

EGIGATEK SPPLike

Application Note

Slave / Peripheral Role r05

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1. Introduction

The purpose of this document is to give a quick outline on what EGIGATEK SPPLike is, and how it works.

2. SPPLike Profile

The goal of the SPPLike profile is to offer a simple “serial cable replacement” similar to classic SPP using a Bluetooth low energy module. This includes bi- directional data exchange between two SPPLike modules, a SPPLike module and another Bluetooth low energy capable device.

The SPPLike application supports the following service:

- SPPLike Service
- Device Information Service (Version 1.1)
- Battery Service (Version 1.0)
- GATT
- GAP

The SPPLike profile mandates three services: SPPLike, Device Information and Battery Service.

GAP and GATT services are mandated by Bluetooth Core Specification Version 4.0. as shown in Figure 1.0.

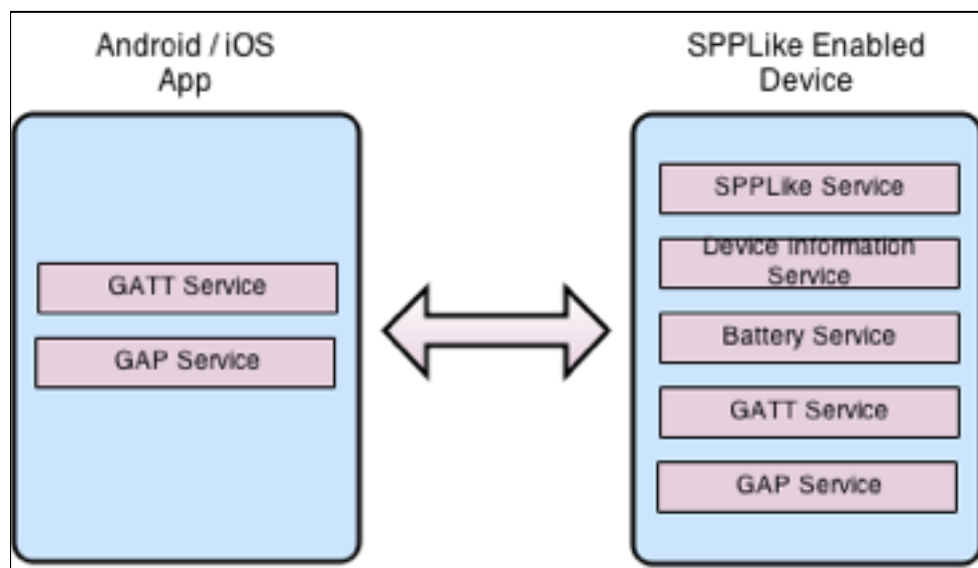


Figure1.0

3. SPPLike Service

The SPPLike Service should be instantiated as a «Primary Service».

The service UUID shall be set to the UUID value assigned to [SPPLike Service] as defined in 3.2.

3.1.Service Characteristic

Three characteristics are exposed in the SPPLike Service. Only one instance of characteristic is permitted within this service.

Characteristic Name	Requirement	Mandatory Properties	Optional Properties	Security Permissions	Optional Security Permissions
Data Transfer	M	Write, Notify	Write with-out Response		Writeable with Authentication
PIO IN State	M	Notify			
PIO OUT State	M	Write	Write with-out Response		Writeable with Authentication

- The Data Transfer characteristic shall be used to transfer serial data between a SPPLike Device with an App of IOS / Android, or between SPPLike Devices as well.
The value format used for writes and notifications shall be set to an array of UINT8 values. A SPPLike Device shall be able to send and receive arrays of up to 20 UINT8 values.
The characteristic UUID shall be set to the UUID value assigned to [Data Transfer] as defined in 3.3.
- The PIO IN State characteristic(PIO 5) is use for notify when PIO state is changed by external controller.
The characteristic UUID of PIO IN State shall be set to the UUID value assigned to [PIO IN State] as defined in 3.4.
- The PIO OUT State characteristic(PIO 8) is a writeable property, when remote GATT Server can change PIO state though this characteristic.
The characteristic UUID of PIO OUT State shall be set to the UUID value assigned to [PIO OUT State] as defined in 3.5.

