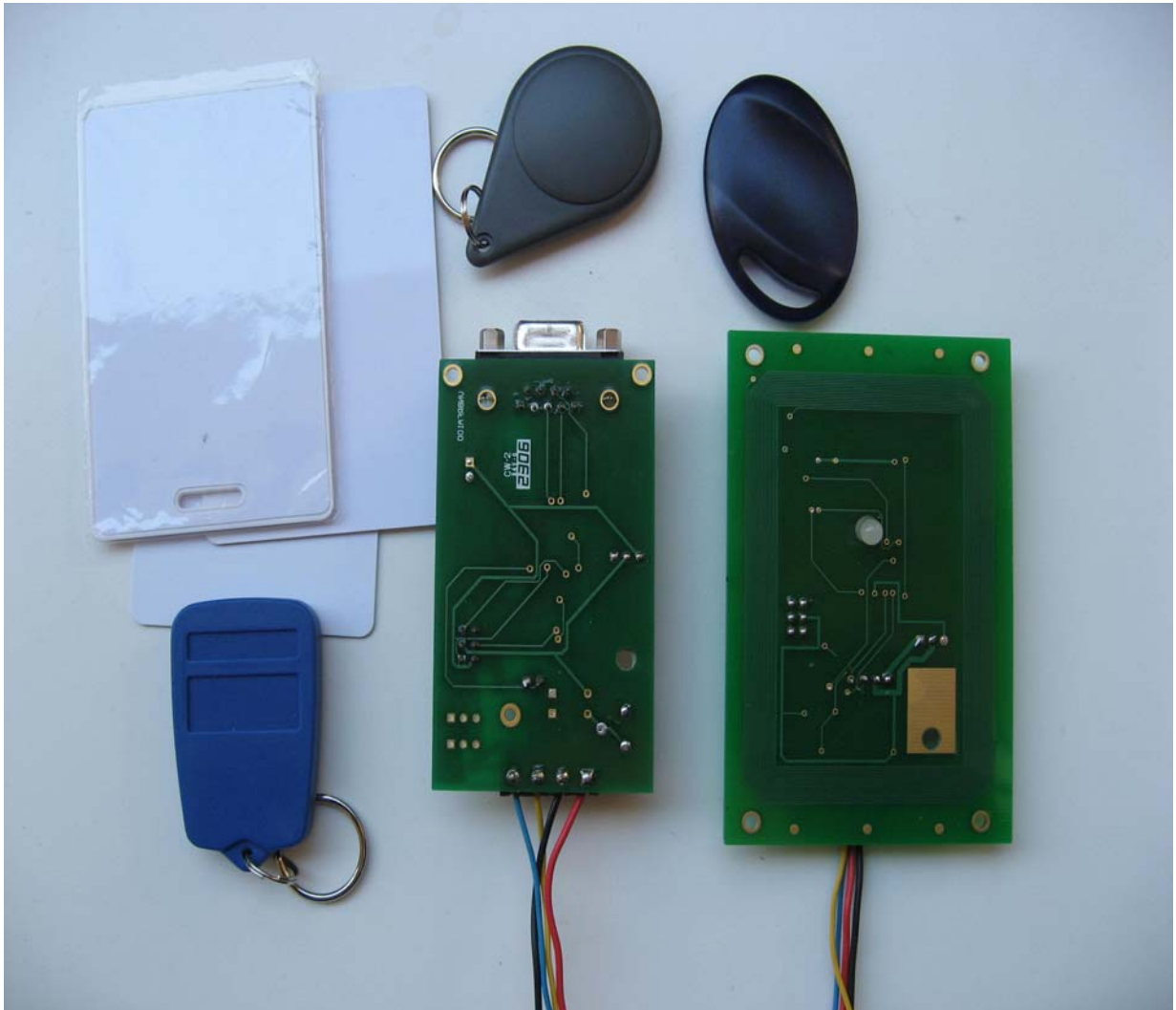

VNBTECH

RFID Development Kit



VNB Technologies Inc. <http://www.vnbtech.com>

Introduction of RFID technologies

RFID or Radio Frequency Identification is a generic term for technologies that use radio waves to automatically identify people or objects.

