

Operational Description Hand Held Reader

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Overview

RFID Tag Reader

- 900 Mhz band 902 – 928 Mhz band FCC Part 15 Unlicensed
- 10 foot read range (typical, dependent upon reader and tag orientation)
- 500 tag/second read rate (typical)
- Read Auto ID Class 0 tags

Barcode Reader

- CCD-based 1-D scanner
- Can read barcodes up to a distance of 50 cm (19.6")
- Auto-adaptive scan rate of up to 36 scans per second
- Can be used in any lighting conditions from total darkness to full sunlight (100,000 lux).
- Safe, no lasers, scanner's lighting is produced by LEDs
- Optics: 645 nm visible LED
- Symbologies – UPC (E&A), EAN, Code 11, Code 39, Code 128, UCC EAN 128, ISBN, ISBT, Interleaved, Matrix, Industrial and Standard 2 of 5, Codabar, Code 93, MSI, Plessey, Telepen

Data Entry and Reader Control

- 320 x 240 pixel, monochrome backlit LCD
- Touch panel operation
- Alphanumeric/function keypad
- Trigger switch for 1-handed operation
- Beeper for audio feed back for scans, and other operations

Tag Data Processing and Storage

- Windows CE.net operating system
- SuperH 32-bit RISC microprocessor running at 156MHz
- 208 MIPS
- 32 MB Flash ROM
- 32 MB RAM

Host Processor Interfaces

- USB v1.1 High-speed serial bus
- Optional 802.11b wireless network interface with 128-bit data encryption, WiFi compliant
- RS232 serial interface – 16C550 like, standard UART

Environmental/Operational Characteristics

- -20 - +50 degrees C operating temperature range
- Water-resistant case

- Internal rechargeable battery pack providing 8 hours operation on a single battery charge (at avg. of TBD read operations per minute)

Physical Characteristics

- Height 12 inches or 30.5 cm tall
- Width 3.5 inches or 8.9 cm wide
- Depth 5.5 inches or 14.1 cm deep.
- The HHR weighs approximately 2.5 pounds

The typical use of the Hand Held Reader (HHR) is to read Auto ID Class 0 RF tags and or bar codes. The RF tags are read in the range of 902 to 928 MHz. The reader would then process this information through a customer specific application that resides on the HHR. The custom software would upload the processed information via the built in serial interface, USB v1.1, or the 802.11b wireless interface, to a customer specific database.

The Hand Held Reader (HHR) operates either off of an internal battery pack, at 6.0V and 2.7 amp hour, or an external AC wall wart. There are two types of AC adaptors for the HHR. One AC adaptor will only charge the internal battery, and the other AC adaptor will allow for the HHR to be powered from the AC power. The unit's standard configuration is for the unit to run off of internal battery power. The AC adaptors are not interchangeable, meaning that the AC power unit will not recharge the HHR.

The user interface consists of a 320 x 240 pixel, monochrome backlit LCD. The LCD display has an integrated touch panel, to be used as a pen and pad operation, similar to a Palm Pilot. Additionally an alphanumeric/function keypad surrounds the LCD display. A trigger switch activates either the bar code scanner or RF reading functionality of the HHR. A beeper is integrated for audio feedback from the HHR.

