ISSC Technologies Corp.

IS1678_SPP_UI Tool
User Guide

Table of Contents

1. INTRODUCTION

IS1678_SPP is a support BR / EDR and dual mode BLE products.
IS1678_SPP can reach information through these two modes of transport and the Remote Device.
IS1678_SPP can also support SPP and MFi protocol.
The UI Tool design is to try to make these complex parameters simplistic,
Allows users to use clear and simple interface to design their hearts IS1678_SPP the desired behavior patterns,
And this document is a user guide of the UI configuration tool which provides a friendly interface for customers to edit parameters and GATT Table of SPP. This UI tool brings SPP into a real product of Bluetooth Low Energy with proper configurations.

2. NOMENCLATURE

- BR/EDR(Basic Rate/ Enhanced Data Rate)
  - Bluetooth 3.0 RF
- BLE (Bluetooth Low Energy)
  - Bluetooth 4.0 RF
- SPP (Serial Port Profile)
  - This profile is based on ETSI 07.10 and the RFCOMM protocol. It emulates a serial cable to provide a simple substitute for existing RS-232, including the familiar control signals.
- iAP
  - iPod Accessory Protocol for APPLE.
- MFi (Made for iPhone/ iPod/ iPad)
  - Apple device
- iDevice
  - iPhone/iPad/iPod Touch .It support iAP protocol for Apple device.
- Standby Mode
  - It can be link mode.
- Low Power mode
  - It is save power mode. It has 32k in work.
- GATT
  - Generic Attribute Profile (GATT) is built on top of the Attribute Protocol (ATT) and establishes common operations and a framework for the data transported and stored by the Attribute Protocol.
- Service
  - A service is a collection of data and associated behaviors to accomplish a particular function or feature of a device or portions of a device. A service may reference other primary or secondary services and/or a set of characteristics that make up the service.
- Characteristic
  - A characteristic is a value used in a service along with properties and configuration information about how the value is accessed and information about how the value is displayed or represented.

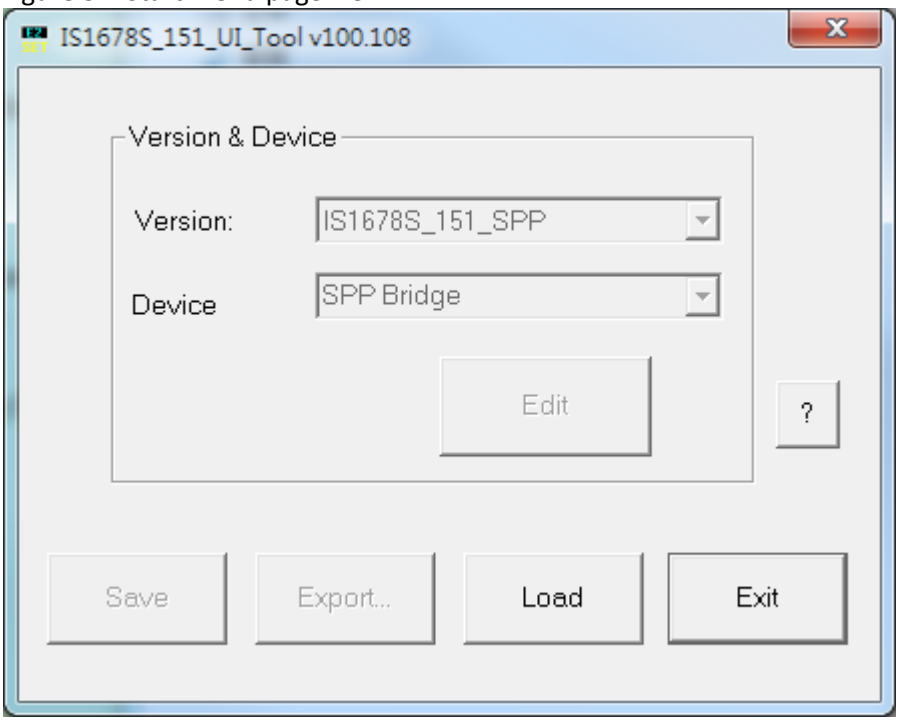
3. TOOL OVERVIEW

There are three parts in UI configuration tool: Start Menu, Main Features and Function Settings, those will be introduced in the following sections.

3.1 Start Menu Page

After launching this tool, the very first view you will see is Start Menu. It consists of two blocks, information block and operation block as presented below.

Figure 3.1 Start menu page view



- **Version**

  Display the IC part number.

