

System Description

1. System Structure Diagram

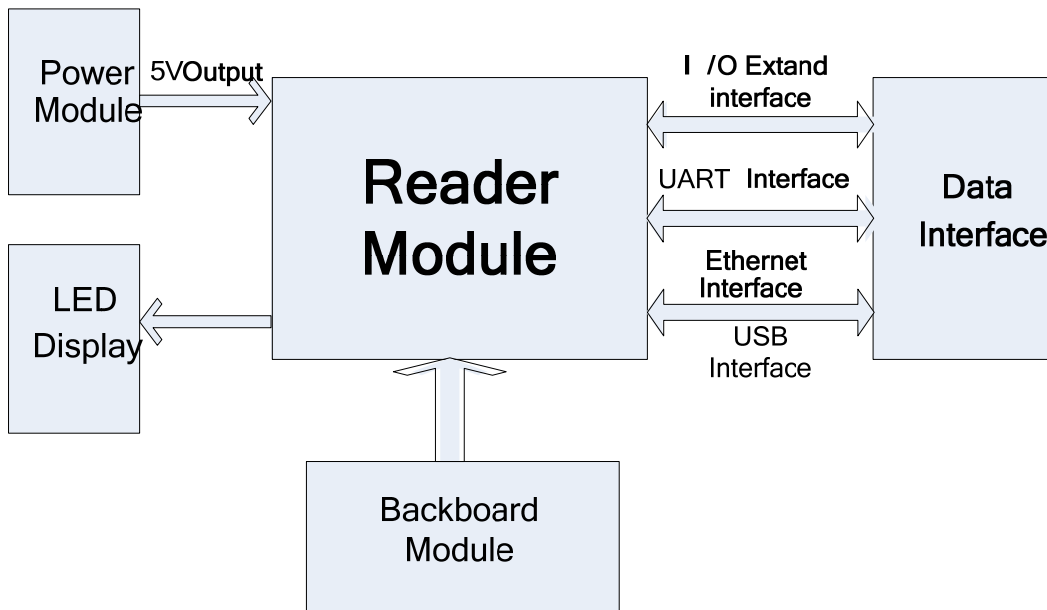


Diagram 1: System Structure Diagram

The system consists of Reader Module, Power Module, Data Interface , LED Display and Backboard Module.

Power module provides all the direct voltage.

Data interface uses communicate with PC.

LED display is used for indicating the state of the communication port and the antenna.

