

RFID TRAINING KIT

HBE-RFID-REX



- Signal-measuring practice to understand the RFID System's basic principles
- LF 125kHz & HF 13.56MHz RFID Reader
- Air-interface standardization practice
- RFID application software practice (MFC example)
- Embedded System-combined Reader's application practice

■ FEATURE

Signal Level's RFID Principle Practice

- Data Coding-Modulation-Demodulation-De-Coding's operation principle practice
- Data Coding mode-RZ, NRZ, Miller, Bi-phase, Manchester
- Modem mode-ASK, FSK, PSK

Various band's RFID Reader & Tag Practice

- 125KHz Reader : Corresponding to ISO 18000-2 (Measuring each part's signals through self circuit configuration)
- 13.56MHz Reader : Corresponding to ISO 14443-A / ISO 15693-A
- USB interface

RFID Embedded Practice Part

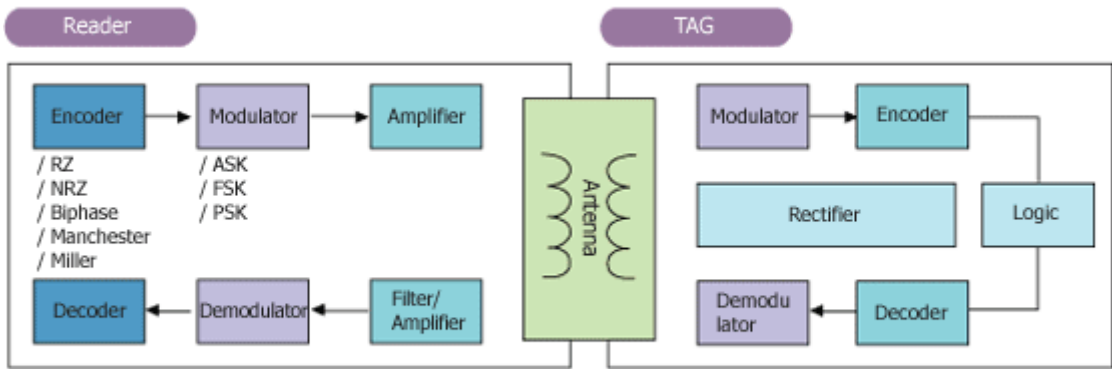
- Implemented the embedded system (Intel XScale PXA255)- Handheld type RFID Reader.
- WinCE 5.0 applied
- Adopted the Touch Pad-supported 4 °±wide TFT LCD

Various Applications Practice

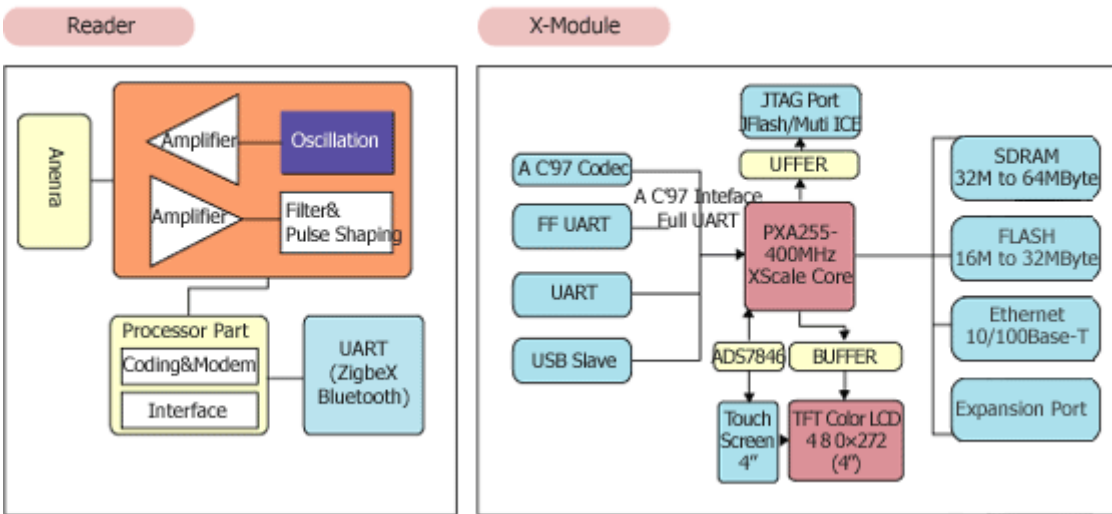
- Interworking with ZigbeX, USN practice unit of this company
- Embedded system's extensive applications

RFID-REX Product Configuration

RFID Principle







RFID Embedded



Item	Q'ty	Remark
Encoding part	1	Data Encoding
Decoding part	1	Data Decoding
ASK Module	1	ASK Modem
FSK Module	1	FSK Modem
PSK Module	1	PSK Modem
RFID Reader	2	Reader Module – 125KHz/13.56MHz (option : 900MHZ Reader)
LCD Module	1	4"wide TFT LCD
PXA Module	1	Intel PXA255 / WinCE 5.0
Base	1	Power, I/O