- **Device**

  Display the IC function

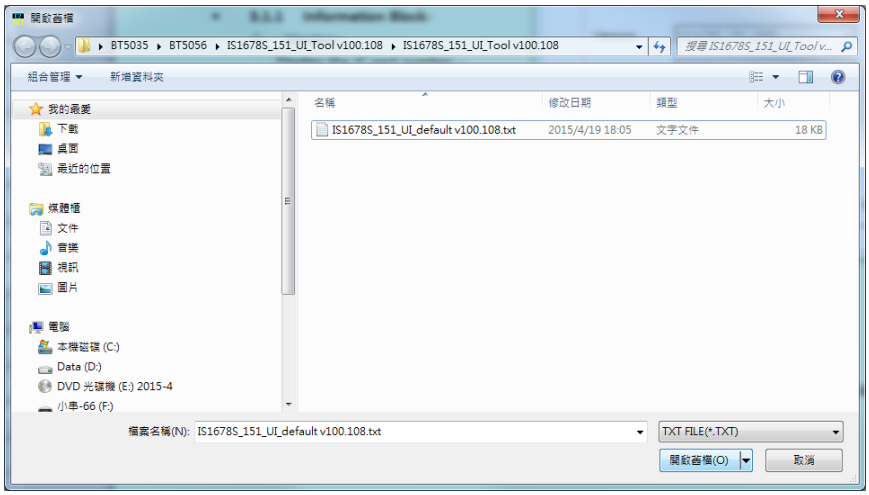
3.2 Operation

✧ Load

Load UI parameters to this tool.

Before doing anything with this tool, to load an UI parameter table is a must.

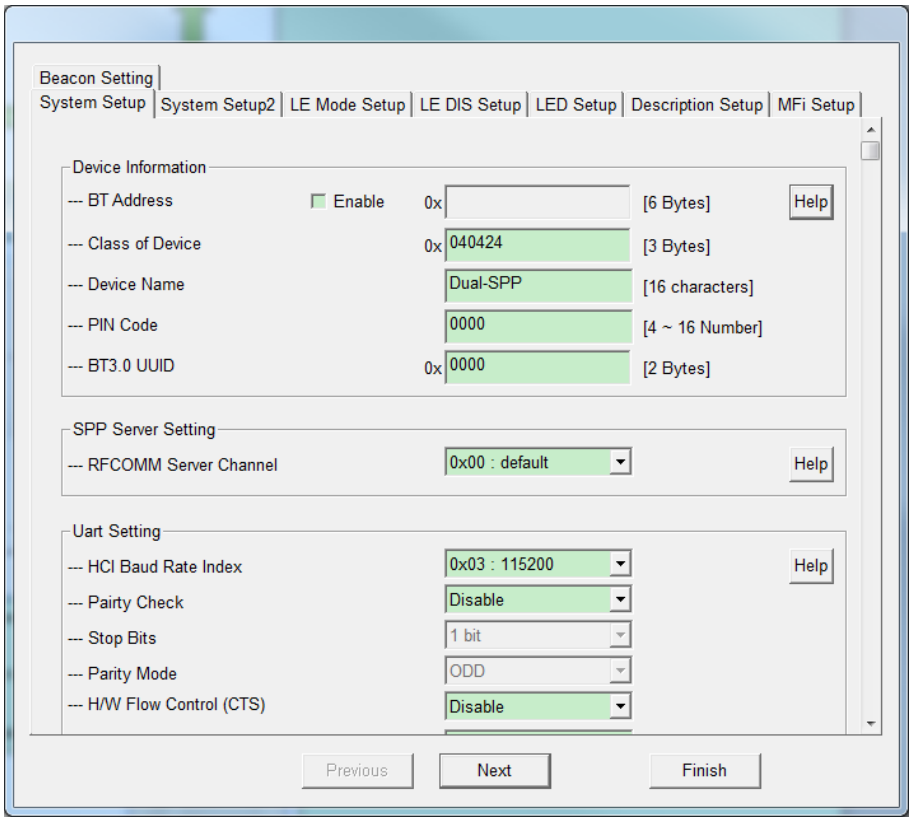
Figure 3.2.1 Load UI parameters from a text file



✧ Edit

Start to edit system parameters. This button is can into the UI modify page.

