Theory of Operation

The Compact Reader consists of a single PCB that essentially contains a Control unit, UHF transceiver module, serial communication interfaces and I/O's drivers.

The UHF module is a Chipcon's RF Transceiver -model CC1021 (Complies with FCC CFR47 part 15) The module, oscillated from a 14.7456 MHz crystal oscillator, provides operational frequency (transmit/receive) at 916.5MHz, it is FSK modulated with 40KHz deviation and 16KHz data rate. Typically, the UHF receiver is constantly open for burst messages coming from the sensors in order to obtain continuously "listening". In Tx mode - the reader interrogates the sensors for their ID, status and user data. It writes information into the sensors and retrieves logged information (events) into its Flash memory module.

The demodulated data coming from the UHF transceiver transferred to the control unit (Texas Instruments MSP430 16-bit Microcontroller) via the SPI channel for processing & decoding. The microcontroller fed from two clocks: 32.678 KHz for internal real-time clock and a 6MHz crystal for its operation.

Two serial communication interfaces (RS232, RS485) used to exchange data between the reader and the user (controlling PC) the I/O module provides one external interrupt input (active low, isolated) as well as three isolated outputs for general purpose.

The Reader powered from an indoor power supply & comm. unit (PSC unit)

that provides both protected and isolated power and serial communication lines. The PSC unit contains AC/DC adapter providing protective and isolated operation DC power (24VDC or 48VDC depends on model) for the outdoor compact reader. It also equipped with RS-232 to RS-485 converter module for standard bi-directional serial communication between the outdoor compact reader (RS-485 interface) and controlling PC (RS-232 interface)