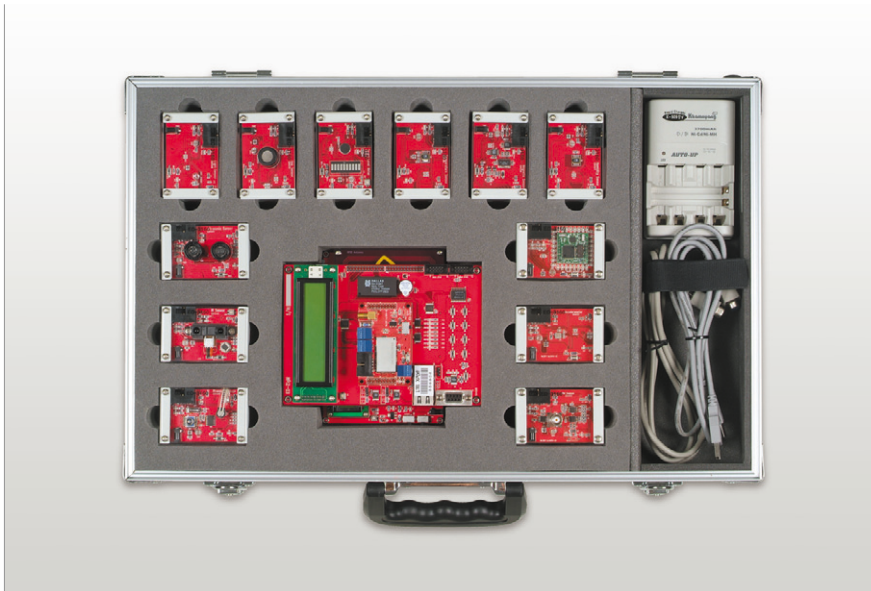


- USN / RFID System

UBIQUITOUS SENSOR NETWORK TRAINER

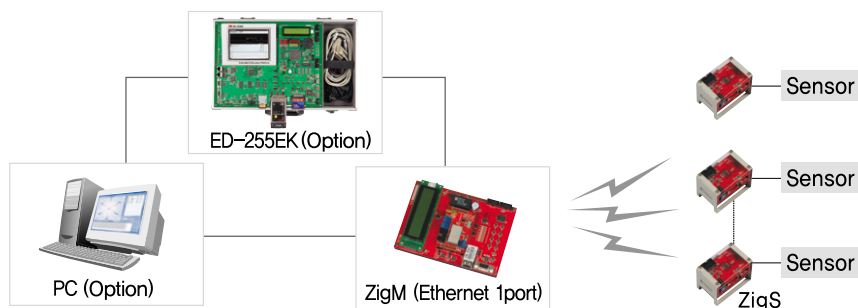
ED-3160

- The optional Embedded System(ED-255EK) can be linked as a gateway
- ZigBee network can be built using TinyOS, F8WOS
- Capable of control and monitor through Ethernet
- The RFID Card Reader is supplied as a standard shipped component for applied experiments on security, home automation and robot
- The Mote Expansion enables easy build of the USN Control System
- 10 types of basic sensors(standard shipped components) & additional 7 types of sensors(Options)



> EXPERIMENTS

- Overview of the sensor network
- Understanding of the sensor network hardware
- Sensor network development environment build
- Sensor network configuration method
- Data transmission among ZigBee modules using the sensor network
- Description of each sensor supplied in the equipment
- ZigBee module and programming of the sensor control program
- Sensor data collection using the sensor network
- Usage and programming knowledge of the PC monitoring software
- Sensor control using the PC monitoring software



> SPECIFICATIONS

ED-ZigM

- Interface : RS-232, TCP/IP, GPIO Port
- JTAG
- Processor : Atmega128L, 8bit RISC
- Memory : 128k Program Flash, 64k SRAM
- Operating System : F8W, TinyOS
- Multi Channel Radio : 2.4/2.4835GHz
- Data Rate : 250kbaud
- RF Chip : CC2420(IEEE 802.15.4)
- RTC : DS1307
- Network : 10/100 Auto Detect
- Power : 3.0~3.3V

ED-ZigS

- Interface : RS-232, GPIO Port
- JTAG
- Processor : Atmega128L, 8bit RISC
- Memory : 128k Program Flash
- Operating System : F8W, TinyOS
- Multi Channel Radio : 2.4/2.4835GHz
- Data Rate : 250kbaud
- RF Chip : CC2420(IEEE 802.15.4)
- Power : 3.0~3.3V

ED-255EK(GATEWAY)(OPTION)

- Processor : PXA255 400MHz
- Memory
 - » FLASH : 32MByte

- » SDRAM : 128MByte
 - » SRAM : 1MByte
 - Ethernet : 10/100Mbps 2Port
 - Serial : UART FF UART, ST UART, BT UART
 - USB : Host, Client
 - 6.4" TFT LCD/Touch Screen, Multi Media Card, PCMCIA, CF, MMC PS2, IIC, IrDA, RTC, Sound(AC'97 Codec)
 - OS : Linux-2.4.19, WinCE 4.2
- ※Detail Specification : refer to ED-255EK product specification

