

Project - Smart Agriculture System

Implementing Smart Agriculture System using Raspberry Pi

Overview

- *In earlier existing smart farming, there are some limitations in the automation.*
- *The main disadvantage of using Bluetooth or WIFI module is that it can able to retrieve information for the user at a certain distance.*
- *So, to overcome this problem in our project we have introduced IoT (i.e., Internet of Things). IoT works based on the internet, it can able to send and receive data via network.*
- *Added to this automation we have included the MQTT Protocol.*
- *Reason is user can able to retrieve information with a low generation data network.*

Methodology

- *A lightweight protocol MQTT is used for data transfer between constrained devices and it keeps bandwidth requirements to an absolute minimum.*
- *Automatic Watering of plants is done with the help of Moisture*

Sensor.

- *Data collected from DHT sensor is transferred via MQTT Protocol.*

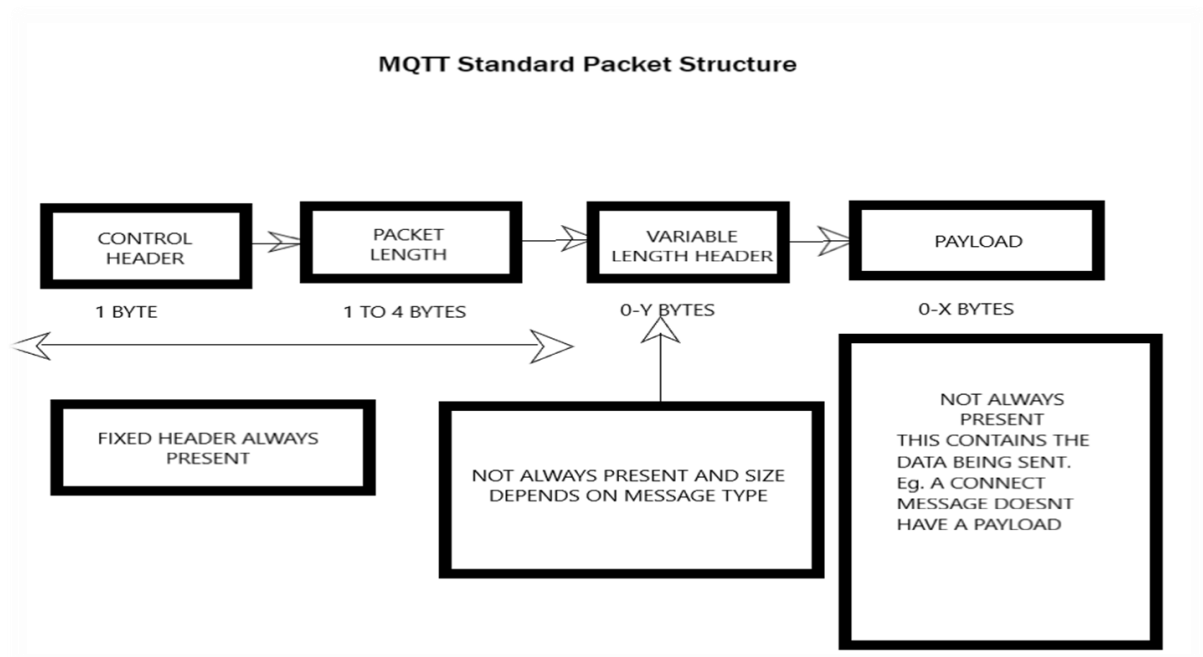
Hardware Requirements

- *Raspberry pi*
- *Temperature and humidity sensor*
- *Moisture Sensor*
- *Water pump*
- *Buzzer*

