

RFID APPLICATION TRAINER

ED-3100



> FEATURE

- F/W program practices for RFID Reader
- Various types of test point for Air-interface experiments
- Anti-collision function
- OCX Library useful for application engineers
- 13.56MHz I-CODE Type in common usage
- Capability of reading and writing data on Tag
- Mini-Plant interlocked with conveyor(management of warehouse, process, parking lot, etc.)
- Application modules for easy mounting and demounting (Management of entrance & exit, logistics, vending machine, etc.)

> TOPICS COVERED

- Development Environment(AVR, JTAG, Compiler)
- ED-3100 Configuration and Operation
- AVR Device through sample exercises
- I-CODE₁ Label IC
- SLRC₄₀₀ Reader IC
- OCX(Examples)
- Unselected Commands
- Anti-collision and Selected Commands
- Write, Selected, Addressed Commands
- Other Commands(Selected read, Halt, EAS/Quiet)

> SPECIFICATIONS

- **RFID Reader**
 - » Reader Control CPU : ATMEGA128
 - » Carrier Frequency : 13.56MHz \pm 1kHz
 - » Protocol : I-CODE₁
 - » Reading Distance : Around 100mm
 - » Display : 2 line character LCD
 - » Input Device : Mode selection switch 4ea
 - » Interface : RS-232, RS-422
- **RFID Antenna**
 - » 2Types(PCB pattern, plant practice part)
- **RFID Tag**
 - » 13.56MHz I-CODE₁ (R/W) : 10ea

- **Application Module**
 - » Warehouse management, process management, I/O expansion mode
- **Software**
 - » Electronic textbook per topic
 - » PC-based learning of theory and experiments
 - » Maximization of learning efficiency through visual support GUI

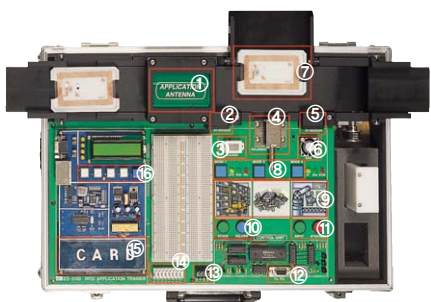
ACCESSORIES

- Guide CD (I-CODE Datasheet, API Guide, F/W Full Source, Demo Program) : 1ea
- Experimental Manual : 1ea

RFID APPLICATION TRAINER

ED-3100

Product Segments : RFID Reader B/D + 3 Types of Conveyor Belt Application Modules



- | | |
|----------------------------|---------------------------|
| 1. Application-use Antenna | 9. PANEL Mode Windows |
| 2. Object Detection Sensor | 10. Warehouse Mode Switch |
| 3. Buzzer | 11. Process Mode Switch |
| 4. Solenoid | 12. Communication Port |
| 5. Object Detection Sensor | 13. Power Supply Terminal |
| 6. FAN | 14. I/O Output Terminal |
| 7. Card Case | 15. RFID Antenna |
| 8. Mode Selection Switch | 16. Reader Setup Switch |

Reader B/D Control Window



Each control command is based on Icon click, and it enables to check a protocol of data being transmitted or received

- | | |
|---------------------------------|-----------------------------|
| ① System Initialization | ⑥ Antenna Conversion Switch |
| ② Topic Selection Button | ⑦ Buzzer Control Windows |
| ③ Protocol Monitor Windows | ⑧ Solenoid Control Windows |
| ④ RFID Protocol Windows | ⑨ FAN Control Windows |
| ⑤ Conveyor Belt Control Windows | |

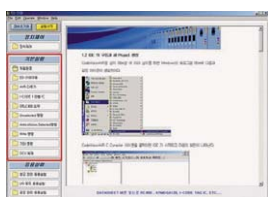
Application Experiments Control Window



Interlocking experiments : Automatic Warehouse, I/O Mode, Process Line with conveyor line

- | |
|---|
| ① Topic Selection Button |
| ② "Warehouse Management Mode" Control Windows |
| ③ "I/O Mode Mode" Control Windows |
| ④ "Process Management" Control Windows |
| ⑤ Application Experiment Windows (Warehouse) |

Electronic Textbook



The above Window explains how to operate AVR Compiler's IDE within the development environment folder. Selecting each topic will retrieve files of electronic textbook and display information in needs.

