

Document History

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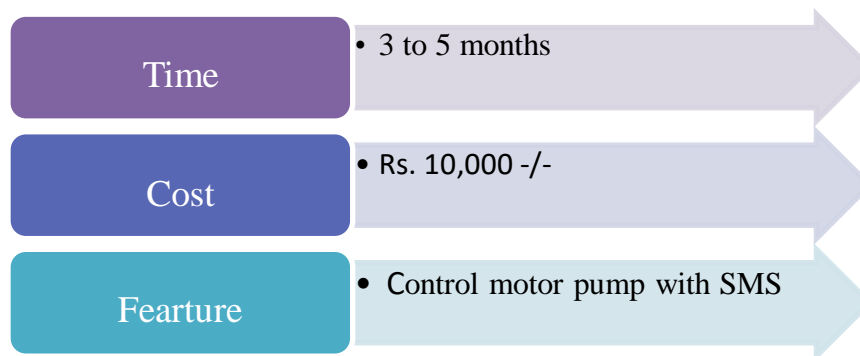
Case Study of Single-Phase Mobile Starter

1. Requirements:

i. Empathize Research:

In this Case Study of Mobile Starter is provided to monitor and control the status of agriculture motor pumps at anytime from anywhere motor can on/off through SMS. So, farmers take full control without visiting the agriculture field. They have some feature like staring the motor and stopping the motor and check the status of the motor. Even if any low water detected the water level sensor it stops running and intimated to the controller to avoid the dry run prevention.

Analysis:



ii. High-Level Requirement:

ID	Description
HR01	Motor Pump turn on
HR02	Motor Pump turn off
HR03	Check the status of Motor Pump

iii. Low-Level Requirement:

ID	Description	Datasheet
LR01	1 channel 30A Relay	link
LR02	AVR ATmega328	link
LR03	SIM800A Quad-Band GSM	link
LR04	Single-phase Motor Pump	link

iv. SWOT Analysis:

Strengths :

1. Portable to control motor
2. Check the status of the motor
3. Easy to turn ON and Turn OFF
4. It useful for farmers

weaknesses :

1. data package required
2. signal problem

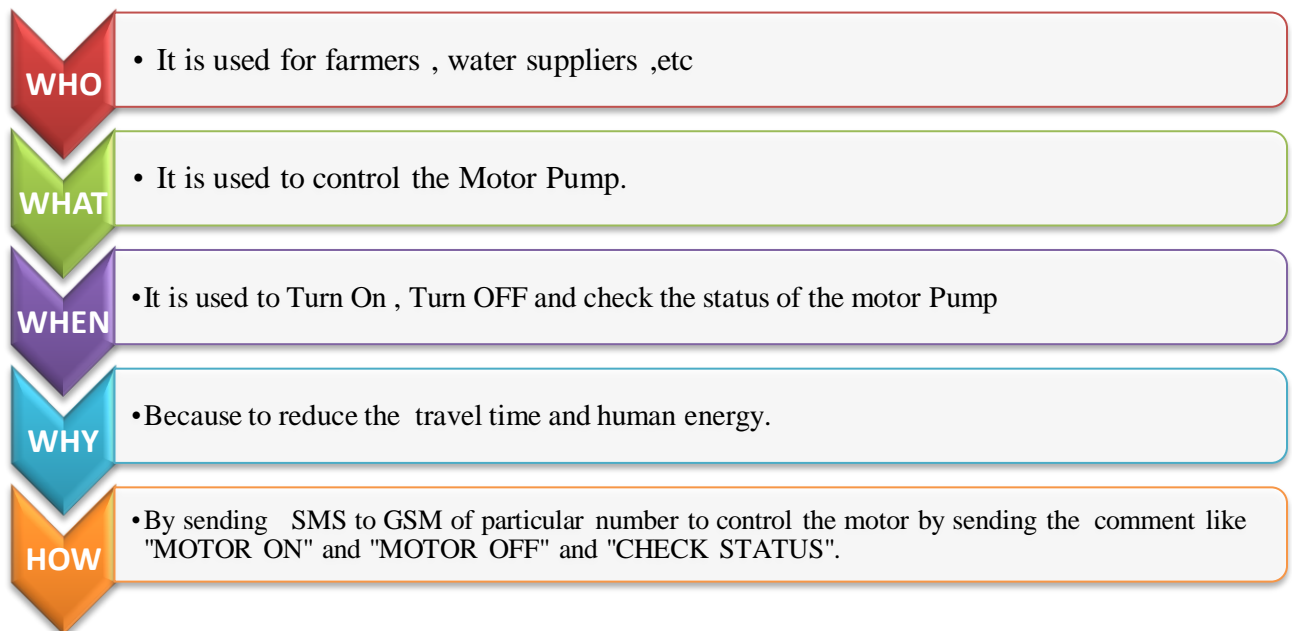
Opportunities :