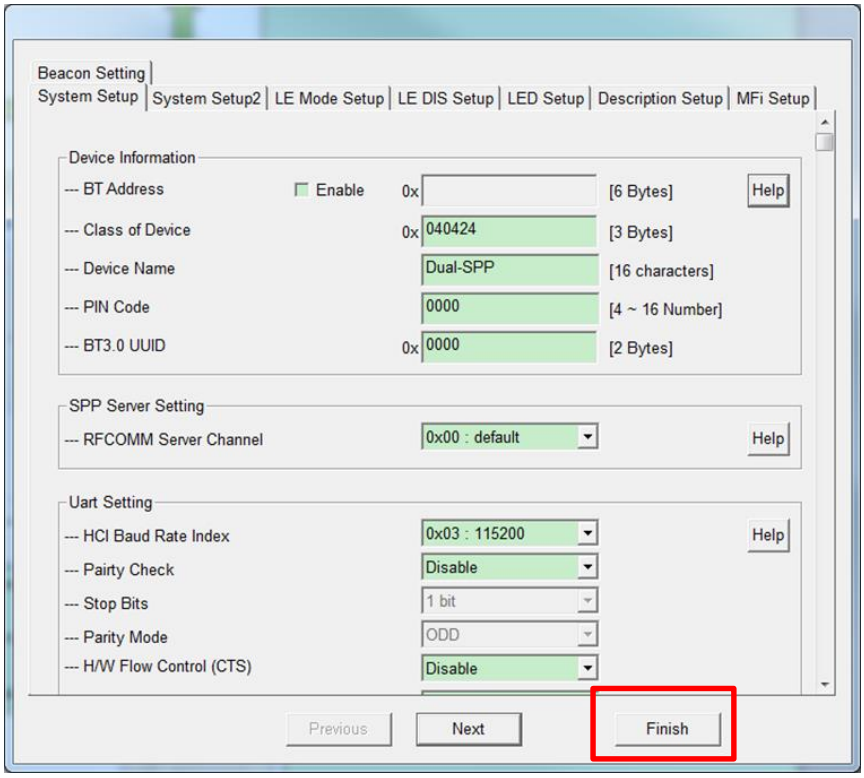
Figure 3.2.2 Load UI parameters from a text file and into edit page.

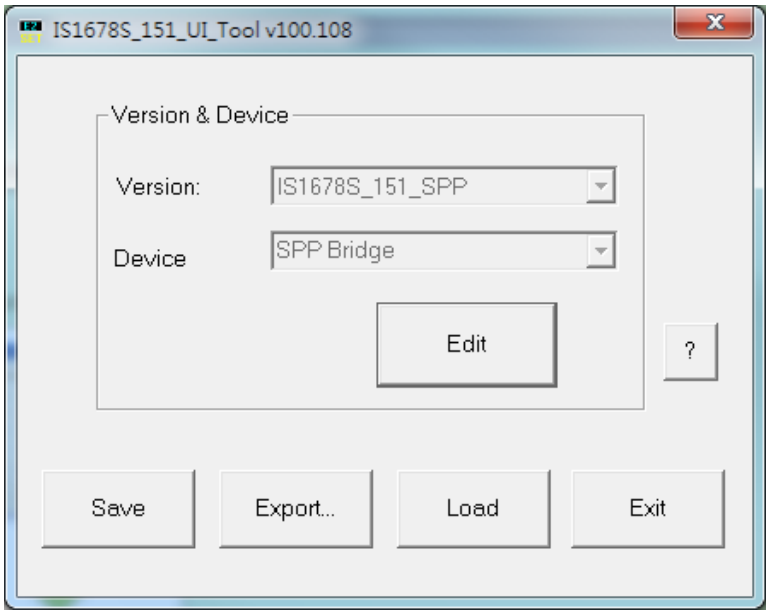


✧ Finish

When finish edit UI parameter, must push the “finish” button can leave modify page.

Figure 3.2.3





✧ Export

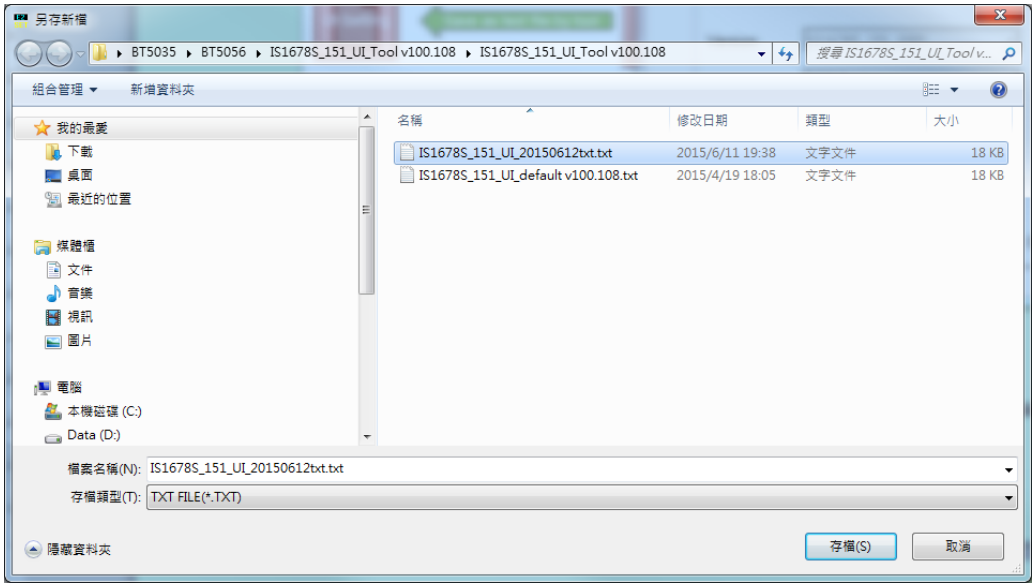
Before Export the UI settings as a text.

