

Irrigation is one of the key components of precision agriculture. It helps farmers avoid water wastage and improve the quality of crop in their fields by irrigating at the correct times, minimizing runoffs and other wastages, and determining the soil moisture levels accurately. Replacing manual irrigation with automatic valves and systems also does away with human error (e.g. forgetting to turn off a valve after watering the field) and is instrumental in saving energy, time, and valuable resources.

Sciencetech 6205SI IoT Enabled Smart Irrigation is specially designed help users to understand the concept of IoT based smart irrigation and how various sensors can be deployed and their data can be used to generate events and control irrigation system.

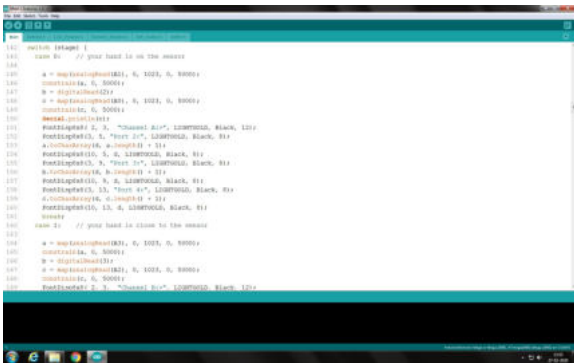
Features

- Arduino software compatible hardware.
- Soil moisture sensor, soil temperature sensor, solar radiation sensor, leaf wetness sensor, flow sensor and actuator like relay, sprinklers, and water pump provided.
- Water pump and sprinkler control application.
- Battery smart sensor gateway for sensor connectivity provided.
- USB and zigbee connectivity for computer interface.
- Wi-Fi connectivity for cloud interface available.
- 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 a sensor's real time graph analysis on PC and mobile.
- 10 DIN sockets for sensor and actuator interface.
- On board charging and protection circuit for battery.
- Signal test points and switch fault provided.
- Inbuilt voltmeter and ammeter.
- User friendly, self explanatory system.

Scope of Learning

- Understanding of Arduino IDE software
- Interfacing of LED blink program
- Interfacing of ACD and UART programs
- Implementation of color LCD
- Testing and understanding of soil moisture sensor
- Testing and understanding of soil temperature sensor
- Testing and understanding of solar radiation sensor
- Testing and understanding of leaf wetness sensor
- Design and development of smart irrigation automation programs
- Design and development of pump and sprinkler control applications
- Program to configure events and alarms
- Interfacing of Wi-Fi and Zigbee module
- Interfacing of ESP8266 for online cloud
- Implementation of python program to collect data and upload on cloud

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
Wi-Fi module	: 1 no. (2.4GHz)
Zigbee transceiver	: 2 nos. (2.4GHz/63mW)
Flash memory	: 256 KB of which 8 KB used by boot loader
SRAM	: 8 KB
EEPROM	: 4 KB
Clock speed	: 16 MHz
Node operating voltage	: 5V DC
Soil moisture	: Analog voltage
Soil temperature	: 0 to 100C
Solar radiation sensor	: Analog voltage
Leaf wetness	: Analog voltage
Relay module	: 4 channel
Flow sensor	: 0-30LPM

Package contains

	Quantity
• Scientech Smart sensor gateway	1
• SS157 Industrial soil moisture sensor	1
• SS162 Industrial soil temperature sensor	1
• SS180 Solar radiation sensor	1
• SS156 Leaf wetness sensor	1
• Thermal camera	1
• Sprinklers	2
• 4 channel relay board	1
• Flow sensor	2
• 0.5HP motor	1
• Threaded pipe (25ft)	2
• Wooden platform for motor	1
• Tripod	1
• Relay power plug	1
• USB Xbee receiver	1
• Patch cord	5
• USB cable (A to B)	1
• Power adapter	1
• Antenna	1

