

>>Sensor

Sensor principle / application lab equipment

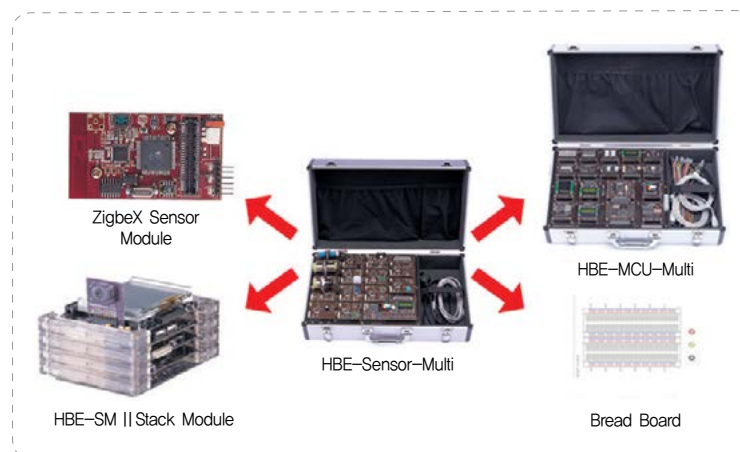


HBE-Sensor-Multi

- Supports multiform MCU of independent module structure
- Supports CPLD module for digital circuit experiment
- Functional modularity of application
- Provides analysis and measurement module for improving the efficiency of MCU learning
- Supports various interfaces for signal connections between MCU and module
- Offers measurement point for signal analysis
- Provides multiform program experiments for the basis and project experiments

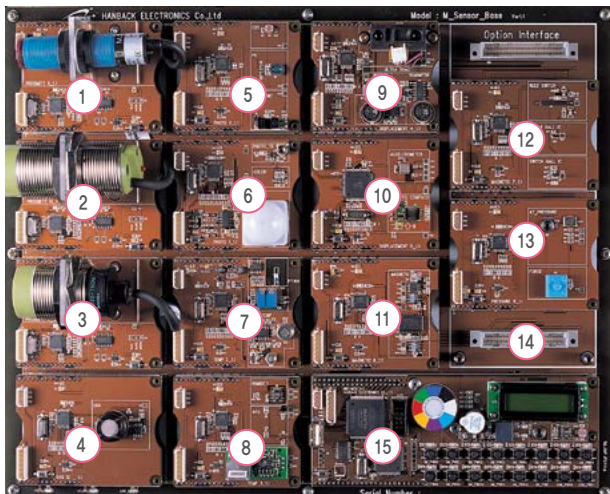
Features

- Basically loaded with 8 bit MCU (ATmega128) for practicing various sensors application.
 - Provide maximum expandability into various optional sensors from basic sensor through changeable module configuration.
 - Possible to practice various microprocessor programming through sensors application.
 - Possible to configure sensor modules according to necessary application.
 - Provide various input switches and output display devices.
 - Possible application modules for education of USN and sensors.
 - Provide various exemplary programs necessary for application practice.
- Designed suitably for sensor application by obtaining digitalized output every sensor module.
- Capable of being used as an applicable sensor module of imbedded, UCN, MCU etc for maximizing product utility.
 - Possible to practice various projects by providing the interface co-operating with each module of HBE-MCU-Multi.



Example to use together with other Hanback's Trainer

Configuration and Names



1. Proximity Sensor A
2. Proximity Sensor B
3. Proximity Sensor C
4. Gas Sensor
5. Optical Sensor A
6. Optical Sensor B
7. Thermo Sensor A
8. Thermo Sensor B
9. Displacement Sensor
10. Motion Sensor
11. Magnetic Sensor A
12. Magnetic Sensor B
13. Pressure Sensor
14. Extended Board Connector
15. MCU

Sensor

HBE-Sensor-Multi

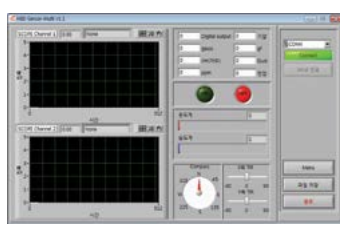
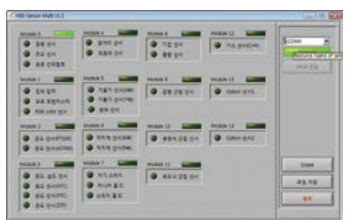
Hardware Specifications