But this function is not enable now.

✧ Save

Save the UI settings to the another “.txt”.

Figure 3.2.4 save the UI setting an the another “.txt”



3.3 Pressing the “Edit” button into the setup pages.

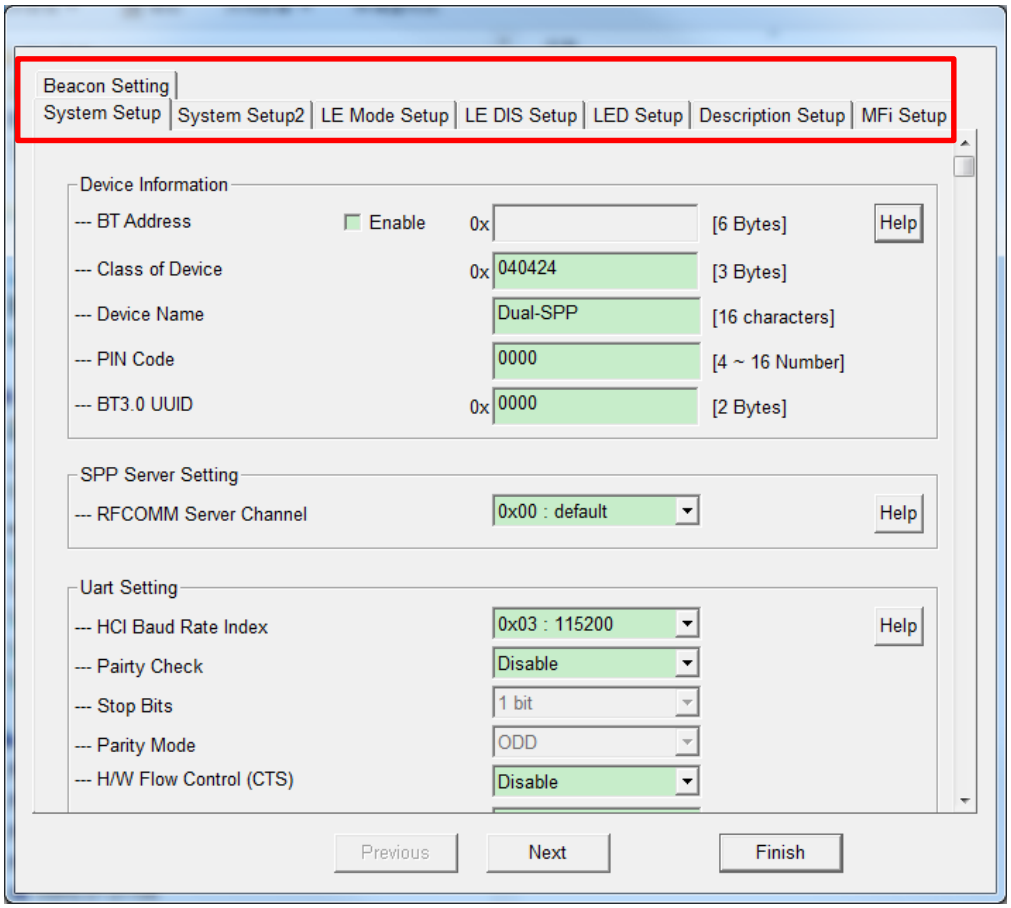


Figure 3.3 Function setting page view

- **System Setup Page**
  The parameter is all about the system configuration in this page.
- **System Setup2 Page**
  The parameter is about GPIO configuration and some system configuration in this page.
- **LE Mode Setup Page**
  The parameter is all about LE mode setting in this page.
- **LE DIS Setup Page**
  In this page user can setting LE UUID and device information service table.
- **LED Setup Page**
  The parameter is all about LED configuration in this page. There is one LED in SPP. It indicates what current state is to user and its respective flash pattern of LED.
- **Description Setup Page**
  The parameter is the Product information
- **MFi Setup Page**
  The parameter is all about MFi Link information
- **Beacon Setup Page**
  The parameter is all about iBeacon configuration in this page.

