# SmartConnect BTLC1000 Device

Bluetooth® Low Energy (BLE) 4.1 Link Controller

Summary

The SmartConnect BTLC1000 is an ultra-low-power Bluetooth® SMART (BLE 4.1) System on a Chip (SoC) with Integrated microcontroller (MCU), transceiver, modem, MAC, PA, TR switch and Power Management Unit (PMU). It can be used as a Bluetooth Low Energy link controller or data pump with external host MCU. When combined with external memory, it can also function as a standalone applications processor with embedded BLE connectivity.

The qualified Bluetooth Smart protocol stack is stored in dedicated ROM and includes L2CAP service layer protocol, security manager, attribute protocol (ATT), generic attribute profile (GATT) and the Generic Access Profile (GAP). Additionally, application profiles such as proximity, thermometer, heart rate, blood pressure and many others are supported and included in the protocol stack.
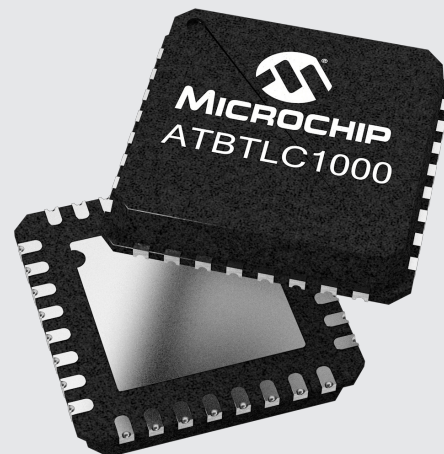
BTLC1000 SoC Target Applications

- Wearable devices with health and fitness sensors
- Smart appliances
- Security and proximity tags
- Home automation
- Smartphone accessories
- HID keyboards, mice and remote controls

The BTLC1000 provides a cost-effective solution for many Bluetooth Smart based applications by integrating the Bluetooth Low Energy Radio and Baseband with an ARM® Cortex® M0-based microcontroller. The need for very few external components minimizes the total system solution cost. The BTLC1000 can be powered by a number of different battery types, ranging from coin-cell, AA and AAA batteries to Lithium polymer batteries, without the need for external power management circuitry (VBAT range = 1.8V to 4.3V)

Accelerating RF Design

To help accelerate design development, Microchip offers the BTLC1000 as a single-chip module for fast integration, and as an XPRO wing that is compatible with any existing Xplained PRO Evaluation Board.

Power Architecture and Consumption

The BTLC1000 uses an innovative radio and DSP architecture that delivers extremely low power consumption along with high performance.

The BTLC1000 has the lowest power consumption available in the market.
- TX peak current: < 3 mA @ 3.6V, 0 dBm pout
- RX peak current: < 4 mA @ 3.6V
- Sleep current: < 1µA with 8 KB RAM retention and RTC
- Advertise: > four-year battery life with CR2032 coin-cell battery when advertising every one second as a beacon

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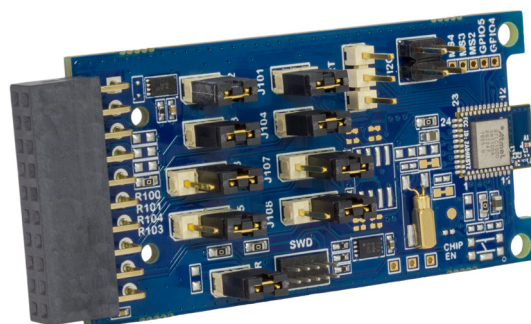
Key Features

- BLE4.1 SoC with fully embedded stack (link and host layer, including ATT/GATT/GAP) in ROM (128 KB)
- Cortex M0-based MCU with 128 KB RAM
- On-board ADC 11-bit and PWM generator and general-purpose timers
- Superior sensitivity (–96 dBm) and range (TX pout = 4 dBm max)
- Ultra-low power consumption in advertising, connection, scanning modes
- SPI, UART and I^{2}C as host interfaces
- Integrated PMU with buck DC/DC allows for VBAT range of 1.8V-4.3V
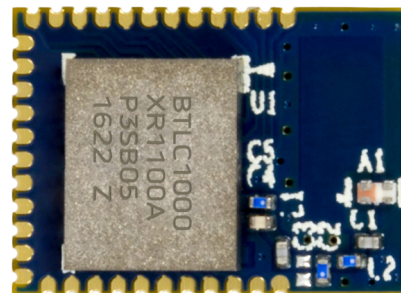
Ordering Code	Description
ATBTLC1000A-UU-T	BLE 4.1 link controller, 2.2 x 2.1 mm WLCSP
ATBTLC1000A-MU-T	BLE 4.1 link controller, 4 x 4 mm QFN, T&R
ATBTLC1000A-MU-Y	BLE 4.1 link controller, 4 x 4 mm QFN, Tray
ATBTLC1000-XR1100AT	BLE 4.1 SiP, 26 MHz Crystal, 5.5 x 4.5 mm SiP, T&R
ATBTLC1000-ZR110CA	Certified BLE 4.1 module, includes chip antenna, 7.5 x 10.5 mm, Tray

Dev Kit Ordering Code	Description
ATBTLC1000ZR-XPRO	Xplained Pro extension board with ATBTLC1000-ZR110CA module compatible with Xplained Pro MCU boards
ATBTLC1000ZR-XSTK	Starter kit including Xplained Pro L21 Board and the ATBTLC1000ZR-XPRO extension board for quick evaluation

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