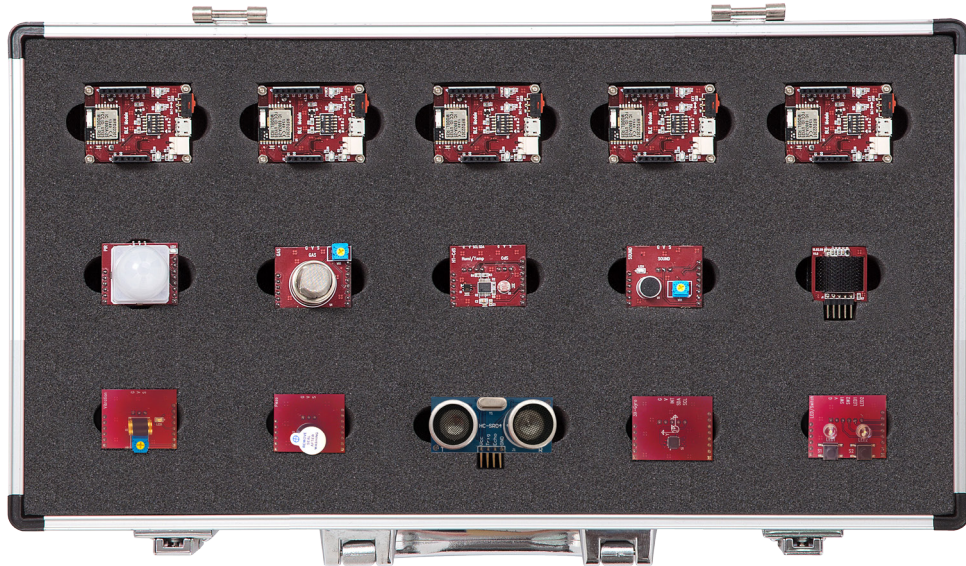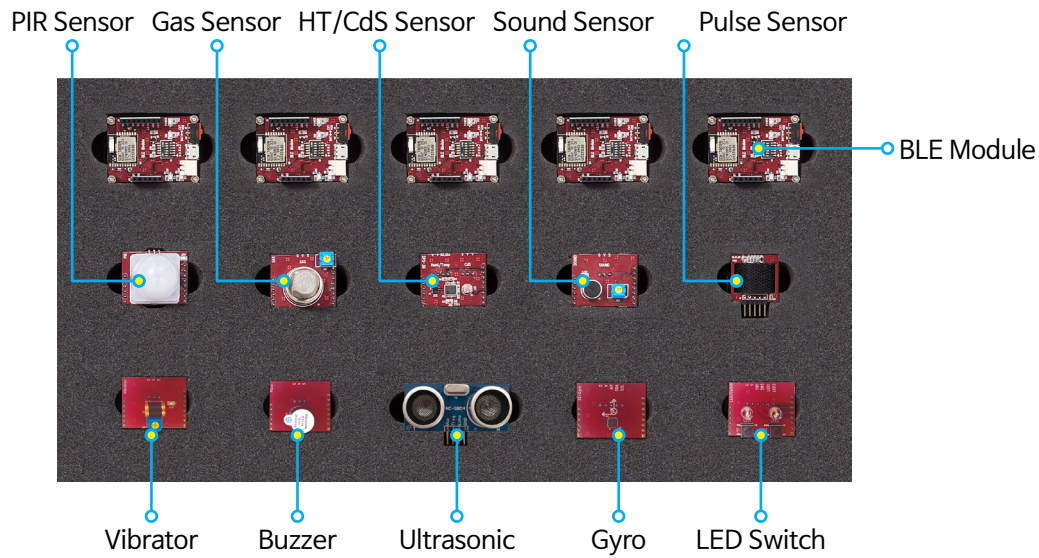**IoT SMART FAMILY**