• MCU Module

Item	Specification	Remark
MCU-ATmega128	Up to 8MIPS Throughput at 8MHz JTAG Interface, ISP Program 128K Bytes FLASH, 4k Bytes Internal SRAM 4K Byte EEPROM 8-channel PWM, 8-channel 10-bit ADC I ² C, Dual UART	
I/O (1)	Text LCD 16 Key pad USB ISP Port	2Line 16char Text LCD Back Light Sensor module power control PC interface use
I/O (2)	Illuminance Sensor-CdS Thermo-Hygro Sensor-SHT11 Digital Atmosphere Sensor	Visible Light Sensor -40 ~ 124°C Range, TWI I/F Absolute pressure 10 - 1100 mbar UART I/F
Actuator	Step Motor Relay Buzzer	5V Stepping Motor 1EA Step LED 4EA Dual Channel Relay 1EA Piezo buzzer 1EA

* Specifications can be changed without notice

Application Software



Sensor

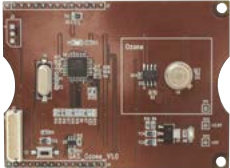
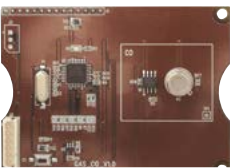
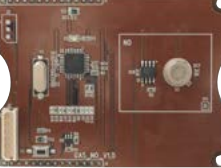
>>HBE-Sensor-Multi

• Sensor Module

Module Name	Main Component	Sensor	Use
Optical Sensor A	CdS Si-PD Photointerruptor	Light level Sensor Illuminance Sensor Photointerruptor	Indoor sunlight control AE(Automatic exposure) System Object Detecting
Optical Sensor B	Pyroelectric Sensor Photo TR Color Sensor	Human detecting Phototransistor RGB color Sensor	Crime preventing Photoelectric Counter Lighting control
Thermo Sensor A	Semiconductor Thermo Sensor Platinum Thermo Sensor	Touching Thermo Sensor Touching Thermo Sensor(PT100)	Thermometer
Thermo Sensor B	Thermopile Thermistor Thermo-Hygro Sensor	Non-touchingThermoSensor PTC/NTC DigitalThermo-HygroSensor	Non-touching Thermometer Temperature-Compensation Thermo-Hygrometer
Displacement Sensor A	Optical Distance Sensor Ultrasonic Sensor	Optical typed Distance Measurement Ultrasonic typed Distance Measurement	Range Finder Object Sensing
Motion Sensor	Acceleration Sensor Compass Sensor	DualaxisSlopeDetectingSensor Digital Direction Sensor	Slope Measurement Direction Measurement
Magnetic Sensor A	Terrestrial magnetism Sensor	Dual axis Terrestrial magnetism Sensor	Navigation Systems
Magnetic Sensor B	Reed Switch Switching Hole IC Linear Hole IC	Magnetic Switch Hole IC Switching type Hole IC Linear type	Crime Preventing Switch Speed Measurement Speed Measurement
Pressure Sensor	Atmosphere Sensor Weight Sensor	Digital Atmosphere Sensor Touching Weight Sensor	Atmosphere Measurement Touching Sensor
Proximity Sensor A	Optical Proximity Sensor	Optical typed Proximity Sensor(Industrial use)	Object Detecting
Proximity Sensor B	Capacitive Proximity Sensor	Capacitive typed Proximity Sensor(Industrial use)	Object Detecting
Proximity Sensor C	Inductive Proximity Sensor	Inductive typed Proximity Sensor(Industrial use)	Object Detecting
Gas Sensor	CH4	CH4 Detecting Sensor	Gas Detecting
MCU	CdS Atmosphere Sensor Thermo-Hygro Sensor	ADCSensingOpticalSensor UARTSensingAtmosphereSensor TWISensingThermo-HygroSensor	Light Level Measurement Atmosphere Measurement Thermo-Hygro Measurement

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• **Sensor Module(Optional)**

Gas Sensor B	Gas Sensor C	Gas Sensor D
		
Ozone Sensor	Dust Sensor	CO ₂ Sensor
Gas Sensor E	Gas Sensor F	
		
CO Sensor	NO Sensor	

Sensor

HBE-Sensor-Multi

Contents

Contents of Education		
HBE-SENSOR-MULTI for Sensor Experiment	1. Overview of HBE-SENSOR-MULTI	7. Displacement Sensor
	2. AVR MicroController	8. Motion Sensor
	3. MCU & Sensor Interface	9. Magnetic Sensor
	4. Testing Sensor Module	10. Pressure sensor
	5. Optical Sensor	11. Proximity Sensor
	6. Temperature Sensor	12. Gas sensor