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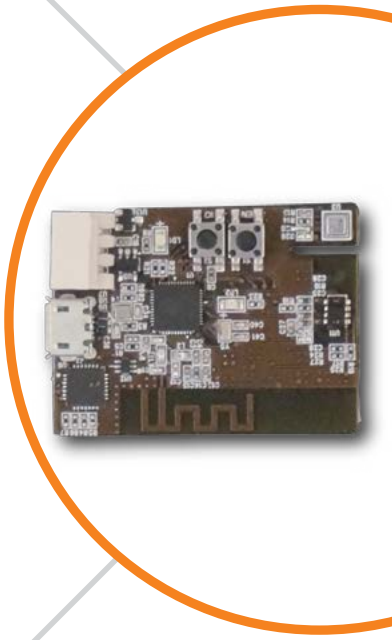
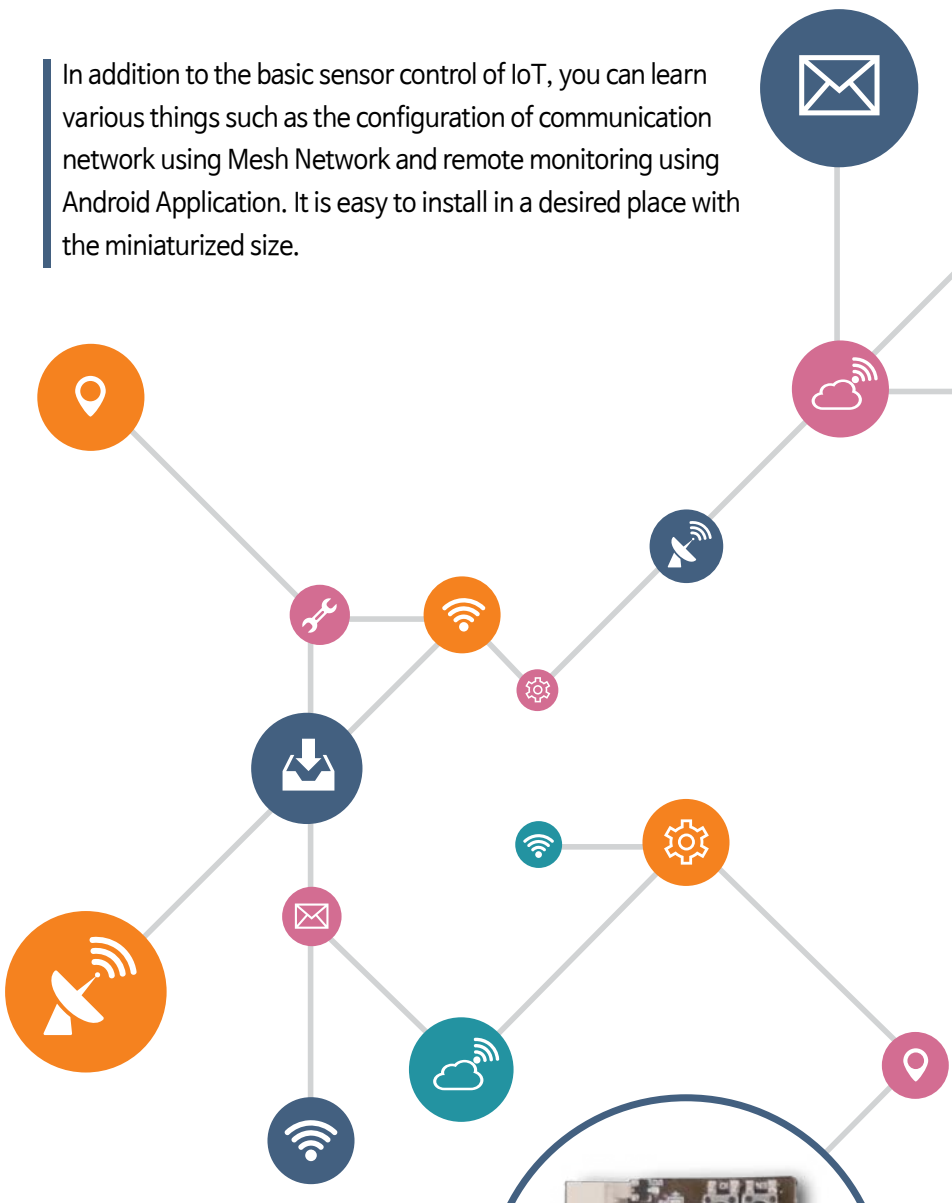
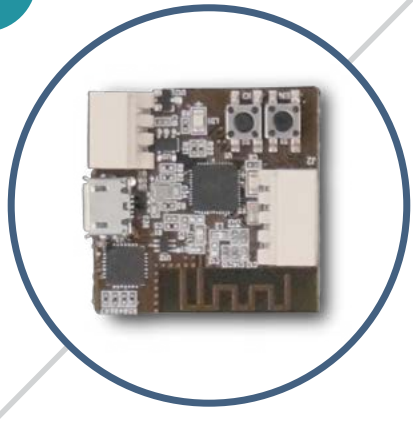