3.4 System setup

- **Device Information**
  - **BT Address**
    This parameter is the Bluetooth address of the device.
  - **Class of Device**
    The Class is the class of device/service field (CoD).
    It is indicated using the 'Format Type field' within the CoD.
    The value could be 0x040424(HS) or 0x001F00 (Uncategorized)
    CoD Generator link:
    http://bluetooth-pentest.narod.ru/software/bluetooth_class_of_device-service_generator.html
  - **Device Name**
    NameFragment is a local device name. If a remote device requires a local name, a local device replies the local device name
  - **PIN Code**
    The App_Fix_PIN_Code which is four byte ASCII code is a fixed PIN code of a local device.
    The local device replies the PIN code using the App_Fix_PIN_Code when remote devices send a PIN code request command."
  - **BT3.0 UUID**
    This parameter is the Universally Unique Identifier of the device.
    Only for BT3.0 and it can setting by user.
    Allow customer to define their own UUID to be connectable. Devices without correct UUID would be disconnected."
- **SPP Server Setting**
  - **RFCOMM Server Channel**
    Choose RFCOMM server channel
- **UART Setting**
  - **HCI Baud Rate Index**
    The HCI Baud Rate Index is the baud rate index of the HCI UART.
  - **Parity Check**
    Set this parameter to enable configure UART frame for Parity setting
  - **Stop Bits**
    This Parameter is used to configure UART frame for stop bit setting
  - **Parity Mode**
    This Parameter is used to configure UART frame for parity setting
  - **H/W Flow Control (CTS)**
    Set this parameter to enable UART H/W flow control (CTS).
    If MCU not support flow control, this parameter must set disable.
  - **Max BR/EDR Data Segment Size On Air**
    The data large than this parameter will be divided and sent to remote side.
  - **UART RX_IND**
    Enable / Disable UART RX IND

- **Max BLE Data Segment Size On Air**
  The data large than this parameter will be divided and sent to remote side.
- **Check UART RX Data Interval**
  Check UART RX Data Interval

➢ **Operation Mode Setting**

- **BT Operation Mode**
  Select the Bluetooth single mode or dual mode
- **Operation Pattern**
  This parameter is used to set the operation pattern.
- **Configure Mode Timeout**
  This parameter is used to set configure mode timeout.

➢ **Sniff Mode Setting**

- **Sniff Interval**
  RF Off interval under connected state, if want to save more power, this function be enabled is necessary. The recommended value is 0x0320.
- **Enter Sniff Waiting Time**
  Enter Sniff mode waiting time, time duration start in data transmission finish.
- **Un-sniff When Receive Data From IC**
  Enable / Disable to leave sniff mode option when receiving data from IC.
- **Un-sniff When Receive Data From Remote**
  Enable / Disable to leave sniff mode option when receiving data from remote.

➢ **Connection Setting**

- **QoS Setting**
  Ask shorter Polling Interval (12.5ms) to get higher throughput or responses ACK time if role of IC is slave.(in RF active mode)
- **To Be Master**
  Ask to become the Master after link is established.
- **Supervision Timeout**
  Ask to change ""Supervision timeout""
  Define the timeout period when there is no response.
  It is available only when IC is role master.
- **Inquiry Scan Interval Value (BR/EDR)**
  The periodic interval of inquiry scan window
  Device transmission information in the inquiry scan window, which allow the device to be discoverable.
- **Page Scan Interval Value (BR/EDR)**
  The periodic interval of page scan window.
  Device transmission information in the page scan window, which allow the device to be connectable.

- **Inquiry Setting**
  - **Inquiry Timeout Value**

    This parameter is used to set inquiry timeout value
  - **EIR Manufacture Data**

    This parameter is used to configure the Specific Manufacture Data in EIR

    EIR=>Extended Inquiry Response
- **Security Setting**
  - **Pairing Method**

    Select pairing method

    Just work->no security

    Passkey entry->the passkey needs to be entered on remove device

    Passkey confirm--->the passkey displays and needs to be confirmed on remote device
  - **Bluetooth 3.0 Pairing Mode**

    Enable/Disable Bluetooth 3.0 Pairing Mode
  - **Bluetooth 4.0 BLE Security**

    This parameter is used to set BLE Security.
  - **BLE User Confirm Option**

    This parameter is used to enable/disable LE user confirm passkey refer to PIN code. And PIN Code must set 6 digits if enable.

    This option only works when Passkey confirm and ""BT4.0 security"" are both enable.

    If enable, PIN CODE is required to be 6 digits and enter on the mobile side.

