>>IoT(Internet of Things)

IoT Tümleşik Platformu

HBE-IoT-Smart Home

- ARM temelli Gateway Servisi
- Akıllı Telefon veya Tablet PC ile bağlantı
- Zigbee, Bluetooth ve Wi-Fi Haberleşmeleri
- BLE temelli Sensör Modül servisi
- Arduino temelli Akıllı Sensör Testi
- Çalışma için Çevre Aygıt servisi, GPIO ile bağlantı/ Kesme / ADC
- Android, Linux temelli Open API servisi

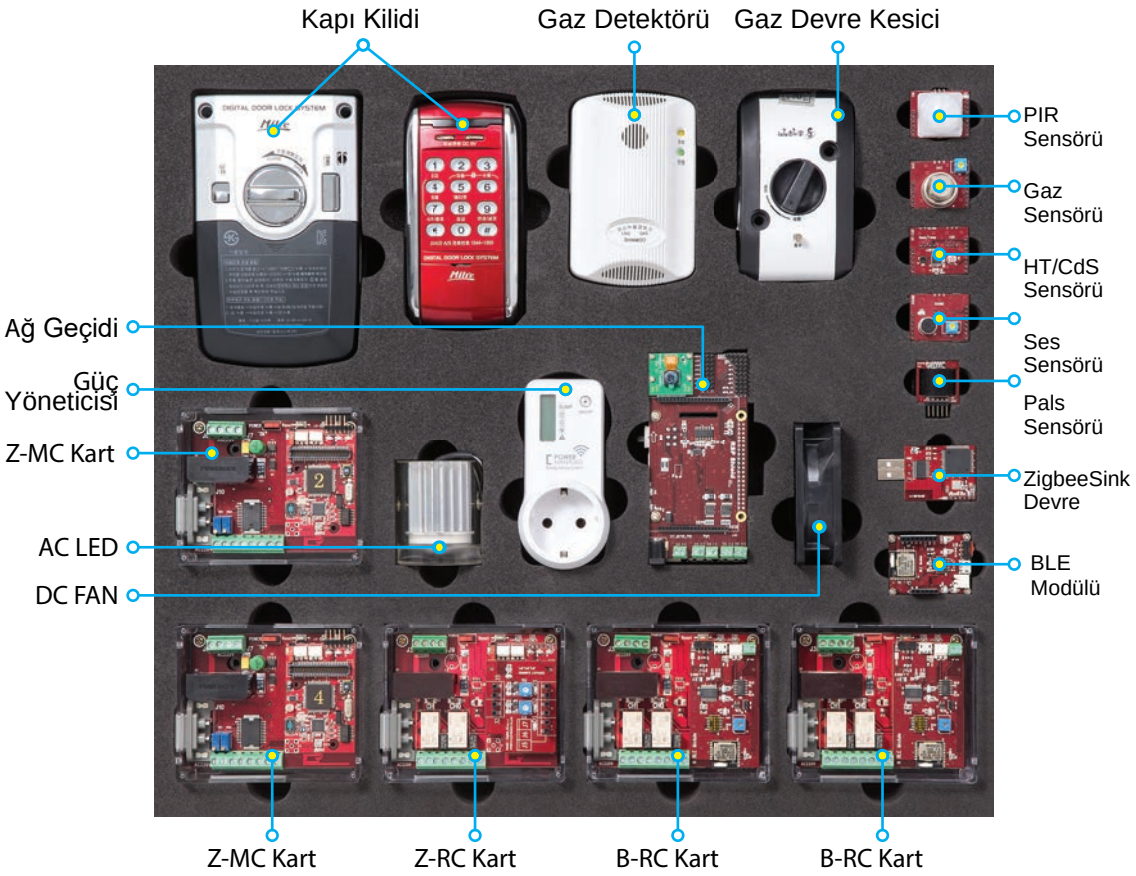
Tanıtım

IoT, akıllı sensör ve ev tesislerini kablo/kablosuz iletişim ağı ile entegre ederek ve belirli bir otomasyona karar vermek için başka bir nesneye ve bir kişiye teslim ederek kendi başına bilgi üretebilen ICT konverjans ev ağına dayalı çeşitli sensör ve aktüatörleri kilitleyen Tümleşik Platformu belirtir.

