

Internet of Things

# IoT Smart Server



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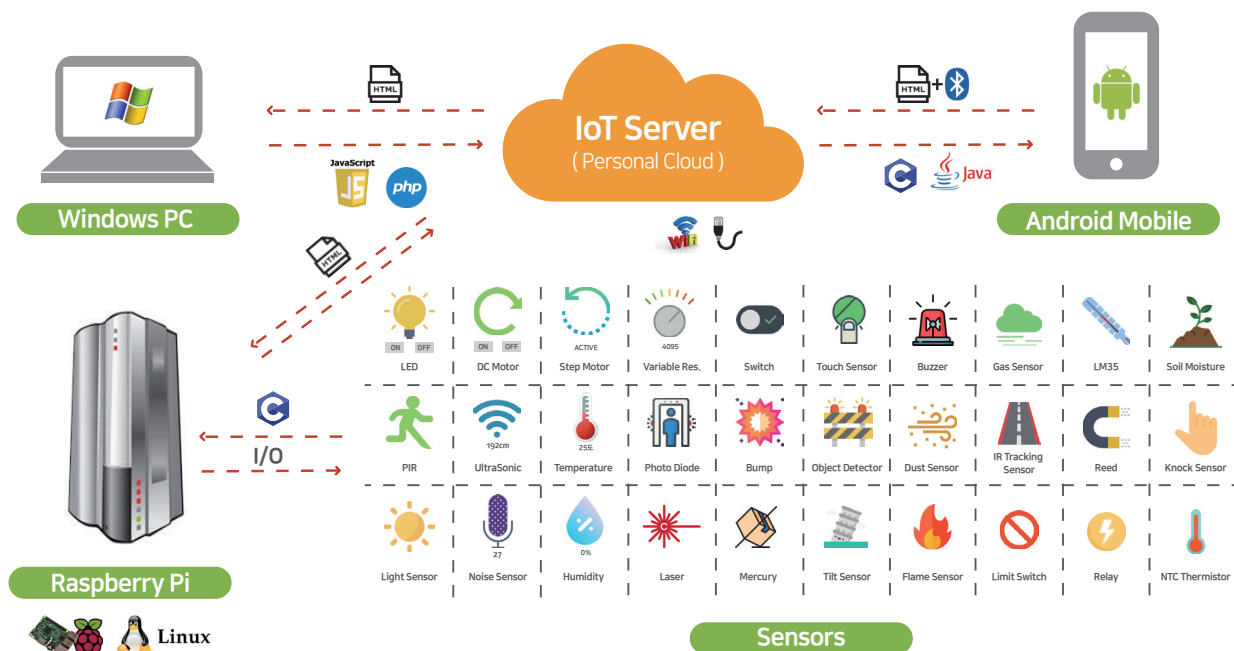
In addition to the basic concept of IoT, it is also possible to learn to implement IoT remote control system in various ways. This product was developed to provide the broad knowledge and experience from the beginning to the completion of IoT field leading the future science and technology.



## Product Features

- ▶ Learn different ways to control sensor including basic control, remote control via wireless communication
- ▶ Provides about 120 examples and programs
- ▶ Control and experience about 30 kinds of sensors used in real life
- ▶ Experience server building required in IoT
- ▶ Experience Raspberry Pi and Linux
- ▶ Learn about Bluetooth communication
- ▶ Experience HTTP protocol and server/client communication
- ▶ Learn the interface between programs through CGI
- ▶ Experience a wide range of programming language such as C, HTML, PHP, and JavaScript, etc.
- ▶ Provides training on web page composition via JavaScript
- ▶ Provides Android-based HTTP interlocking application
- ▶ Provides Android-based Bluetooth interlocking application