RFID APPLICATION TRAINER

ED-3710

- F/W program practices for RFID Reader
- 13.56MHz and 900MHz in common use
- Data Read/Write to 900MHz Tag
- ED-3710 application programming (13.56MHz, 900MHz)
- Fixed Type RFID Reader



> FEATURE

900MHz RFID

- Multi Protocol RFID Reader module that meets the ISO standard and USA's EPCglobal standard
- Suitable for large-scale logistics and retail systems by the multiple tag recognition over 30 objects per second
- Supports ISO/IEC18000-6B/6C, EPC C1G1, C1Gen2 Multi-protocol
- Small, thin and low power design with the world-class MIC and TTA certified
- RF output controllable by the user(Max. +30dBm)
- Convenient host interface and firmware upgrade through serial communication
- 900MHz RFID R/W application program

13.56MHz RFID

- Supports ISO/IEC 14443 Type A, Type B and ISO/IEC 15693 standards
- Supports I-CODE and Tag-It protocol
- Low power architecture
- Internal oscillator buffer to connect 13.56 MHz quartz
- Supports SPI-compatible serial interface
- Programmable ASK modulation rate from 8% to 100%
- Programmable transmission current up to 120mA
- Multi-protocol RFID Reader function

> EXPERIMENTS

- Part 1 : RFID Overview
 - » RFID overview and characteristics
 - » RFID hardware and software technology
 - » RFID standardization and security
- Part 2 : 13.56 RFID F/W Programming
 - » Microprocessor's structure and function
 - » 8051 structure and function
 - » Usage of 8051 Development Tool
 - » LED control using uVision2
 - » LCD control using uVision2
 - » RFID Program
- Part 3 : RFIDMaster Program
 - » ED-3710 Equipment
 - » RFIDMaster
 - » RFIDMaster_Step 01~06 Application
- Part 4 : 900MHz RFID
 - » 900MHz RFID application program
 - » 900MHz RFID operation

RFID APPLICATION TRAINER

ED-3710

> APPLICATION USAGE

- Digital door-lock / building entrance
- E-cash reader
- Public transport terminals
- Handheld terminals
- On board Units
- Contactless PC terminals
- Portable or fixed type RFID Reader
- Security, logistics and factory automation

> SPECIFICATIONS

MAIN COMPONENTS

• 900MHz RFID

- » Frequency : [Korea] 908.5~914MHz, FHSS
[USA] 902~928MHz, FHSS
- » Transmitting Output : 15~30dBm(adjustable by 1 dB step)
- » Consumption Power : <1.5A(Peak), <50mA(Standby), <2mA (Sleep)
- » Protocol : ISO18000-6B, 6C
EPCglobal Class 0+, Class 1
EPCglobal Class 1 Generation 2
- » Response Distance : Minimum 3 meter @ 30dBm (ISO/IEC18000-6C Tag, 2.5dBi, Antenna)
- » Interface Host : RS232 or TTL Serial 9,600~115,200bps
- » Antenna : MMCX Type
- » Certification : MIC, TTA

• 13.56MHz RFID

- » Multi-protocol RFID Reader : TRHoM31
- » Frequency : 13.56MHz
- » Protocol : ISO/IEC 14443 A/B, 15693 standards
Tag-It Protocol

- » Modulation Type : ASK 8~100%
- » Operating Range : ISO 14443 A/B <100mm,
ISO 15693 <150mm
- » Supply Voltage : 2.7V~3.6V
- » Package Size : 7.0 mm x 7.0 mm
- » Package LQFP(32pin)
- » Antenna : PCB Patten Antenna
- » Control Unit : AT89C51ED2, 11.0592MHz, Built-in ISP function
- » Communication : RS232 port. 9600Bps
- » LED : 2ea
- » LCD : 16 x 2 Line Text LCD(4Bit control)
- » Power : DC +5V, 3.3V

ACCESSORIES

- AC Power Cord : 1ea
- Serial Cable : 2ea
- Program CD : 1ea
- User's Manual : 1ea

RFID LOGISTICS AUTOMATION TRAINER

ED-9600S

- Industrial training system grafting RFID technology and PLC technology
- Consists of Logistics Warehouse, Material Supplier, Conveyor and Ejection Unit
- Automation control of various sensors, pneumatic elements and motors by Programmable Logic Controller
- One-touch lever type for Conveyor Unit allowing easy mount and dismount
- Multi-channel [5 channels] function mounted in RFID Reader



> SPECIFICATIONS

SUPPLY UNIT - 1EA

- **Materials Supply** : Aluminum profile structure, sensor mountable and storage of materials up to 9ea(max.)
- **Magazine** : $\varnothing 16$ -X75 Supply Cylinder

CONVEYOR A(2EA), B(2EA), C(1EA) - 5EA

- **Urethane Belt Type**
 - » Width : 55mm
 - » Thickness : 2mm
- **Length**
 - » Conveyor A : 672mm
 - » Conveyor B : 742mm
 - » Conveyor C : 870mm
- **Conveyor Motor**
 - » $\varnothing 35$ DC 24V
 - » No Load, No Ratio : 6000RPM 0.025A
 - » Max Load, Ratio : 55RPM 0.09A

