4DD8-9293-62AF5F545E31 - Soil moisture high value

Uuid DAF44716-BFB0-4DD8-9293-62AF5F545E31 - Soil moisture Alarm set

Uuid DAF44717-BFB0-4DD8-9293-62AF5F545E31 - Soil moisture Alarm

- In the fourth primary service with UUID DAF44718-BFB0-4DD8-9293-62AF5F545E31, the Data logger service is advertised. It contains three characteristic fields.

Uuid DAF44719 – BFB0 – 4DD8 – 9293 – 62AF5F545E31 - Enable data logger service

Uuid DAF4471A – BFB0 – 4DD8 – 9293 – 62AF5F545E31 - The data displayed when read

Uuid DAF4471B – BFB0 – 4DD8 – 9293 – 62AF5F545E31 - Read the logged data, set

- In the fifth primary service with Uuid DAF4471C – BFB0 – 4DD8 – 9293 – 62AF5F545E31, two characteristic fields will be displayed.

Uuid DAF4471D–BFB0–4DD8–9293 – 62AF5F545E31- Device Firmware Update Mode Set

Uuid DAF4471E – BFB0 – 4DD8 – 9293 – 62AF5F545E31 - Switch Mode Set

Uuid 1805- Time Stamp

- In the Sixth primary service with Uuid 180A, three characteristic fields will be displayed.

Uuid 2A29- Manufacturer Name

Uuid 2A24- Model Number

Uuid 2A23- System ID

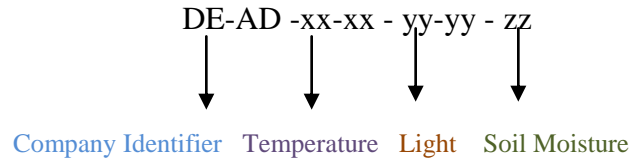
- In the Seventh primary service with Uuid 180F, characteristic field will be displayed.

Uuid 2A19- Battery Level

- The High and Low values for checking alarm condition in Temperature low/high, Light level low/high and Soil moisture low/high values can be set by, clicking on the corresponding characteristic field (UUID), enter a new value in the “**value box**” shown below the characteristics and click on 'Send update'
- To set alarm, change the Alarm set value (UUID DAF4470A – BFB0 – 4DD8 – 9293 – 62AF5F545E31-temperature/ DAF44710 – BFB0 – 4DD8 – 9293 – 62AF5F545E31-light level/ DAF44716 – BFB0 – 4DD8 – 9293 – 62AF5F545E31-soil moisture) to 01. If the current value read from the sensor is less than the low value, the Alarm field to the corresponding service (UUID DAF4470B–BFB0–4DD8–9293–62AF5F545E31-temperature/ DAF44711–BFB0–4DD8–9293–62AF5F545E31-light level/ DAF44717– BFB0–4DD8–9293–62AF5F545E31-soil moisture) will show 0x01. If the value read from the sensor is greater than the high value, the alarm field will show 0x02.
- To turn off the alarm, update the Alarm set field to 0x00 of the corresponding services.
- To go to the Device Firmware Update mode, set DFU Mode set value to 0x01 (UUID DAF4471D–BFB0–4DD8–9293–62AF5F545E31) in Device management service and click 'disconnect', click 'back' and start discovery by clicking 'start discovery' . Then the DFU image gets loaded and by right clicking in the panel select the option “Over the air DFU” and browse for the firmware to be loaded and update. After 100% completion message the new firmware gets loaded on the device
- To go to the Broadcast mode, set Mode Switch set value to 0x01 (UUID DAF4471E–BFB0–4DD8–9293–62AF5F545E31) in Device management service and click 'disconnect', click 'back' and start discovery by clicking 'start discovery' .

- In the Broadcast mode the data is advertised as manufacturing data since the custom services are not tied to any standard UUID. The battery service is advertised with UUID 0x180F. The battery level is shown as percentage value (100% is shown as 0x64)

The data format of custom data is



- Time Stamp characteristic is used for real time tracking (Uuid **1805**). This characteristic gets started when the device power up itself. User can also set the values for current time, year, day, month for so that the time tracking resumes from the user set value. The data format of time stamp is as flows

yy-yy - mm - dd - hr - min - sec

- The embedded application code stays in the Broadcast mode until a power on reset is incurred

### **Data Logger Service**

- To enable data logger service, set the characteristics DAF4**4719**–BFB0–4DD8–9293–62AF5F545E31 to 0x01. The application will start logging data to the flash. To download data from the peripheral, set the characteristics DAF4**471B** – BFB0 – 4DD8 – 9293 – 62AF5F545E31 to 0x01. The application will the stop data logging and starts to send data to the connected central device. The data field is an unsigned integer array of size 16. The data format is as given below.

The 1<sup>st</sup> 2 bytes contains the year.