ACCESSORIES

- Serial Cable
- PC Program
- DC 5V Adapter
- JTAG
- Ethernet Cable

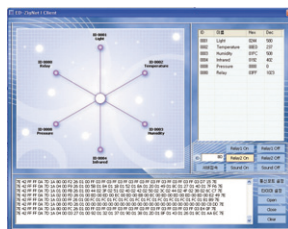
OPTIONS

- Optional Sensor Modules(7ea)
 - » Acceleration Sensor
 - » GPS Sensor
 - » Interface Module
 - » PH Sensor
 - » Finger Print Sensor
 - » Azimuth Sensor
 - » Relay Module

Software and Development Environment

- F8W, TinyOS
- Multi-Hop, Ad-hoc Routing Protocol
- Library of each sensor
- Network monitor program

Application Program



Sensor (Basic : 10ea)



Illumination Sensor

Lux Meter and Photo Alarm Experiments

- Illumination measurement using Cds, Photo IC (AMS302)
- Designed for low electric power
- Temperature compensation function(Built-in)
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : 0.1~50,000LUX



Magnetic Sensor

Magnetic Flux Meter, Tachometer, Speed Meter Experiments

- 2-axis magnetic field intensity measurement
- Designed for low electric power
- Possible use as for a compass
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : -6.00~+6.00gauss



Temperature Sensor

Thermometer Experiments

- Precision measurement using Thermistor, IC
- Designed for low electric power
- Calculation of humidity and dew point
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : -40~123.8°C
- Minimum Resolution : 0.1°C



Humidity Sensor

Hygrometer Experiments

- Precision measurement using Thermistor, IC
- Designed for low electric power
- Capable of relative/absolute humidity measurement
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : 0~100%
- Minimum Resolution : 0.03%



Pyroelectric Sensor

Human Body Detection Sensor

- Distance measurement using infrared rays
- Entrance & exit monitoring by human body detection
- Infrared sensing
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : 10~80cm



Ultrasonic Wave Sensor

- Distance measurement using ultrasonic waves
- Temperature compensation function
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : 50~200cm



Sound Sensor Sound Detection

- Sound detection using microphone
- Display by Level Meter
- In the use of general-purpose ATmega8L
- RS-232 communication
- Frequency : 31.5Hz~8.5kHz
- Measuring Range : 35~130dB



Pressure Sensor Atmospheric Pressure Measurement

- Atmospheric pressure measurement using Barometer
- Contact pressure measurement using FSR(Force Sensing Resistor)
- Possible measurement of temperature and altitude
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : 300~1100mbar(Barometer),
0.5~10kgf/cm²(FSR)



GAS Sensor Gas Measurement

- Capable of measuring Carbon Monoxide, Methane, Ethanol, Propane, Isobutane, Hydrogen
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : 500~10000ppm



RFID RF Card Reader

- 13.56MHz RFID Reader
- Designed for low electric power
- Detection Distance : 100mm
- ISO/IEC 14443 Type A, Type B Read
- ISO 15693 Read

Sensor (Optional : 7ea)



Acceleration Sensor(2-axis) Motion Sensing

- Measurement of 2-axis Gradient
- Measurement of 2-directional acceleration of gravity
- Useful for measuring the target's motion
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : $\pm 25^\circ$ (Gradient)
- Minimum Resolution : 0.1°



Azimuth Sensor

Direction Sensing

- Electronic compass sensor
- LED Display of the North Pole(10°)
- Designed for low electric power
- In the use of general-purpose ATmega8L
- SPI communication



PH Sensor

PH Density Measurement

- Sensor connection through BNC Cable
- Liquid pH sensing using the Probe
- Designed for low electric power
- In the use of general-purpose ATmega8L
- RS-232 communication
- Measuring Range : 0~14pH



GPS Sensor

Location Detection

- Location detection using GPS module and antenna
- Altitude detection
- Designed for low electric power
- In the use of general-purpose ATmega8L
- RS-232 communication
- Latitude & longitude indication : 0.01 sec
- Target speed indication : 300m/sec(max)



Finger Print Sensor

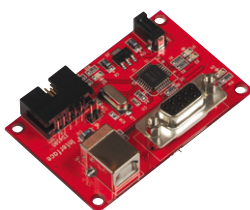
Finger Print Sensing

- High speed finger print recognition using DSP
- Programmable
- Designed for low electric power
- Sensing Area 16 x 19mm
- In the use of capacitive sensor for excellent imaging quality
- 500dpi image resolution
- Low Avg EER



Relay Module

- Relay 2EA
- Buzzer 1EA
- Illumination measurement using Cds
- Temperature measurement using Thermistor
- Relay & Buzzer drive using the software



Interface Module

- Connection between Base Station and PC
- Serial communication for PC
- USB communication for PC
- USB 2.0 compatible
- Capable of using the power source of Mote or USB