IoT BEACON

IoT Platform

- Interworked on Smart Phone or Tablet PC
- Arduino programming by BLE Module
- BLE based Sensor Module Service
- BEACON Service
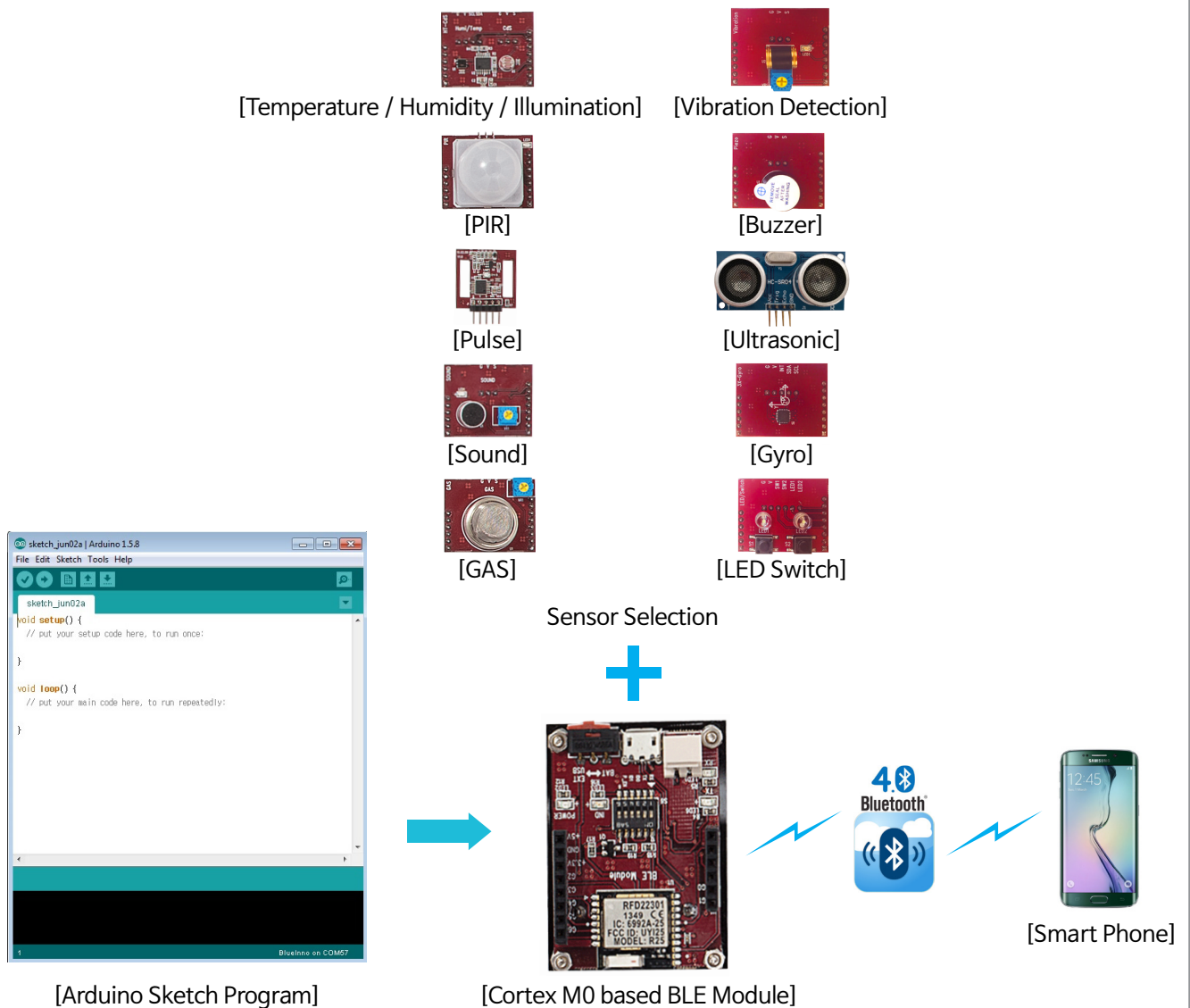- Various Projects Supports

Features

- Sensor data collection is implemented around open hardware platform, so anyone can easily experience IoT service.

- Provides 10 basic sensor data bases and application examples.

- Supports various projects such as sensor collection and indoor map service using BEACON.

- Sensor module information acquisition and actuator control for IoT basic technology for each module by providing unit module practice function using firmware.
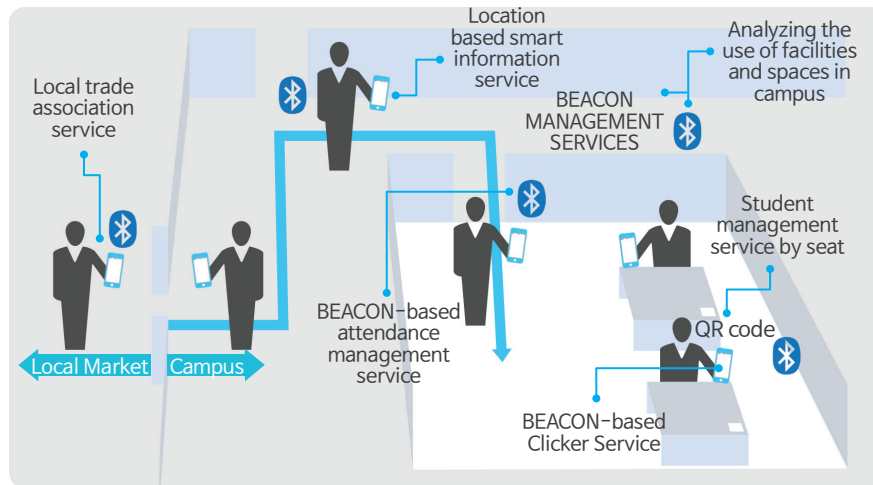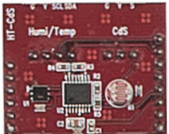
Configuration and Name

PIR Sensor Gas Sensor HT/CdS Sensor Sound Sensor Pulse Sensor

BLE Module

Vibrator   Buzzer   Ultrasonic   Gyro   LED Switch

Basic Practice

[Temperature / Humidity / Illumination]   [Vibration Detection]

[PIR]   [Buzzer]