Özellikler

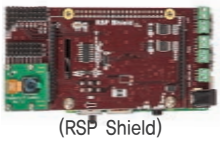
- Able to be interlocked with facilities used at actual home appliances such as Door Lock, Gas Circuit Breaker, Gas Detector and Fan, and electronic appliances using Commercial Power of 220V, providing various experiences by modularization to build it to real environment.
- Able to test it from the beginning step by step, providing 5 Basic Sensors and Bluetooth(BLE) moduleadditionally available at IoT test.
- Able to test Bluetooth(BLE), Zigbee and Wi-Fi used much for IoT wireless communication method in oneequipment .
- Interlocked with Sensor and Actuator in order to test Smart Home technology deciding and operatingfor itself, and connected with Internet in order to implement Remote Control and Monitoring.
- Able to test of Actuator Control and Sensor Information Acquisition to get IoT basic technology bymodules, providing Unit Module Test function using Firmware.
- Able to test Actuator Control Test and Sensor Information Acquisition using Smart Device, providing aprogram connected with Smart Device.
- Able to build Home Smart System by using Sensor Information Monitoring and Remote Access Controlfunction through IoT Gateway.
- Able to build IoT Smart Agriculture Management System.
- Able to build Smart Unmanned Surveillance System.
- Able to build IoT Smart Forest Fire Surveillance and Environment Monitoring System.
- Able to do Monitoring energy Smart Home uses through Power Manager.
- Able to implement Smart Device Program communicating with Firmware of each node wirelessly sopossible to use Security Algorithm for Security Function, a conversation topic, at IoT.

Konfigürasyon ve İsim



Donanım Özellikleri

•İşlemci Modülü

Modül	Madde	Özellikler
Ağ Geçidi RSP Shield + Raspberry Pi 3	Ağ Geçidi Modülü, Sunucu ve Akıllı Telefon ile iletişim kurmak ve Görüntü Bilgilerini toplamak ve iletim için kamera ile çeşitli sensör bilgileri almak.	
 (RSP Shield)	**İşlemci**	Broadcom BCM2837 900MHz Cortex-A53 quad-core
	RAM	1GB LPDDR2 SDRAM
	Hafıza	MicroSD 8GB
	USB 2.0	USB A Type x 4 Ports
	Güç	600mA up to 1.8A @ 5V
 (Raspberry Pi 3)	**Kamera**	5M Pixel(CSI)
	Motor Arayüzü	DC Motor Drive 2EA (3.5mm Terminal Block 4EA)
	Expansion I/O	GPIO : 7EA, UART : 1EA, I^2C : 1EA, SPI : 1EA, ADC : 8EA
	Şarj Cihazı	Li-Ion Batarya
	Batarya	Li-Ion Batarya, 3.7V/1800mAh
	Boyut	116 x 56mm

