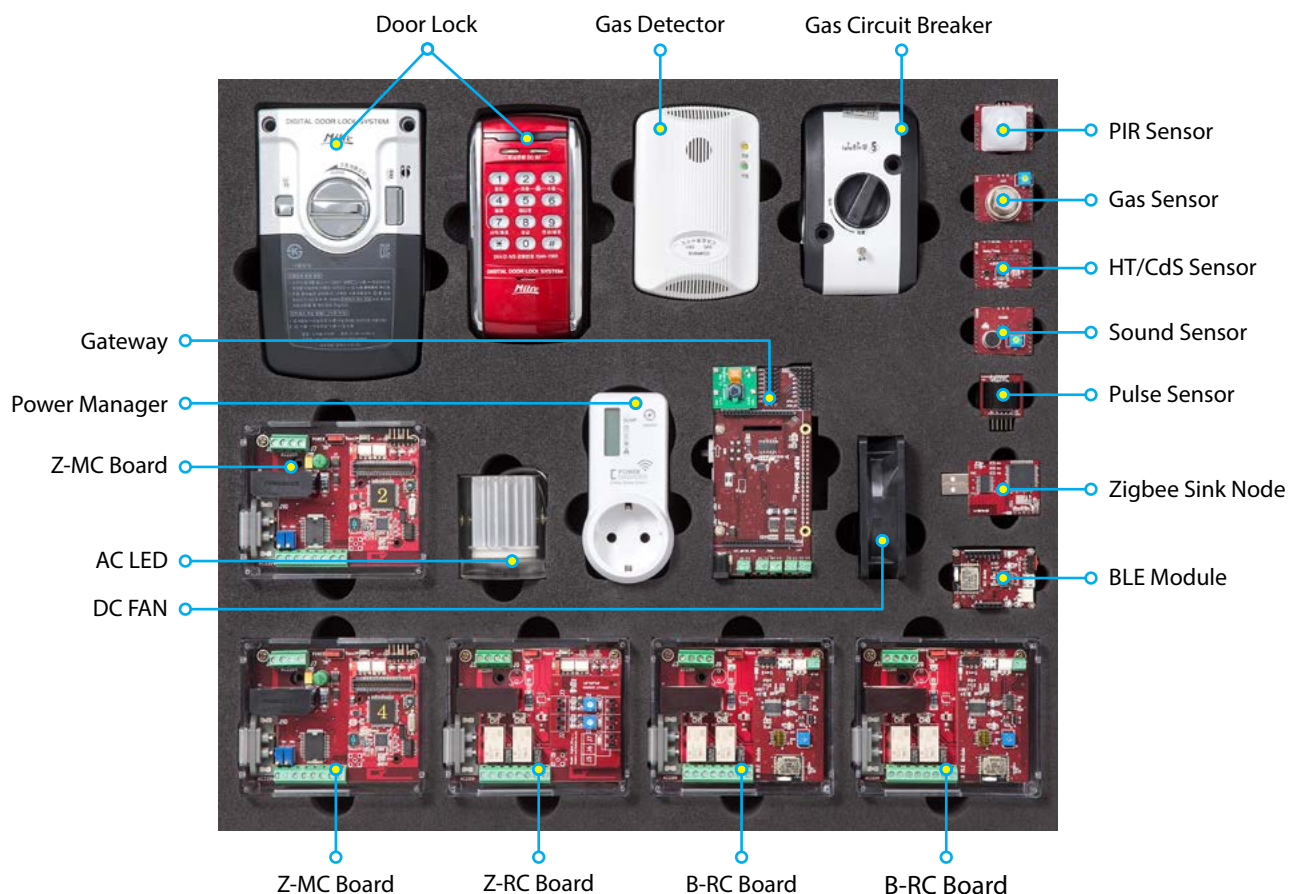


[illegible]

A collection of various electronic components and modules, including a smart meter, AC output, gas detector, door lock, and various circuit boards, arranged on a metal tray.

