

# **BLUEGIGA BLUETOOTH SMART SOFTWARE**

RELEASE NOTES

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Version 1.7



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# Table of Contents

|       |   |   |
|-------|---|---|
| 1     | Bluegiga Bluetooth Smart Software - Release Notes             | 4 |
| 1.1   | Changes: 1.3.0 Beta (Build 110) compared to 1.2.2 (Build 100) | 4 |
| 1.2   | Changes: 1.2.2 (Build 100) compared to 1.2.1 (Build 91)       | 4 |
| 1.3   | Changes: 1.2.1 (Build 91) compared to 1.2.0 (Build 89)        | 4 |
| 1.4   | Changes: 1.2.0 (Build 89) compared to 1.2.0 (Build 88)        | 5 |
| 1.5   | Changes: 1.2.0 (Build 88) compared to 1.1.1 (Build 71)        | 5 |
| 1.6   | Changes: 1.1.1 (Build 71) compared to Beta 2 (Build 55)       | 5 |
| 1.7   | Changes: 1.1.0 Beta 2 (Build 55) compared to Beta (Build 46)  | 6 |
| 1.7.1 | Known Issues with Build 55                                    | 6 |
| 1.8   | Changes: 1.1.0 Beta compared to 1.0.3                         | 6 |
| 1.9   | Changes: 1.0.3 compared to 1.0.2                              | 6 |
| 1.9.1 | Memory Limits for 1.0.x                                       | 7 |
| 1.10  | Changes: 1.0.2 compared to 1.0.1                              | 7 |
| 1.11  | Changes: 1.0.1 compared to 1.0.1                              | 7 |

# 1 Bluegiga Bluetooth Smart Software - Release Notes

## 1.1 Changes: 1.3.0 Beta (Build 110) compared to 1.2.2 (Build 100)

**Date:** May 20th, 2014

**Note:** Release 1.3.0 Build 110 is a beta release for BLE 1.3 SW and BLE121LR Module

### New Features

- Bluetooth Smart software now supports the new BLE121LR hardware
- BLE Software Update tool now also support the new BLE121LR hardware
- SDK examples have been updated and restructured to support the BLE121LR and the new DKBLE development kit
- New API command added for turning On/Off USB Interface on BLE112
- New API command added to access the AES128 hardware encryption engine
- New API command added to reduce the RX sensitivity and shorten the range.
- OTA firmware update now supports just upgrading the BGScript application and GATT database
  - ~90% smaller firmware file and faster and lower power OTA updates
  - Enables OTA update on the hardware variants that only have 128kB flash

### Quality Improvements:

- In BGAPI packet mode the length checks have been added and too short or long BGAPI packet will produce an error
- Advertising mode (scannable and non-connectable) while connected to an other device enabled
- Enhancements made to BGScript engine that allow more efficient use of RAM

## 1.2 Changes: 1.2.2 (Build 100) compared to 1.2.1 (Build 91)

**Date:** Feb 16th, 2014

### New Features

- Added the support of BLE113 with the internal 256kB flash memory
- Added software support for Over-the-Air (OTA) firmware update for the internal 256kB memory
- Added support for SPI interface and pin selection for external SPI flash to be used with OTA updates.
- Added a compiler option to generate a separate firmware file for OTA firmware updates
- Added APIs for reading (Read Data), writing (Write Data), and erasing (Erase Page) the user area data on the internal flash memory
- Added APIs for handling I/O port interrupts (Io Port Irq Enable) and setting the directions (Io Port Irq Direction)
- Added API's for handling the comparator functionality under HW commands and events.
- Added testing APIs for sending and receiving data (Phy Tx, Phy Rx, Phy End) for *Bluetooth* testing purposes
- BGScript code can now be split into multiple files with the new IMPORT and EXPORT directives.

### Quality Improvements:

- OTA firmware update reliability improved
- BGScript fixed when sign extensions are used
- Bonding robustness improved in the cases when encrypted link in use

## 1.3 Changes: 1.2.1 (Build 91) compared to 1.2.0 (Build 89)

**Date:** October 25th, 2013

### Quality Improvements:

- Interoperability improvements, which make pairing and connection establishment more reliable with new Android devices supporting *Bluetooth* Smart.
- Enhanced broadcasting improved and connection reliability improved for devices that are in reliable advertisement mode.
- BGBuild compiler will now produce errors if BGScript variables use reserved names.
- BLE Update tool's Windows compatibility improved.

## 1.4 Changes: 1.2.0 (Build 89) compared to 1.2.0 (Build 88)

Date: October 14th, 2013

### Improvements:

- CC debugger drivers now included in the *Bluetooth* Smart Software and SDK installation package.