1. agriculture product
2. water tank filling

Threats:

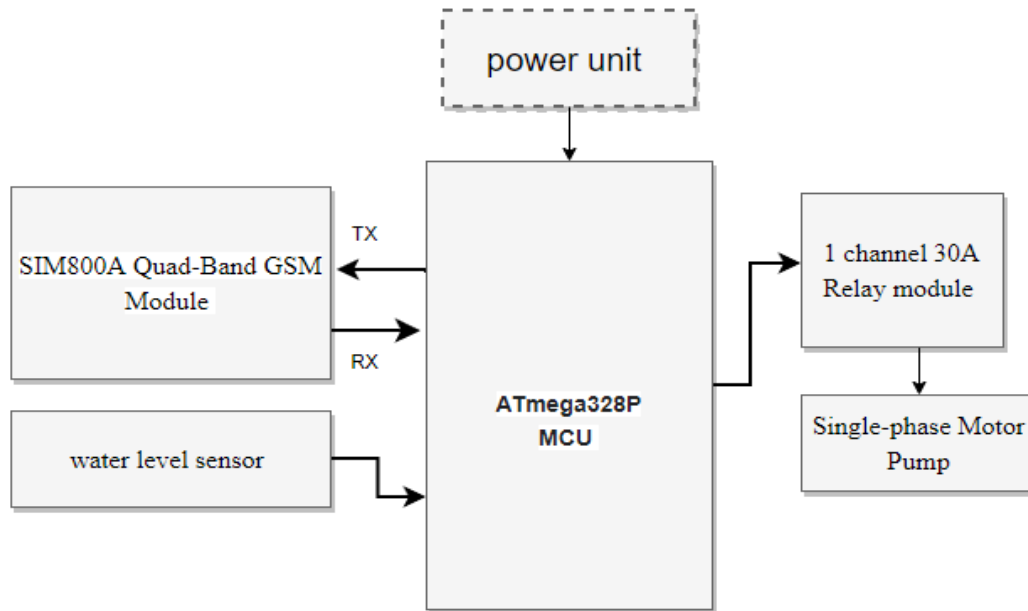
1. minimum range of a Requirement
2. tough competition
3. slow stock clearance sale

v. 4W 1H:



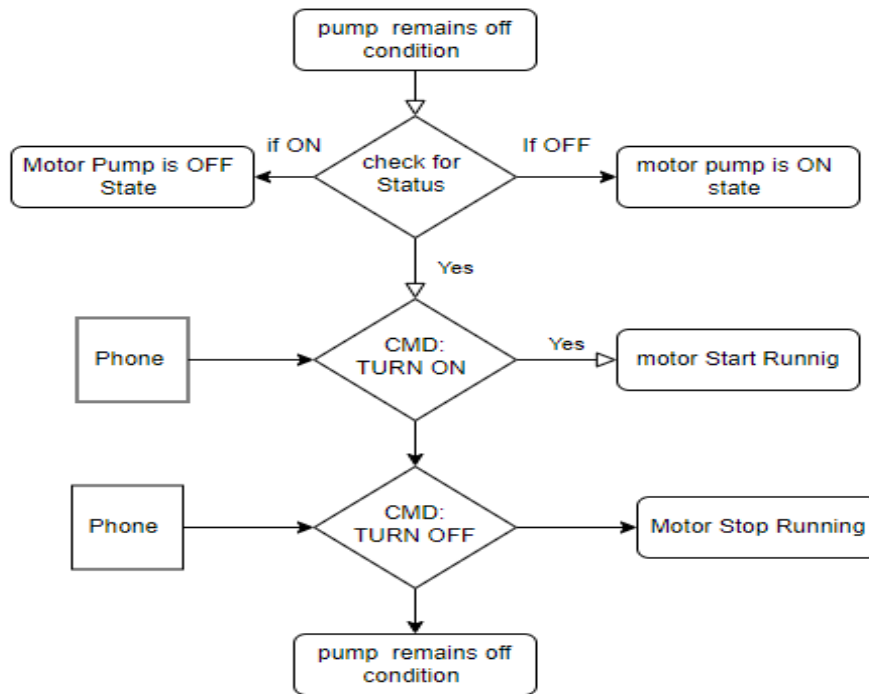
2. Design:

i. Block Diagrams:

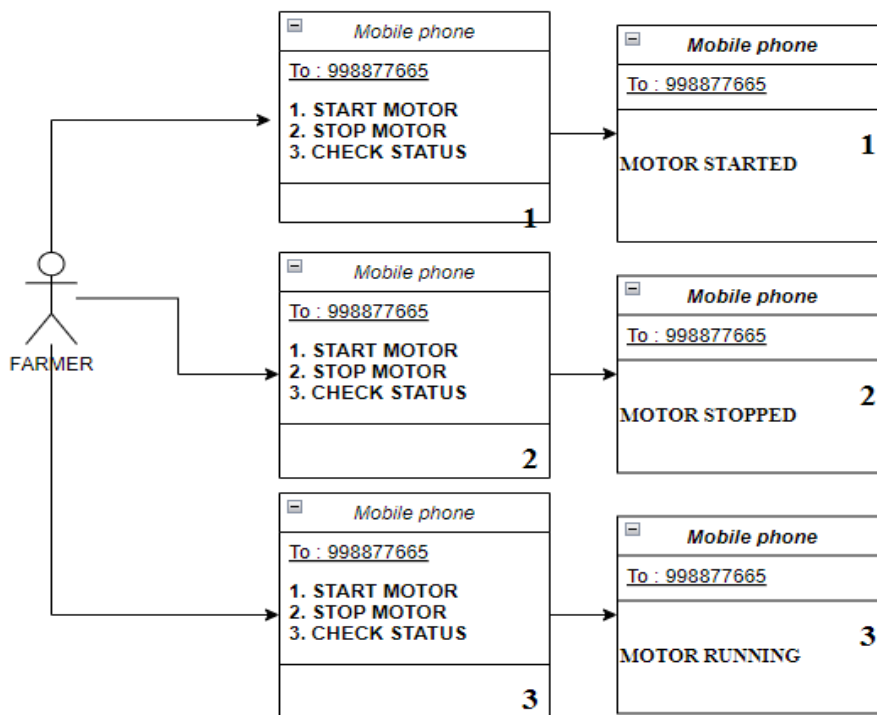


- **Sensor:**
 - **Water level sensor:** It shall be sensing the level of the water to avoid the dry run prevention.
- **Actuator:**
 - **Relay module:** It shall be used to control the single-phase motor and used as protection circuit.
 - **Single -Phase motor Pump:** it shall be used as pump the water from the tank and feed to the agricultural field.
- **Protocol:**
 - **GSM module:** Global System for Mobile communication - GSM, It is has RS232, DB9 Connector, TTL Pins & I2C, it shall be send SMS and call can transmitted and received.
- **Micro controller:**
 - **AVR At mega 328:** Microcontroller development board with a chip of ATmega328P. 6 GPIOs, 6 PWM and 6 ADC, a 16 MHz crystal frequency, USB program debug with the reset button.

ii. Structural Diagram:



iii. Behavioral Diagram:



3. Evaluation

i. High Level Testing Plan:

Test Id	Test case	Expected output	Actual output
1	GSM module for “ Turn On ”	“Motor Started”	“Motor Started”
2	GSM module for “ Turn Off ”	“Motor Stopped”	“Motor Stopped”
3	GSM module for “ Status ”	“Motor in running “	“Motor in running “

ii. Low Level Testing Plan:

Test Id	Test case	Expected output	Actual output
1	GSM module	“Motor ON “	“Motor ON”
2	Water level sensor	1	1
3	Relay Module	0	0 (Turn ON)

4. Conclusion:

I. summary:

Agriculture is one of the economic developments of country. In this case study Mobile Starter is provided to monitor and control the status of agriculture motor pumps at anytime from anywhere motor can on/off through SMS. So, farmers take full control without visiting the agriculture field. They have some feature like starting the motor and stopping the motor and check the status of the motor. Even if any low water detected the water level sensor it stops running and intimated to the controller to avoid the dry run prevention and the addition features can be add by changing into IOT technology.

- **Advantages:**
 - It shall be controlling the motor by Starting and Stopping, checking the status of the motor through the mobile phone.
 - It shall use for Dry run prevention.
- **Disadvantages:**
 - It may cause some network issues based the locations.
 - It must recharge sim which has been inserted in GSM module.
- **Applications:**
 - It shall be used for Agriculture Field
 - Building water tank can be controlled.

5. REFERENCES:

- [1] J Lokesh Heda, Pritesh Vinita Singh, Fault Monitoring and Protection of Three Phase Devices, International Journal of Innovative Research in Electrical, Electronics, Instrumentation, and Control Engineering, Vol. 4, Iss. 4, 2016, 208-210.
- [2] Biswarup Nandi, Bhutada, Rinkesh Thakur, Piyush Bhattad, Mobial Stater based GSM Automation, International Research of Computer Science Engineering, 2015978-17281-5374- 2 2 (ICIRCA-2020).