## Block Diagram



## Hardware Specification

Module	Category	Specification	Module	Category	Specification
Raspberry Pi 4	Processor	Broadcom BCM2711 1.5GHz Cortex-A72 Quad-core	Sensor Modules	Touch Sensor	Sensor : TTP223 Operating Voltage : 3.3V~5V Dimension : 15x11(mm) I/O Interface : 1pin Digital Output
	Memory	1GB or 2GB or 4GB LPDDR4 SDRAM		IR Sensor	Sensor : FC33 Operating Voltage : 3.3~5V I/O Interface : 1pin Digital Output
	Storage Capacity	MicroSD		Shock Sensor	Sensor : SW-420 Operating Voltage : 5V I/O Interface : 1pin Digital Output
	USB 2.0	USB 2.0 2ports, USB3.0 2ports		Dust Sensor	Sensor : GP2Y1014AU0F Operating Voltage : 5V I/O Interface : 1pin Digital Input, 1pin Analog Output
	Power	USB-C socket 5V, 2A		Gas Sensor	Sensor : MQ-2 Operating Voltage : 3.3V~5V I/O Interface : 1pin Analog Output
	Audio	3.5mm A/V Jack		Soil Moisture	Operating Voltage : 3.3V~5V I/O Interface : 1pin Analog Output
	Digital Video	HDMI 2 * micro HDMI		Tracking	Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output
	Ethernet	10/100 Base T		Thermistor Temperature	Operating Voltage : 3.3V~5V I/O Interface : 1pin Analog Output
	Wireless Network	802.11n, Bluetooth 4.0		Temperature	Sensor : LM35 Operating Voltage : 3.3V~5V I/O Interface : 1pin Analog Output
	Expension I/O	40EA GPIO (2x20 2.54mm Pitch Header)		Limit Switch	Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output
Size	116x56mm	Knock Sensor	Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output		
RSP Shield	Expension I/O	40EA GPIO (2x20 2.54mm Pitch Header)	Relay	Feature : NC/NO Relay, 250VAC 10A / 30VDC 10A Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Input	
	ADC	8ch 12bit Analog to Digital Converter			
Sensor Modules	PIR	Sensor : RE200B Sensing Range : 110 Degree Operating Voltage : 3.3V I/O Interface : 1pin Digital Out	Actuator Modules	LED Module	Feature : RED Operating Voltage : 3.3V~5V Current : 20mA Lumminous Intensity : 6000~7000mcd at 20mA View Angle : 30 Degree I/O Interface : 1pin Digital Input
	Sound Sensor	Sensor : Microphone Feature : ambient sound detection, sound level detection Operating Voltage : 5V I/O Interface : 1pin Analog Output		DC Motor	Motor : Micro Type DC Motor Motor Driver : TB6552 Operating Voltage : 5V I/O Interface : 2pin Digital Input
	Humidity Temperature Sensor	Sensor : DHT11 Feature : temperature and humidity sensor, ambient temperature and humidity detection Operating Voltage : 5V I/O Interface : 1pin Digital Output		Step Motor	Feature : 32 Step, 1/16 Gear Motor Motor Driver : ULN2003 Operating Voltage : 5V I/O Interface : 4pin Digital Input
	UltraSonic	Sensor : HC-SR04 Feature : 2~500cm distance measuring range, 40kHz Frequency Operating Voltage : 5V I/O Interface : 2pin Digital Output		Switch Module	Feature : Tact Button I/O Interface : 1pin Digital Input
	Light Sensor	Sensor : CdS Operating Voltage : 5V I/O Interface : 1pin Analog Output		Buzzer Module	Sound Output at 10cm : 60dB(Min) Operating Voltage : 3.3V~5V Current Consumption : 2mA Dimension : 15x19(mm) I/O Interface : 1pin Digital Input
	Variable Resistor	Sensor : 1kΩ Variable Resistor Feature : 0~5V DC Variable Voltage out I/O Interface : 1pin Analog Output		Laser Module	Wavelength : 650nm Operating Voltage : 5V Dimension : 15x19(mm) I/O Interface : 1pin Digital Input
	Tilt Sensor	Contact Resistance : 50mΩ max Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output Dimension : 15x19(mm)		RGB LED	Operating Voltage : 3.3V~5V I/O Interface : 3pin Digital Input
	Mercury Sensor	Operating Voltage : 3.3V~5V I/O Interface : 1pin Digital Output Dimension : 15x19(mm)			
	Reed Sensor	Operating Voltage : 3.3V~5V Switching Current : 0.5A Contact Rating : 10W/VA Dimension : 21x36(mm) I/O Interface : 1pin Digital Output			
	PSD Sensor	Operating Voltage : 3.3V~5V Sensing Range : 2~40cm Dimension : 16x41 (mm) I/O Interface : 1pin Digital Output, 1pin Analog Output			
Flame Sensor	Operating Voltage : 3.3V~5V Sensing Range : 60 Degree Adjustable Sensitivity : Variable Resistor Dimension : 15x41 (mm) I/O Interface : 1pin Digital Output, 1pin Analog Output				

## Software Specification

Module	Category	Specification
RaspberryPi 3B	Raspbian	4.9.2-10
	Kernel	4.4.11-v7+
	GCC	4.9.2
Server Software	lighttpd	1.4.35
	PHP	5.6.36-0+deb8u1
	Bluetoothctl	5.23

Module	Category	Specification
Android Application	SDK	API 18 (4.3 Jellybean) to API 28 (9.0 Pie)
	JRE	1.8.0_152

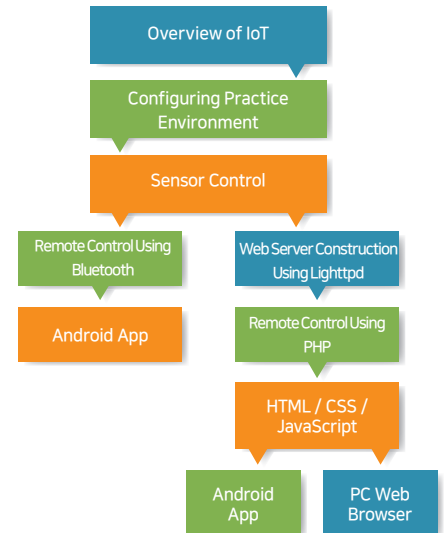
## Education Contents

- ▶ **Chapter1.** Overview of IoT
- ▶ **Chapter2.** Configuring IoT Smart Server and Practice Environment
- ▶ **Chapter3.** Practice for Smart Sensor Control Using Raspberry Pi
- ▶ **Chapter4.** Remote Control Using Bluetooth
- ▶ **Chapter5.** Web Server Construction Using Lighttpd
- ▶ **Chapter6.** Remote Control Using PHP
- ▶ **Chapter7.** Configuring Interface Using JavaScript

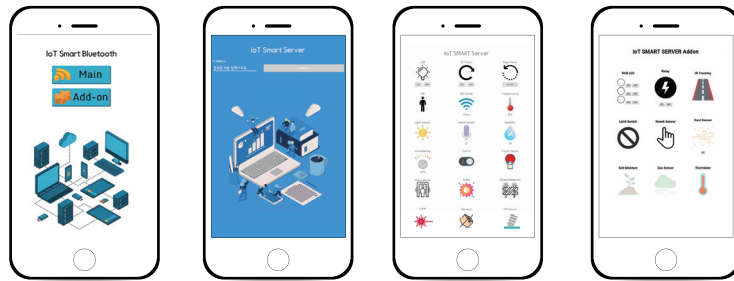
### OS



### Language



## APPS



## Layout