IoT

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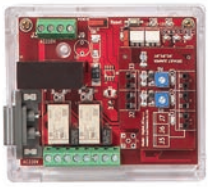
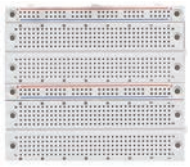
Modül	Madde	Özellikler
Ağ Geçidi(ADK-2560)	Arduino tabanlı IoT sistemi oluşturmak için kullanılan ağ geçidi modülü.	
(Opsiyon)	Mikro Kontrolör	ATmega2560 16MHz
	Flaş Bellek	256KByte (8KB used by bootloader)
	Çalışma Hızı	16MHz
	USB Kontrolör	ATmega8U2 16MHz
	USB Sunucu	MAX3421E USB 2.0
	KontrolörGPIO	2x18 Socket(1EA), 1x10 Socket(1EA), 1x8 Socket(5EA)
	Çalışma Gerilimi	7~12V
	Boyut	122 x 76mm
Z-RC Kart	Zigbee haberleşmesine dayalı Röle'yi kontrol ederek çeşitli elektronik ve elektrikli cihazları kontrol etmek için modül.	
	İşlemci	ATmega 128L
	RF Bölümü	CC2420 2.4GHz (IEEE 802.15.4 PHY)
	Transfer Hızı	Maksimum 250Kbps
	Temel Sensör	Sıcaklık/Nem, Aydınlanma Şiddeti
	Girişi Gerilimi	AC90 ~ 240V, 50/60Hz
	AC Gerilim Girişi	AC(2 sockets- figure 8) , 3.5mm Terminal Block 2EA
	Röle	2CH, 250V/2A
	Dijital I/O	IN: 2EA, OUT: 3EA
	Boyut	76 x 93.5mm
Z-MC Kart	Zigbee haberleşmesine dayalı Motor kontrol ederek çeşitli Aktüatörleri kontrol etmek için modül.	
	İşlemci	ATmega 128L
	RF Bölümü	CC2420 2.4GHz (IEEE 802.15.4 PHY)
	Transfer Hızı	Maksimum 250Kbps
	Temel Sensör	Sıcaklık/Nem, Aydınlanma Şiddeti
	Giriş Gerilimi	AC90 ~ 240V, 50/60Hz
	AC Gerilim Girişi	AC(2 sockets- figure 8) , 3.5mm Terminal Block 2EA
	Röle	2CH, 250V/2A
	Motor Sürücü	L298, up to 46V/4A
	Motor Girişi	3.5mm Terminal Block 2EA
	Boyut	76 x 93.5mm
B-RC Kart	Bluetooth 4.0 (BLE) haberleşmesine dayalı, Röle'yi kontrol ederek çeşitli elektronik ve elektrikli cihazları kontrol etmek için modül.	
	İşlemci	16MHz ARM Cortex-M0
	RF	Bluetooth LE, 2.4GHz
	Veri Hızı	250 ~ 2000kbps
	Çalışma Gerilimi	AC90 ~ 240V, 50/60Hz
	AC Giriş	AC(2 sockets- figure 8) , 3.5mm Terminal Block 2EA
	Röle	2CH, 250V/2A
	Harici, Dijital Giriş	3.5mm Terminal Block 1EA
	Boyut	76 x 93.5mm
BLE Modül	Çeşitli Sensörleri monte etmeyi ve Bluetooth 4.0 (BLE) iletişimi ile sensörden alınan verileri akıllı cihaza veya Ağ Geçidine iletmeyi sağlayan modül.	
	İşlemci	16MHz ARM Cortex-M0
	RF	Bluetooth LE, 2.4GHz
	Veri HızıO	250 ~ 2000kbps
	Çalışma Gerilimi	2.2V ~ 5V
	Batarya Gerilimi	Lityum 3V (240mAh@to 2.0V)
	I/O	GPIO 7EA(I^2C, SPI, PWM), 2.54mm Soket
	Boyut	36 x 48mm

Module	Item	Specifications
Sink Node	Module to connect Gateway, Sensor and Control Module by Zigbee communication. Mounted on Gateway.	
	Processor	ATmega 128L
	RF part	CC2420 2.4GHz (IEEE 802.15.4 PHY)
	Transfer Rate	Maximum 250Kbps
	Operating Voltage	5V
	Size	31 x 55mm
Power Manager	Module to measure the rate of Power Consumption and transmit it by Wi-Fi.	
	Processor	Single-Phase Energy Meter
	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	Specifications
HT/CdS Module	Module able to measure Humidity, Temperature and Intensity of Illumination. Non-contact characteristic and not affected by Noise.	
	Photo Sensor	CdS 1EA
	Temperature/Humidity Sensor	0 ~ 100%RH/-40 ~ 125℃
	Operating Voltage	3.3V
	I/O	3pin Header 1EA, 4pin Header 1EA (2.54mm Pitch)
	Size	27 x 33mm
PIR Module	Human Body Detection sensor sensing Infrared waves generated from animals and human beings.	
	Infrared Sensor	RE200B
	Sensing Range	110 degree
	Operating Voltage	3.3V
	I/O	3pin Header 1EA (2.54mm Pitch)
	Size	27 x 33mm
Pulse Module	Sensor measuring Heartbeat by Infrared rays emitted from Infrared LED according to the change of vascular pressure.	
	Pulse Sensor	1EA
	Sensor	Light Photo Sensor
	Operating Voltage	3.3V
	I/O	3pin Header 1EA (2.54mm Pitch)
	Size	27 x 33mm
Sound Module	Sound detecting Sensor.	
	Sound Sensor	Microphone
	Sensitivity	Adjustable (with potentiometer)
	Operating Voltage	5V
	I/O	3pin Header 1EA (2.54mm Pitch)
	Size	27 x 33mm

IoT
>>HBE-IoT-Smart Home

Module	Item	Specifications
Gas Module	Sensor Module detecting LPG, natural gas, Coal or Charcoal gas.	
	Gas Sensor	MQ-5
	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
Gas Detector	Commercial Gas Sensor Module detecting LPG and LNG gas.	
	Type	Single instant diffusion and burning type
	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	Module user can make and test a circuit directly. *Integrated HBE-IoT-Smart Home incl. / Separated HBE-IoT-Smart Home not incl.	
	Strip	Terminal Strip 4EA, Bus Strip 2EA
	Size	105 x 90mm