The 3<sup>rd</sup> byte contains the month.

The 4<sup>th</sup> byte contains day.

The 5<sup>th</sup> and 6<sup>th</sup> byte contains Hour.

The 7<sup>th</sup> byte contains Minutes.

The 8<sup>th</sup> byte contains Seconds.

The 9<sup>th</sup> and 10<sup>th</sup> byte contains the temperature.

The 11<sup>th</sup> and 12<sup>th</sup> byte contains light level.

The last 4 bytes contains the soil moisture level.

An example of the data array received in master control panel is 07DD0B15000B32000101020200000003 which is arranged as shown below



07DD	0B	15	000B	32	00	0101	0202	000000	03
↓	↓	↓	↓	↓	↓	↓	↓		↓
2013	11	21	11	50	00	temperature	light level	soil moisture level	
(Time stamp)									

## 4.4 Sentry Profile

- Connect the nRF51822 Development Dongle to USB of the PC. Power up the evaluation board.
- Open the Master Control Panel in PC.
- From the option 'Master Emulator', select the segger serial number of the development dongle and click 'Start Discovery'.
- Master control panel will show the Sentry profile alarm service continuously
- To connect to the alarm service, select the device Wimoto\_Sentry and click 'Select device'.
- Click 'Service discovery'. All the characteristics in the service will be displayed. Click 'Enable services'.
- In the first primary service Uuid 4209DC68 - E433 – 4420 - 83D8 - CDAACCD2E312, four characteristic fields will be displayed.

Uuid 4209DC69 - E433–4420 - 83D8 - CDAACCD2E312- Current X, Y, Z acceleration data

Uuid 4209DC6A - E433 – 4420 - 83D8 - CDAACCD2E312- Movement alarm set

Uuid 4209DC6B - E433 – 4420 - 83D8 - CDAACCD2E312- Movement alarm clear

Uuid 4209DC6C - E433 – 4420 - 83D8 - CDAACCD2E312- Movement alarm

- In the second primary service Uuid 4209DC6D-E433–4420-83D8-CDAACCD2E312, three characteristic fields will be displayed.

Uuid 4209DC6E - E433 – 4420 - 83D8 - CDAACCD2E312- Current PIR state

Uuid 4209DC6F - E433 – 4420 - 83D8 - CDAACCD2E312- PIR Alarm set

Uuid 4209DC70 - E433 – 4420 - 83D8 - CDAACCD2E312- PIR Alarm

- In the third primary service Uuid 4209DC71 - E433 – 4420 - 83D8 - CDAACCD2E312, three characteristic fields will be displayed.

Uuid 4209DC72 - E433 – 4420 - 83D8 - CDAACCD2E312 - Enable data logger service

Uuid 4209DC73 - E433 – 4420 - 83D8 - CDAACCD2E312 - The data displayed when read

Uuid 4209DC74 - E433 – 4420 - 83D8 - CDAACCD2E312 - Read the logged data, set

- In the fourth primary service Uuid 4209DC75 - E433 – 4420 - 83D8 - CDAACCD2E312, two characteristic fields will be displayed.

Uuid 4209DC76-E433–4420- 83D8 - CDAACCD2E312- Device Firmware Update Mode Set

Uuid 4209DC77 - E433 – 4420 - 83D8 - CDAACCD2E312- Switch Mode Set

Uuid 1805- Time Stamp

- In the Fifth primary service with Uuid 180A, three characteristic fields will be displayed.

Uuid **2A29**- Manufacturer Name

Uuid **2A24**- Model Number

Uuid **2A23**- System ID

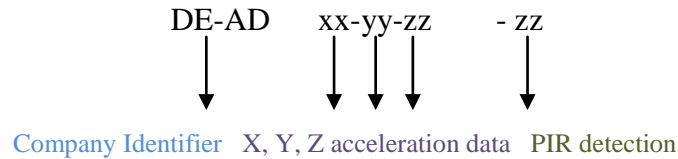
- In the Sixth primary service with Uuid 180F, characteristic field will be displayed.