- It provides Bluetooth (BLE), Zigbee, and Wi-Fi, which are widely used as IoT wireless communication method, to be practiced in one equipment.
- It can practice smart home technology that operates by judging itself by interlocking sensor and actuator, and it is possible to implement remote control and monitoring by connecting to internet.
- By providing the unit module practice function using firmware, it is possible to acquire sensor information and practice actuator control to acquire IoT basic technology for each module.
- By providing interlocking program with smart device, it is possible to acquire sensor information and practice actuator control using smart device.
- Smart home system can be constructed using sensor information monitoring and remote access control function through IoT gateway.
- IoT smart agricultural management system can be built.
- IoT smart unmanned monitoring system can be built.
- IoT Smart Fire Fighting and Environmental Monitoring System can be built.
- Power Manager allows you to monitor the amount of power used in a smart home in real time.
- It is possible to directly implement the program of the smart device that wirelessly communicates with the firmware of each node. Therefore, you can practice by applying security algorithm for security function.

Configuration and Name



Hardware Specification

• Processor Module

Module	Item	Specification	Remarks
	Gateway(ADK-2560)	Micro Controller	ATmega2560 16MHz
		Flash Memory	256KByte (8KB used by bootloader)
		Clock Speed	16MHz
		USB Controller	ATmega8U2 16MHz
		USB Host Controller	MAX3421E USB 2.0
		GPIO Socket	2x18 Socket(1EA), 1x10 Socket(1EA), 1x8 Socket(5EA)
		Operating Voltage	7~12V
		Dimension	122 x 76mm
	Z-RC Board	Processor	ATmega 128L
		RF part	CC2420 2.4GHz (IEEE 802.15.4 PHY)
		Transfer Rate	Maximum 250Kbps
		Base Sensor	Temperature/Humidity, Intensity of illumination
		Operating Voltage	AC90 ~ 240V, 50/60Hz
		AC IN	AC, 3.5mm Terminal Block 2EA
		Relay	2CH, 250V/2A
		Digital I/O	IN: 2EA, OUT: 3EA
	Z-MC Board	Processor	ATmega 128L
		RF part	CC2420 2.4GHz (IEEE 802.15.4 PHY)
		Transfer Rate	Maximum 250Kbps
		Base Sensor	Temperature / Humidity, Intensity of illumination
		Operating Voltage	AC90 ~ 240V, 50/60Hz
		AC IN	AC, 3.5mm Terminal Block 2EA
		Relay	2CH, 250V/2A
		Motor Driver	L298, up to 46V/4A
	B-RC Board	Processor	16MHz ARM Cortex-M0
		RF	Bluetooth LE, 2.4GHz
		Data rate	250 ~ 2000kbps
		Operating Voltage	AC90 ~ 240V, 50/60Hz
		AC IN	AC, 3.5mm Terminal Block 2EA
		Relay	2CH, 250V/2A
		Ext, Digital In	3.5mm Terminal Block 1EA
		Size	76 x 93.5mm
	BLE Module	Processor	16MHz ARM Cortex-M0
		RF	Bluetooth LE, 2.4GHz
		Data rate	250 ~ 2000kbps
		Operating Voltage	2.2V ~ 5V
		Battery	Lithium Cell 3V (240mAh@to 2.0V)
		I/O	GPIO 7EA(I ² C, SPI, PWM), 2.54mm Socket
		Size	36 x 48mm



Gateway Module used to build Arduino-based IoT system

Module for control of various electronic and electric devices through relay control based on Zigbee communication






Module for controlling various motors through motor control based on Zigbee communication

Module for controlling various electronic and electric devices through relay control based on Bluetooth 4.0 (BLE) communication

It can be equipped with various sensors, and a module for transmitting the acquired data from sensors to smart device or gateway by Bluetooth 4.0 (BLE) communication