[Pulse]   [Ultrasonic]

[Sound]   [Gyro]

[GAS]   [LED Switch]

Sensor Selection

+

```
sketch_jun02a | Arduino 1.5.8
File  Edit  Sketch  Tools  Help

sketch_jun02a
void setup() {
  // put your setup code here, to run once:

}

void loop() {
  // put your main code here, to run repeatedly:

}


1                                      BlueInno on COM57
```

[Arduino Sketch Program]

[Cortex M0 based BLE Module]

[Smart Phone]

Application

- Local trade association service
- Local Market
- Campus
- Location based smart information service
- BEACON MANAGEMENT SERVICES
- Analyzing the use of facilities and spaces in campus
- BEACON-based attendance management service
- Student management service by seat
- QR code
- BEACON-based Clicker Service

- Indoor map service
- Facilities storage status notification service
- Visually Impaired Risk Detection Service
- Lost Property Search Service
- Automatic Attendance Check Service
- Classroom notification services
- Coupon notification service in front of the store

Hardware Specification

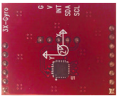| Module	Item	Specification	Remarks
BLE Module	Processor	16MHz ARM Cortex-M0	Various sensors can be installed, and modules for transmitting the data acquired by the sensor to the smart device or gateway through Bluetooth 4.0 (BLE) communication
	RF	Bluetooth LE, 2.4GHz	
	Data rate	250 ~ 2000kbps	
	Operating 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	
HT/CdS Module	Photo Sensor	CdS 1EA	Human body detect sensor. Sensors for detecting infrared wavelengths in animal and humans
	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	Infrared Sensor	RE200B	Human body detect sensor. Sensors for detecting infrared wavelengths in animal and humans
	Sensing Range	110 degree	
	Operating Voltage	3.3V	
	I/O	3pin Header 1EA (2.54mm Pitch)	
	Size	27 x 33mm	
Pulse Module	Pulse Sensor	1EA	Infrared rays emitted by infrared LED measure heart rate according to changes in blood pressure
	Sensor	Light Photo Sensor	
	Operating Voltage	3.3V	
	I/O	3pin Header 1EA (2.54mm Pitch)	
	Size	24 x 24mm	
Sound Module	Sound Sensor	Microphone	Sound sensing sensor
	Sensitivity	Adjustable (with potentiometer)	
	Operating Voltage	5V	
	I/O	3pin Header 1EA (2.54mm Pitch)	
	Size	27 x 33mm	
Gas Module	Gas Sensor	MQ-5	Sensor module that detects LPG, natural gas, coal or charcoal gas
	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
Ultrasonic Sensor	Ultrasonic Sensor	HC-SR04	Object perception, distance measurement module
	Distance	2-500cm	
	Frequency	40KHz	
	Measuring Angle	15 degree	
	Operating Voltage	5V	
	Dimension	33 x 45(mm)	
3X-Gyro sensor	Gyro Sensor	ITG3205	Angular velocity detection sensor module
	Interface	I²C Serial interface	
	ADC Resolution	16Bit	
	Operating Voltage	3.3V/5V	
	Dimension	27 x 33(mm)	
LED/SW	Components	White LED 5PI 2EA, Tact Switch 2EA	Module consisting of two LEDs and a switch
	Allowable Voltage and Current	2.0~5V, 5mA(Min)	
	Operating Voltage	3.3V~5V	
	Dimension	27 x 33(mm)	
Vibration Detection	Shock Sensor	801S	Shock Detection Sensor Module
	Interface	3P Buckled wire connector	
	Operating Voltage	5V	
	Dimension	27 x 33(mm)	
Buzzer	Sound Pressure Level	88dB(Min)	Buzzer (piezoelectric element) device module
	Current Consumption	40mA(Max)	
	Operating Voltage	3.3V~5V	
	Dimensions	27 x 33(mm)	

Software Specification

Module	Item	Specification
BLE Module	F/W IDE	Arduino 1.6.x
	Communication	Bluetooth Communication S/W
	Function	Sensor Control S/W
Sensor Module	Application	Android Application S / W

Textbook Chapter

Title	Textbook Contents
Learning Internet of Things with BEACON	Learning 1. Overview of the Internet of Things Learning 2. Composition of IoT technology Learning 3. IoT standardization and security of things Learning 4. Smart Sensor Technology Configuration and Application Learning 5. BLE Communication Program Practice Learning 6. Intrusion detection system using PIR sensor Learning 7. Gas leakage alarm system using gas sensor Learning 8. Child care assistant system using sound sensor Learning 9. Temperature/humidity/illuminance meter using HT−CdS sensor Learning 10. Pulse measurement with pulse sensor Learning 11. Automotive Rear Detector Using Ultrasonic Sensor Learning 12. Vibration system using vibration sensor Learning 13. Picture book using angular velocity sensor Learning 14. Prevention system using buzzer Learning 15. Smart LED light using lighting / switch module Learning 16. Developing museum guide service using BEACON Learning 17. Development of electronic coupon service using BEACO