• Actuator

Module	Item	Specifications
LED	Lighting Control Test Module.	
	Type	Diffuse Lighting type
	Color Temperature	Warm White : 2500 ~ 3500K
	Operating Voltage	AC100 ~ 230V, 50/60Hz
	Power Consumption	4W
	Size	40 x 53mm
FAN	Motor Control and Ventilation Control Test Module.	
	Bearing Type	Ball
	Operating Voltage	12V
	Current Rating	230mA
	Speed	3250rpm
	Size	80 x 80mm
Gas Circuit Breaker	Gas Circuit Breaker Control Module.	
	Shut-off Method	Geared Motor
	Contact Speed	within 10 seconds
	Manual Operation	Clutch Push Type
	Operating Voltage	12V
	Current Rating	Max 500mA
	Size	106 x 86mm
Door Lock	Door Lock Control Module.	
	Method	One way solution(Secret Code)
	Operating Voltage	8V
	Operating Temperature	-20 ~ 50℃
	Size	Front: 65 x 130mm

Specifications of HBE-IoT-Smart Home Software

Module	Item	Specifications
Gateway	OS	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 and FAN
Z-RC Board	OS	TinyOS 2.x
	Function	Relay Control, Temperature/Humidity/ Illumination Measurement
Z-MC Board	OS	TinyOS 2.x
	Function	Motor Control, Temperature/Humidity/ Illumination Measurement

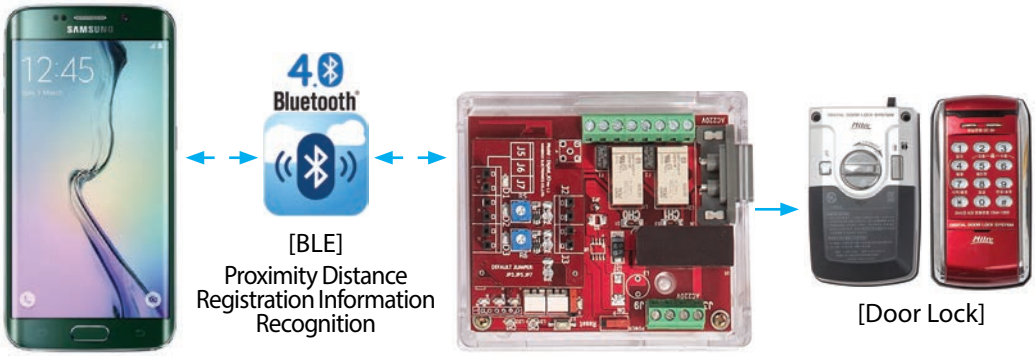
Module	Item	Specifications
B-RC Board	F/W IDE	Arduino 1.5.8
	Function	Relay Control
BLE Module	F/W IDE	Arduino 1.5.8
ADK-2560 Module	F/W IDE	Arduino 1.0.5
	Communication	Bluetooth Communication S/W
	Function	Sensor Control S/W
Sink Node	OS	TinyOS 2.x
	Function	Communication with Z-RC/Z-MC Board
Smart Device	OS	over Android 4.3
	BLE	Door Lock Control, AC LED Control
	Wi-Fi	Gas Detector, Fan Control, Power Monitor
	Camera	CCTV Program

Examples

• Smart Door lock System

Able to open and close Locking System remotely with Smart Phone.

