

LM068 Bluetooth® 5.0 Dual Mode RS232 Serial Adapter

Standalone (With Embedded Bluetooth® 5.0 Stack)

Revised

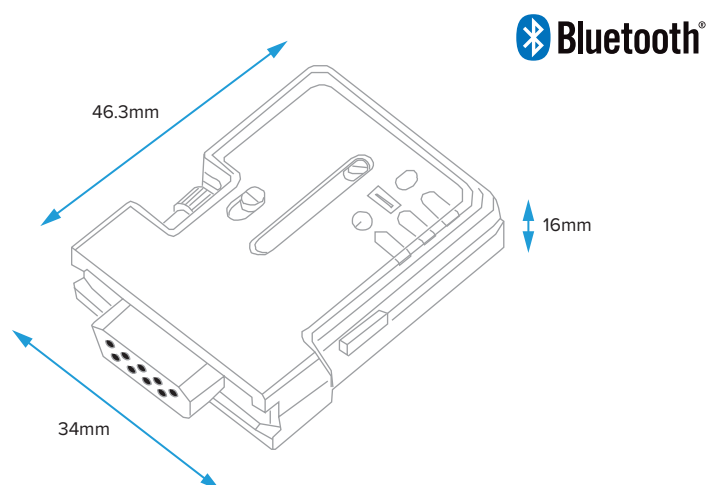
19/JAN/2021

Datasheet Version

1.4

Ordering Options

See last page



Features

- World's smallest Bluetooth® 5.0 Serial Adapter
- Bluetooth® 5.0 specification (Dual Mode)
- Serial (RS232) interface
- 46.3mm x 34mm x 16mm
- Powered by USB or Pin 9
- DTE / DCE (Master / Slave) mode switch
- DTR / DSR Handshaking and RTS / CTS Flow control lines
- Full Duplex for simultaneous communication between sender and receiver
- Low Power Consumption
- Applications available including SPP with GAP Central, SPP or GAP Peripheral and SPP to Serial Bridge
- Configurations pre-installed on production
- Over-the-Air Upgrade (OTAU) available
- Configurable with AT Commands
- Application firmware support
- RoHS, REACH and WEEE Compliant Solution
- See our website for this products certifications

Overview

The LM068 is the world's smallest Bluetooth® 5.0 serial adapter (RS232), providing a secure and reliable Bluetooth® 5.0 connection.

Designed to replace RS232 cables between a master (DTE) device and slave (DCE) devices such as printers, data loggers and digital signalling devices. This standalone adapter incorporates a micro-controller unit with an 8 Mbit flash memory for running the application.

The firmware controls the RS232 signals, including DTR / DSR handshaking and RTS / CTS flow control lines. The AT Command set is used to change the configurations, plus the developer can also configure and modify the settings of a remote LM068 from a local LM068.

Customised configurations and settings can be preloaded to the LM068, simplifying the manufacturing and testing process.

We also offer Bluetooth® Dual Mode applications, which can be customised to your specification. The module can be used as a bridge between Bluetooth® 5.0 and is backward compatible with 2.0, v2.1 and Bluetooth® v4.0, v4.1 devices, using our SPP to Serial Bridge application. We also offer SPP with GAP Central and SPP or GAP Peripheral applications.

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General Specification

Wireless

Bluetooth® Standard	5.0 (Dual Mode)
Adapter Type	Standalone (Configurable with AT Commands)
Profiles	SPP and GATT-Based

Hardware

Chipset	Qualcomm
Antenna	IC Antenna Onboard
Microcontroller (MCU)	16-bit RISC 80 MHz MCU
Flash Memory	8 Mbit
RAM	56 KB (12K x 24-bit)
Program Interface	SPI
Interfaces	Serial (RS232)
Power Supply	5V (USB) or 4V - 12V (Pin 9)
Crystal Oscillator	26 MHz
LED Indicators	Blink (BLUE), SPP (ORANGE) and LE Connection (RED) (TBC)

RS232 (Serial)