Uuid **2A19**- Battery Level

- Current PIR State (Uuid 4209**DC6E** - E433 – 4420 - 83D8 - CDAACCD2E312) will be initialized to 0x00 and when the PIR sensor triggers an interrupt , Current PIR State will be set to 0x01
- Inputting values for the corresponding characteristics can be done by clicking on the corresponding characteristic field (UUID), enter a new value in the “**value box**” shown below the characteristics and click on 'Send update'
- To set alarm, change the Alarm set value (UUID 4209**DC6A** - E433 – 4420 - 83D8 - CDAACCD2E312 - Movement alarm /4209**DC6F** - E433 – 4420 - 83D8 - CDAACCD2E312- PIR Alarm set) to 01.If the logic level at pin P0.02 (for PIR sensor) is Logic High then PIR Alarm (Uuid 4209**DC70** - E433 – 4420 - 83D8 - CDAACCD2E312) is set to 0x01. If the accelerometer detects a movement it generates a logic Low at pin P0.04 then Movement alarm (Uuid 4209**DC6C** - E433 – 4420 - 83D8 - CDAACCD2E312) is set to 0x01, also the current X, Y, Z acceleration data register values from MMA8653 are also displayed.
- To turn off the alarm, update the Alarm set field to 0x00 of the corresponding services.
- In Movement alarm service, there is an additional characteristic added ‘Movement Alarm Clear’ (Uuid 4209**DC6B** - E433 – 4420 - 83D8 - CDAACCD2E312). When this characteristic is set to 0x01 the Movement Alarm (4209**DC6C** - E433 – 4420 - 83D8 - CDAACCD2E312) gets reset to a value 0x00 and the Movement Alarm Clear also gets cleared (0x00). This is to explicitly specify that the alarm condition is understood by the user and it is not critical.
- To go to the Device Firmware Update mode, set DFU Mode set value to 0x01 (UUID 4209**DC76** - E433 – 4420 - 83D8 - CDAACCD2E312) in Device management service and click 'disconnect', click 'back' and start discovery by clicking 'start discovery' . Then the DFU image gets loaded and by right clicking in the panel select the option “Over the air DFU” and browse for the firmware to be loaded and update. After 100% completion message the new firmware gets loaded on the device
- To go to the Broadcast mode, set Mode Switch set value to 0x01 (UUID 4209**DC77**- E433–4420- 83D8- CDAACCD2E312) and click 'disconnect', click 'back' and start discovery by clicking 'start discovery' .
- In the Broadcast mode the data is advertised as manufacturing data since the custom services are not tied to any standard UUID. The battery service is advertised with UUID

0x180F. The battery level is shown as percentage value (100% is shown as 0x64)

The data format of custom data is



- Time Stamp characteristic is used for real time tracking (Uuid **1805**). This characteristic gets started when the device power up itself. User can also set the values for current time, year, day, month for so that the time tracking resumes from the user set value. The data format of time stamp is as flows

yy-yy - mm - dd - hr - min - sec

- The embedded application code stays in the Broadcast mode until a power on reset is incurred

- **Data Logger Service**

To enable data logger service, set the characteristics 4209**DC72** - E433 - 4420 - 83D8 - CDAACCD2E312 to 0x01. The application will start logging data to the flash. To download data from the peripheral, set the characteristics 4209**DC74** - E433 - 4420 - 83D8 - CDAACCD2E312 to 0x01. The application will the stop data logging and starts to send data to the connected central device. The data field is an unsigned integer array of size 16. The data format is as given below

The 1<sup>st</sup> 2 bytes contains the year.

The 3<sup>rd</sup> byte contains the month.

The 4<sup>th</sup> byte contains day.

The 5<sup>th</sup> and 6<sup>th</sup> byte contains Hour.

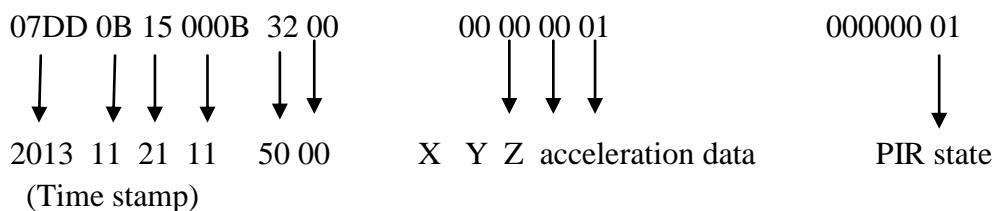
The 7<sup>th</sup> byte contains Minutes.

The 8<sup>th</sup> byte contains Seconds.

The 9<sup>th</sup>-12<sup>th</sup> byte contains X , Y , Z data from MMA8653

The last 4 bytes contains the PIR state (0-No detection ,1-Detection)

An example of the data array received in master control panel is 07DD0B15000B320000000000100000001 which is arranged as shown below



## 4.5 Thermo Profile

- Connect the nRF51822 Development Dongle to USB of the PC. Power up the evaluation board.
- Open the Master Control Panel in PC.
- From the option 'Master Emulator', select the segger serial number of the development dongle and click 'Start Discovery'.
- Master control panel will show the Thermo profile alarm service continuously
- To connect to the alarm service, select the device Wimoto\_Thermo and click 'Select device'.
- Click 'Service discovery'. All the characteristics in the service will be displayed. Click 'Enable services'.
- In the first primary service will Uuid 497B8E4E - B61E - 4F82 - 8FE9 - B12CF2497338, six characteristic fields will be displayed.