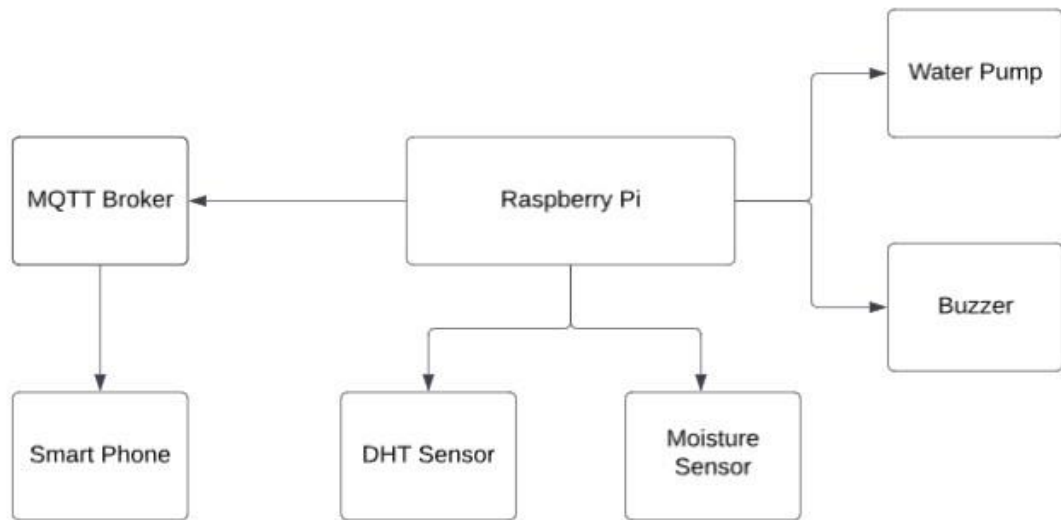
Software Requirements

- *Raspbian OS*
- *Python IDLE*
- *MQTT Protocol*

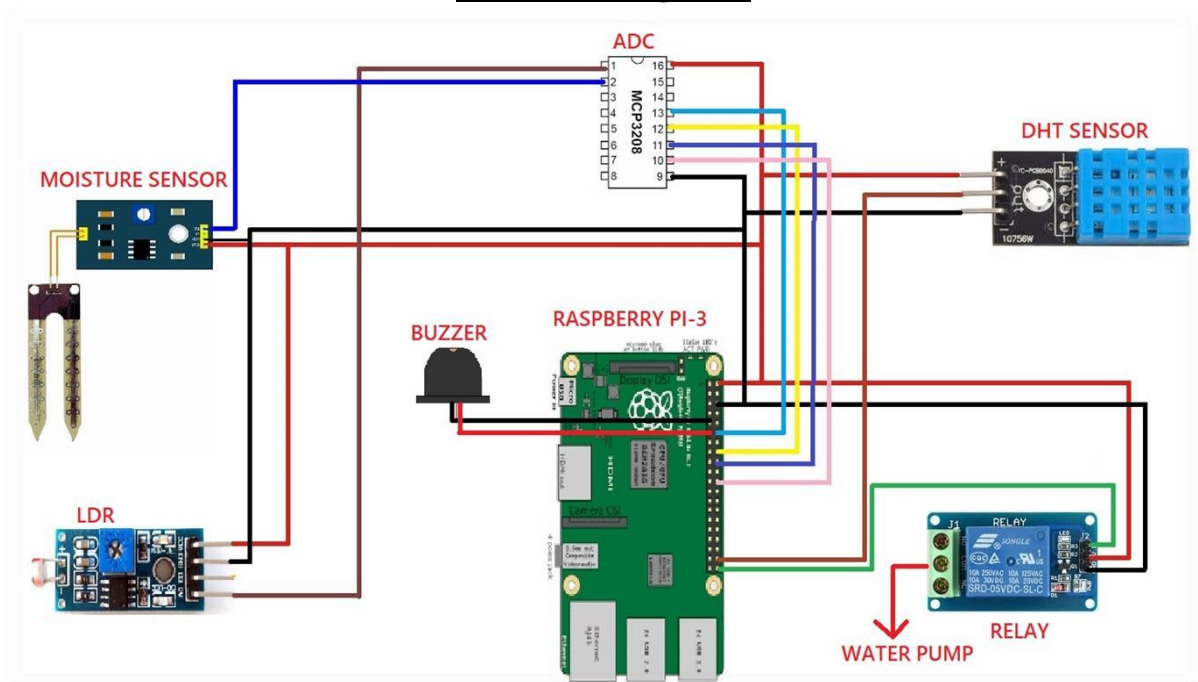
MQTT Packet Structure