Internet of Things

SOM TBW

In addition to the basic sensor control of IoT, you can learn various things such as the configuration of communication network using Mesh Network and remote monitoring using Android Application. It is easy to install in a desired place with the miniaturized size.





HANBACK ELECTRONICS Since 1984

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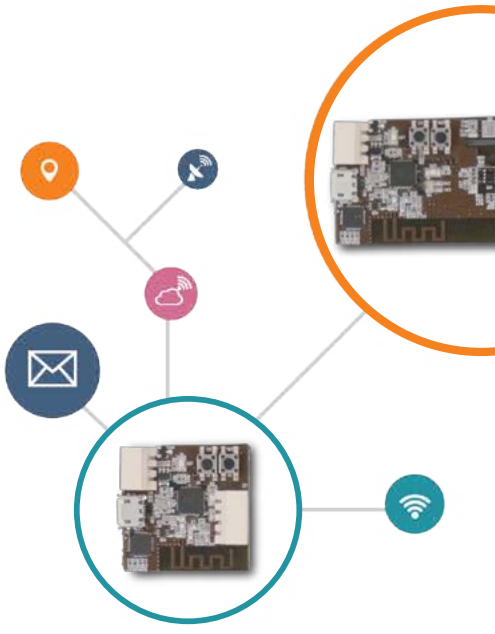
Internet of Things

SOM TBW

It provides not only the practical exercises of IoT basic sensor control, as well as of various communication for personal network configuration using Mesh Network. It is also a compact module, easy to carry and install in any place. It is possible to experience data collection and communication related to 9 kinds of sensors, and can manage and monitor data by linking with desired platform through Open Gateway.