Uuid 497B8E4F - B61E - 4F82 - 8FE9 - B12CF2497338- Current Thermopile Temperature

Uuid 497B8E50 - B61E - 4F82 - 8FE9 - B12CF2497338- Thermopile Temperature low value  
( for the alarm)

Uuid 497B8E51 - B61E - 4F82 - 8FE9 - B12CF2497338- Thermopile Temperature high value

Uuid 497B8E52 - B61E - 4F82 - 8FE9 - B12CF2497338- Thermopile Temperature Alarm set

Uuid 497B8E53 - B61E - 4F82 - 8FE9 - B12CF2497338- Thermopile Temperature

- In the second primary service will Uuid 497B8E54-B61E-4F82-8FE9-B12CF2497338, five characteristic fields will be displayed.

Uuid 497B8E55 - B61E - 4F82 - 8FE9 - B12CF2497338- Current Probe Temperature level

Uuid 497B8E56 - B61E - 4F82 - 8FE9 - B12CF2497338- Probe Temperature level low value  
(for the alarm)

Uuid 497B8E57 - B61E - 4F82 - 8FE9 - B12CF2497338- Probe Temperature level high value

Uuid 497B8E58 - B61E - 4F82 - 8FE9 - B12CF2497338- Probe Temperature level Alarm set

Uuid 497B8E59 - B61E - 4F82 - 8FE9 - B12CF2497338- Probe Temperature level Alarm

- In the third primary service will Uuid 497B8E5A - B61E - 4F82 - 8FE9 - B12CF2497338, three characteristic fields will be displayed.

Uuid 497B8E5B - B61E - 4F82 - 8FE9 - B12CF2497338- Enable data logger service

Uuid 497B8E5C - B61E - 4F82 - 8FE9 - B12CF2497338- The data displayed when read

Uuid 497B8E5D - B61E - 4F82 - 8FE9 - B12CF2497338- Read the logged data, set

- In the fourth primary service with Uuid 497B8E5E - B61E - 4F82 - 8FE9 - B12CF2497338, two characteristic fields will be displayed.

Uuid 497B8E5F - B61E - 4F82 - 8FE9 - B12CF2497338- Device Firmware Update Mode Set

Uuid 497B8E60 - B61E - 4F82 - 8FE9 - B12CF2497338- Switch Mode Set

Uuid 1805- Time Stamp

- In the Fifth primary service with Uuid 180A, three characteristic fields will be displayed.

Uuid 2A29- Manufacturer Name

Uuid 2A24- Model Number

Uuid 2A23- System ID

- In the Sixth primary service with Uuid 180F, characteristic field will be displayed.

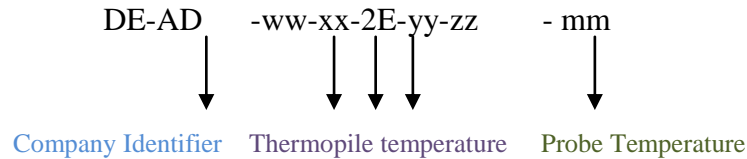
Uuid 2A19- Battery Level

- The High and Low values for checking alarm condition in Thermopile Temperature low/high, Probe Temperature level low/high values can be set by, clicking on the corresponding characteristic field (UUID), enter a new value in the “**value box**” shown below the characteristics and click on 'Send update'
- The Thermopile Temperature is represented as a string where the corresponding hex value of each character is displayed instead the digit  
( for example 30.29 is represented as “33 30 2E 32 39”) so while setting the values for low and high Thermopile Temperature this convention has to be followed
- To set alarm, change the Alarm set value (UUID 497B8E52 - B61E - 4F82 - 8FE9 - B12CF2497338- Thermopile Temperature /497B8E58 - B61E - 4F82 - 8FE9 - B12CF2497338- Probe Temperature) to 01. If the current value read from the sensor is less that the low value, the Alarm field to the corresponding service (UUID 497B8E53 - B61E - 4F82 - 8FE9 - B12CF2497338- Thermopile Temperature /497B8E59 - B61E - 4F82 - 8FE9 - B12CF2497338- Probe Temperature) will show 0x01. If the value read from the sensor is greater than the high value, the alarm field will show 0x02.
- To turn off the alarm, update the Alarm set field to 0x00 of the corresponding services.
- To go to the Device Firmware Update mode, set DFU Mode set value to 0x01 (UUID 497B8E5F - B61E - 4F82 - 8FE9 - B12CF2497338) in Device management service and click 'disconnect', click 'back' and start discovery by clicking 'start discovery' . Then the DFU image gets loaded and by right clicking in the panel select the option “Over the air DFU” and browse for the firmware to be loaded and update. After 100% completion message the new firmware gets loaded on the device
- To go to the Broadcast mode, set Mode Switch set value to 0x01 (UUID 497B8E60 - B61E - 4F82 - 8FE9 - B12CF2497338) and click 'disconnect', click 'back' and start discovery by

clicking 'start discovery' .