Module	Item	Specification	Remarks
	Processor	ATmega 128L	Module for connecting gateway, sensor and control module with Zigbee communication method. Mounted on Gateway
	RF part	CC2420 2.4GHz (IEEE 802.15.4 PHY)	
	Transfer Rate	Maximum 250Kbps	
	Operating Voltage	5V	
	Size	31 x 55mm	
	Processor	Single-Phase Energy Meter	Module for measuring the amount of power consumed and transmitting it via Wi-Fi communication
	RF	Wi-Fi (IEEE 802.11b/g/n Compatible)	
	Data Rate	11, 5.5, 2, 1 Mbps	
	Relay	1CH, 16A/250VAC	
	Operating Voltage	220V/60Hz	
	Rated Capacity	Max 10A	
	Size	45 x 92mm	

• Sensor

Module	Item	Specification	Remarks
	Photo Sensor	CdS 1EA	Modules for measuring humidity, temperature, and illumination Non-contact characteristics and no influence of noise
	Temperature / Humidity Sensor	0 ~ 100%RH / -40 ~ 125°C	
	Operating Voltage	3.3V	
	I/O	3pin Header 1EA, 4pin Header 1EA (2.54mm Pitch)	
	Size	27 x 33mm	
	Infrared Sensor	RE200B	Human body detect sensor Sensors for detecting infrared wavelengths in animals and humans
	Sensing Range	110 degree	
	Operating Voltage	3.3V	
	I/O	3pin Header 1EA (2.54mm Pitch)	
	Pulse Sensor	1EA	The infrared ray emitted from the infrared LED is a sensor that measures heart rate according to changes in blood pressure
	Sensor	Light Photo Sensor	
	Operating Voltage	3.3V	
	I/O	3pin Header 1EA (2.54mm Pitch)	
	Sound Sensor	Microphone	Sound Sensing Sensor
	Sensitivity	Adjustable (with potentiometer)	
	Operating Voltage	5V	
	I/O	3pin Header 1EA (2.54mm Pitch)	
	Gas Sensor	MQ-5	LPG, natural gas, coal or charcoal, gas detect sensor module
	High Sensitivity	LPG, Natural gas, Town gas	
	Low Sensitivity	Alcohol, Smoke	
	Operating Voltage	5V	
	I/O	3pin Header 1EA (2.54mm Pitch)	
	Size	27 x 33mm	

Module	Item	Specification	Remarks
	Type	Single instant diffusion and burning type	Commercial gas sensor module that detects LPG and LNG gas
	Operating Voltage	AC 220V, 60Hz	
	Appropriate Gas	LPG, LNG	
	Alarm indication	Yellow LED Flashes and Alarm sound	
	Output	DC 8V(when Alarm)	
	Size	110 x 73mm	
Bread Board	Strip	Terminal Strip 4EA, Bus Strip 2EA	Modules that users can construct their own circuits and practice *On board type included *Module type not included.
	Size	105 x 90mm	

• Actuator

Module	Item	Specification	Remarks
	Type	Diffused Light Type	Lighting Control Practice Module
	Color Temperature	Warm White: 2500 ~ 3500K	
	Operating Voltage	AC100 ~ 230V, 50/60Hz	
	Power Consumption	4W	
	Size	40 x 53mm	
	Bearing Type	Ball	Motor Control and Ventilation Control Training Module
	Operating Voltage	12V	
	Current Rating	230mA	
	Speed	2500rpm	
	Size	80 x 80mm	
	Shut-off Method	Geared Motor	Gas shutoff control module
	Opening and closing speed	Within 10 seconds	
	Manual operation	Clutch push method	
	Operating Voltage	12V	
	Current Rating	Max 500mA	
	Size	106 x 86mm	
	Method	One way solution(Secret Code)	Door opening / closing control module
	Operating Voltage	8V	
	Operating temperature	-20 ~ 50°C	
	Size	Front: 65 x 130mm	