    If disable, the PIN CODE is only confirmed on the mobile side.
  - **Trust Device Connection**

    This parameter is used to enable/disable trust (paired) device connection.

    This function only works at BT4.0. If enable , the device only allows the connection with remote device which had been connected before.
- **Bluetooth 3.0 Link Back Setting**
  - **Page Timeout Value**

    The timeout period of device page process.
  - **Link Back Device Number**

    This parameter decides how many devices will be tried to link while it is power on.

    It will be stop once the link is connected or link back timing is up.

    The maximum is allowed to try 8 different devices. 0x00: disable link back function."
  - **Link Loss Reconnection**

    IC shall auto reconnect to last lost remote device.

    Device would link back to the last connection after link loss.
  - **BR/EDR Visibility in Link Back Mode**

    Decide the visibitlty of Bluetooth device under the Link Back Mode.

    Device is visible(BR/EDR discoverable) when trying to link back last connection.

- **LE Visibility in Link Back Mode**
  Decide the visibitlty of Bluetooth device under the Link Back Mode.
  Device is visible(LE discoverable) when trying to link back last connection.
- **Page Times**
  The maximum times for which the device will retry to connect to a remote device when power-on and loop mode enabled.
  0x00:disable link back function.
  How many times the device will do the page process after power-on.
- **Page Times After Link Loss**
  The maximum times for which the device will retry to connect to a remote device when Link Loss
  0x00:disable link back function.
  How many times the device will do the page process after link loss.
- **Link Back Loop Times**
  Enter LinkBack mode when standby time is up, and increment the counter afterward.
  If counter greater than ""Link_Back_Loop_Setting"", device shall enter S2 mode.
  0x00 : disable function
  0xFF :enable function and never enter S2 mdoe.
  Device will enter Link Back mode when standby timeout then be back standby mode again if nothing connected.
  If there is still nothing fould after certain loops, device will enters S2 state.

Standby Mode Setting

- **Standby Timeout after Power ON**
  The device will be standby after power on, then enter S2 mode after the standby timeout.
  0x00~0xFE: Standby time parameters.
  0xFF: Disable auto power_off function(enter S2 mode)
- **Standby Timeout after Disconnection**
  The device will be standby after disconnection, then enter S2 mode after the standby timeout.
  0x00~0xFE: Standby time parameters.
  0xFF: Disable auto power_off function(enter S2 mode)
- **Discoverable under Standby Mode**
  Enable/disable the inquiry scan (visible, discoverable) under standby mode.

MCU Setting

- **Wakeup Externel MCU Wait Time**
  The waiting time from waking up MCU to the 1st signal sending.
  Wake up MCU by pulling high TX_IND (P0_4).

Misc.

- **Allow Into Low Power Mode Only In Standby**
  Just allow IC enter low power mode(32k) when at Standby mode.
- **Switch Mode**
  This parameter is uesd to enable Switch Mode of LDO33.
- **SW Button Feature**
  Enable/disable the function of SW button to enter S4 state.

- **Version Control**
  - **EEPROM Footprint**

    The 16 ASCII characters for the customers' version control code. The download tool can check by this code and reject to download the EEPROM if it's mismatch.

3.5 System Setup2 Page

- **Link Quality Detection Setting**
  - **Link Quality Detection RF**

    Enable/Disable link quality detection.

    The RF_Tx_Power_Control_feature will be disabled if Enable this parameter.
  - **RSSI Normal Threshold**

    This parameter is used to set RSSI normal threshole value >-70 high.
  - **RSSI Weak Threshold**

    This parameter is used to set RSSI weak threshole value <-80 low.

- **Battery Detection Setting**
  - **Battery Detection**

    Thie parameter is uesd to enable battery detection
  - **High Battery Level**

    High battery level(4.0V)
  - **Normal Battery Level**

    This parameter is defined a normal voltage value of a battery. When the voltage is lower than this value, the device will start low battery warring.
  - **Low Battery Level**

    This parameter is defined a low voltage value of a battery. When the voltage is lower than this value, the device will shut down.
  - **Dangerous Battery Level**

    The threshold of Dangerous battery level.

    System will shut down below this level.
  - **Low Battery Into shutdown Down Time**

    Waiting time before system shut down when battery voltage is at low battery level.

- **RF Class Setting**
  - **RF class**

    The RF_Class is the RF class type.