CONVEYOR APPLICATION KIT - 4EA

- Direction change block and stop block(mountable and removable)

CLASSIFICATION UNIT - 3EA

- Cylinder, solenoid and sensor in one unit

SOLENOID UNIT - 1EA

- Manifold type, DC 24V 5/2 Way Double Acting Solenoid Valve

STORAGE UNIT - 1EA

- Aluminum profile 20 x 20 structure(3 by 3)

STACKER CRANE - 1EA

- **X Axis**
 - » Type : Ball Screw type, Position Detection Sensor and Cable Bear
 - » LM and Motor : DC 24V, 15W, 3000RPM Decelerator 10 : 1
- **Y Axis**
 - » Type : Ball Screw type
 - » Position Detection Sensor and Cable Bear
 - » LM and Motor : DC 24V, 15W, 3000RPM Decelerator 10:1
- **Z Axis**
 - » Type : Pneumatic type, cylinder and air chuck

CONTROL UNIT - 1EA

- **CPU**
 - » Pressure : 0~10 bar, Memory : 68K bit
- **Power**
 - » Input : AC 100~230V
 - » Output : DC 5V 2A, DC 24V 0.3A

RFID LOGISTICS AUTOMATION TRAINER

ED-9600S

• Communication Unit

- » Computer linked, RS232 : 2ea

• Input

- » DC 24V Input 16 points sync/source : 3ea

• Output

- » Output relay output 16 points : 2ea

• Base

- » Can mount eight I/O modules

TOUCH PANEL - 1EA

• Display

- » TFT Color LCD

• Touch Screen : 6.4" 640 x 480

• Color : 65,536

RFID UNIT - 1EA

• Frequency : 13.56MHz

• Channel : 3CH(Max)

• Antenna Type : R-type Antenna

RFID CONTROLLER - 1EA

• Characteristics

- » RFID Reader's communication data display
- » Manual input of RFID Tag Data
- » Compatible to various types of PLC
- » Relay between RFID Reader and PLC and display functions
- » Memory area allocation per function and per channel
- » Connection by PLC serial and Internet
- » Communication without configuring a separate PLC communication frame(protocol)
- » Ethernet communication mountable without hardware modification

• Specifications

- » 8 bit Microprocessor
- » Screen size : 113 x 64mm
- » Communication : RFID - RS232/422/485
PLC - RS232/422/485, Ethernet(option)
System firmware upgrade port
- » Power : DC 24V 0.7A
- » Power switch : ø16 Key Switch
- » Data keyboard : Numeric input, MODE, direction key
- » Function Key : Read, Write, Reset
- » Display : READ mode, WRITE mode, SETUP mode
4CH data communication display
- » Compatible System : GLOFA, MASTER-K, Melsec-Q,
SIMATIC S7-300

PNEUMATIC SERVICE UNIT - 1EA

• Gradient adjustable type

- » Operating pressure : 0~10 bar, Setup pressure : 0.5~ 8.5 bar
- » Air Filter, Pressure Adjusting Valve(with Pressure Gauge)
- » Automatic Drain Valve mounted

WORK TABLE - 1EA

- Dimension : 1060(W) x 760(H) x 830(D)mm
- Material : Aluminum profile and MDF structure
- Groove Space : 25mm

