Chipsmall

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With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

BLED112 *Bluetooth*® Smart USB Dongle

Table of Contents

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Key Features

- *Bluetooth* **v.4.0, single mode compliant**
  - Supports master and slave modes
  - Up to 8 connections

- **Integrated** *Bluetooth* **Smart stack**
  - GAP, GATT, L2CAP and SMP
  - *Bluetooth* Smart profiles

- **Radio performance**
  - Transmit power :   +0 dBm
  - Receiver sensitivity: -93dBm

- **USB host interface**
  - Supports USB/CDC (virtual COM port)

- **Programmable 8051 processor for stand-alone operation**

- *Bluetooth***, CE, FCC, IC, Japan and South-Korea qualified**

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Benefits

- **Integrated *Bluetooth* stack**
  - No *Bluetooth* stack needed on the host
  - Operating system independent

- **Wide Operating System support**
  - Windows®
  - Linux
  - MAC OS
  - Android

- **BGAPI™ software interface**
  - An OS independent API between the dongle and the host

- **On-dongle applications**
  - Developed with simple BGScript™ scripting language
  - Enables stand-alone operation

- ***Bluetooth*, CE, FCC, IC, South-Korea and Japan qualified**
  - Proven interoperability
  - No qualification costs

BLED112 Overview

- **_Bluetooth_ low energy radio**
  - Frequency: 2402 – 2480 MHz
  - TX power: 0 dBmRX sensitivity: -93 dBm
  - Modulation: GFSK
  - Symbol rate: 1 Mbps

- **Antenna**
  - Integrated PCB antenna

- **Typical line of sight range:**
  - +0dbm: 20-40 meters
  - -20 dBm: ~5 meters

BLED112 Overview

A programmable 8051 microcontroller

- **Architecture**
  - 8-bit, 8051 architecture

- **SRAM**
 - 8 kB

- **Flash**
 - 128kB

Bluetooth® Smart Software

Bluetooth Smart Software

- ***Bluetooth v.4.0*, single mode compliant**
  - Supports master and slave modes
  - Up to 8 simultaneous connections

- **Implements all *Bluetooth* Smart functionality**
  - GAP, L2CAP, ATT, GATT
  - Security manager: bonding, encryption
  - *Bluetooth* Smart profiles

- **Simple API for external host processors**
  - BGAPI^{TM} : A simple protocol over UART or USB interfaces
  - BGLib^{TM} : A C library for host processors implementing BGAPI

- **Supports standalone applications as well**
  - BGScript^{TM} : A simple scripting language for writing applications
  - **No separate host needed**

- **Blutoooth Smart Profile Toolkit^{TM}**
  - XML based development tool for Bluetooth Smat profiles
  - Fast and simple profile development

- **Small memory requirements**
  - ~4kB RAM
  - ~70kB flash (depending of used features/profiles)