## 1.5 Changes: 1.2.0 (Build 88) compared to 1.1.1 (Build 71)

Date: September 26th, 2013

### New Features

- Production quality firmware for BLE113 Bluetooth Smart Module.
- Enhanced Broadcasting added, so a peripheral device is able to check whether advertisements are received by a master device.
- Both non-connectible advertising and active/passive scanning without ability to connect, enabled at the same time, are now possible for a slave during a connection. When connected and in master mode, active/passive scanning with ability to connect is additionally possible, for the master to be able to connect to multiple slaves.
- Security: Fixed passkey support added for bonding. A fixed six digit passkey can be pre-determined and then used during the bonding procedure.
- DFU: Over-the-Air (OTA) firmware upgrade feature added to enable wireless software updates. Requires additional flash, such as an external 128 kB flash memory module connected via SPI.
- DFU : DFU over UART feature added.
- BGScript: BGScript applications can now use functions (procedures). memset() functionality added.
- BGAPI: Added new commands to investigate the RF channel quality (RSSI) or by measuring packet loss during a connection.
- BGAPI: Validation of BGAPI commands added, BGAPI protocol produces errors for invalid or incomplete BGAPI commands sent by a host.
- BGAPI: New event is added which is generated when a bonding is attempted but the bonding list is already full.
- BLEGUI: DFU over UART, USB or OTA can now be done using BLEGUI.
- SDK: Beta-level C-language libraries and IAR Embedded Workbench for 8051 compatible SDK is now available via special request.
- SDK: Bluetooth Smart SDK comes now as a self-installing executable, including BLE Update firmware flashing tool.

### Quality Improvements:

- BLE113 software has reached production quality, improving power consumption and connection timing.
- Defragmenting of flash memory is enabled by default.
- USB functionality (BLE112 and BLED112) made more robust in general and when USB 3.0 ports are used.
- Robustness improvements done for advertising, scanning, and connections.

## 1.6 Changes: 1.1.1 (Build 71) compared to Beta 2 (Build 55)

- **This is the the official 1.1.0 build for BLE112 and BLED112 modules. Bluegiga license key is required in the module, and if it is missing, it needs to be applied with BLE Update via the CC debug programming pins.**

- BLE113 support added. SW is not considered yet to be fully qualified for BLE113, and the possible changes and improvement for BLE113 will still take place.
- Few semantics changes for command, the set\_txpower command uses range 0-15. timer behaviour improvement - Cancelling previous timer if new repeating timer is added,
- Various improvements and fixes from multi-connection features, e.g., connection interval designed be in range  $2.5 * \text{max\_connections}$ , reliability improved up to 8 simultaneous connections,
- Multiple quality improvements, e.g., validating supervision time-out when connecting, connection reliability with slave latency improved, de-fragmenting PS store at boot-up, watermarks working properly over USB too, fixing issue with too short SW timer, robustness improvement related to scanning and connection establishments
- PC GUI SW improved - E.g., logview clearing, performance improved when long log traced

## 1.7 Changes: 1.1.0 Beta 2 (Build 55) compared to Beta (Build 46)

- Packet mode option added for easing up the flow control when using BGAPI over UART (See hardware.xml/usart)
- Throughput options added for higher throughput (See config.xml/throughput)
- BG Script performance improved for having the faster scripts
- BG Script watchdog timer added (See config.xml/script\_timeout)
- Cable Replacement iPhone reference implementation included (a separate Zip file at Tech Foun)
- New BLE SW update tool for BLE SW (a separate zip at Tech Forum), this is to be used instead TI SW update tool (SmartRF).
- User Read Response and User Write Response API's implemented.
- Various fixes done based on the feedback to Beta build (e.g, script functions like memcmp, I2C functionality)

Note: Final 1.1.0 SW release will require a Bluegiga license key in the module, and this will need to be applied with BLE Update via the CC debug programming pins..

### 1.7.1 Known Issues with Build 55

- Multi-connection (master mode) is not fully stable in highly stressed use cases
- Calling system\_endpoint\_tx command multiple times in a row can crash the script
- C examples with BGLib not yet make compatible with 1.1.0 SW.

## 1.8 Changes: 1.1.0 Beta compared to 1.0.3

- Multi-connection support added to the master side (i.e., central). Verified up to 4 simultaneous connections.
- API's supporting the cable replacement use case, e.g., for enabling E2E flow control
- Chipset's PWM capability accessible via BGAPI.
- BGAPI changes for I2C usage
- Multiple new BG script features such as logical AND, WHILE loop, bit shifting.
- Flexible build-time memory management added, e.g., removing BGscript size limitation when operating with the available flash memory size
- Several smaller improvements for quality and stability.

Note: Final 1.1.0 SW release will require the Bluegiga license key at the module and this will need to be entered to the modules through the programming pins.

## 1.9 Changes: 1.0.3 compared to 1.0.2

- BGScript activation for BLE112 fixed.
- SetScanParameter (related to scanning window) reliability improved.
- Transitions to PM3 (power mode 3) improved for decreasing unnecessary power consumption.

## **1.9.1 Memory Limits for 1.0.x**

- Combined GATT database and BGScript size is limited to 2KB flash
- 256 bytes is reserved for script buffers and variables
- 2KB GATT attribute values stored in ram
- PS - Store size is 14KB

Note: These limitations are not applicable as such to 1.1.x SW branch where the flexible build-time memory management is supported.

## **1.10 Changes: 1.0.2 compared to 1.0.1**

- Commands returning variable length data works in BGScript.
- ADC functionality fixed if using analog pin as reference.

## **1.11 Changes: 1.0.1 compared to 1.0.1**

- SW is also released through Bluegiga tech forum
- Few final fixes done.

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