With advances in technology, there is a constant demand for improvement in standard of living, security and energy efficiency. Every building be it residential, commercial or industrial runs on some or the other form of energy, thus there is a need to reduce and optimize this energy consumption. Efficient energy management not only reduces consumption but also reduces energy costs.

Scientech 6205SB IoT Enabled Smart Building training setup is specially designed to help understand the concept of smart buildings and how various sensors can be deployed and their data can be used to generate events and trigger alarms. Scientech smart building comes with various sensors. The data from these sensors can be used to generate various events like switching on and off lights, triggering an alarm, providing access to a user using RFID tags and readers. This product helps explore various aspects of smart building intended to optimize energy usage and security.

Applications

Hospitals

Buildings

Offices

Banks

Factories

Universities

Features

- Platform to learn, explore, and develop IoT skills.

- Three floors with six blocks table top building structure.

- Each block of building with LED lights.

- Arduino software compatible hardware.

- LPG gas, smoke, fire, PIR, temperature, humidity, and CO_2 sensors.

- RFID module for access control application.

- Touch switch panel with 4 power sockets and bulb intensity control output.

- Wi-Fi camera interface.

- Battery smart sensor gateway for sensor connectivity.

- USB and zigbee connectivity for personal computer (PC) interface.

- Wi-Fi connectivity for cloud interface.

- Sensor gateway with color LCD display.

- Buzzer and input/output switch for testing.

- Wi-Fi connectivity and android app for field testing.

- Software to view sensor's real time graph analysis on PC and mobile.

- 10 din sockets for sensors and actuators interface.

- On board charging and protection circuit for battery.

- Signal test points and switch fault.

- Inbuilt voltmeter and ammeter.

- Compact tabletop ergonomic design.

- Ready experimental details.

- User friendly, self explanatory system.

Scope of Learning

- Understanding of arduino IDE software.

Interfacing of :

- Wi-Fi and zigbee module.

- ESP8266 for online cloud interfacing.

- LED blink program.

- ACD and UART programs.

Implementation of:

- Color LCD.

- RFID control application.

- Python program to collect data and upload on cloud.

Testing and understanding of:

- Motion sensor.

- Temperature and humidity sensor.

- CO_2 sensor.

- LPG, fire and smoke sensor.

Design and develop:

- Smart building automation programs.

- Light control applications.

- Program to configure events and alarms.

Software window

Sensor interfacing code

Technical Specifications

Microcontroller	: ATmega2560
Sensors and actuator connector	: 10 nos.
Digital I/O pins	: 34 nos.
Analog input pins	: 16 nos.
UART	: 2 nos.
I2C	: 1 no.
Switch faults	: 30 nos.
Test points	: 30 nos.
Power supplies	: 5V and 3.3V
Variable potentiometer	: 1 no (10k)
Switches	: 3 nos.
Digital voltmeter and ammeter	: 0 - 25V/10A
Buzzer and LED	: 1 no. each
Color LCD	: 1.77 inch
Battery	: 3.7V/4400mAh
USB	: 2.0
Clock speed	: 16 MHz
Wi-Fi module	: 1 no. (2.4GHz)
Zigbee transceiver	: 2nos. (2.4GHz/63mW)
Flash memory	: 256 kb of which 8 kb used by boot loader
SRAM	: 8 kb
EEPROM	: 4 kb
Node operating voltage	: 5V DC
Camera	: Wi-Fi IP camera
Touch panel	: 4 switches, 1 regulator
RFID module with 5 cards	: 125 KHz
LPG gas sensor	: MQ06
Smoke sensor	: MQ135
Fire sensor	: TTL
PIR sensor	: TTL
Temperature sensor	: 0-100 degree celsius
Humidity sensor	: 0-100 %RH
CO_2 sensor	: 0-2000ppm
Interconnection for modules	: 2 mm patch cords and FRC cables
Power Supply	: 110V - 260V AC, 50/60Hz
Weight	: 3.5kg (approximately)
Operating conditions	: 0-40^{0}C, 85% RH

Package contains (in nos.)

- Scientech smart sensor gateway — 1
- Scientech 6205SB smart building structure — 1
- Wi-Fi IP camera — 1
- Power adapter for camera — 1
- Ethernet cable — 1
- DIN connector cable — 8
- USB xbee receiver — 1
- RFID cards — 5
- Mains power cord — 1
- USB cable — 1
- Patch cord — 5

Smart sensor gateway

Subject to change - Version 1.0