2. Reader Module Structure Diagram

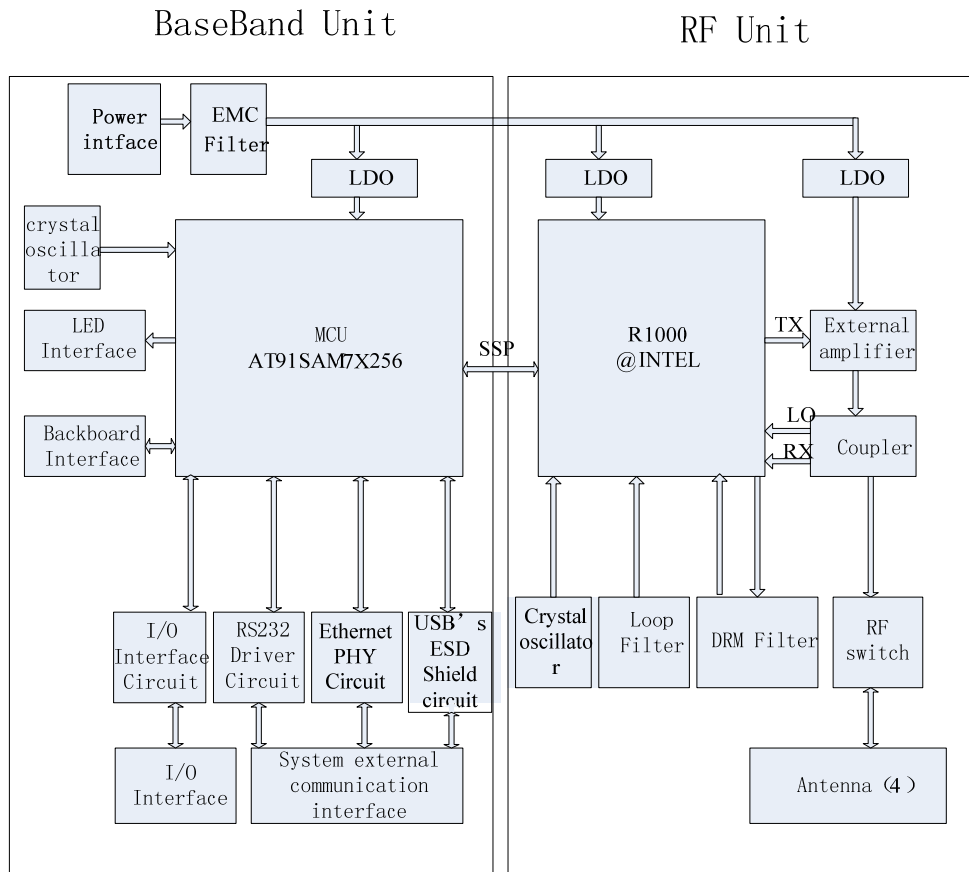


Diagram 2: Reader Module Structure Diagram

The Reader module is consist of Base band Unit and RF Unit.

The RF unit is based on Intel's R1000 RFID transceiver chip. The RF signal's transmits/ receives and encoding/decoding will be completed by R1000.

Under the control of base band Unit, RF Unit transmits the modulated carrier with frequency range from 902MHz to 928MHz which could be amplified by external Amplifier. Transmit the signal to a certain area by antenna within which the tags receive signal then feedback its signal. After going into the radio frequency unit, the feedback signal will be demodulated and then will be decoded.

The RF Unit performs decoding the tag signal and protocol disposal.

The RF Unit is consist of transmitting and receiving part,

·transmitting part

The transmitting part is as below according to the RF signal flow.

Temperature-compensated oscillator (24MHz) → R1000 internal PLL → R1000 internal amplifier → end amplifier → coupler → microwave switcher with maximum output power 30dBm(1W).

·receiving part

The receiving part is as below according to the return signal flow

Coupler → R1000 internal LNA → R1000 internal demodulator → R1000 internal front differential amplifier → R1000 internal IF amplifier and filter → output double channel digital signal.

The base band unit is control parts of the XCRF-860 reader, it contains an ARM7 chip and some peripheral circuits. It performs communication with PC via Ethernet or RS-232 or USB ,it also controls the RF Unit do read/write operations on tags and the indicator lamps (LED).