Interface	D_SUB 9 pin female
Signal	RxD, TxD, DTR, DSR, RTS, CTS and GND
Full Duplex	Yes
Baud Rate	9.6, 19.2, 38.4, 57.6, 115.2, 230.4, 460.8, 921.6 and 1382.4 Kbps

RF Characteristics

Tx Output Power	TBA
Rx Sensitivity	TBA
Antenna Gain	1 dBi to 3 dBi (Typical)
Range (in open space)	TBA
Data Rate	Up to 3Mbps
Frequency	2.4 GHz to 2.485 GHz

Physical Characteristics

Operating Temperature	TBA
Dimensions (L x W x H)	46.3mm x 34mm x 16mm
Weight	19.16g
Certifications	See our website for this products certifications
Compliance	RoHS, REACH and WEEE



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Firmware

The LM068 Bluetooth® 5.0 Dual Mode module is configured by using AT commands in configuration mode. The AT command set controls the primary operations such as information enquiry, connection/disconnection set up and settings. The LM068 module can be configured via its UART interface from a microcontroller or computer, using MCU software or a serial terminal (e.g. Hercules SETUP utility) respectively. At the start of every power up cycle the LM068 enters the configuration mode.

When the LM068 is connected to another Bluetooth device it enters into data mode. In data mode, users can send/receive data between the module and the remote device via UART. To exit data mode, the user can use the escape sequence. If the LM068 responds with “OK” to the escape sequence it enters into the online_command_mode (i.e. the connection is still active, AT commands can be entered via UART or the connection can be dropped). The LM068 can re-enter into data mode by using AT commands.

Default Factory Settings

Device Settings

- Discoverable: ON
- Device Name: LM068_SPP+GAPCEN_0106
- Echo of command: ON
- Response to commands: ON
- Pairable State: ON

UART Settings

- Baud rate : 19200
- Stop bit : ONE
- Parity bits: NONE
- Flow Control: OFF

Bluetooth® (v1.0 - v3.0) Profile Settings

- SPP Role: Dual
- Escape sequence check enabled: YES

Bluetooth® low energy Settings

- GAP Role: Central or Peripheral (dependent on the application)

Security Settings

- Pin: 1234
- DPIN: OFF
- MITM: OFF
- IOTYPE: No Input Output





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Bluetooth® Applications

The LM068 module can run full application code for a wide range of industries. This includes the M2M (industrial cable replacement), EPOS, health & fitness and consumer electronics industries.

The LM068 modules can run all Bluetooth® applications. Depending on whether the embedded developer requires a Bluetooth® low energy connection, a high-quality data stream Bluetooth® connection or both simultaneously.

LM Technologies offer application support, including designing new applications such as:

- Alert Tag
- Beacon
- Blood Pressure Sensor
- Cycling Speed and Cadence Sensor
- Environment Sensor
- Health Thermometer
- Heart Rate Sensor
- Keyboard & Mouse
- Multifunction Steering Wheel
- Printer
- Security Tag
- Serial Communication
- Time Client
- Temperature and Pressure
- Weight Scale

Firmware Available

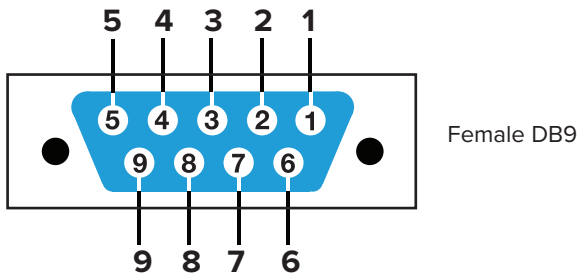
- SPP with GAP Central
- SPP or GAP Peripheral
- SPP to Serial Bridge



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Signals



Pin out for LM068 Adapter

Pin	RS232 Signal	DTE to DCE Direction	DCE to DTE Direction	Description
1	CD	Input	Output	Not Connected
2	RxD	Input	Output	Receive Data
3	TxD	Output	Input	Transmit Data
4	DTR	Output	Input	Data Terminal Ready
5	GND	n/a	n/a	Signal Ground
6	DSR	Input	Output	Data Set Ready
7	RTS	Output	Input	Request to Send
8	CTS	Input	Output	Clear to Send
9	Vcc	Input	Input	Power Supply