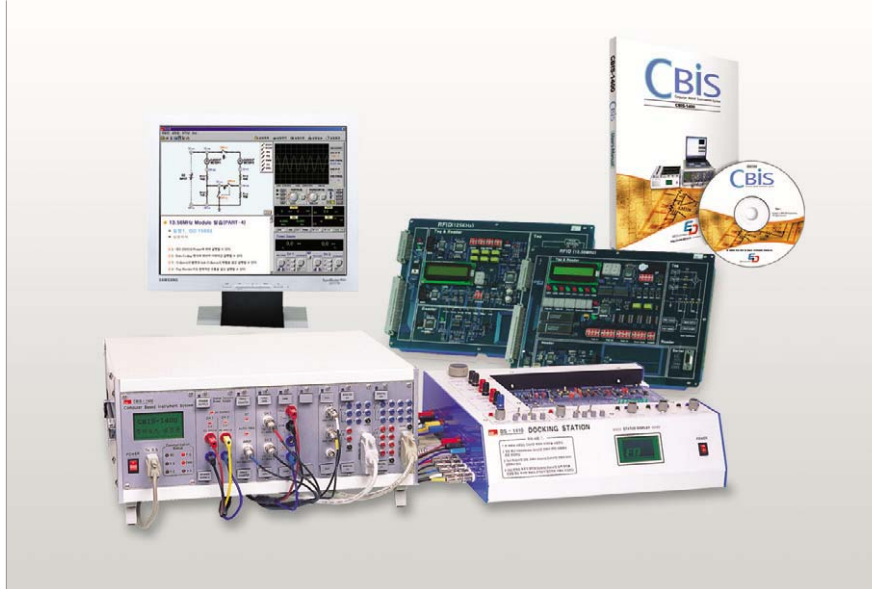
ACCESSORIES

- Work Materials : ø45 x 25mm MC(9ea)
- Cable : AC Power Cord, RS232C Cable, B-Jack Cable (1set)
- User's Manual
- Pneumatic Hose

• USN / RFID System

PC BASED RFID TRAINER

ED-1450



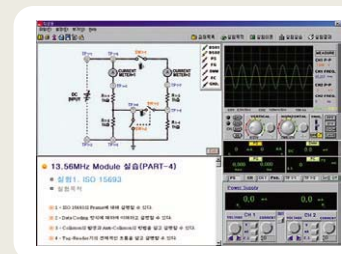
> FEATURE

- The PC based RFID Trainer ED-1450 is a complete training system of total 2 Experimental Modules for RFID basic principles and application experiments.
- Basically, ED-1450 model is designed for use by connecting to DS-1410 Docking Station(Optional). PC connection through the Docking Station enables contact control on MMI(HMI) based software. It is also used together with CBIS-1400(Optional) for real-time measurements on the computer screen.
- The electronic manual operable on PC comes with ED-1450 and e-learning is optimized by remote control of student's operating program and evaluation of student's online report in real time.
- Through DS-1410, it provides Variable Power Supply(VPS), Function Generator(FG), Analog Output, Digital Output needed for experiments.
- ISO/IEC 14443/15693/1800-3
- Operating Range : 125kHz(within 70mm), 13.56MHz(within 70mm)
- Anti Collision function
- Tag : 125kHz(Read Only Tag), 13.56MHz(Read / Write Tag)

> CONFIGURATION

- ED-1450 : PC Based RFID Trainer
 - » Number of Modules : 2ea
 - » Module Dimension : 290(W) x 210(H) x 26(D)mm
- Required System
 - » DS-1410 : Docking Station(Optional)
 - › Please refer to page 24 on DS-1410 specifications
 - » CBIS-1400 : Computer Based Instrument System(Optional)
 - › Please refer to page 22 on CBIS-1400 specifications
 - » Computer(Optional)

Operating Software



PC BASED RFID TRAINER

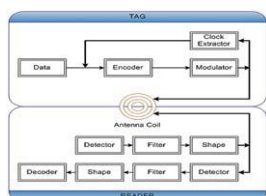
ED-1450

Experiments Module



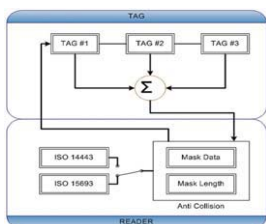
M-51 RFID 125kHz Module

- Reader Frequency : 125kHz
- CPU : AVR(ATMega128), FPGA(EPM7064S)
- Line Coding : NRZ, RZ, Manchester, Biphasic
- Modulation : ASK (Amplitude Shift Keying)
- RS232 Serial Interface : PC communication
- Dip Switch : 16bits data
- Fixable Numeric Display(FND) : 8 bits Mode Display
- Liquid Crystal Display(LCD) : Data Frame Display



M-52 RFID 13.56MHz Module

- Reader Frequency : 13.56MHz
- CPU : AVR(ATMega128, Mega16), RFIC(TRHo31M)
- Line Coding : ISO 14443A(Manchester Coding)/ISO 15693(Manchester Coding)
- Modulation : ASK(Amplitude Shift Keying)
- RS232 Serial Interface : PC communication
- Dip Switch : Tag Data, Mask Data, Mask Length
- Fixable Numeric Display(FND) : 2ea
- Liquid Crystal Display(LCD) : Data Frame Display, Tactile Switch



OS ENVIRONMENT

- Pentium IV above 1.7GHz, RAM 512M or higher
- Hard Disk Min. 500Mbyte free space
- USB 2.0 Compatible
- Windows NT4.0/2000/XP
(Recommended OS : Windows XP)

ACCESSORIES

- 125kHz TAG : 5ea
- 13.56MHz TAG : 5ea
- Connection Cord : 1set
- RS232 Cable : 1ea
- Program CD : 1set
- User's Manual : 1ea
- AC Power Cord : 1ea