- **GPIO Configuration**
  - **GPIO (default setting)**

	N/C	UART_RTS	UART_CTS	LOW_BATTERY_IND	RSSI_IND	GET WIFI INFO KEY	LINK_DROP_CONTROL (DISCONNECT)	UART_RX_IND	PAIRING_KEY	INQUIRY CONTROL	PROFILE_IND
P0_0		■									
P0_5	■										
P1_7			■								
P3_1										■	
P3_2							■				
P3_3								■			
P3_4									■		
P3_7				■							

3.6 LE Mode Setup Page

- **LE Connection Setting**
  - **LE Connection Parameter Update Request**

    Device will sent parameter (the subsequent 4 parameters) update request if enable this option, or the LE connection settings will be assigned by Remote when disable this option.

    Modify 0x01d6~0x01dd to 0xFF if disable this option.
  - **Min LE Connection Interval**

    This parameter is used to set LE min connection (on link) interval
  - **Max LE Connection Interval**

    This parameter is used to set LE max connection (on link) interval
  - **LE Slave Latency**

    This parameter is used to set LE slave latency (like sniff)

    LE Response Time = ((LE Connection Interval * 1.25) * (LE Slave Latency + 1))
  - **LE Supervision Timeout**

    This parameter is used to set LE supervision timeout.

    Master definitions the timeout period when there is no response.

- **LE Advertising Setting**
  - **LE Fast Advertising Interval**

    This parameter is uesd to set LE fast advertising interval
  - **LE Reduced Power Advertising Interval**

    This parameter is uesd to set LE second advertising interval for less current

- **LE Fast Advertising Timeout**
  This parameter is uesd to set LE fast advertising timeout value
- **Power On LE Reduced Power Advertising Timeout**
  This parameter is uesd to show Power On LE Reduced Power Advertising timeout value.
  Power On LE Reduced Power Advertising timeout = Power on Standby Time - LE Fast Advertising Timeout. This value should be consistent to the according value of BR/EDR.
- **Disconnection LE Reduced Power Advertising Timeout**
  This parameter is uesd to show Disconnection LE Reduced Power Advertising Timeout value.
  Disconnection LE Reduced Power Advertising Timeout = Disconnection Standby Time - LE Fast Advertising Timeout. This value should be consistent to the according value of BR/EDR.

RF TX power Setting

- **Connected TX Power Level**
  This parameter is used to set Connected (on link) TX Power Level.
- **Advertising TX Power Level**
  This parameter is used to set Advertising TX Power Level.

Specific Transparent Service Setting

- **Transparent Service UUID Configuration**
  This parameter is used to enable the specific Transparent Service UUID Setting
  If enable, device only allows to build the connection with identical UUID remote.
  https://developer.bluetooth.org/gatt/services/Pages/ServicesHome.aspx
- **Transparent Service UUID**
  This parameter is used to configuration the specific Transparent Service UUID
- **Transparent TX UUID**
  This parameter is used to configuration the specific Transparent TX UUID
- **Transparent RX UUID**
  This parameter is used to configuration the specific Transparent TX UUID
- **Transparent TX Property**
  This parameter is used to configuration the property of specific TX characteristic
  In the other words, to select the transmitting method (notify/ indicate) from device to remote.
- **Transparent RX Property**
  This parameter is used to configuration the property of specific RX characteristic
  In the other words, to select the receiving method (notify/ indicate) from device to device.

Advertising Data Setting

This parameter is uesd to set advertising data.
Length--> the length of data
Device name-->BT3.0 Device name, and display words
UUID--> BT4.0 UUID
Manufacture data-->BT4.0 product information (ASSCII)
Flag--> Bluetooth standard version (BT 3.0 and BT3.0+BT4.0 -->01 / BT4.0 -->05)

Other--> reference "" https://www.bluetooth.org/en-us/specification/assigned-numbers/generic-access-profile"""

- **Scan Response Data Setting**

  This parameter is uesd to set scan response data
  The information sending to a scan remote.
  (Advertising is a broad casting information,
  Scan response only sends to the remote which is scan with BT4.0)"

3.7 LE DIS Setup Page

- **Device Information Service**
  - **Model Number**

    This parameter is used to config model number characteristic of device information service.
    https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml
  - **Serial Number**

    This parameter is used to config serial number characteristic of device information service.
    https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml
  - **Manufacture Name**

    This parameter is used to config manufacture name characteristic of device information service.
    https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml
  - **Software Version**

    This parameter is uesd to config Software Version characteristic of device information service.
  - **SYSTEM ID**

    The System ID characteristic value
    https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml
  - **Enable MFi Version Mapping to DIS**

    Enable MFi Firmware version and Hardware version Mapping to DIS.
    DIS=device information service