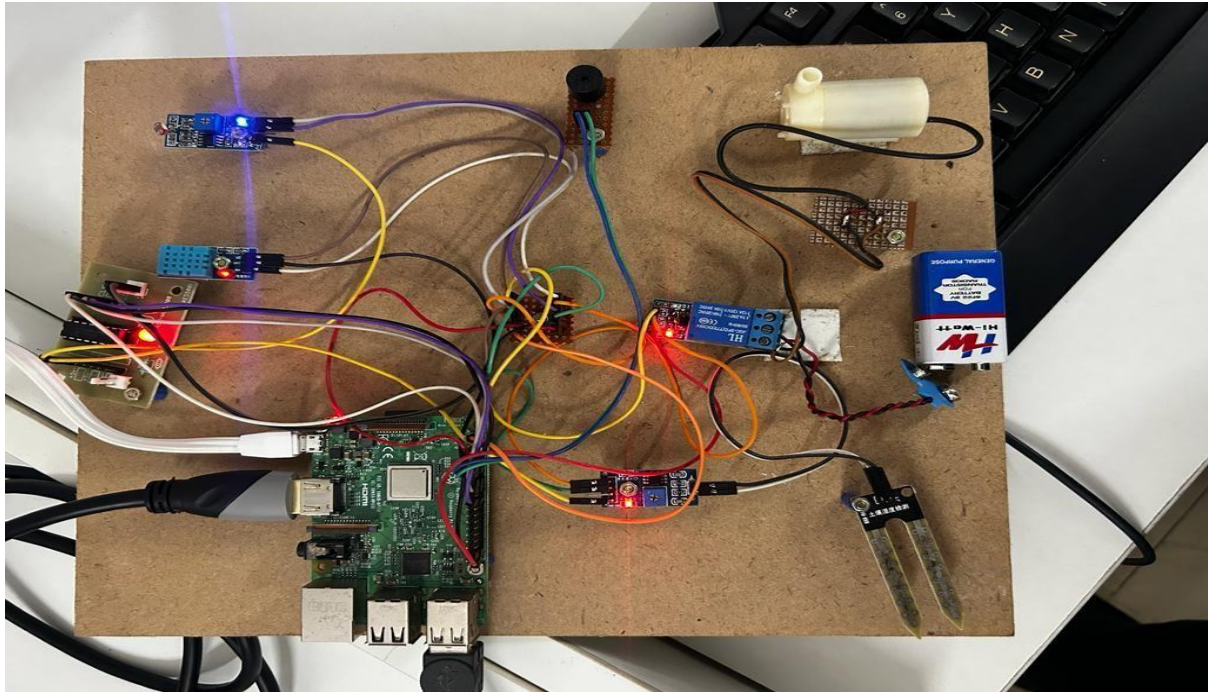
Block Diagram of Purpose System



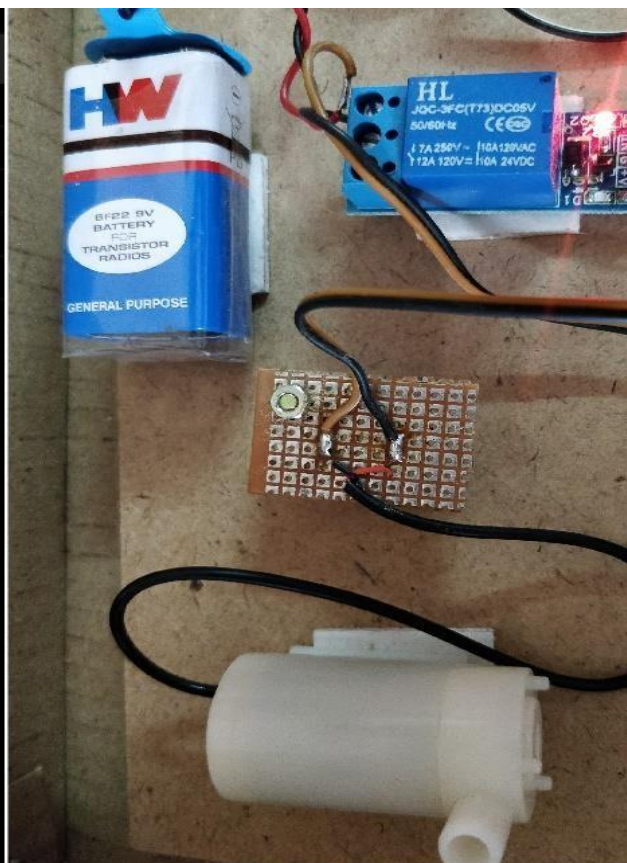
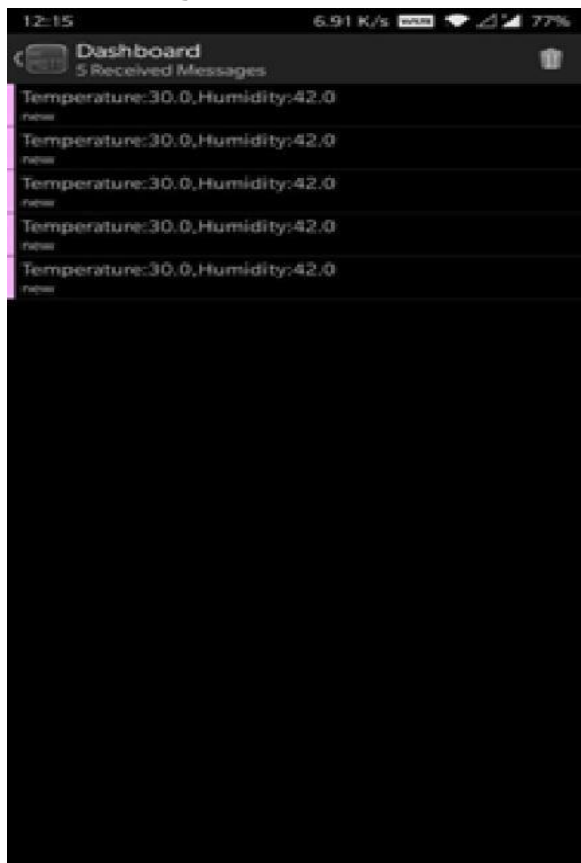
Circuit diagram



