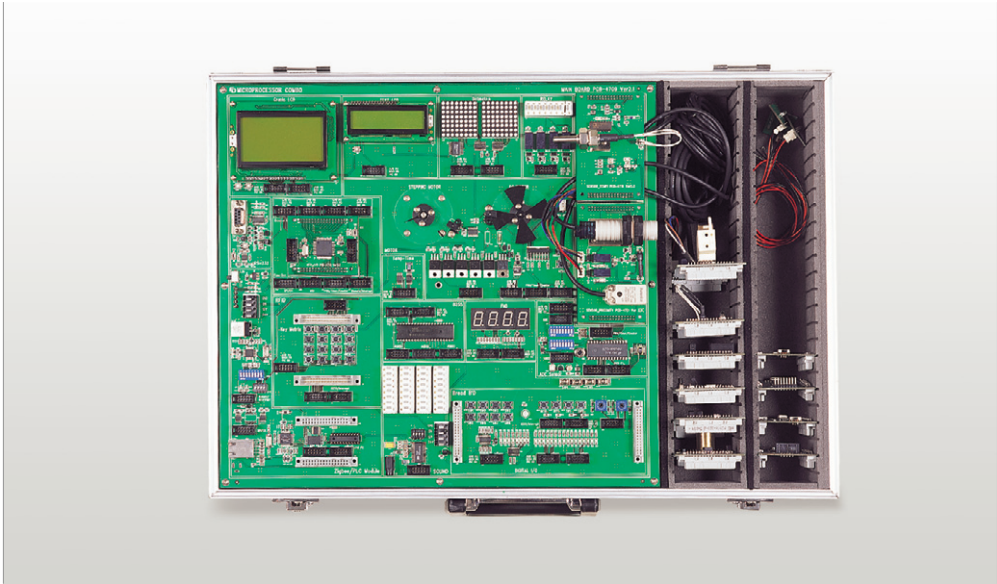


# MICROPROCESSOR COMBO

New  
**ED-4512**

- Mountable 5 type of MCU(8051,PIC, Atmega128, Atmega8535, Upd78f0547)
- Practice of various communications such as RS-232 USB and Ethernet
- Practice from basic I/O exercises to sensor application exercises with 5 MCU's
- Possible of various practice by using of Bread Board and I/O Expansion Port
- Storage of sensor data display and Excel data using UI(LabVIEW)
- Practice of RFID(13.56MHz), ZigBee and LonWorks(option)



## > EXPERIMENTS

### MICROPROCESSOR

- Digital I/O Control - Tact Switch, Toggle Switch, Relay Control, Key Matrix
- Display Control - FND, Dot Matrix, TEXT LCD, Graphic LCD
- Motor Control - DC Motor(24V), Steeping Motor(24V)
- ADC/DAC Control - LM35, VR, CDS, Human Detection Sensor, DC Motor
- Communication Control - RS-232, USB Ethernet Communication
- TIME/Temperature - DS161620, DS1320
- External EEPROM R/W - 2432, 9366(EEPROM) Read / Write
- RFID / ZigBee / LonWorks(OPTION)

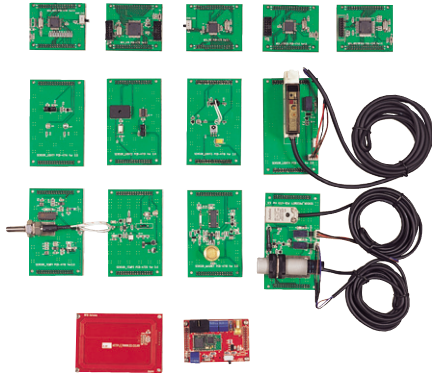
### SENSOR

All sensor related experiments utilize the internal ADC and UART of each MCU(LabVIEW)

- **Optical Sensor**
  - » CdS, Photo Diode, Photo Transistor, Photo Interrupt, Photo Coupler, Pulse Diffused Sensor, Laser Diode, Color Sensor
- **Temperature Sensor**
  - » RTD Resistance Sensor, Thermocouple Sensor, Thermistor, IC, Temperature Switch Sensor
- **Magnetic Sensor**
  - » Hall IC(switching, linear type), Magnetic Reluctance(MR Elements), Reed Relay
- **Proximity Sensor**
  - » Inductive Sensor, Capacitive Sensor, Magnetic Sensor

## > SYSTEM CONFIGURATION

- **Main Board : 1ea**
- **Microprocessor : 5ea**  
(AT89C51ED2 : 1ea, ATMEGA128 : 1ea, PIC : 1ea, ATMEGA8535 : 1ea, uPD78F0547 : 1ea)
- **Sensor Module : 8ea**  
(Optical Sensor : 4ea, Temperature Sensor : 2ea, Proximity Sensor : 1ea, Magnetic Sensor : 1ea)
- **LabVIEW**
- **Option Modules : 3ea**  
(RFID : 1ea, ZigBee : 1ea, LonWorks : 1ea)