Although RFID technology is a few decades old, it has become more widely used in recent years due to diminishing cost restraints. Up until recently, it has been too expensive and too limited to be practical for many commercial applications.

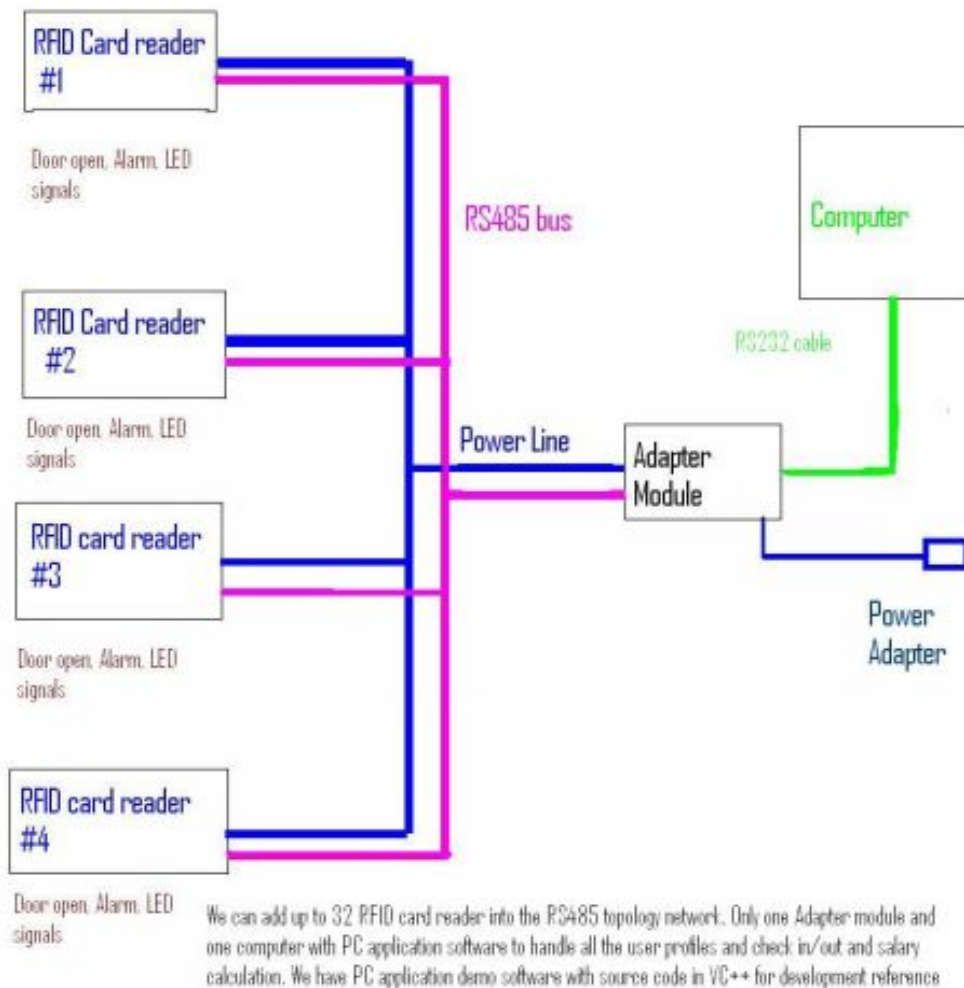
Today, RFID technology is used in applications such as access control, tagging inventory for security to prevent counterfeiting, access credit and bank accounts via embedded chips, and human resource tracking.

The basic RFID system is composed of three parts: transponders cards, antennas/reader, and network/controllers.

The VNBTECH RFID Development Kit includes a simple read-only and read/write transponder to demonstrate multiple no contact communication possibilities.

A PC software application and preloaded firmware drivers in each of the prototype board demonstrate automate time card system or security control check in and check out system. This will enable you to quickly develop your own RFID applications.

The RFID Prototype Board has a short range RFID antenna connected to an external RFID transceiver IC. (Note that: The short range antenna is a PCB trace; it is not an externally connected antenna) The RFID prototype board connects to external components using a four-wire RS485 bus.