- In the Broadcast mode the data is advertised as manufacturing data since the custom services are not tied to any standard UUID. The battery service is advertised with UUID 0x180F. The battery level is shown as percentage value (100% is shown as 0x64)

The data format of custom data is



- Time Stamp characteristic is used for real time tracking (Uuid 1805). This characteristic gets started when the device power up itself. User can also set the values for current time, year, day, month for so that the time tracking resumes from the user set value. The data format of time stamp is as flows

yy-yy - mm - dd - hr - min - sec

- The embedded application code stays in the Broadcast mode until a power on reset is incurred

#### ○ Data Logger Service

To enable data logger service, set the characteristics 497B8E5B - B61E - 4F82 - 8FE9 - B12CF2497338 to 0x01. The application will start logging data to the flash. To download data from the peripheral, set the characteristics 497B8E5D - B61E - 4F82 - 8FE9 - B12CF2497338 to 0x01. The application will the stop data logging and starts to send data to the connected central device. The data field is an unsigned integer array of size 16. The data format is as given below.

The 1<sup>st</sup> 2 bytes contains the year.

The 3<sup>rd</sup> byte contains the month.

The 4<sup>th</sup> byte contains day.

The 5<sup>th</sup> and 6<sup>th</sup> byte contains Hour.

The 7<sup>th</sup> byte contains Minutes.

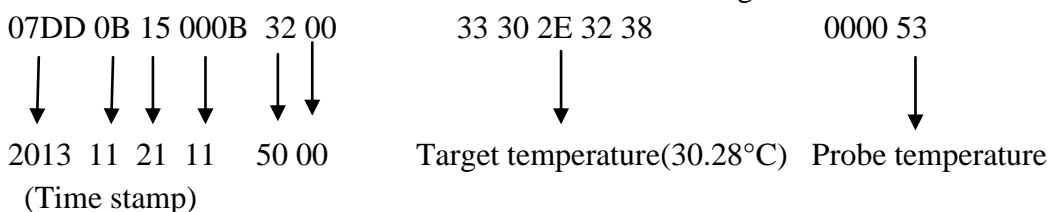
The 8<sup>th</sup> byte contains Seconds.

The 9<sup>th</sup> -12<sup>th</sup> byte contains target temperature

The last 4 bytes contains the probe temperature (8 bit value from ADC)

An example of the data array received in master control panel is

07DD0B15000B320033302E3238000053 which is arranged as shown below





## 4.6 Water Profile

- Connect the nRF51822 Development Dongle to USB of the PC. Power up the evaluation board.
- Open the Master Control Panel in PC.
- From the option 'Master Emulator', select the segger serial number of the development dongle and click 'Start Discovery'.
- Master control panel will show the Water profile alarm service continuously
- To connect to the alarm service, select the device Wimoto\_Water and click 'Select device'.
- Click 'Service discovery'. All the characteristics in the service will be displayed. Click 'Enable services'.
- In the first primary service will Uuid 35D8C7DB-9D78-43C2-AB2E-0E48CAC2DBDA, six characteristic fields will be displayed.

Uuid 35D8C7DC-9D78-43C2-AB2E-0E48CAC2DBDA - Current Water Presence

Uuid 35D8C7DD-9D78-43C2-AB2E-0E48CAC2DBDA - Water Presence Alarm Set

Uuid 35D8C7DE-9D78-43C2-AB2E-0E48CAC2DBDA - Water Presence Alarm

- In the second primary service will Uuid 35D8C7DF-9D78-43C2-AB2E-0E48CAC2DBDA, five characteristic fields will be displayed.

Uuid 35D8C7E0-9D78-43C2-AB2E-0E48CAC2DBDA - Current Water level

Uuid 35D8C7E1-9D78-43C2-AB2E-0E48CAC2DBDA - Water level low value (for the alarm)

Uuid 35D8C7E2-9D78-43C2-AB2E-0E48CAC2DBDA - Water level high value

Uuid 35D8C7E3-9D78-43C2-AB2E-0E48CAC2DBDA - Water level Alarm set

Uuid 35D8C7E4-9D78-43C2-AB2E-0E48CAC2DBDA - Water level Alarm

- In the third primary service will Uuid 35D8C7E5-9D78-43C2-AB2E-0E48CAC2DBDA, three characteristic fields will be displayed.

Uuid 35D8C7E6-9D78-43C2-AB2E-0E48CAC2DBDA - Enable data logger service

Uuid 35D8C7E7-9D78-43C2-AB2E-0E48CAC2DBDA - The data displayed when read

Uuid 35D8C7E8-9D78-43C2-AB2E-0E48CAC2DBDA - Read the logged data, set

- In the fourth primary service with Uuid 35D8C7E9-9D78-43C2-AB2E-0E48CAC2DBDA, two characteristic fields will be displayed.