- **Specific DIS UUID Setting**
  - **DIS UUID 1 Configuration**

    This parameter is used to enable/disable specific DIS UUID 1
  - **DIS UUID 1**

    This parameter is used to config specific DIS UUID 1
  - **DIS UUID 1 Value**

    This parameter is used to config the value of specific DIS UUID 1
  - **DIS UUID 2 Configuration**

    This parameter is used to enable/disable sepcific DIS UUID 2

- **DIS UUID 2**
  This parameter is used to enable/disable specific DIS UUID 2
- **DIS UUID 2 Value**
  This parameter is used to config the value of specific DIS UUID 1

➢ **Regulatory Certification Data List**

- **Regulatory Certification Data List Count**
  Defines the regulatory certification data list count
  https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml
- **Regulatory Certification Data List Length**
  Defines the regulatory certification data list length
  https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml
- **Authorization Body**
  Code assigned by IEEE 11073-20601 identifying the authorizing the authorizing body
  https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml
- **Authorization Body Structure Type**
  Identifies the data structure
  https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml
- **Authorization Body Structure Length**
  Defines authorization body data length
  https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml
- **Authorization Body Data**
  Format defined by Authorizing Bode (Continua)
  https://developer.bluetooth.org/gatt/services/Pages/ServiceViewer.aspx?u=org.bluetooth.service.device_information.xml

3.8 LED Setup Page

- **Standby LED Flash Setting**
- **Inquiry LED Flash Setting**
- **Link LED Flash Setting**
- **Link Back LED Flash Setting**
- **Low Battery LED Flash Setting**
- **Page LED Flash Setting**
  - **Type**
    This is the LED display method.
  - **On Duration**
    This the LED on time for flash.
  - **Off Duration**
    This the LED off time for flash.
  - **Count**
    This is the number of the flash times for a round.
  - **Interval**
    This is the time interval for a round.
  - **Interval**
    This parameter is used to set LED warning time interval if low battery happens
- **LED Brightness Setting**
  - **LED Brightness**
    LED brightness setting. 0~16 steps

3.9 Description Setup Page

- **Product Description Setting**
  - **Service Name Fragment**
    Local SDP service name.
  - **Service Name Length**
    Local SDP service name length.
  - **Vendor ID**
    This is intended to uniquely identify the vendor of the device.
  - **Product ID**
    This is intended to distinguish between different products made by the vendor.
  - **Product Version**
    This is intended to differentiate between versions of products with identical Vendor IDs and Product IDs
  - **VID Source**
    This attribute designates which organization assigned the Vendor ID.

3.10 MFi Setup Page

- **MFi Transmission Setting**

- **Burst iAP Transmission**
  When set this parameter to Enable, the data can still transfer to iDevice and no wait a ACK.
  It can still transfer many package(data) and the iDevice unity many ""ACK"" to back together.
- **Data Retransmission Interval**
  This parameter to setting interval when the data retransmission.

➢ **MFi Description Setting**

- **Bundle Seed ID Pref Token**
  This string identifies and tells the remote which accessory's preferred application is.
  APPLE would assign the string set.
- **SDK Protocol Token**
  This information is used to tell the application and establish communication channels.
- **APP Bundle ID**
  By sending this command to an iPod, the accessory request it to launch a specific application.
  The accessory passes an Application Bundle ID string, such as 'com.mycompany.myapp', to specify which application to launch.
- **Accessory Name**
  Please refer to the \"MFi Accessory Firmware specification\".
- **Accessory Firmware Version**
  Please refer to the \"MFi Accessory Firmware specification\".
- **Accessory Hardware Version**
  Please refer to the \"MFi Accessory Firmware specification\".
- **Accessory Manufacturer**
  Please refer to the \"MFi Accessory Firmware specification\".
- **Accessory Model Number**
  Please refer to the \"MFi Accessory Firmware specification\".
- **Accessory Serial Number**
  Please refer to the \"MFi Accessory Firmware specification\".

3.11 Beacon Setup Page

➢ **Beacon Setting**

- **Beacon Feature**
  Enable/Disable Beacon function
  What is Beacon Things?
  There will be two formats of advertising packets existing in the air, and iPhone can refer to the Beacon packets and create the connection to the specific SPP service automatically.
- **Beacon Advertising Interval**
  This parameter is used to configure advertising interval for Beacon using
- **Beacon Advertising Data Length**
  This parameter is used to configure advertising data length for Beacon using
- **Beacon Advertising Data**

This parameter is used to configure advertising data for Beacon using

- **Beacon Secret Key**

  To config the Secret key for Beacon Admin function.
  This cecret key shall be applied when accessing some setting in the proprietary APP.
  The serial number in the LE setting is the device name.
  It will not display if disable this function."

4. Revision History

Version	Date	History
V0.1	2015/06/14	First Edition