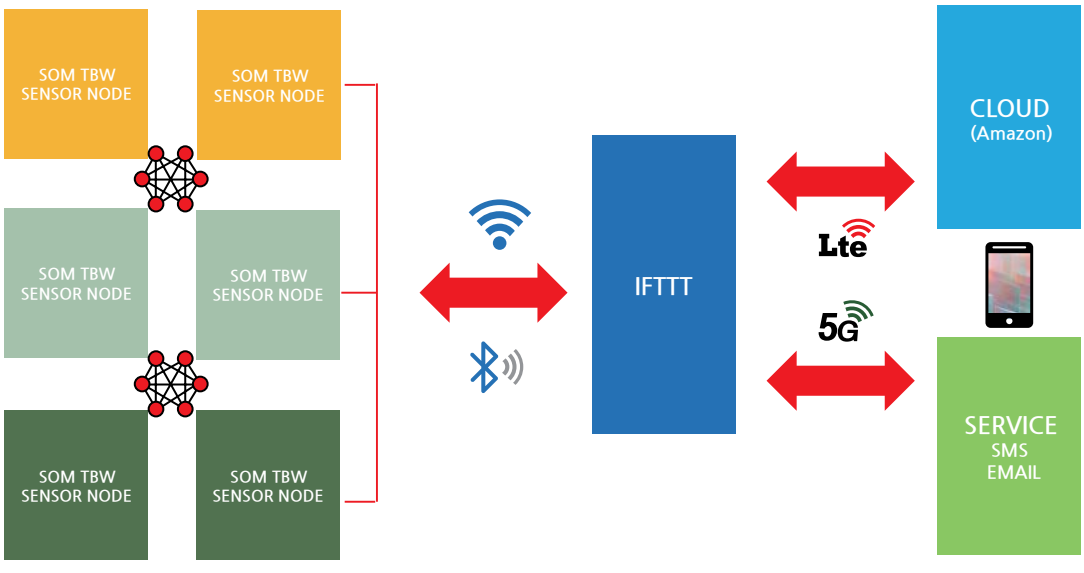
Product Features

- Sensor data collection is implemented by Open Hardware Platform and can be easily accessed by anyone.
- It provides practical exercise not only for basic sensor data, but also applications of 9 kinds of sensor.
- It provides unit module practice function using firmware which enables to acquire sensor information and to practice control them for learning IoT technology related to each sensor.
- You can experience IoT connected with various platforms by using Open Gateway Platform.
- Sensor data can be monitored easily by various SNS, SMS, e-mail and smart phone notifications.
- Each module can be connected through Mesh Network, so you can build your own network even in a space where network is not available.
- It is possible to connect various sensors using expansion port.

Application Area

- Smart Home Farm
- Industrial Automation
- Wearable Electronics
- Healthcare
- Consumer Electronics
- University Campus

Block Diagram



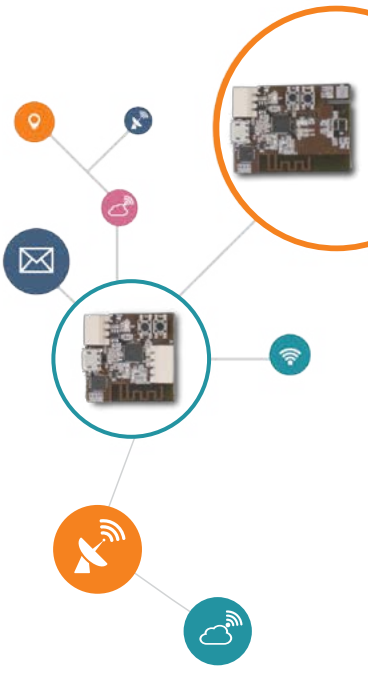
Hardware Specifications

Module	Category	Specifications	
Enviroment Module	CPU	Xtensa Dual-core 32 bit LX6 Microprocessor 160 or 240MHz and Performing at up to 600 DMIPS	
	Memory	520KB SRAM	
	Wi-Fi	802.11 b/g/n	
	Bluetooth	v4.2 BR / EDR and BLE	
	UART	1EA UART Interface	
	Gas Sensor	Response time	〈 1s
		Sensor to sensor deviation	+/- 15% +/- 15
		Power consumption	〈 0.1 mA in ultra-low power mode
		Output data processing	direct output of IAQ (Index for Air Quality)
	Humidity Sensor	Response time	8s
		Accuracy tolernace	± 3% relative humidity
		Hysteresis	≤ 1.5% relative humidity
	Pressure Sensor	RMS noise	0.12 Pa
		Sensitivity error	± 0.25%
		Temperature coefiicient offset	± 1.3Pa/K
	Temperature Sensor	-40 ~ 85 ℃	
	Ambient Light	- UV and IR blocking filters - Programmable gain and integration time - Very High Sensivity - Ideally suited for operation behind dark glass	
	RGB Color Sensor	- UV and IR blocking filters , Programmable gain and integration time, Very High Sensivity - Ideally suited for operation behind dark glass	
	Proximity Sensor	Trimmed to provide consistent reading , Offset compensation, Programable driver for IR LED current , Saturation indicator bit	
	Complex Gesture Sensor	Four separate diodes sensitive to different directions, Offset compensation, Programable driver for IR LED current, 32 dataset storage FIFO, Interrupt driven I^2C communication	
	Bettery	3.7V 280mA	
	Size	40mm x 35mm x 20mm	
Expansion Module	CPU	Xtensa Dual-core 32bit LX6 Microprocessor 160 or 240MHz and Performing at up to 600 DMIPS	
	Memory	520KB SRAM	
	Wi-Fi	802.11 b/g/n	
	Bluetooth	v4.2 BR/EDR and BLE	
	UART	1EA UART Interface	
	Bettery	3.7V 280mA	
	Size	35mm x 35mm x 20mm	

