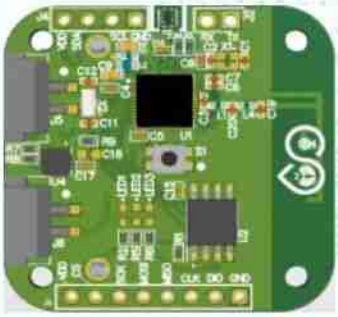
BLE Node

Overview

The BLE nodes are peripheral devices equipped with NRF52 microcontrollers, sensors like: SHT 40 and LIS3DH and external flash memory: W25Q16. Each BLE node is capable of establishing a Bluetooth connection and transmitting data to the Gateway and any other BLE node.

The nRF52832 is a versatile multiprotocol SoC designed for Bluetooth® LE, including 2 Mbps high-speed mode, and concurrent protocol support. Powered by a 64 MHz Arm® Cortex®-M4 with FPU, it offers ample Flash and RAM for complex applications. It includes NFC-A Tag for easy pairing and payments, plus rich peripherals like PDM and I²S for audio. An advanced on-chip power management system ensures ultra-low energy consumption.

Key Features



- Multiprotocol support with advanced Bluetooth® LE features.
- High-performance processor for complex applications.
- Generous memory for demanding IoT and wearable use cases.
- NFC-A Tag for easy pairing and payments.
- Rich peripherals including audio interfaces.
- Ultra-low power with adaptive management.
- Flexible connectivity for diverse designs.
- Suitable for wearables, healthcare, smart home.

Technical Specifications

- 2.4 GHz RF transceiver with Bluetooth® LE support, 2 Mbps throughput.
- Concurrent multiprotocol operation for BLE, Bluetooth Mesh, and proprietary 2.4 GHz.
- Integrated NFC-A Tag for secure pairing and data exchange.
- ARM® Cortex®-M4F processor with hardware FPU and DSP extensions.
- Configurable memory variants: up to 512 kB Flash and 64 kB RAM.
- Ultra-low-power architecture with 0.3 µA System OFF mode.
- Operating voltage range: 1.7 V – 3.6 V.
- Comprehensive peripheral set including 12-bit ADC, PDM/I²S, timers, SPI, I²C, UART.
- EasyDMA controller for high-efficiency peripheral-to-memory transfers.

APPLICATIONS:

- Internet of Things (IoT): Ideal for building low-power wireless devices for sensor networks, wearables, and smart home applications.
- Health and Fitness: Can be used in fitness trackers and health monitoring devices.
- Beacons and Remote Controls: Suitable for creating location-based services and wireless control devices.
- It can be integrated into smart building systems for controlling lighting, HVAC (heating, ventilation, and air conditioning), and security systems.
- It can be used in devices that transmit patient data like heart rate, blood oxygen levels, or activity levels to healthcare providers remotely.