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The BLE9163K, known as the "Credential Controller," is a modular assembly featuring an HID RCS55102000-A01 (Omnikey module), which functions as a 125 kHz and 13.56 MHz RFID/BLE reader.

Powered by an STM32L071CZT6 ultralow-power 32-bit MCU (ARM Cortex M0+) with 192KB flash, the credential controller manages a keypad, LED, sounder, and the Omnikey module via LPUART, and communicates with an external lock controller via UART1. A UART Data Available Out line alerts the lock controller when data is ready for transmission.

The 4x3 keypad matrix is configured with push-pull outputs for rows and interrupt-driven inputs for columns. Any key press wakes the controller. The BLE9163K requires +5.2VDC to power the LEDs, sounder, and Omnikey module, with a +3.3VDC regulator (TPS70933) providing power to the MCU. The Omnikey module controls the power mode, primarily using the HF/LF Ping Mode (autonomous mode).

A U.FL connector allows for BLE antenna connection, and a 30-pin Hirose DF12A-30DS-0.5V interface connects to the Omnikey module. The LED indicator (SFT825N-S) consists of red, green, and blue LEDs, driven by PWM at approximately 10mA each to reduce power consumption. The sounder (BZ401) is driven by a 3.3V, 2730Hz square wave at a 50% duty cycle.

A 24-pin Hirose DF11-24DS-2C connector interfaces with an external board, with primary signals including +5V2, GND, UART1_RX, UART1_TX, UART1_DATA_OUT, UART_CTS, UART_RTS, and CARD_PRESENT_INT. The RFID HF antenna is an external FLEX circuit, while the LF antenna is a wound coil fitting around the keypad domes. The BLE antenna PCB sits below the keypad, with a 50-ohm coax cable and U.FL connector.

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