3. Backboard Module Structure Diagram

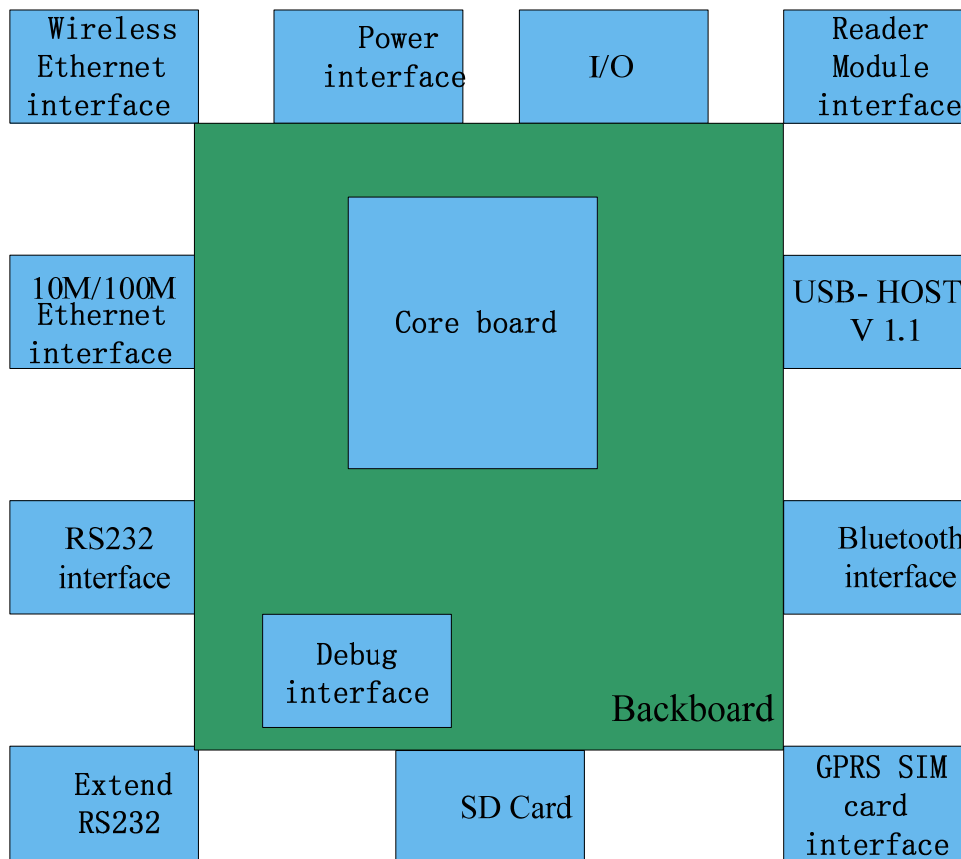


Diagram 3: Backboard Module Structure Diagram

The Backboard Module is consist of Backboard and Core board.

The Backboard includes variety of interfaces, so it performs interface signal which is controlled by Core board's microprocessor to transmit to corresponding communication port.

The core board is a microprocessor system. It contains the following parts: PXA270 ,Power and power management, 128MB SDRAM, 64MB NOR FLASH, peripheral interface, watchdog.

The reader module interface connects between the core board and the reader module to keep good communication with each other.

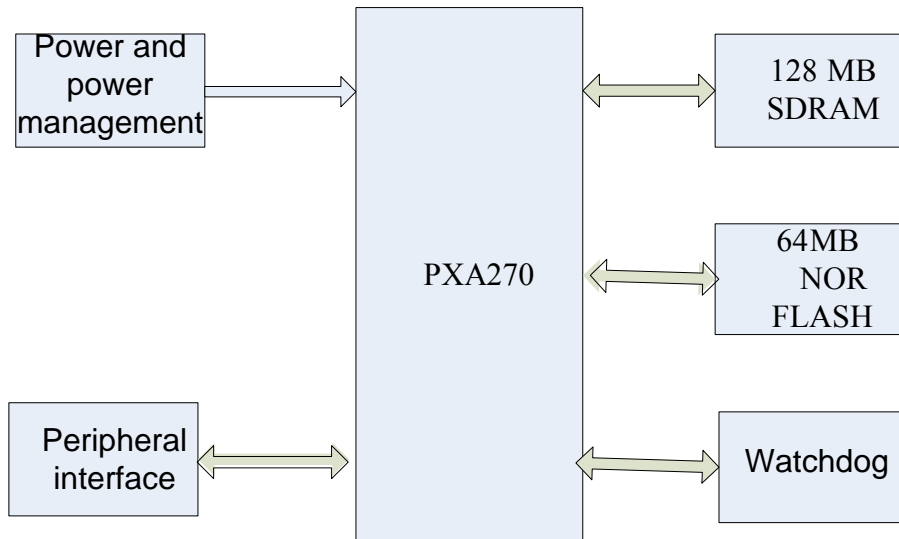


Diagram 4:Core board structure diagram

The reader module is going to read/write tags according to the microprocessor's instructions.

3. Power Structure Diagram

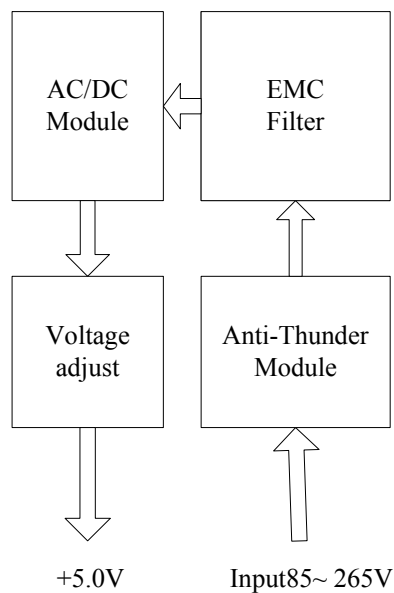


Diagram 5: Power Structure Diagram

Power module output is +5V direct current to interrogator, the maximum output current is 5A.