Factory Settings

The factory settings of the COM Port are as follows:

Baud Rate	19200 bps
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

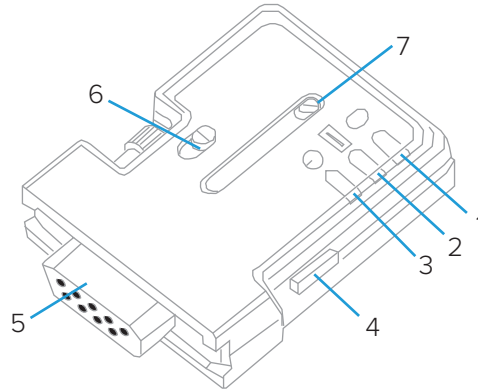
Customised settings are available as factory settings upon special request; Bonding, Pre-Pairing, different Baud Rates, Data Bits, Parity and Flow Control Settings.

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Hardware Structure

- 1 Blink LED.
- 2 SPP LED.
- 3 LE Connection LED.
- 4 Mini USB Connector.
- 5 RS232 Connector.
- 6 Slide Switch.
- 7 Reset Button.



Switch Functions

Reset Button

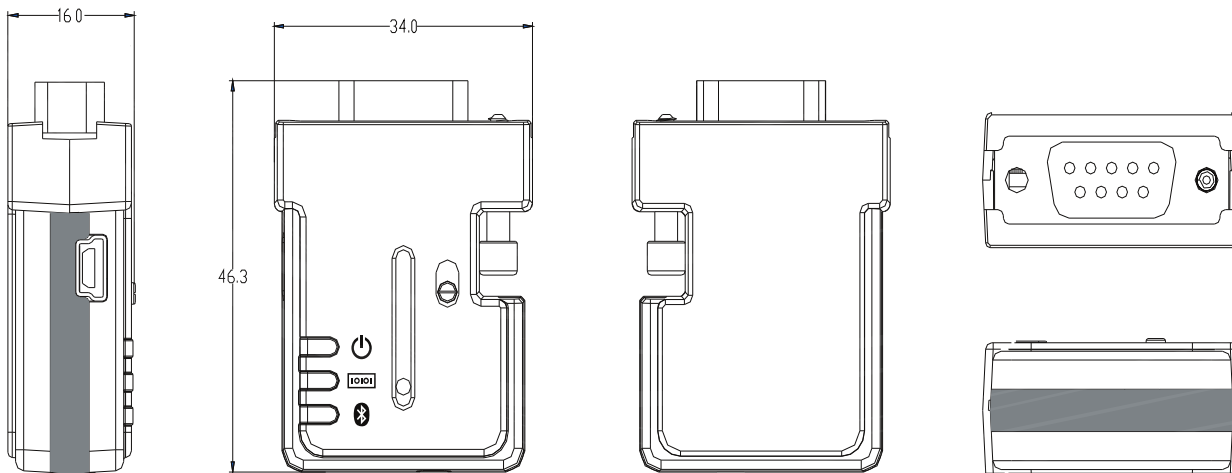
By pressing the Reset Button you can:

Disconnect a wireless connection (after a short press).
Restore the factory settings (after over 3 seconds press).

Slide Switch

The slide switch can swap Tx/D / Rx/D, RTS / CTS and DTR / DSR Signals.
By switching, you can set the adapter as a DTE (towards antenna connector)
or a DCE (towards RS232 connector).