- ***Bluetooth* qualified**

Bluegiga *Bluetooth*®
Smart Software
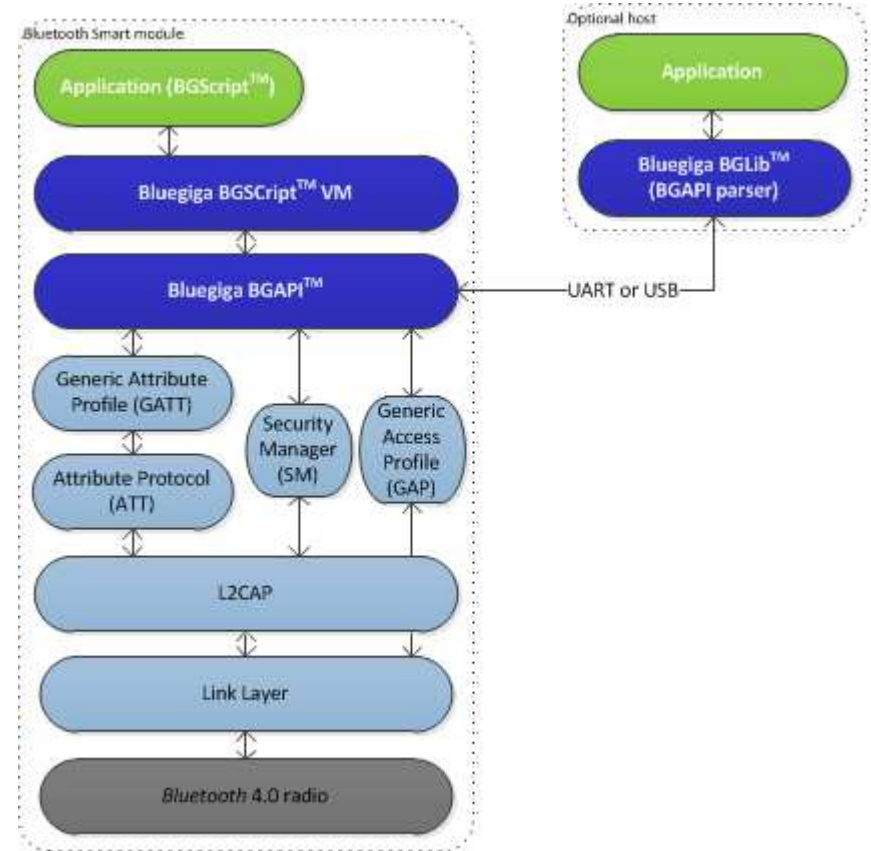
Bluetooth Smart Software

- **BGAPI™ protocol** : A simple binary command, response and event protocol between the host and the stack

    - Used when a separate host (MCU) is used to control BLED112 over USB

    - Very small memory requirements size requirement and low implementation overhead

Bluetooth Smart Software
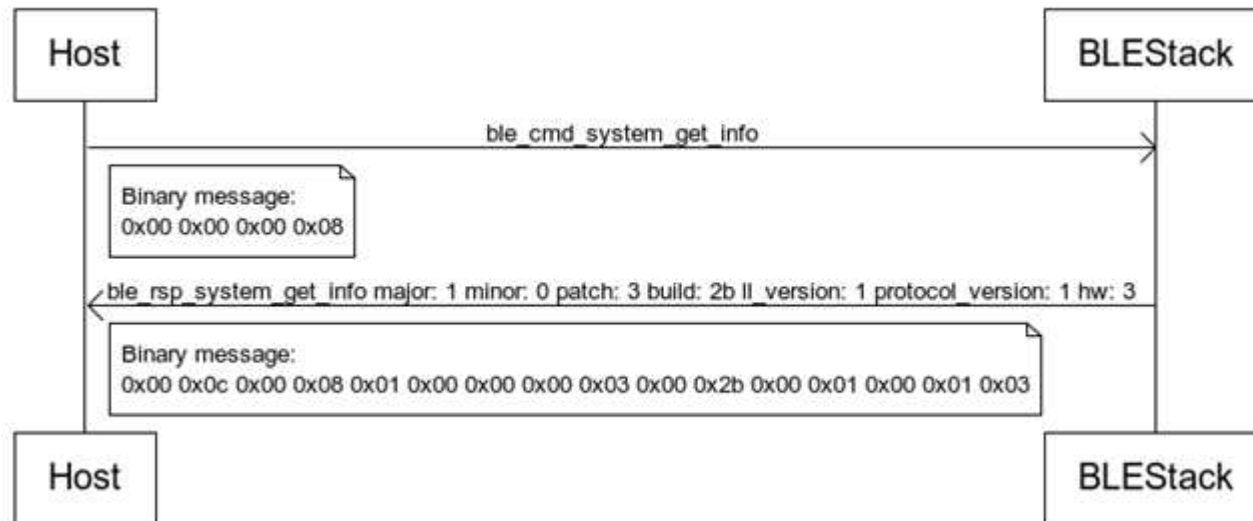
- **BGLib™ library** : A portable ANSI C library, which implements the BGAPI protocol

    - Easy to port to various architectures such as : ARM Cortex, PIC16/32 etc.