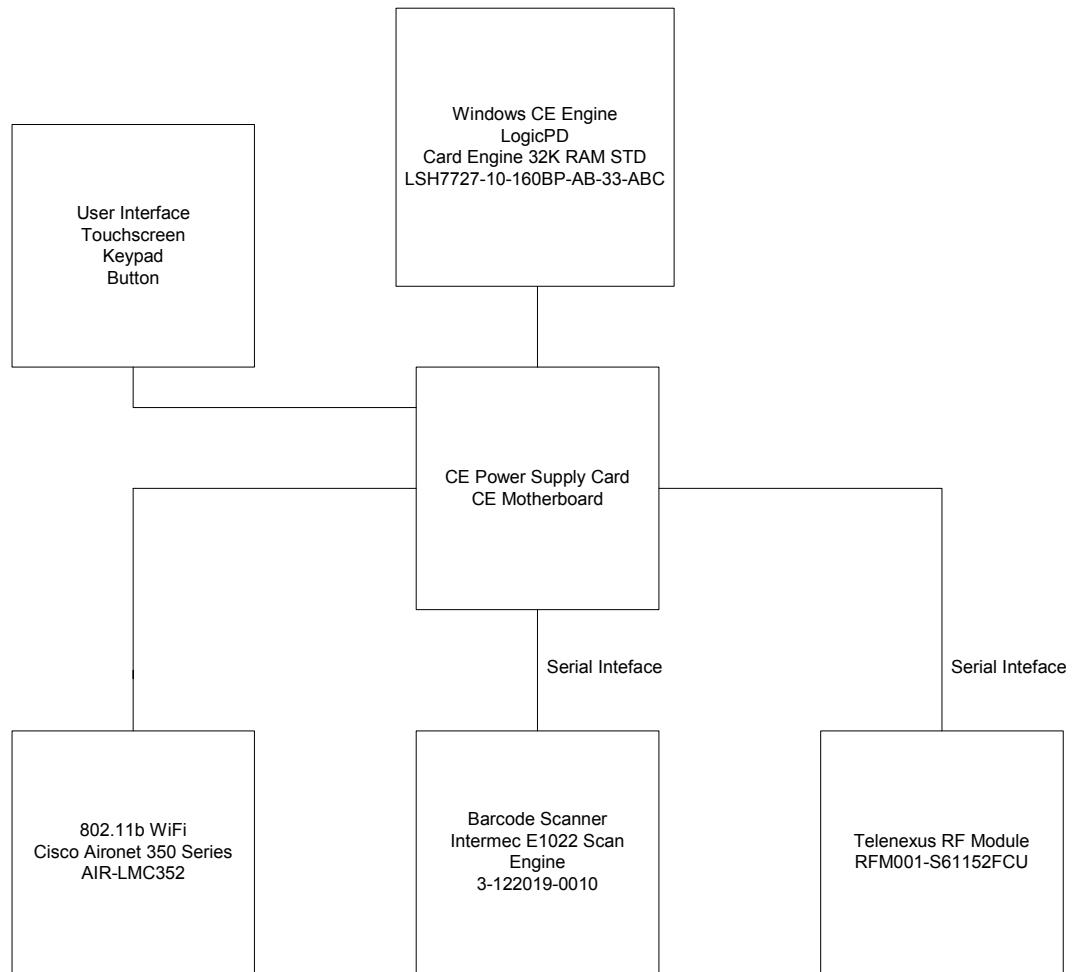


Block Description

The Hand Held Reader, (HHR) is a generic hardware platform for a customer's custom software to operate on. The platform consists of an RF Section, 802.11b wireless interface, a solid state bar code scanner, the required hardware to run Windows, and a user interface.

The current software that runs on the HHR was written at Telenexus for demonstration purposes only. The software allows for all of the hardware functionality to be exercised. The RF section frequency selection, hop table, and hop duration is firmware controlled.

The following block diagram depicts the major systems of the HHR.



Windows CE Card Engine

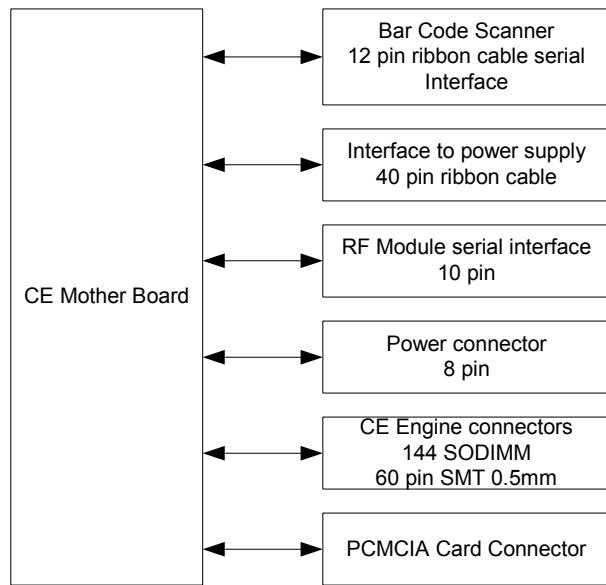
The Windows CE Card Engine was designed by LogicPD, part number LSH7727-10-160BP-AB-33-ABC, and built into the HHR. The card contains a 156MHz 32bit RISC processor with 32 Mbytes of RAM and Flash memory. Windows CE is resident in the Flash on the CE Card Engine.

Wireless Interface

The wireless interface consists of a Cisco 802.11b WiFi card. The card is a Cisco Aironet 350 series, part number AIR-LMC352, 800-13712-05.

CE Mother Board

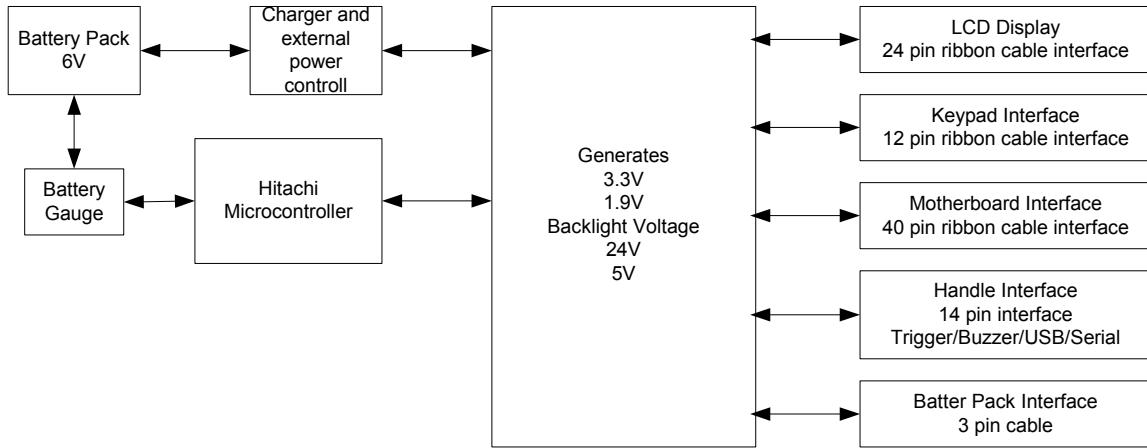
The CE Mother Board was designed at Telenexus and contains the physical interfaces for the CE engine to communicate to the rest of the system. The CE Mother Board interfaces to the following, please refer to the diagram.



The CE Mother Board consists of a CPLD, UART and buffers, to allow for all of the different interfaces to function.

CE Power Supply Card

The CE Power Supply Card was designed at Telenexus and generates the correct voltages for HHR operation. The CE Power Supply card also contains the required circuitry for battery recharging, battery voltage reporting, and determining which power supply to use, battery or AC wall power.



RF Section

The RF section of the Hand Held Reader is a self contained RF unit. The RF Module consists of 3 boards, an antenna, the RX board and the TX board. The RF Module has 24V being supplied for antenna tuning, and battery voltage to the RF Module. The RF module then takes the battery voltage and generates the required voltages for proper operation. The module also contains a serial interface for communication to the CE Engine.

