

>>Radio Frequency Identification

RFID General Test System HBE-RFID-REX II



- Test of RFID system configuration Reader and Tag wireless communication(Principle part)
- RFID Reader Test for each Band (LF :125KHz /HF :13.56MHz /UHF :900MHz)(Principle part)
- PC control program for RFID system Principle part Test
- PC control program for understanding of characteristics of Reader by RFID system Frequency Band
- RFID application program implementation Test and Contents using API for making Windows application

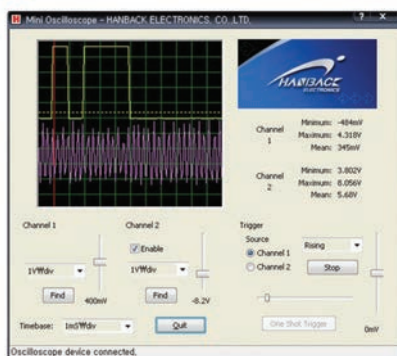
Features

• Wireless communication system based RFID fundamental Test(Coding and Modulation)

- Test by waveform measurement of each step for operating principle of Data Coding-Modulation-Demodulation-Decoding
- RFID Data coding type Test(RZ, NRZ, Miller, Biphase, Manchester)
- RFID Modulation type Test(ASK, FSK, PSK)
- Test of Principle part control and Signal measurement using HBE-RFID-REX II exclusive Program
- Measurement Software for PC of 2 channel Digital Oscilloscope
- Coding data generation Test by C programming

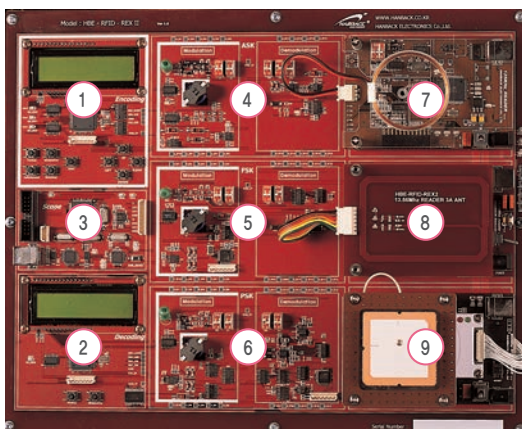
• RFID reader and Tag Test of each Frequency Band

- ISO18000-2 Standard based 125KHz RFID Reader
- : Test of Firmware and Signal measurement of each circuit for 125KHz reader implementation
- 13.56MHz reader supporting ISO14443A/ISO15693A Standards
- : Firmware Source for Reader implementation and TRH-033M-s device adaptation of domestic 3A Logics companies
- USB interface and separate Independent Source for RFID reader single operation
- Interconnection with various Applications including USN mote(ZigbeX)
- API test Contents for implementation of RFID system application program for PC



Configuration and Names

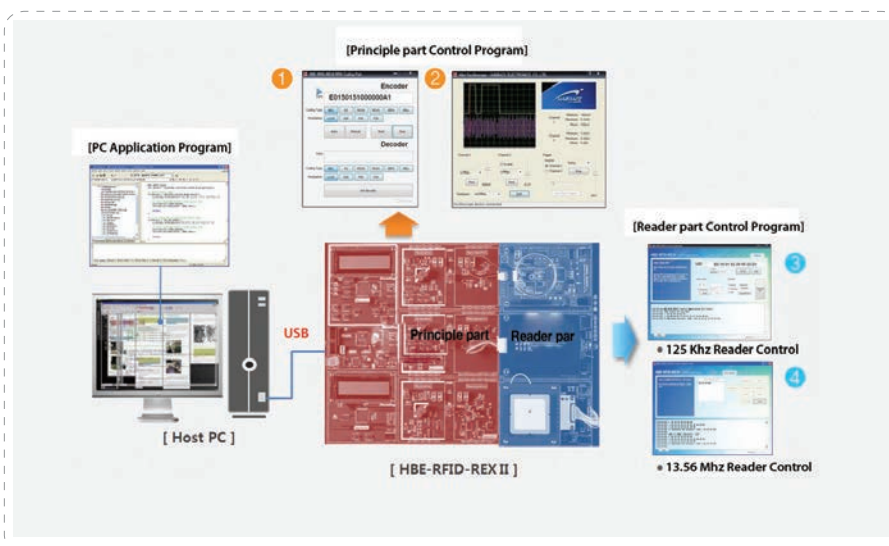
HBE-RFID-REX II is composed of Principle part for RFID reader and Tag wireless communication Test and Reader part mounting 3 readers for each frequency band. Principle part is divided into Coding Part and Modulation & Demodulation Part . And Reader part configures reader by each frequency band for mounting and detaching. Decoding module and Demodulation module implement Reader and Encoding module and Modulation module implement Tag. And we can check the changes of signal by modulator configuration at Test Point of each part.