    - Uses fuction–call back architecture

C Functions

```
/* Function */
void ble_cmd_gap_connect_direct(
    bd_addr address ,
    uint8 addr_type ,
    uint16 conn_interval_min ,
    uint16 conn_interval_max ,
    uint16 timeout
);

/* Callback */
void ble_rsp_gap_connect_direct(
    uint16 result ,
    uint8 conn
);
```

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Bluetooth Smart Software

- **BGScript™ scripting language** : A very simple BASIC-like application scripting language

    - Used when applications are implemented on the BLED112's 8051 controller

    - Enables very fast application development and allows programs to be executed directly on the BLED112 without the need of an external MCU

```
# System boot event listener : Executed when BLE112 is started
event system_boot(major ,minor ,patch ,build ,ll_version ,protocol_version ,hw )


    # Configure ADV interval to 1000ms and start advertisements an all channels
    call gap_set_adv_parameters(1600, 1600, 7)

    # Start generic advertisement and enable connections
    call gap_set_mode(2,2)

   #Start a continuous software timer, which generates interrupts every 1000ms
   call hardware_set_soft_timer(32768, 1, 0)
end
```

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Bluetooth Smart Software

- **Why to use BGScript™?**

- **Very simple to use**
  - Fast development of simple *Bluetooth* Smart applications
  - Examples: Pairing, simple user interfaces, simple sensors

- **Free software development tools**
  - Code developed with any text or source code editor
  - Code compiled with Bluegiga's free compiler

- **Several example scripts available**
  - Heart Rate sensor
  - Proximity reporter
  - FindMe tag
  - Medical devices such as blood glucose

- **Cuts out the need for external MCU**
  - Reduced product eBoM
  - Smaller footprint
  - Faster time-to-market

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Bluetooth Smart Software

- **Bluetooth Smart Profile Toolkit™**: A tool for creating *Bluetooth* Smart profiles

  - *Bluetooth* Smart profiles are very simple

  - Can be describes with a single file of XML

  - Profile toolkit is a Simple description language of *Bluetooth* Smart Profiles

- **Several example profiles and services available**
  - Heart Rate Sensor
  - Proximity Reporter
  - FindMe
  - Blood glucose

```xml
<?xml version="1.0" encoding="UTF-8" ?>
- <configuration>
  + <service>
  - <service>
      <uuid>3a00</uuid>
      <description>Heartrate Service</description>
    - <characteristic id="heartrate">
      - <properties>
          <read />
          <notify />
        </properties>
        <uuid>3a01</uuid>
        <value type="UINT8" />
        <description>Beats per minute</description>
      </characteristic>
    - <characteristic id="rr_interval">
      + <properties>
        <uuid>3a02</uuid>
        <value type="UINT16" />
        <description>R-R Interval</description>
      </characteristic>
    - <characteristic>
        <uuid>3a03</uuid>
      + <properties>
        <value type="SFLOAT" unit="kJ" />
        <description>Energy Expended</description>
      </characteristic>
    - <characteristic>
        <uuid>3a04</uuid>
      + <properties>
        <value type="UINT8" />
        <description>Sensor Status</description>
      </characteristic>
    + <characteristic type="aggregate">
    </service>
  </configuration>
```

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Certifications

- ***Bluetooth* 4.0**
  - BLED112: Controller subsytem
  - Software : Host subsystem

- **CE**
  - EN300328
  - EMC330489

- **FCC**
  - FCC Modular approval

- **Industry Canada**
  - IC modular certification

- **South Korea**
  - KCC certification

- **Japan**
  - ARIB-STD-66

Thank You