Uuid 35D8C7EA-9D78-43C2-AB2E-0E48CAC2DBDA- Device Firmware Update Mode Set

Uuid 35D8C7EB-9D78-43C2-AB2E-0E48CAC2DBDA - Switch Mode Set

Uuid 1805- Time Stamp

- In the Fifth primary service with Uuid 180A, three characteristic fields will be displayed.

Uuid **2A29**- Manufacturer Name

Uuid **2A24**- Model Number

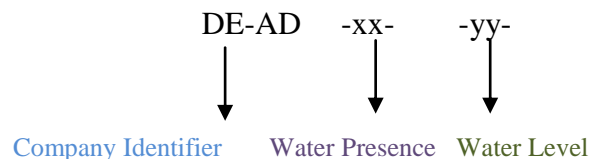
Uuid **2A23**- System ID

- In the Sixth primary service with Uuid 180F, characteristic field will be displayed.

Uuid **2A19**- Battery Level

- The High and Low values for checking alarm condition in Water level low/high values can be set by, clicking on the corresponding characteristic field (UUID), enter a new value in the “**value box**” shown below the characteristics and click on 'Send update'
- To set alarm, change the Alarm set value (UUID **35D8C7DD** - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA - water presence/ UUID **35D8C7E3** - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA water level) to 01. If the current value read from the sensor is less than the low value, the Alarm field to the corresponding service (UUID **35D8C7DE** - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA -water presence/ UUID **35D8C7E3** - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA water level) will show 0x01. If the value read from the sensor is greater than the high value, the alarm field will show 0x02.
- To turn off the alarm, update the Alarm set field to 0x00 of the corresponding services.
- To go to the Device Firmware Update mode, set DFU Mode set value to 0x01 (UUID **35D8C7EA** - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA) in Device management service and click 'disconnect', click 'back' and start discovery by clicking 'start discovery'. Then the DFU image gets loaded and by right clicking in the panel select the option “Over the air DFU” and browse for the firmware to be loaded and update. After 100% completion message the new firmware gets loaded on the device
- To go to the Broadcast mode, set Mode Switch in Water level service to 0x01 (UUID **35D8C7EB** - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA) and click 'disconnect', click 'back' and start discovery by clicking 'start discovery'.
- In the Broadcast mode the data is advertised as manufacturing data since the custom services are not tied to any standard UUID. The battery service is advertised with UUID 0x180F. The battery level is shown as percentage value (100% is shown as 0x64)

The data format of custom data is



- Time Stamp characteristic is used for real time tracking (Uuid **1805**). This characteristic gets started when the device power up itself. User can also set the values for current time, year, day, month for so that the time tracking resumes from the user set value. The data format of time stamp is as flows

yy-yy - mm - dd - hr - min - sec

- The embedded application code stays in the Broadcast mode until a power on reset is incurred

- **Data Logger Service**

To enable data logger service, set the characteristics 1901(En) to 0x01. The application will start logging data to the flash. To download data from the peripheral, set the characteristics 1903(Do) to 0x01. The application will stop data logging and starts to send data to the connected central device. The data field is an unsigned integer array of size 16. The data format is as given below. Currently the time stamp is hardcoded to 2013-11-21 11:50:00, since the real time clock is not yet realized.

The 1<sup>st</sup> 2 bytes contains the year.

The 3<sup>rd</sup> byte contains the month.

The 4<sup>th</sup> byte contains day.

The 5<sup>th</sup> and 6<sup>th</sup> byte contains Hour.

The 7<sup>th</sup> byte contains Minutes.

The 8<sup>th</sup> byte contains Seconds.

The 9<sup>th</sup> -12<sup>th</sup> byte contains water presence. (1- water present, 0 - water not present)

The last 4 bytes contains the water level. (8 bit value from ADC)

An example of the data array received in master control panel is

07DD0B15000B32000000000100000053 which is arranged as shown below

07DD	0B	15	000B	32	00	000000	01	000000	53
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
2013	11	21	11	50	00	water presence		water level	
(Time stamp)									

## **5 Known Issues**

No known issues currently.

## **6 Debugging**

If the Master Control panel (MCP) is not detecting the development dongle when both the dongle and evaluation board are connected to the PC, close the Master Control panel first. Then unplug both the boards. Then plug only the development dongle and open MCP. The MCP will now detect the dongle.