RFID Prototyping Board Includes:

- One Buzzer
- One Dual-color LED
- Short range RFID Antenna (can read up to 10 cm distance)
- EM4095 RFID reader IC (125 kHz)
- RS-485 Port and Transceiver
- ICD port (6-pin)

The RS485 connection on the RFID Prototype board is to accommodate multi-drop/multi-node network of RFID units and other RFID related components. There are 32 nodes can be connected together on the 4-wire RS485 bus.

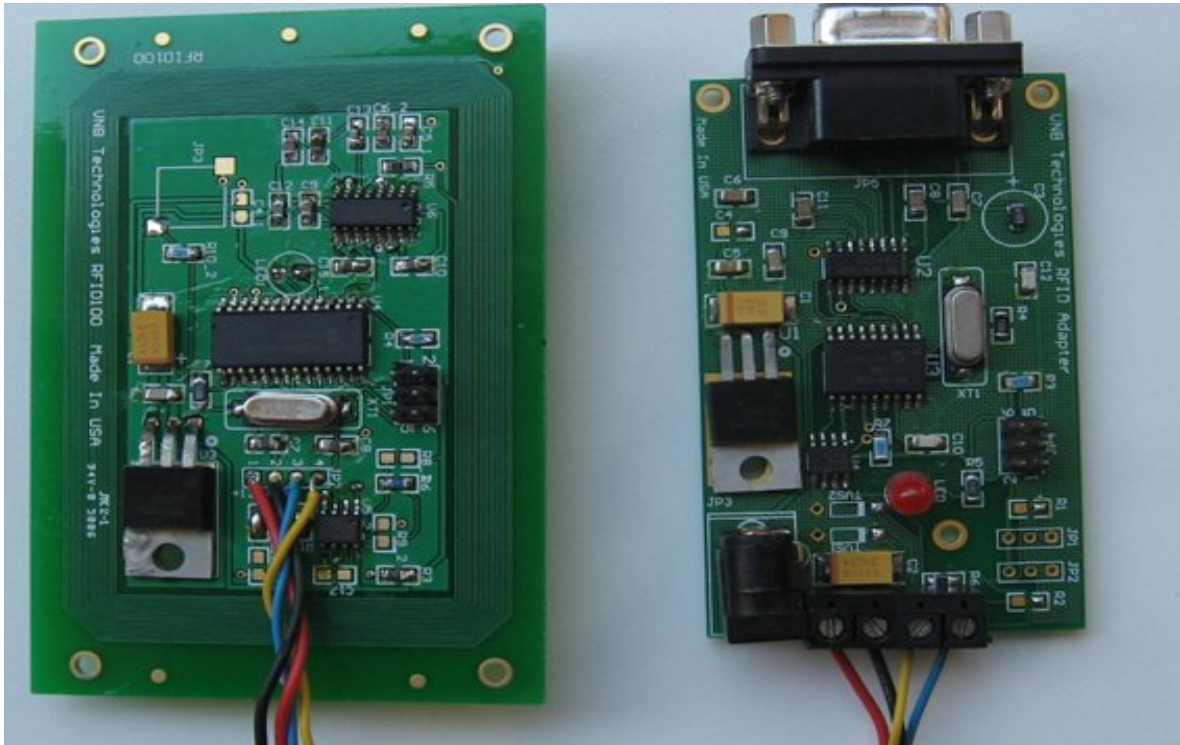
The RS485 Prototyping Board Includes:

- PIC16F628A
- RS-485 Port and transceiver
- RS-232 Port and transceiver
- 2 LEDs, red and green to indicate RX and TX activities
- ICD port (6-pin)

This acts as the RS485-RS232 adapter. To simplify development we also provide a RS485-to-RS232 adapter that will convert the RS485 to RS232 so you can connect the RFID Prototype board to a PC. Also we provide you PC application software to act as a controller.