1. Encoding Part
2. Decoding Part
3. Scope Part
4. ASK Module
5. FSK Module
6. PSK Module
7. RFID Reader (125KHz)
8. RFID Reader (13.56MHz)
9. RFID Reader (900Mhz / Option)

Software Specifications

HBE-RFID-REX II software is usually composed of Principle part control program, Reader part control program and PC application program, which is used for RFID system test effectively. Principle part control program is divided into UID Code format Generator(01) and RFID Signal Analyzer(02) and Reader part control program is divided into 125KHz(03) reader control program and 13.56MHz(04) reader control program. PC application program provides each API for 125KHz and 13.56MHz reader control programming test. (900MHz reader control program provided additionally)

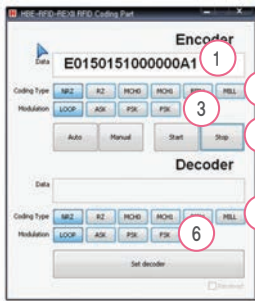


Radio Frequency Identification

>>HBE-RFID-REX II

• 1-1. RFID UID Code format Generator

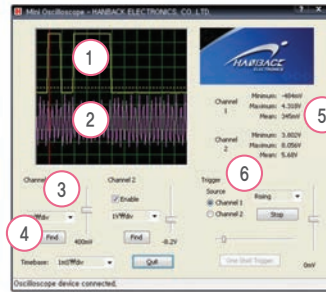
This is a software to control Principle part of HBE-RFID-REX II. We can set Coding Mode by UID data format and Modulation & Demodulation type and operation.



1. UID display
2. Coding Type specified
3. Modulation type specified
4. Operation specifying button
5. Decoding Type specified
6. Demodulation type specified

• 1-2. RFID Signal Analyzer

This provides 2 channel digital oscilloscope which can measure the changes of waveform by signal processing of Modulation & Demodulation part and the signal generated at HBE-RFID-REX II coding part.



1. Coding data waveform
2. Modulation waveform
3. Voltage Scale waveform
4. Time Scale waveform
5. Measured value display
6. Trigger specified

• 1-3. RFID Signal Analyzer

Items	Description	Items	Description
Frequency	150KHz	Number of Channels	2 CH
Time Base	2uS~50mS	Trigger Scale	100mV (one shot)
Vertical Sensitivity	100mV~10 V/div	Sample Rate	1 Msa/s
Offset scale	100mV	Saved File	CSV & BMP

• 2-1. RFID Multi-Reader Control software

This is a software to test the characteristics of reader of HBE-RFID-REX II by each band, which is composed of "125KHz RFID Reader Controller" and "13.56MHz RFID Reader Controller".



1. Menu : The first page, Reader Control menu select
2. Communication port check window
3. Reader select
4. Port connect button
5. 13.56MHz Tag Detection
6. Principle part control program button
7. Help window
8. Message window

• 2-2



Card Detection screen



125KHz reader control screen



13.56MHz reader control screen (ISO14443A)

• 2-3

Program Name	Program Description
Card Detection	13.56MHz Tag Card Type (ISO14443A/ISO15693A) & UID Read
125KHz Reader control	64bit UID reading , 18000-2 Tag Memory block Read/Write (4bit*8block)
13.56MHz Reader control	ISO 14443A Command Support : REQA/Anticollision/Select/HALT ISO 15693A Command Support : Inventory/Stayquite/Read block/Select/Reset to Ready
PC application program	Principle part Firmware source(c-coding) provided 125KHz reader implementation Firmware source (c-coding) provided Sample source for 125KHz Windows Application provided 13.56MHz reader implementation 14443A / 15693A support Firmware source (c-coding) provided Sample source for 13.56MHz Windows Application provided

Radio Frequency Identification




Hardware Specifications

• Components and Specifications of RFID Principle part

Components	Item	Description
Coding part (Encoding / Decoding)	- 11 Keypad	- Processor & Controller : ATmega128
	- 16*2 Text LCD	- Operation Voltage : +5Vdc, +3Vdc
	- Test Port Array	
Modulation/ Demodulation part (ASK/FSK/PSK)	- 2*2 Transformer	- Processor : ATmel ATmega8
	- Active/Logic	- Operation Voltage : +12Vdc, +5Vdc
	- Discrete Component	

HBE-RFID-REX II

• Components and Specifications of RFID Reader part

Components	Items	Description
 125KHz Reader	Coil Antenna ATmega128 ISP Port USB Client Port Test Port Array	125KHz Baseband Max 5cm Detection range Protocols (Air Interface) : ISO18000-2 Controller : Atmel ATmega128 Communication port : USB Support Ext. Antenna Port Serial Expansion Connector
 13.56MHz Reader	PCB Antenna ATmega128 ISP Port USB Client Port	13.56MHz Baseband Max 12cm Detection range Protocols (Air Interface) : ISO14443A/ISO15693A Controller : Atmel ATmega128 RFID IC : 3A Logics TRH033M-S Communication port : USB Support Serial Expansion Connector
 900MHz Reader-M (Option)	50 x 50 Patch antenna USB Client port Serial Expansion Connector	Frequency : 917.10~923.30MHz, FHSS (Korea Band) Controller : Phychips PR9000 Power : 5 ~ 20dBm(1dB step adjustable) Protocol : ISO18000-6C/EPC global Gen2 Recognized Distance : Max. 1m@20dBm Antenna : SMA type /45 *45 Patch antenna

* Specifications can be changed without notice

Contents

Contents of Education

HBE-RFID-REX2
Operation & Experiment
Manual

Chapter 1. General Principles of RFID	Chapter 7. 125KHz Reader Control Software
Chapter 2. RFID Standardization Trends	Chapter 8. 13.56MHz RFID Smart Card Standard
Chapter 3. Data Coding	Chapter 9. 13.56MHz RFID Reader Hardware
Chapter 4. Modulation and Demodulation	Chapter 10. 13.56MHz RFID Reader Firmware
Chapter 5. 125-KHz Reader Hardware	Chapter 11. 13.56MHz RFID Reader Control Software
Chapter 6. 125KHz RFID Reader Firmware Exp	Chapter 12. HBE-RFID-REX2 Introduction

Components



HBE-RFID-REX II



User's Manual and CD



RFID Tag



HBE-AVR-ISP Programmer



Charger(5V/1A)



USB cable (A to B Type)