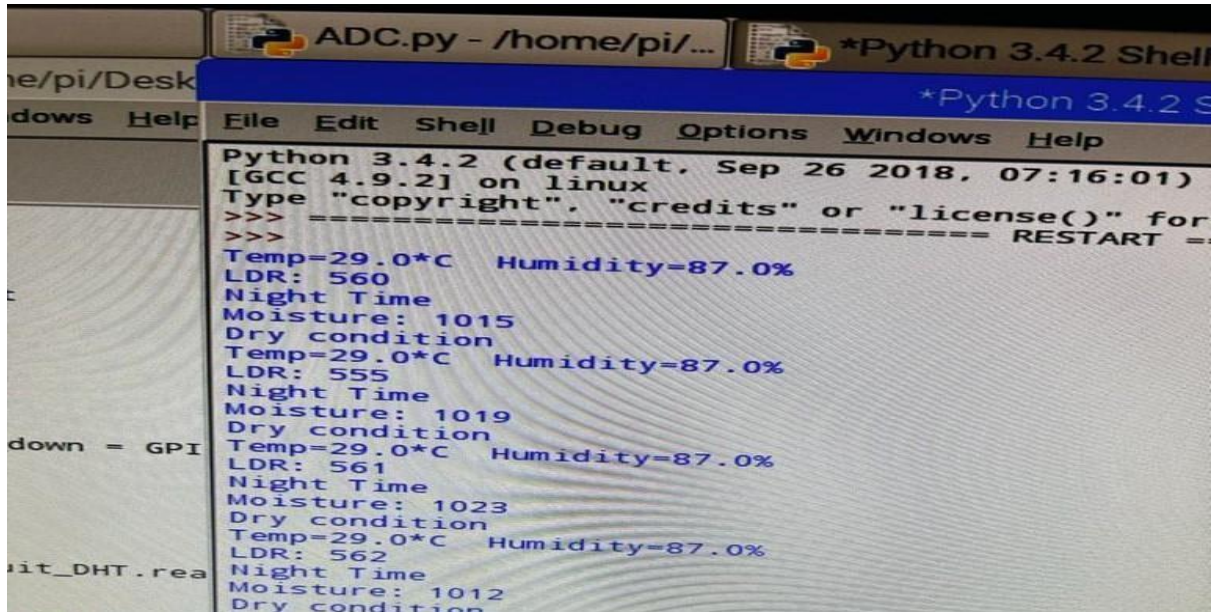
Implementation:



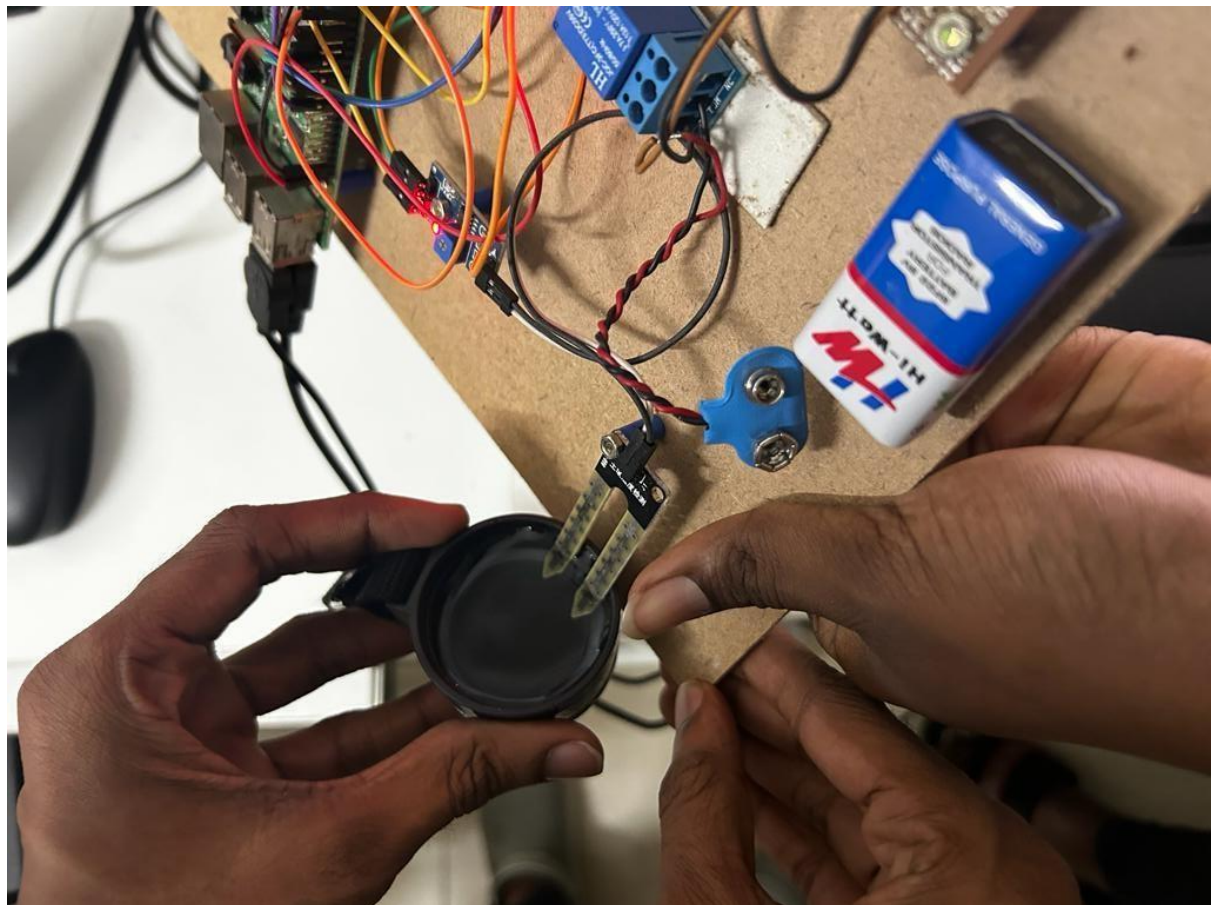
Temperature and Humidity output in mobile connected with MQTT



Output in Terminal



```
ADC.py - /home/pi/... *Python 3.4.2 Shell
Python 3.4.2 (default, Sep 26 2018, 07:16:01)
[GCC 4.9.2] on linux
Type "copyright", "credits" or "license()" for
>>> ===== RESTART =====
>>>
Temp=29.0*C Humidity=87.0%
LDR: 560
Night Time
Moisture: 1015
Dry condition
Temp=29.0*C Humidity=87.0%
LDR: 555
Night Time
Moisture: 1019
Dry condition
Temp=29.0*C Humidity=87.0%
LDR: 561
Night Time
Moisture: 1023
Dry condition
Temp=29.0*C Humidity=87.0%
LDR: 562
Night Time
Moisture: 1012
Dry condition
```



```
Temp=29.0*C Humidity=87.0%
LDR: 480
Night Time
Moisture: 604
Wet condition
Temp=29.0*C Humidity=87.0%
LDR: 487
Night Time
Moisture: 599
Wet condition
Temp=29.0*C Humidity=87.0%
LDR: 502
Night Time
Moisture: 592
Wet condition
Temp=29.0*C Humidity=87.0%
LDR: 498
Night Time
Moisture: 584
Wet condition
Temp=29.0*C Humidity=87.0%
LDR: 480
Night Time
Moisture: 582
Wet condition
Temp=29.0*C Humidity=87.0%

_up_down = GPI
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mqtt-dashboard.co
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in, True)
ckpin, False) #
pin, False) #
```

Analysis:-

- *The temperature and humidity level are updated to the user via the app which uses MQTT.*
- *The water pump starts working if the humidity level falls below the required threshold level automatically and vice versa.*
- *Various threshold level can be fixed based on the type of plant and area of the farming.*

Conclusion and Future Work

- *The automated watering of plants and getting the live reports from the farm will reduce the work of a farmer.*
- *Need not to spend a lot of time in farm.*

The further future improvements that can be done in farming using IoT:

- 1. Aid Pest Management*
- 2. Improving Water Usage*
- 3. Become Climate-Proof*