Software Specifications

Module	Item	Specification
Gateway	O/S	Raspbian Linux 3.xx
	Camera Program	Pi Camera Driver, Camera Streaming Server
	Server Program	Z-RC/Z-MC Board Control S/W for Gas Detector, Gas Circuit Breaker, FAN etc
Z-RC Board	O/S	TinyOS 2.x
	Function	Relay Control, Temperature / humidity / illumination measurement
Z-MC Board	O/S	TinyOS 2.x
	Function	Motor Control, Temperature / humidity / illumination measurement
B-RC Board	F/W IDE	Arduino 1.5.8
	Function	Relay Control
BLE Module	F/W IDE	Arduino 1.5.8
ADK-2560 Module (Option)	F/W IDE	Arduino 1.0.5
	Communication	Bluetooth Communication S/W
	Function	Sensor Control S/W
Sink Node	O/S	TinyOS 2.x
	Function	Communication with Z-RC / Z-MC Board
Smart Device	O/S	Android 4.3 or later
	BLE	Door Lock Control, AC LED Control
	Wi-Fi	Gas Detector, Fan Control, Power Monitor
	Camera	CCTV Program

Textbook Chapter

Title	Textbook Contents
Smart Home IoT Fundamentals and Application Practice	Learning 1. Overview of the Internet of Things Learning 2. Composition of IoT technology Learning 3. IoT standardization and security Learning 4. Smart Sensor Technology Configuration and Application Learning 5. Smart Sensor Application Practice (1) Learning 6. Smart Sensor Application Practice (2) Learning 7. Smart Sensor Application Practice (3) Learning 8. Smart Sensor Application Practice (4) Learning 9. IoT Control Application Practice (1) Learning 10. IoT Control Application Practice (2) Learning 11. IoT Control Application Practice (3) Learning 12. IoT Control Application Practice (4) Learning 13. IoT Control Application Program Practice (1) Learning 14. IoT Control Application Program Practice (2) Learning 15. Practice of power consumption measurement application

Configuration

- HBE IoT SMART HOME (On board type or Module type)
 - Cable 5EA
 - Micro to A Type USB Cable 1EA
 - 5V/2A Power Adapter 1EA
 - User Guide book 1EA
 - Platform DVD 1EA
 - Product Selection
- This equipment is optional and you can choose one of Module type or On board type for your environment.



[Module Type]

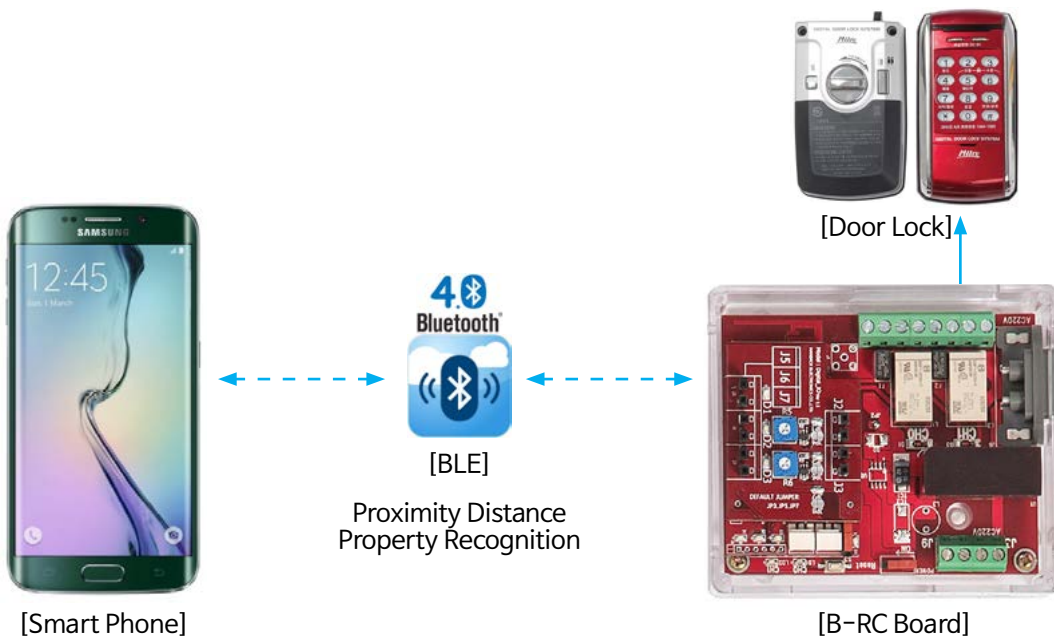


[On board Type]