Software Specifications

Module	Category	Specifications
Enviro	F/W IDE	Arduino 1.8.5
	Function	Sensor Control S/W
	Communication	Mesh Network Library

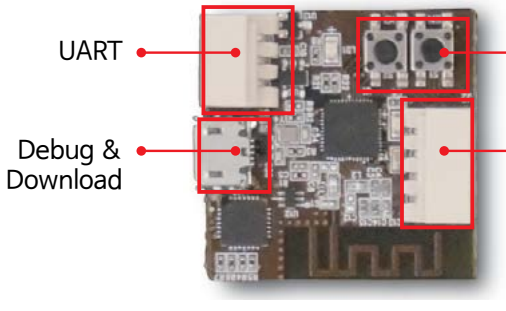
Training Contents



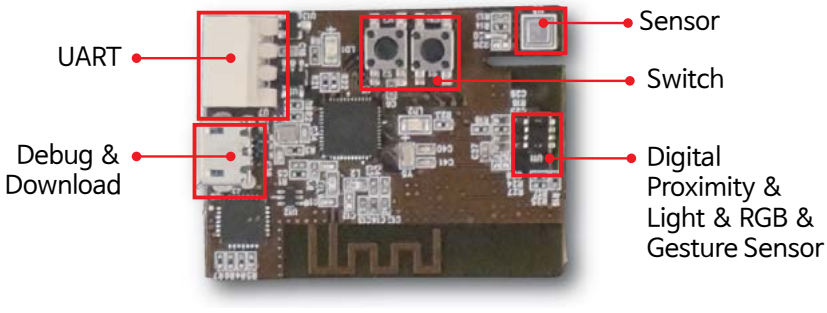
[Mesh Network Implementation Using TBW]

- Overview of Mesh Network
- Development Environment of Arduino
- Practice of Environment Sensor Using BME680
- Practice of Perimeter Detection Using APDS-9960
- Mesh Network Practice
- Using IFTTT Service through TBW
- Building a Linux Development Environment

Layout

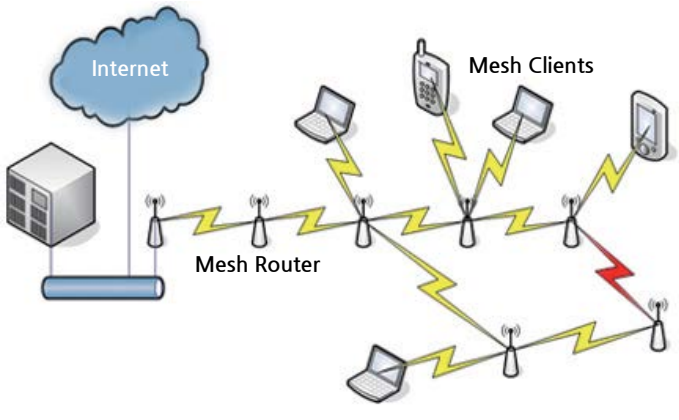


[Expansion Module]



[Enviroment Module]

Mesh Networks



APPS