HBE-RFID REX PARTS SPECIFICATIONS

Coding Part - Signal Encoding/Decoding	
<ol style="list-style-type: none"> 1. Signal coder-encoder & Decoder : - 64bit format Monitoring - 8bit format Monitoring 2. Coding Data : NRZ/RZ/Manchester :Manchester1/Biphase/Miller 3. Device : - CPU : Atmega128 - CPLD : MAX II 	
Modulation & Demodulation Part	
<ol style="list-style-type: none"> 1. ASK, FSK, PSK Modulation & Demodulation 1.1 ASK, FSK, PSK Modulation Signal Monitoring <ul style="list-style-type: none"> - Implementing test points for each part practice - NRZ / RZ / Manchester / Biphase / Miller 1.2 Tag Back scattering Check <ul style="list-style-type: none"> -Course of supplying power to TAG (Indicate LED) 	
RFID Reader & Antenna	
<ol style="list-style-type: none"> 1. Antenna <ol style="list-style-type: none"> 1) Data transmission practice through inductive coupling <ul style="list-style-type: none"> - Data transmission through RLC resonance - Impedance matching practice 2) TAG recognition distance practice 3) Feature practice according to antenna types 2. RFID Reader <ol style="list-style-type: none"> 1) Reader Practice : - 125Khz-nstructin Circuit - 13.56Mhz-EM4094 2) USB Interface 3) Various Application Practice <ul style="list-style-type: none"> - Fixed Reader practice - Extend Application practice(ZigbeX or Bluetooth interworking) 	
Embedded part	
<ol style="list-style-type: none"> 1. LCD Module <ol style="list-style-type: none"> 1) 4" Wide LCD With Touchpad 2) UART : ZigbeX/Bluetooth module 2. PXA-255 Module <ol style="list-style-type: none"> 1) CPU : intel PXA-255 2) OS : WinCE 3) Connection Wired LAN/Full UART 	

■ HBE-RFID REX PRODUCTS SPECIFICATIONS

Part name	Main Component	Specifications
Coding part (Encoding/Decoding)	<ul style="list-style-type: none"> - 10 KEYPAD - 16*2 Text LCD - JTAG Port - ISP Port - Test Port Array - Status Led *8 	<ul style="list-style-type: none"> - Processor & Controller : ATMEL A tmega128, MA X II (570 Logic) - Operation Volt : +5Vdc, +3Vdc
Modem part (ASK/FSK/PSK)	<ul style="list-style-type: none"> - 2*2 Transformer - ISP Port - Active/Logic/Discrete Component 	<ul style="list-style-type: none"> - Processor : ATMEL A Tmega128 - Operation Volt : +12Vdc, +5Vdc
125KHz Reader	<ul style="list-style-type: none"> - Coil Antenna - Atmega128 - JTAG Port - ISP Port - USB Client Port - Test Port Array - DC Adaptor 	<ul style="list-style-type: none"> - 125Khz Baseband - Max 15cm Detection range (dependent on Air-Interface protocols and Tag brands) - Protocols (Air Interface) : ISO18000-2 - Controller : ATMEL Atmega128 - Communication port : USB 2.0 Support - Operation Voltage : +3Vdc, +5Vdc
13.56Mhz Reader	<ul style="list-style-type: none"> - PCB Antenna - Atmega128 - JTAG Port - ISP Port - USB Client Port - Test Port Array - DC Adaptor 	<ul style="list-style-type: none"> - 13.56Mhz Baseband - Max 15cm Detection range (dependent on Air-Interface protocols and Tag brands) - Protocols (Air Interface) : ISO1443-A/ ISO 1569-3 - Controller : Atmel Atmega128 - RFID IC : EM4094 - Communication port : USB 2.0 Support - Operation Voltage : +3Vdc, +5Vdc
LCD module	<ul style="list-style-type: none"> - TFT Graphic LCD - UART (with ZigbeX & Bluetooth) 	<ul style="list-style-type: none"> - 4"wide TFT LCD - Touch PAD - Operation Voltaget: +3Vdc, +5Vdc
X-Module	<ul style="list-style-type: none"> - Intel PXA255 - Main Memory - AC97 Codec - Ethernet Controller - USB 2.0 Client port - RS232 port - JTAG 	<ul style="list-style-type: none"> - Intel XScale PXA255 (400Mhz) Flash 32MByte, SDRAM 128MByte - CS4202 Audio Code - SMSC LAN91C111 - Expansion Connector : Supported TFT Graphic LCD Etc UART (ZigbeX...) - OS : WinCE 5.0
Base	<ul style="list-style-type: none"> - Power Supply - USB - LAN - Socket :8ea 	<ul style="list-style-type: none"> - Input : AC115~230V/60~50Hz - Output : +5Vdc(5A), +12Vdc(1A)

■ Accessories

Accessory	- AC to DC Adaptor : 220V AC input +5VDC(1A) Output - Stylus Pen
Cable	- Power Cable : AC85-264 Free Voltage input - USB Cable : A to B Type - Ethernet Cable : Crossover Type
Etc	- User's Manual : Paper - CD : Manual, Datasheet, Application SW
TAG	Card type : ISO 18000/ISO1443

■ Table of Practice Contents

RFID Introduction

1. RFID System Overview

RFID Principle (Practice)

2. Data Coding (Encoding & & Decoding)
3. ASK modulation & demodulation practice
4. FSK modulation & demodulation practice
5. PSK modulation & demodulation practice
6. Antenna theory & practice

RFID Reader

7. 125KHZ Reader Hardware
8. 125KHZ Reader firmware
9. 125KHZ Reader soft ware
10. RFID Standard
11. Smart Card Standard ISO 14443 –A
12. Smart Card Standard ISO 15693–A
13. 13.56MHZ Reader Hardware
14. 13.56MHZ Reader software
15. Handheld RFID Reader Hardware
16. Handheld RFID Reader Software

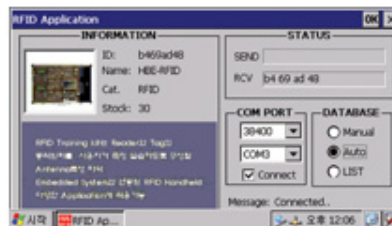
■ HBE-RFID REX Handheld Practice Example (Optional)



HBE-RF ID-REX (13.56MHz)
Example of Using Handheld Reader Types



WinCE Driving Screen



Practice Example



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