Option

## &gt; SPECIFICATIONS

**MAIN BOARD**

- **Output Voltage** : 5V(1A), 12V(1A), 24V(2.5A)
- **LCD Display**
  - » 128 x 64 Graphic LCD with backlight, 2 x 16 Text LCD with backlight
- **Dot Matrix** : 8 x 8 one color x 2
- **7 Segment** : Common cathode 7 segment
- **Stepping Moto, DC Motor** : 24V with Photo Sensor out 1
- **SIPO / PISO** : 74165, 74595 TTL IC
- **Communication** : RS-232, USB, Ethernet
- **Ex - EEPROM**
  - » 2432(I2C communication), 9366(SPI communication)
- **Digital I/O** : 8 x 4 I/O(Terminal Block)
- **DC Relay** : DC Relay(4ea), I/O Control Port

**MICROPROCESSOR****1. AT89C51ED2 Module**

- **CPU** : AT89C51ED2
- **System Clock** : 11.0592MHz
- **Flash Memory** : 64Kbyte
- **System Port** : 32P
- **Interrupt, Timer, UART**
- **ISP Support**

**2. ATMEGA128 Module**

- **CPU** : ATmega128
- **System Clock** : 7.3728MHz
- **Flash Memory** : 128 Kbyte
- **System Port** : 40P
- **A/D Converter** : 10 bit, 8channels
- **Interrupt, Timer, UART**
- **ISP Support**

**3. PIC Module**

- **CPU** : PIC16F877
- **System Clock** : 4MHz
- **Flash Memory** : 8K x 14words
- **System Port** : 32P
- **A/D Converter** : 10bit, 8channels
- **Interrupt, Timer, UART**
- **ISP Support**

**4. ATMEGA8535 Module**

- **CPU** : ATmega8535
- **System Clock** : 7.3728MHz
- **Flash Memory** : 8Kbyte
- **System Port** : 32P
- **A/D Converter** : 10bit, 8channels
- **Interrupt, Timer, UART**
- **ISP Support**

**5. uPD78F0547 Module**

- **CPU** : uPD78F0547
- **System Clock** : 20 MHz
- **Flash Memory** : 128 Kbyte
- **System Port** : 32P
- **A/D Converter** : 10 bit, 8channels
- **Interrupt, Timer, UART**
- **ISP Support**

**SENSOR BOARD****1. Optical Fiber Sensor**

- **Color Sensor(TS230)**
  - » Wavelength : 300~110 nm
  - » Voltage : 5V
  - » Response Speed : Below 1ms
  - » Controlled by : F/W Program
- **Ultraviolet Sensor(KSM603LM, SI5312)**
  - » Detectable Frequency : 37.9kHz
  - » Voltage : 5V
  - » Response Speed : Below 1ms
  - » Controlled by : F/W Program
- **Optical Fiber Sensor(BF3RX)**
  - » Luminous Source : Red LED
  - » Mode Change : Light ON / Dark ON
  - » Response Speed : Below 1ms
  - » Operation Status : DC Relay, Green LED
  - » Voltage : 24V

**2. Temperature Sensor**

- **RTD Resistance Sensor (PT100)**
  - » Measuring Range : 0~200°C
  - » Out Value : 1°C / 0.4Ω
  - » Voltage : 5V
- **Temperature IC(AD590)**
  - » Measuring Range : 0 ~200°C
  - » Out Value : 10 mv/K(absolute)
  - » Voltage : 5V
- **Temperature IC(LM35)**
  - » Measuring Range : 0~200°C
  - » Out Value : 10mv/°C
  - » Voltage : 5V
- **Thermocouple Sensor(K TYPE)**
  - » Measuring Range : 0~200°C
  - » Out Value : 10mv/°C
  - » Voltage : 5V

**3. Proximity Sensor**

- **Inductive Proximity Sensor(PSN17-5DP)**
  - » Output : PNP type
  - » Sensing Distance : 5 mm
  - » Operation Status : DC Relay, Green LED
  - » Voltage : 12V

# MICROPROCESSOR COMBO

# ED-4512

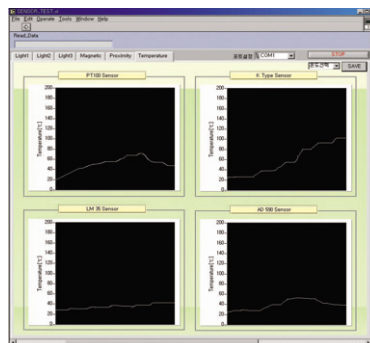
- **Capacitive Sensor(CR18-8DP)**
  - » Output : PNP type
  - » Sensing Distance : 8 mm
  - » Operation Status : DC Relay, Green LED
  - » Voltage : 12V

#### 4. Magnetic Sensor

- **Hall IC : SS49**
  - » Output Range : -1000~+1000 gauss
  - » Voltage : 5V

#### GENERAL CHARACTERISTICS

- **Temperature : 0~45°C 80%RH**
  - » Input Voltage : AC 220V(50/60Hz)
  - » Dimension : 560(W) x 173(H) x 380(D)mm
- **User interface for sensor related experiments(LabVIEW)**
  - » Reads and displays the data of 29 sensors in total
  - » Can Save the data of temperature onto EXCEL
  - » Controls each device as a function



#### ACCESSORIES

- AC Power Cord : 1ea
- Cable(RS-232, LAN, 10 Pin Data, Optical Fiber) : 1set
- Program CD : 1ea
- User Manual : 1ea