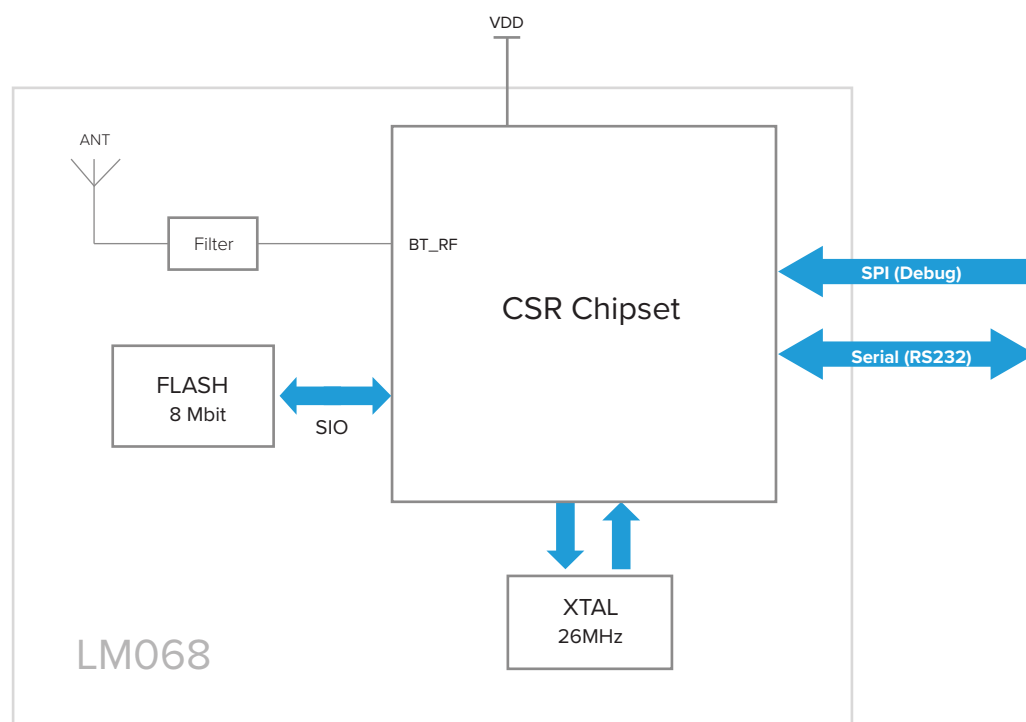
Physical Dimensions



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Block Diagram





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Datasheet Version Notes

v1.0	13 MAR 2018	Added version notes to datasheet.
v1.1	14 MAR 2018	Removed unsupported baud rate. Updated default firmware name and settings.
v1.2	22 MAY 2019	Updated Bluetooth® core version references.
v1.3	24 JUL 2019	Packing Page Revised and Extra Options added
v1.4	19 JAN 2021	Datasheet branding updates.

Helpful Notes

- 1** Download the latest software and from
lm-technologies.com/btserial
- 2** Download any further documentation to assist with your device setup, such as;
Manual, Quick Start & Pairing Guides, Troubleshooting, Notes, Certifications, Applications and Datasheet.
- 3** Need support? Visit our FAQ Support Site
lm-technologies.com/support



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Ordering Options



068-1100

AO - Adapter Only

1 x Bluetooth® 5.0 Serial Adapter



068-1102

SWB - Single White Box

1 x Bluetooth® 5.0 Serial Adapter
1 x DB9 Gender Changer - male to male



068-1101

SRP - Single Retail Pack

1 x Bluetooth® 5.0 Serial Adapter
1 x DB9 Gender Changer - male to male
1 x USB - mini USB Cable for power supply
1 x Power Supply Unit with Multi-Plug faces



068-1104

TWB - Twin White Box

2 x Bluetooth® 5.0 Serial Adapters
1 x DB9 Gender Changers - male to male



068-1103

TRP - Twin Retail Pack

2 x Bluetooth® 5.0 Serial Adapters
1 x DB9 Gender Changers - male to male
1 x USB mini USB Cable for power supply
1 x Power Supply Unit with Multi-Plug faces



Optional - LM025

Slim Line 9 pin to 25 pin Convertor

• See our website to download any applicable Product Software, Manuals and Notes - <http://www.lm-technologies.com/downloads>