## UUID TABLE FOR CLIMATE PROFILE

UUID	SERVICE	CHARACTERISTIC
<b>CLIMATE PROFILE</b>		
E0035607 - EC48 - 4ED0 - 9F3B - 5419C00A94FD	Base UUID	
E0035608 - EC48 - 4ED0 - 9F3B - 5419C00A94FD	Temperature	
E0035609 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Current Temperature
E003560A - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Temperature Low Value (Notification Disabled)
E003560B - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Temperature High Value(Notification Disabled)
E003560C - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Temperature Alarm Set(Notification Disabled)
E003560D - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Temperature Alarm
E003560E - EC48 - 4ED0 - 9F3B - 5419C00A94FD	Light	
E003560F - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Current Light Level
E0035610 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Light Level Low Value(Notification Disabled)
E0035611 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Light Level High Value(Notification Disabled)
E0035612 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Light Level Alarm Set(Notification Disabled)
E0035613 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Light Level Alarm
E0035614 - EC48 - 4ED0 - 9F3B - 5419C00A94FD	Humidity	
E0035615 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Current Humidity Level
E0035616 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Humidity Low Value (Notification Disabled)
E0035617 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Humidity High Value (Notification Disabled)
E0035618 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Humidity Alarm Set (Notification Disabled)
E0035619 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Humidity Alarm
E003561A - EC48 - 4ED0 - 9F3B - 5419C00A94FD	Data Logger	
E003561B - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Data Logging Enable
E003561C - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Data (When Read)
E003561D - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Read Data Enable
E003561E - EC48 - 4ED0 - 9F3B - 5419C00A94FD	Device Management	
E003561F - EC48 - 4ED0 - 9F3B - 5419C00A94FD		DFU Mode Set (Notification Disabled)
E0035620 - EC48 - 4ED0 - 9F3B - 5419C00A94FD		Switch Mode Set (Notification Disabled)
1805		Time Stamp
180A	Device Information	
2A29		Manufacturer Name
2A24		Model Number
2A23		System ID
180F	Battery Service	
2A19		Battery Level

## UUID TABLE FOR GROW PROFI

UUID	SERVICE	CHARACTERISTIC
<b>GROW PROFILE</b>		
DAF44705 – BFB0 – 4DD8 – 9293 – 62AF5F545E31	Base UUID	
DAF44706 – BFB0 – 4DD8 – 9293 – 62AF5F545E31	Temperature	
DAF44707 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Current Temperature
DAF44708 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Temperature Low Value (Notification Disabled)
DAF44709 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Temperature High Value (Notification Disabled)
DAF4470A – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Temperature Alarm Set (Notification Disabled)
DAF4470B – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Temperature Alarm
DAF4470C – BFB0 – 4DD8 – 9293 – 62AF5F545E31	Light	
DAF4470D – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Current Light Level
DAF4470E – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Light Level Low Value (Notification Disabled)
DAF4470F – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Light Level High Value (Notification Disabled)
DAF44710 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Light Level Alarm Set (Notification Disabled)
DAF44711 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Light Level Alarm
DAF44712 – BFB0 – 4DD8 – 9293 – 62AF5F545E31	Soil Moisture	
DAF44713 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Current Soil Moisture Level
DAF44714 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Soil Moisture Level Low Value (Notification Disabled)
DAF44715 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Soil Moisture Level High Value (Notification Disabled)
DAF44716 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Soil Moisture Level Alarm Set (Notification Disabled)
DAF44717 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Soil Moisture Level Alarm
DAF44718 – BFB0 – 4DD8 – 9293 – 62AF5F545E31	Data Logger	
DAF44719 – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Data Logging Enable
DAF4471A – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Data (When Read)
DAF4471B – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Read Data Enable
DAF4471C – BFB0 – 4DD8 – 9293 – 62AF5F545E31	Device Management	
DAF4471D – BFB0 – 4DD8 – 9293 – 62AF5F545E31		DFU Mode Set (Notification Disabled)
DAF4471E – BFB0 – 4DD8 – 9293 – 62AF5F545E31		Switch Mode Set (Notification Disabled)
1805		Time Stamp
180A	Device Information	
2A29		Manufacturer Name
2A24		Model Number
2A23		System ID
180F	Battery Service	
2A19		Battery Level

## UUID TABLE FOR SENTRY PROFILE

UUID	SERVICE	CHARACTERISTIC
<b>SENTRY PROFILE</b>		
4209DC67 - E433 – 4420 - 83D8 - CDAACCD2E312	Base UUID	
4209DC68 - E433 – 4420 - 83D8 - CDAACCD2E312	Movement	
4209DC69 - E433 – 4420 - 83D8 - CDAACCD2E312		Current X, Y, Z axis acceleration
4209DC6A - E433 – 4420 - 83D8 - CDAACCD2E312		Movement Alarm Set(Notification Disabled)
4209DC6B - E433 – 4420 - 83D8 - CDAACCD2E312		Movement Alarm Clear(Notification Disabled)
4209DC6C - E433 – 4420 - 83D8 - CDAACCD2E312		Movement Alarm
4209DC6D - E433 – 4420 - 83D8 - CDAACCD2E312	PIR	
4209DC6E - E433 – 4420 - 83D8 - CDAACCD2E312		Current PIR value
4209DC6F - E433 – 4420 - 83D8 - CDAACCD2E312		PIR Alarm Set(Notification Disabled)
4209DC70 - E433 – 4420 - 83D8 - CDAACCD2E312		PIR Alarm
4209DC71 - E433 – 4420 - 83D8 - CDAACCD2E312	Data Logger	
4209DC72 - E433 – 4420 - 83D8 - CDAACCD2E312		Data Logging Enable
4209DC73 - E433 – 4420 - 83D8 - CDAACCD2E312		Data (When Read)
4209DC74 - E433 – 4420 - 83D8 - CDAACCD2E312		Read Data Enable
4209DC75 - E433 – 4420 - 83D8 - CDAACCD2E312	Device Management	
4209DC76 - E433 – 4420 - 83D8 - CDAACCD2E312		DFU Mode Set (Notification Disabled)
4209DC77 - E433 – 4420 - 83D8 - CDAACCD2E312		Switch Mode Set (Notification Disabled)
1805		Time Stamp
180A	Device Information	
2A29		Manufacturer Name
2A24		Model Number
2A23		System ID
180F	Battery Service	
2A19		Battery Level



