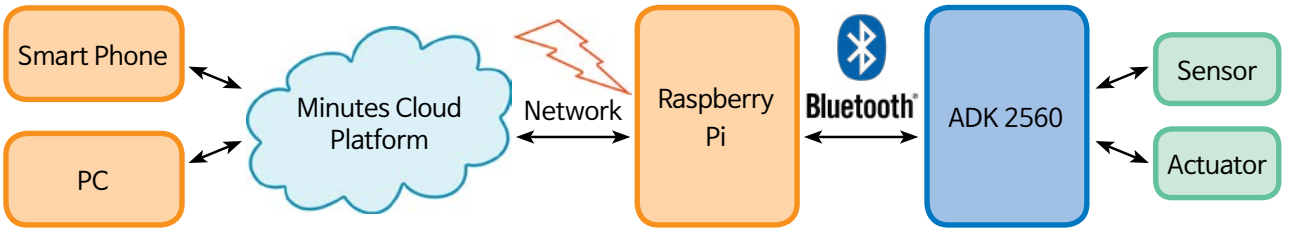
IoT(Internet of Things)

IoT SMART FAMILY

IoT SMART PIONEER LIGHT IOT-012

Summary

It is possible to acquire sensor information for IoT basic technology and practice various motor and actuator control exercises, and it is possible to experience IoT service easily by using Android based cloud Interworking app.



Features

- Sensor data collection is implemented around Open Hardware Platform, so anyone can easily experience IoT service.
- Provides 6 basic sensor data bases and application examples.
- It provides module practice function using firmware and it is possible to acquire sensor information and practice actuator control to acquire IoT basic technology for each module.
- By building a gateway, it is possible to process various projects through sensor information monitoring and remote access control function.
- Provides AWS-based cloud services.
- Provides Android-based cloud interworking service.

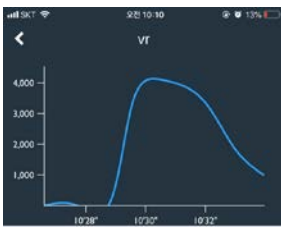
Hardware Configuration and Specification

Module	Item	Specification
Gateway(Raspberry Pi 4)	Processor	Broadcom BCM2711 1.5Ghz Cortex-A72 quad-core
	RAM	2GB
	Storage	MicroSD
	USB	USB 2.0 2ports, USB 3.0 2ports
	Power	USB-C socket 5V, 2A
	Audio	3.5mm A/V JACK
	Digital Video	HDMI 2 * micro HDMI
	Ethernet	10/100 BaseT
	Wireless Network	802.11n , Bluetooth 5.0
	Expansion I/O	40EA GPIO (2x20 2.54mm pitch Header)
	Size	116x56mm
HBE-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 76(mm)
Sensor Module	PIR	Sensor : RE200B Sensing Range : 110 degree Operatiing Voltage : 3.3V I/O Interface : 1pin Digital Output
	Sound Sensor	Sensor : Microphone Feature : ambient sound detection, sound level detection Operatiing Voltage : 5V I/O Interface : 1pin Analog Output
	Humidity / Temperature Sensor	Sensor : DHT11 Feature : temperature and humidity sensor, ambient temperature and humidity detection Operation Voltage : 5V I/O Interface : 1pin Digital Output
	Ultrasonic Sensor	Sensor : HC-SR04 Feature : 2~500cm distance measuring range, 40kHz Frequency Operating Voltage : 5V I/O Interface : 1pin Digital Input, 1pin Digital Output
	Light Sensor	Sensor : CdS Operation Voltage : 5V I/O Interface : 1pin Analog Output
	Variable Resistor Module	Sensor : 1kΩ Variable Resistor Feature : 0 ~ 5V DC Variable Voltage out I/O Interface : 1pin Analog Output
BASE	Raspberry Pi 4 block	Raspberry Pi 4 Connector, Power Switch, I/O Port
	ADK2560 Block	ADK2560 Connector, I/O Port
	Sensor Module Block	6 Types of Sensor Module Connector, I/O Port
	Step Motor Block	Feature : Step Motor, 32 Step, 1/16 Gear Motor Motor Driver : ULN2003 Operation Voltage : 5V I/O Interface : 4pin Digital Input
	LED Block	Feature : RED, GREEN, BLUE COLOR LED Current Consumption : 20mA Lumminous Intensity : 6000~7000mcd at 20mA Viewing Angle : 30 degree I/O Interface : 3pin Digital Input
	Switch Block	Feature : Button 4EA I/O Interface : 4pin Digital Output
Jumper Cable	-	-