Sample Configuration

- Smart Door Lock System
- You can open and close the lock remotely using Smart Phone.

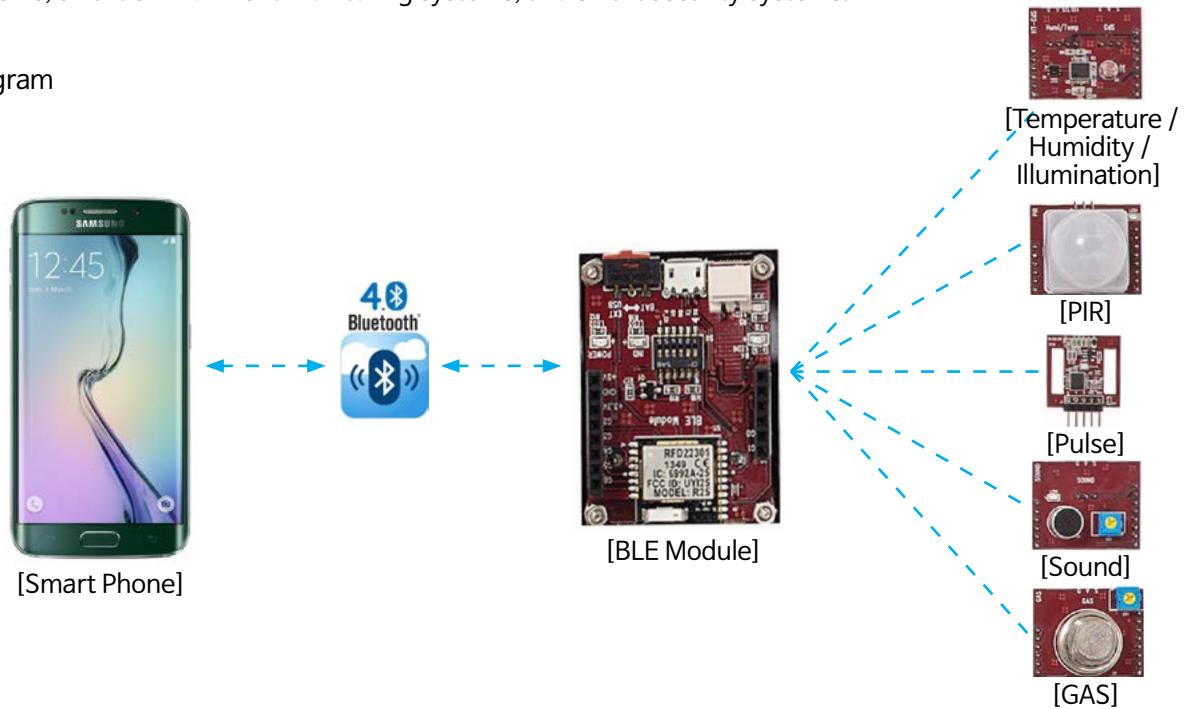
Diagram



• Basic Sensor Application

Smart phones and various sensors can be used to practice sensors used in IoT systems such as smart home systems, smart environment monitoring systems, and smart security systems.

Diagram



• HBE IoT SMART HOME Diagram

In addition to the basic components of HBE IoT SMART HOME, you can connect various sensors and actuators sold by Hanback Electronics Co., Ltd. to build an IoT system suitable for each environment of customers.

Diagram

