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Operational Description

The OMNIKEY SE Reader Core has one dual-core microcontroller (MCU), and this is always powered when the OMNIKEY SE Reader Core is powered; it is responsible for all operations, including low power Credential Detection, Credential reading, and internal Power control.

LF credential communications use discrete circuitry. The frequency used is 125 kHz.
HF credential communications use an HF transceiver integrated circuit. This IC emits the 13.56 MHz carrier signal, which is taken through an EMC filter to the antenna. In the dedicated antennas, an impedance matching circuit has been implemented to control the power at 13.56 MHz.
BLE is provided by a dedicated core of the MCU, and a suitable BLE antenna matching circuit is included along with a U.FL connector for an external BLE antenna listed in the Developer Guide.
Every type of RF communication is carried out separately, not at the same time.

The Reader Core has a number of different states, which it moves through in a controlled way according to the operations required; a Brown Out Reset circuit is always active.

An HID OMNIKEY Secure Element integrated circuit stores required digital keys. A discrete Flash memory device is used for firmware update.

Serial communications ports allow connection to a host and optionally an expansion circuit.

The OMNIKEY SE Reader Core is not designed to supply power to any external circuit. Optional externally powered LEDs and a Buzzer can be attached and activated. Power is from an external source and is rectified to 3.3V by the Reader Core.

The reader components are mounted on both sides of an 8-layer PCB with solid ground and power planes.