RFID Development Kit Includes:

- PC applications software to demonstrate check in/check out the security system
- RFID Prototyping Board
- RS485-to-RS232 Prototyping Board
- 4 Read-Only RFID Transponders (EM4100 technologies)



Communication Protocol between RFID reader and Controller:

The RFID reader sends out a string of \$XX,YYYYYYYYYYY,CS,CRLF.
 Where \$ is the start character of the message. XX is the 2-digit characters of RFID reader or door number and YYYYYYYYYYYY is the 10-digit characters of the RF card ID. CS is 2 hex-code of check sum of all the characters from \$ to the last digit character ID. CRLF is the carried return and line feed

The Controller sends out the message ->\$XX,C,CS,CRLF where xx is the 2-digit of RFID reader number and C is character code:

n = new card ID

i = check in

o = check out

p = program new RFID number (by default, all the RFID readers have an address of 07)

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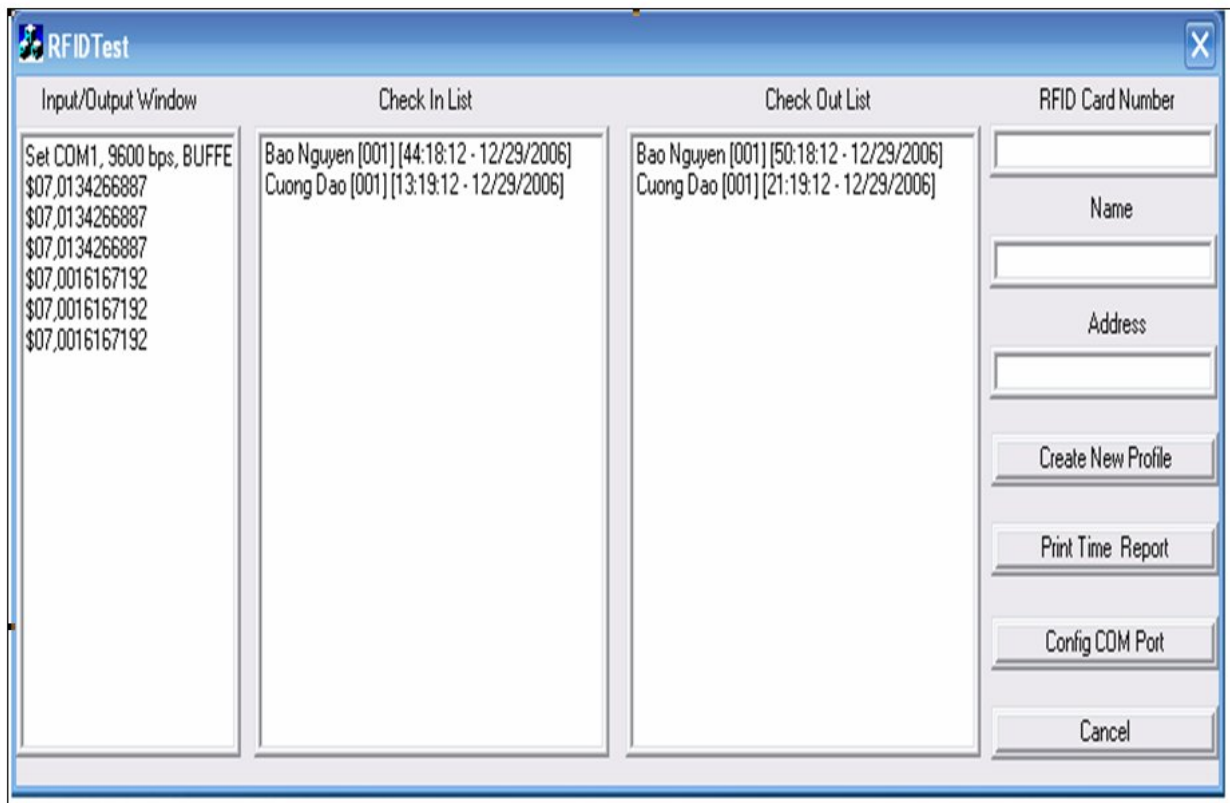
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LED signals and Buzzer sound:

- The Buzzer sounds a beep when the RFID reader reads a compatible RF card.
- LED is flashing red every second then RFID in idle
- LED is solid red when the RFID reader sends out the ID string
- LED is flashing green when the ID is validate for check in
- LED is solid green when the ID is validate for check out
- If the card is read but can't validate, then the LED will goes back to flashing red after 5 seconds

PC application software:

Software to demonstrate check in/check out the security system



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