3.2. UUID SPPLike Service

0x9bbd213de47f4de9ab1f18c5ac73b2f9

3.3. UUID Data Transfer characteristic

0xf0ecfb9775d84a9696d9c9fa7b6dcc3c

3.4. UUID PIO IN State characteristic

0x53477bab4b81472c8cd0b090d9bfc68

3.5. UUID PIO OUT State characteristic

0xd0d23cf93f0441b08aa2be283fb4266e

4. User Interface

This application makes use of the button and LED available on the EGIGA SPPLike Enabled device.

- PIO 5: PIO IN state change.
- PIO 7: go deep sleep on Hi (trigger HI for 1 sec).
- PIO 8: PIO OUT state change.
- PIO 9: for CONNECT_STATUS_LED (LED D2 on EVB)
 - LED ON : connected.
 - LED BLINK : fast blink- adverting without device bonded
slow blink- adverting with device bonded
 - LED OFF : disconnect.
- PIO 10: for link states. HI : connected; LOW: disconnect.
- PIO 11: for Short button press and Extra Long button press. (SW4 on EVB)

Idle Mode 0: go to shadow sleep mode when idle, AT Command Acceptable.

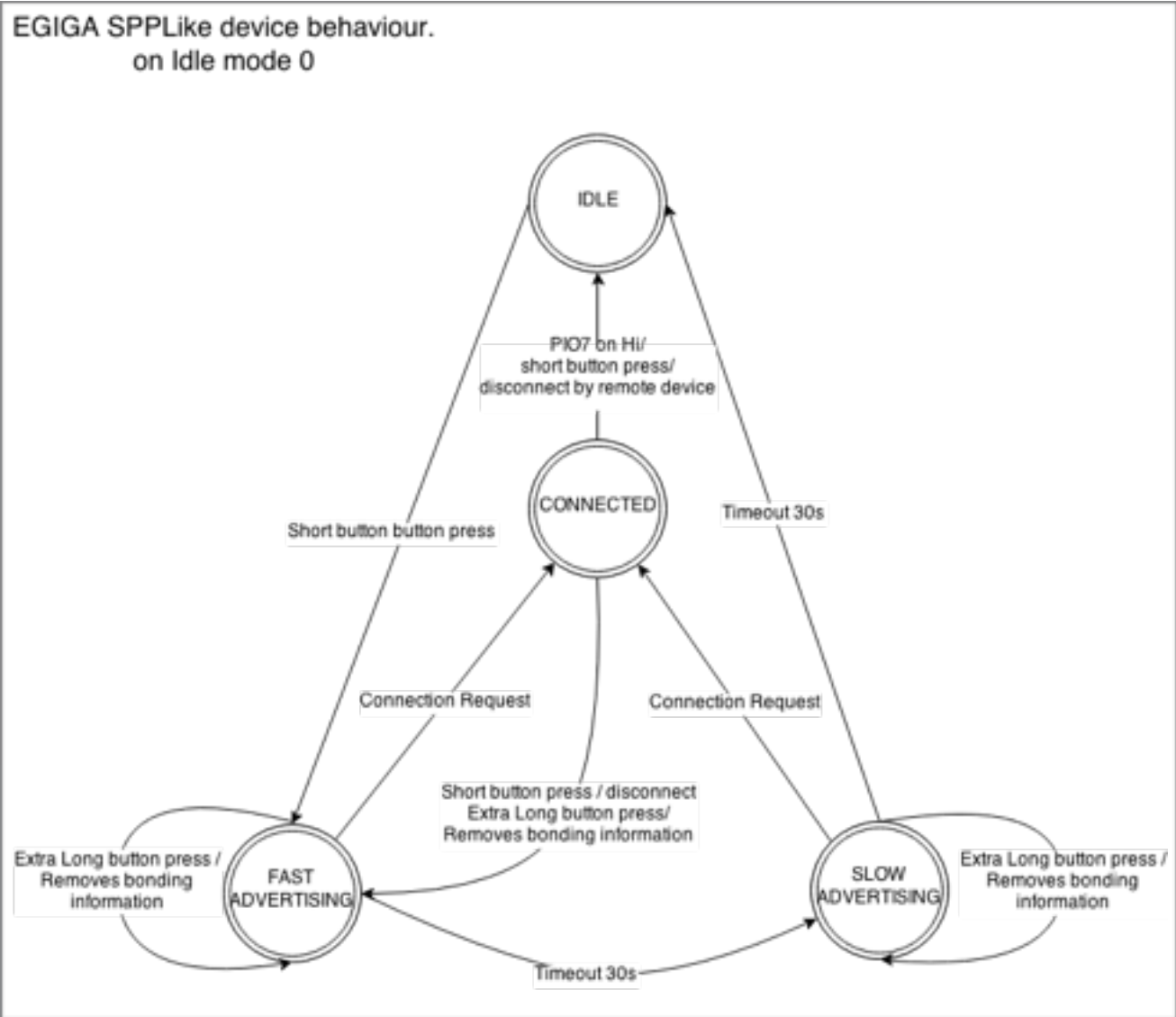


Figure 4.0 SPPLike Slave Role device behavior on idle mode 0.

Idle Mode: 1: always on mode, go to fast advertising when idle.