Software Specifications

Module	Item	Specification
Gateway	O/S	Raspbian Linux 3.xx
	Camera Program	Pi Camera Driver, Camera Streaming Server
	Server Program	Sensor Control S/W
ADK-2560 Module	F/W IDE	Arduino 1.6.x
	Communication	Bluetooth Communication S/W
	Function	Sensor Control S/W
Cloud	Minutes Cloud Platform	Powered by Amazon Web Service (AWS) cloud infrastructure Flexible cloud architecture scalable to the number of IoT devices and users Provides virtual sensors / actuators from a variety of external data sources Web user interface: Provides easy administrator screen through web interface Device management: gateway registration Sensor management: Provides the ability to manage (register / modify / delete) and test the sensor

APPS



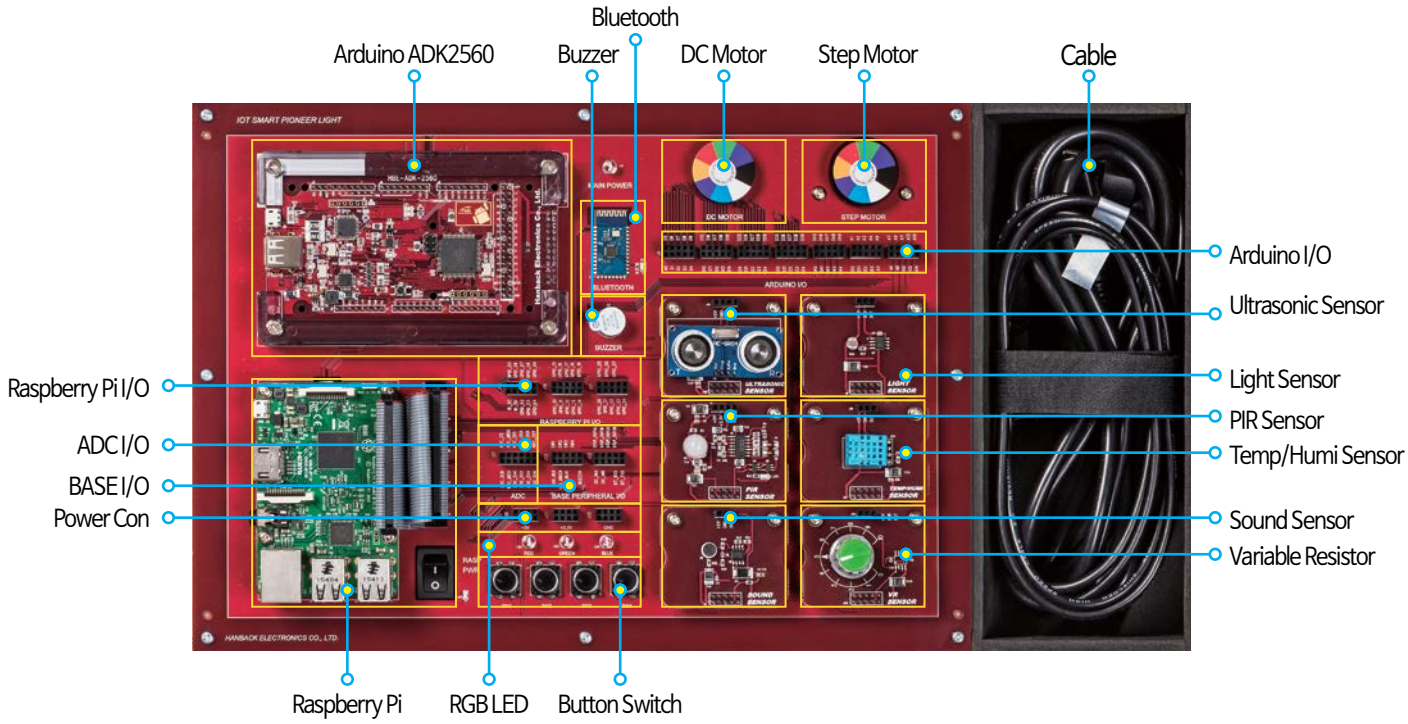
Textbook Chapter

- Overview of Internet of Things
- IoT SMART PIONEER configuration and lab environment configuration
- Practice of smart sensor control using Arduino
- Practice of smart sensor control using Raspberry Pi
- Smart sensor and cloud interworking
- Raspberry Pi

Configuration

- IoT SMART PIONEER LIGHT 1set
- Minutes Cloud S/W
- Ethernet Direct Cable
- HDMI Cable
- Power Cable
- Book / CD
- Jumper Cable 15cm
- Micro 5P USB Cable

Layout



Block Diagram