## UUID TABLE FOR THERMO PROFILE

UUID	SERVICE	CHARACTERISTIC
<b>THERMO PROFILE</b>		
497B8E4D - B61E - 4F82 - 8FE9 - B12CF2497338	Base UUID	
497B8E4E - B61E - 4F82 - 8FE9 - B12CF2497338	Thermopile Temperature	
497B8E4F - B61E - 4F82 - 8FE9 - B12CF2497338		Current Thermopile Temperature
497B8E50 - B61E - 4F82 - 8FE9 - B12CF2497338		Thermopile Temperature Low Value (Notification Disabled)
497B8E51 - B61E - 4F82 - 8FE9 - B12CF2497338		Thermopile Temperature High Value(Notification Disabled)
497B8E52 - B61E - 4F82 - 8FE9 - B12CF2497338		Thermopile Temperature Alarm Set(Notification Disabled)
497B8E53 - B61E - 4F82 - 8FE9 - B12CF2497338		Thermopile Temperature Alarm
497B8E54 - B61E - 4F82 - 8FE9 - B12CF2497338	Probe Temperature	
497B8E55 - B61E - 4F82 - 8FE9 - B12CF2497338		
497B8E56 - B61E - 4F82 - 8FE9 - B12CF2497338		Probe Temperature Low Value (Notification Disabled)
497B8E57 - B61E - 4F82 - 8FE9 - B12CF2497338		Probe Temperature High Value(Notification Disabled)
497B8E58 - B61E - 4F82 - 8FE9 - B12CF2497338		Probe Temperature Alarm Set(Notification Disabled)
497B8E59 - B61E - 4F82 - 8FE9 - B12CF2497338		Probe Temperature Alarm
497B8E5A - B61E - 4F82 - 8FE9 - B12CF2497338	Data Logger	
497B8E5B - B61E - 4F82 - 8FE9 - B12CF2497338		Data Logging Enable
497B8E5C - B61E - 4F82 - 8FE9 - B12CF2497338		Data (When Read)
497B8E5D - B61E - 4F82 - 8FE9 - B12CF2497338		Read Data Enable
497B8E5E - B61E - 4F82 - 8FE9 - B12CF2497338	Device Management	
497B8E5F - B61E - 4F82 - 8FE9 - B12CF2497338		DFU Mode Set (Notification Disabled)
497B8E60 - B61E - 4F82 - 8FE9 - B12CF2497338		Switch Mode Set (Notification Disabled)
1805		Time Stamp
180A	Device Information	
2A29		Manufacturer Name
2A24		Model Number
2A23		System ID
180F	Battery Service	
2A19		Battery Level

## UUID TABLE FOR WATER PROFILE

UUID	SERVICE	CHARACTERISTIC
<b>WATER PROFILE</b>		
35D8C7DA - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA	Water Presence	
35D8C7DB - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA	Water Presence	
35D8C7DC - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Current Water Presence
35D8C7DD - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Water Presence Alarm Set
35D8C7DE - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Water Presence Alarm
35D8C7DF - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA	Water Level	
35D8C7E0 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Current Water Level
35D8C7E1 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Water Level Low Value
35D8C7E2 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Water Level High Value
35D8C7E3 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Water Level Alarm Set
35D8C7E4 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Water Level Alarm
35D8C7E5 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA	Data Logger	
35D8C7E6 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Enable Data Logging
35D8C7E7 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Data
35D8C7E8 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Read Logged Data
35D8C7E9 - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA	Device Management	
35D8C7EA - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		DFU
35D8C7EB - 9D78 - 43C2 - AB2E - 0E48CAC2DBDA		Mode Switch
1805		Time Stamp
180A	Device Information	
2A29		Manufacturer Name
2A24		Model Number
2A23		System ID
180F	Battery Service	
2A19		Battery Level