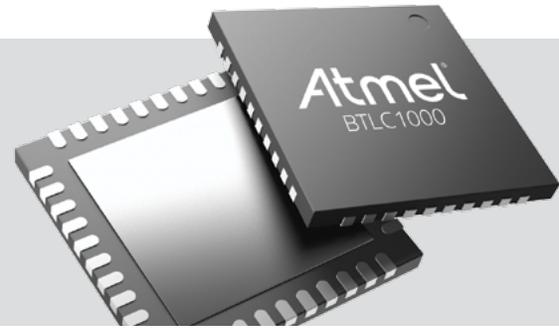# Atmel

SmartConnect BTLC1000
BLE 4.1 Link Controller

The Atmel® 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 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, Atmel offers the BTLC1000 as a single-chip module for fast integration, and as an XPRO wing that is compatible with any existing Atmel 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: < 3mA @ 3.6V, 0dBm pout
- RX peak current: < 4mA @ 3.6V
- Sleep current: < 1uA with 8KB RAM retention and RTC
- Advertise: > 4-year battery life with CR2032 coin cell battery when advertising every 1-second as a beacon
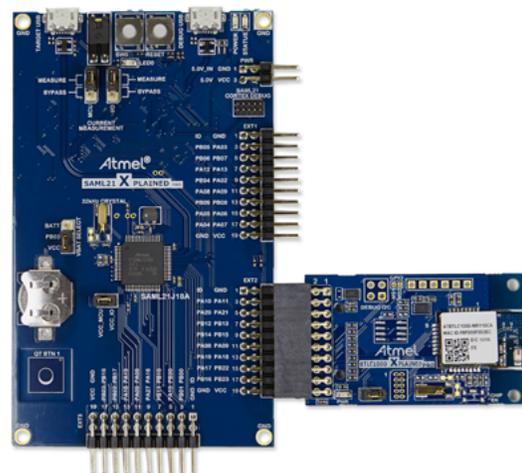
Key Features

- BLE4.1 SoC with fully embedded stack (link and host layer, including ATT/GATT/GAP) in ROM (128KB)
- Cortex M0-based MCU with 128KB RAM
- Onboard ADC (11b) and PWM generator and general-purpose timers
- Superior sensitivity (-96dBm) and range (TX pout = 4dBm max)
- Ultra-low power consumption in advertising, connection, scanning modes
- SPI, UART and I2C as host interfaces
- Integrated PMU with buck DC/DC allows for vbat range of 1.8V–4.3V

Ordering Code	Description
Atmel ATBTLC1000A-MU-T	BLE 4.1 link controller, 4x4 QFN
Atmel ATBTLC1000-MR110CA	Certified Module with ATBTLC1000A-MU chip and chip antenna
Atmel ATBTLC1000A-UU-T	BLE 4.1 link controller, 2.2x2.1 WLCSP
Atmel ATBTLC1000-XPRO	ATBTLC1000- XPRO extension board
Atmel ATBTLC1000-XSTK	Starter kit including XPlained Pro L21 board, ATBTLC1000-XPRO extension board demonstrating BLE health thermometer application with LED control and temperature measurements

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