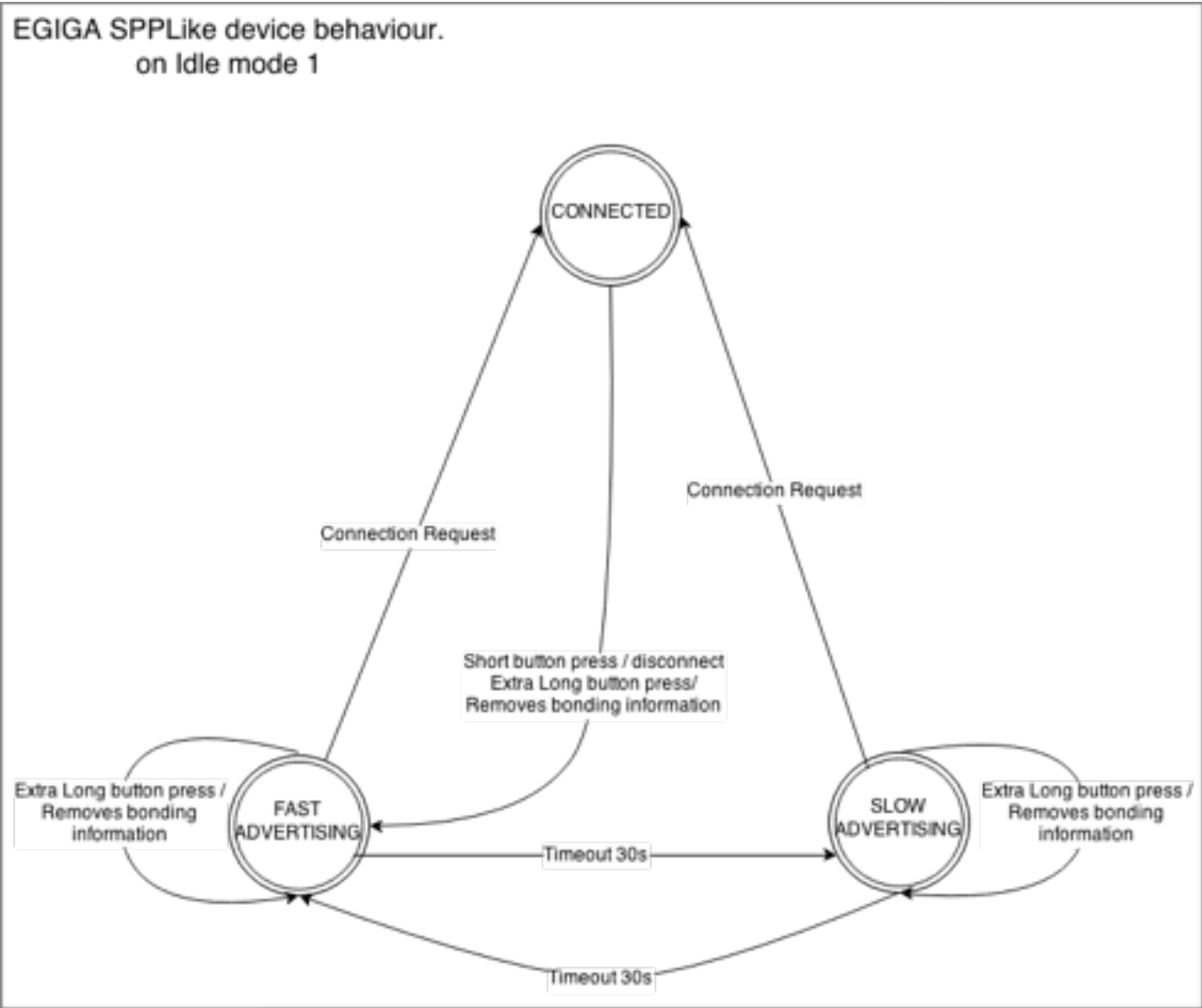


Figure 4.1 SPPLike Slave Role device behavior on idle mode 1.

Idle Mode: 2: go to deep sleep mode when idle.