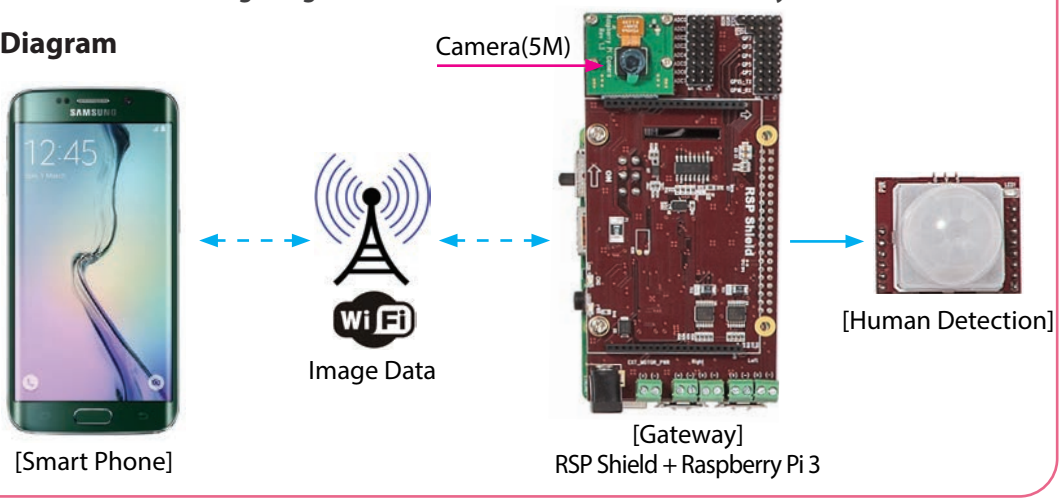
Diagram



• Intruder Unmanned Surveillance System

Able to do Monitoring Image Data collected from Camera of Gateway with Smart Phone.

Diagram



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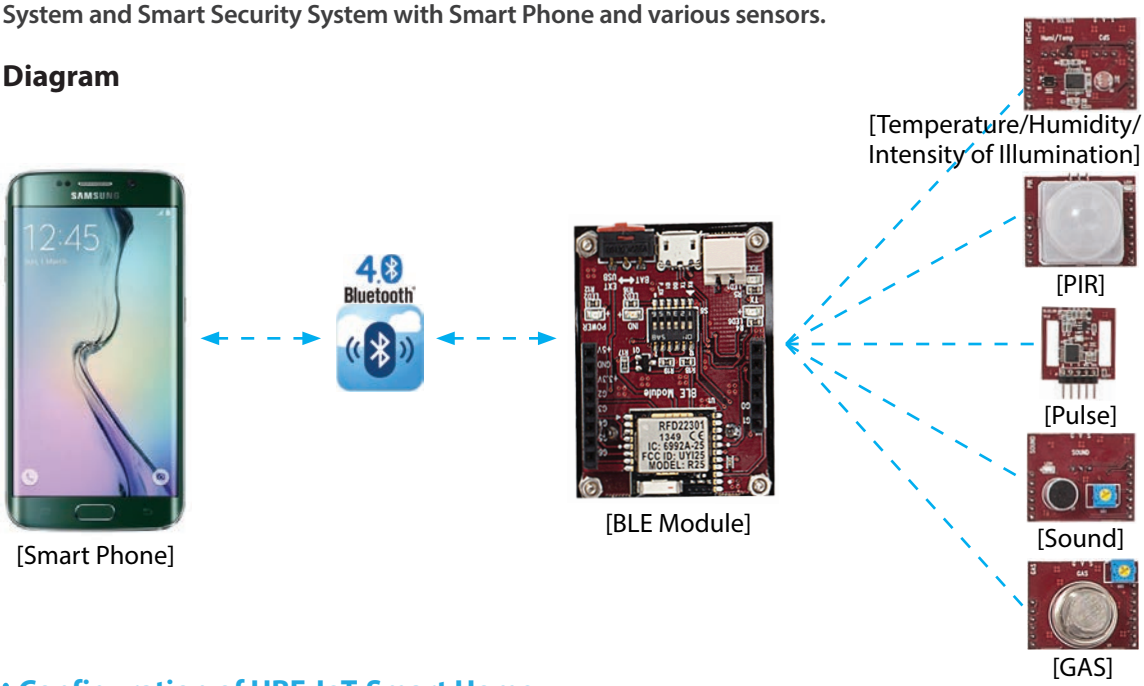
• Application of Basic Sensor

Able to test sensors IoT system uses, such as Smart Home System, Smart Environment Monitoring System and Smart Security System with Smart Phone and various sensors.

