



AmpedUP BLE Stack Datasheet

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1. Overview

This document details the programming references and configuration of the AmpedUP BLE protocol stack.

2. AmpedUP BLE Stack Overview

2.1 Low Energy Stack Layers

- L2CAP LE
- LE GAP
- ATT
- GATT
- SM (security manager)

2.2 Low Energy Roles

- Central
- Peripheral

2.3 Features

In addition to Bluetooth Low Energy spec v4.0, AmpedUP BLE also includes:

2.3.1 BLE v4.1

- 32-bit UUID
- LE L2CAP Connection Oriented Channel Support
- LE Privacy v1.1
- LE Ping

2.3.2 BLE v4.2

- LE Data Packet Length Extension
- LE Secure Connections

3. Configuration Parameters

Name	Default	Description
BuildVersion	140616B	Date code of the firmware (read only).
BD_ADDR	00043e212345	Bluetooth device address (read only).
DeviceName	Amp'ed Up!	Friendly device name. Up to 20 characters are allowed (case sensitive).
ProfileRole	P	Profile Role. P=peripheral, C=central role.
AdvIntMin	256	Min advertising interval, 0.625 ms units: 20 ms to 10240 ms.
AdvIntMax	512	Max advertising interval, 0.625 ms units: 20 ms to 10240 ms
ScanInt	32	Scan Interval, 0.625 ms units: 2.5 ms to 10240 ms.
ScanWindow	18	Scan Window, 0.625 ms units: 2.5 ms to 10240 ms.
ConnectIntMin	40	Min connection interval, 1.25 ms units: 7.5 ms to 4000 ms.
ConnectIntMax	1000	Max connection interval, 1.25 ms units: 7.5 ms to 4000 ms.
CharacteristicMax	4	Default number of custom service characteristics.
ServiceUUID	26cc3fc06241f5b45 34763a3097f6764	Custom service UUID.
FlowControl	False	When False, hardware RTS/CTS flow control is disabled and data not able to transmit over the link may be discarded. When True, RST/CTS flow control is enabled.
UartBaudrate	115200	Main UART baudrate: 1200 to 921,600 baud.
UartParity	None	Main UART parity.
UartDataBits	8	Main UART data bits per character.
UartStopBits	1	Main UART number of stop bits.
HostDeepSleepEn	False	Enables deep sleep mode.
GPIO_HostKeepAwake	None	GPIO register used to prevent the module from entering deep sleep mode. A setting of none means that this function is disabled. Typically, GPIO 5 supports this feature.
GPIO_HostWakeup	None	GPIO register used to wake up the module after it enters deep sleep mode. A setting of none means that this function is disabled. Typically, GPIO 5 supports this feature.
BondingAllowed	True	Automatically allow bonding by default when True.
EnableEncryption	True	Set to True to enable the Bluetooth link encryption
DefaultSecurity	4	Default security mode should be 4 for Authentication required. Modes 2 and 3 are used for legacy compatibility and not supported anymore.
DefaultAuth	5	Default authentication setting. 4 will skip MITM protection and 5 will support MITM protection by asking for a confirmation message during pairing.

AllowSniff	False	Enables sniff mode. Must be False when no 32.768KHz LPO is present.
HardwareType	XXXX	Part number (read only).
MITMEvent	False	True, enables MITM protection during bonding. Requires AT command: at+abPassKeyAccept y.

4. Bluetooth Smart Functions

This chapter details Bluetooth Smart or LE (Low Energy) functions of the AmpedUP BLE stack.

3.1 LeAdv

The **LeAdv** function is used to enable and disable LE advertising functionality.

```
LeAdv [Enable/Disable]
```

Where `Enable` will turn on advertising (default)

`Disable` will turn off advertising

3.2 LeConnect

The **LeConnect** function is used to build a LE connection with a remote device.

```
LeConnect [bd address]
```

Where `[bd address]` is the remote device's BD Address

3.3 LeConnectCancel

The **LeConnectCancel** function is used to cancel a pending connect request.

```
LeConnectCancel
```

3.4 LeDisconnect

The **LeDisconnect** function is used to disconnect from a remote LE device once connected.

```
LeDisconnect
```

3.5 LeDiscovery

The **LeDiscovery** function scans for remote devices.

```
LeDiscovery
```

For each device found, the result is:

```
LeDevice [BD addr]
```

Where `[BD addr]` is in hexadecimal with the most significant byte first.

3.6 LeGetChar

The **LeGetChar** function is used read data from a readable characteristic.

```
LeGetChar [handle]
```

Where `[handle]` is the GATT layer character handle, 1 byte in ascii coded hex format: hh

3.7 LeRole

The **LeRole** function is used to set the LE role.

```
LeRole [role]
```

where [role] is the desired device role:

c: Central role

p: Peripheral role

3.8 LeScan

The **LeScan** function is used to enable and disable LE scanning functionality. For specific interval settings, see the configuration section.

```
LeScan [Enable/Disable]
```

Where `Enable` will turn on scanning (default)

`Disable` will turn of scanning

3.9 LeUpdateChar

The **LeUpdateChar** function is used to update a writeable characteristic.

```
LeUpdateChar [handle] [length] [data]
```

Where

[handle] is the GATT layer character handle, 1 byte in ascii coded hex format: hh

[length] is 1-20 bytes

[data] formatted in ascii coded hex bytes, space delineated: ex. 00 01 02