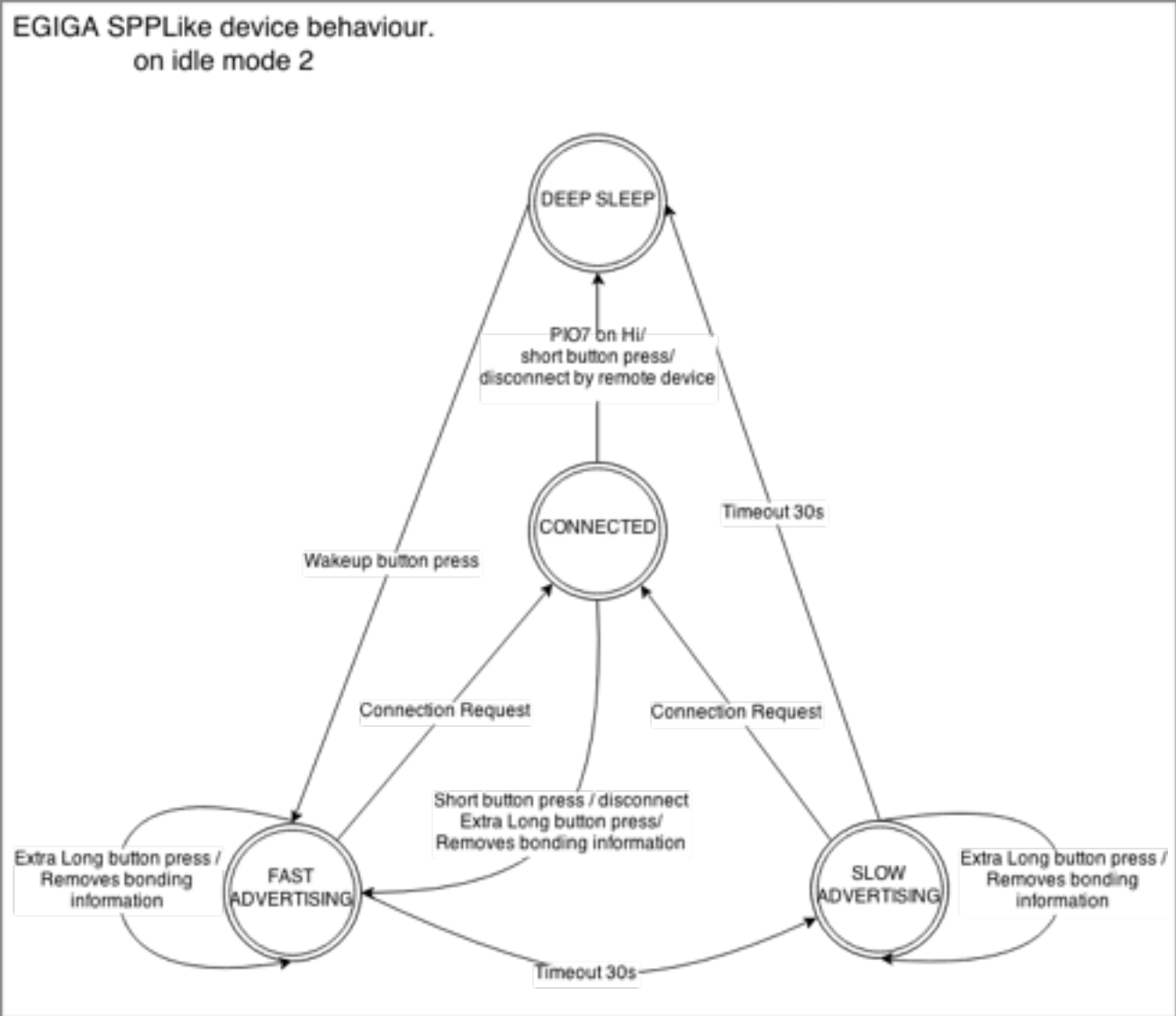


Figure 4.2 SPPLike Slave Role device behavior on idle mode 2.

5. AT Command

AT commands only be accepted before the connection established.

Each command line consists of a prefix, a body and a terminator.

All command lines begin with the prefix AT (ASCII 065, 084) or at (ASCII 097, 116).

The body is a string of characters in the ASCII range 032-255. Control characters other than <CR> (carriage return; ASCII 013) and <BS> (back space; ASCII 008) in a command line are ignored.

The terminator is <CR><LF>.

There is no distinction between upper-case and lower-case characters.

Commands

ATA	Show Bluetooth Device Address
ATB	Show Baud Rate
ATB=Value	Change Baud Rate
ATI	Display Version Information
ATN	Show Local Device Name
ATN=Value	Change Device Name
ATRESET	Reset Device
ATADV	Start advertising
ATSADV	Stop advertising

ATIDLE Show idle mode
 0000 : idle mode 0
 0001 : idle mode 1
 0002 : idle mode 2

ATIDLE=Value Change idle mode

6. Firmware Upgrade

- SPI
- CSR Over-the-Air Update (OTAU) system (version 6).

7. Direct Test Mode

Direct Test Mode is supported in SPPLike Peripheral Role V1.21 onwards, allowing automated testers such as the ANRITSU® MT8852B or the ROHDE & SCHWARZ® Bluetooth Tester 1153.9000.35 (CBT) to connect directly to the CSR10xx IC without the need for additional interfacing software. This utilises a "2-wire" serial interface as described in the Bluetooth v4.1 Specification available from the Bluetooth SIG (www.bluetooth.org).

Usage:

PIO3:

setting PIO3 to high to force the application into Direct Test Mode during the start-up boot sequence.

If the PIO3 is not asserted, the application starts up in the normal operational mode.

PIO9: UART receive.

PIO10: UART transmit.

The system uses PIO9 (RX) and PIO10 (TX) for UART communication.

Baud Rate: 9600.

8. Appendix A Definitions

Term	Meaning
Short button press	Button press for less than 4 seconds
Extra Long button press	Button press for over 4 seconds

9. Appendix B Sample code

- iOS

[BTLE Central Peripheral Transfer](#) from iOS Developer Library

- Android

[Bluetooth Low Energy](#) from Android Developers