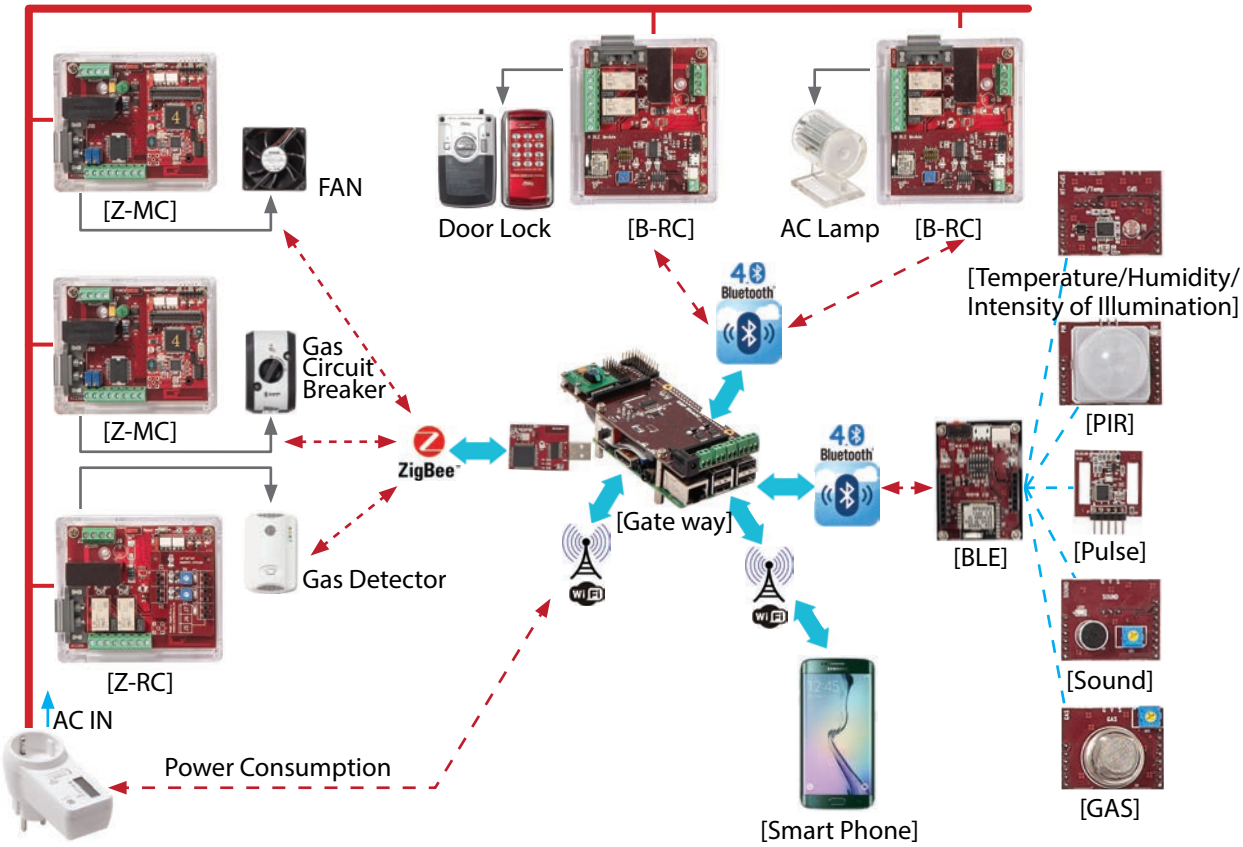
Diagram



• Configuration of HBE-IoT-Smart Home

Able to build IoT system appropriate for each environment of demander by connecting various sensors and Actuators HanBack Electronics sells in addition to basic components of HBE-IoT-Smart Home.

Diagram



Educational Contents

Subject	Contents
Basic and Application Test of IoT	1. Introduction to IoT 2. Configuration of IoT technology 3. Standardization and Security of IoT 4. Configuration and Application of Smart Sensor Technology 5. Application Test of Smart Sensor(1) 6. Application Test of Smart Sensor(2) 7. Application Test of Smart Sensor(3) 8. Application Test of Smart Sensor(4) 9. Application Test of IoT Control(1) 10. Application Test of IoT Control(2) 11. Application Test of IoT Control(3) 12. Application Test of IoT Control(4) 13. Test of IoT Control Application Program(1) 14. Test of IoT Control Application Program(2) 15. Test of Power Consumption Measurement Application Program
Test of IoT Firmware and Application Programming	1. Introduction to IoT 2. Configuration of IoT technology 3. Standardization and Security of IoT 4. Configuration and Application of Smart Sensor Technology 5. Application Test of Sensor and Actuator(1) 6. Application Test of Sensor and Actuator(2) 7. Application Test of Sensor and Actuator(3) 8. Application Test of Sensor and Actuator(4) 9. Communication Program Test(1) 10. Communication Program Test(2) 11. Test of IoT Service Application Program(1) 12. Test of IoT Service Application Program(2) 13. Test of IoT Service Application Program(3) 14. Test of IoT Service Application Program(4) 15. Test of Power Consumption Measurement Application Program

Product Configuration

HBE-IoT-Smart Home 1EA

User Guide book

Platform DVD

2 sockets- figure 8 Cable 5EA

Micro to A Type USB Cable 1EA

Charger(5V/2A) 1EA

Separated HBE-IoT-Smart Home

Integrated HBE-IoT-Smart Home