PROGRESS REPORT

Day 1 - 29th June :

★ I focused on Requirements Analysis and Components Procurements. I carefully reviewed the project requirements and identified the necessary components needed for the implementation. Additionally, I initiated the procurement process to ensure we have all the required materials.

Day 2 - 30th June :

★ Today, I have been primarily working on the Flow meter and its calibration. The YFS-201 Flow Sensor has been calibrated successfully to provide accurate readings. Check out the following Link for more information:

https://github.com/Vimalkanth-MJ/Smart-Water-Meter/tree/main/1.%20Flow%20Meter%20Calibration

Day 3 - 01st July :

★ I focused on implementing LoRa communication for the project. I have been working on establishing the communication protocol between the nodes, ensuring reliable and secure data transmission. This is a crucial aspect of the project, as it will enable effective monitoring and control of the smart water meter system.

★ In addition, I have designed the circuit for the project in breadboard, taking into consideration the components and their interconnections. This step is essential to ensure the proper functioning and integration of all the elements involved in the system.

★ Furthermore, I have successfully implemented the display functionality for the Node. The display will provide real-time information about water usage and relevant metrics, making it easier for users to monitor their consumption. Currently, I am working on the code for the control valve.

★ Check out the following Link for more information:

https://github.com/Vimalkanth-MJ/Smart-Water-Meter/tree/main/2.%20Version%201

Day 4 - 02nd July :

★ Made significant progress, focusing on improving the Lora connection and resolving data transmission bugs that had previously hindered the project's success.

★ A major milestone was achieved by successfully establishing a connection between the Master node and the Internet, allowing for seamless communication and data transfer between the project and online platforms.

PROGRESS REPORT

★ The Blynk IoT dashboard was configured and linked to the Master node, enhancing the project's functionality and enabling remote monitoring and control.

★ While attempting to control the solenoid valve using a MOSFET, I encountered certain difficulties that require further investigation and troubleshooting to ensure successful implementation.

★ Despite the challenges faced, I managed to complete the first version prototype, which includes well-documented code, a comprehensive demo, and accompanying documentation. The entire project, along with all its resources, has been made available on GitHub:

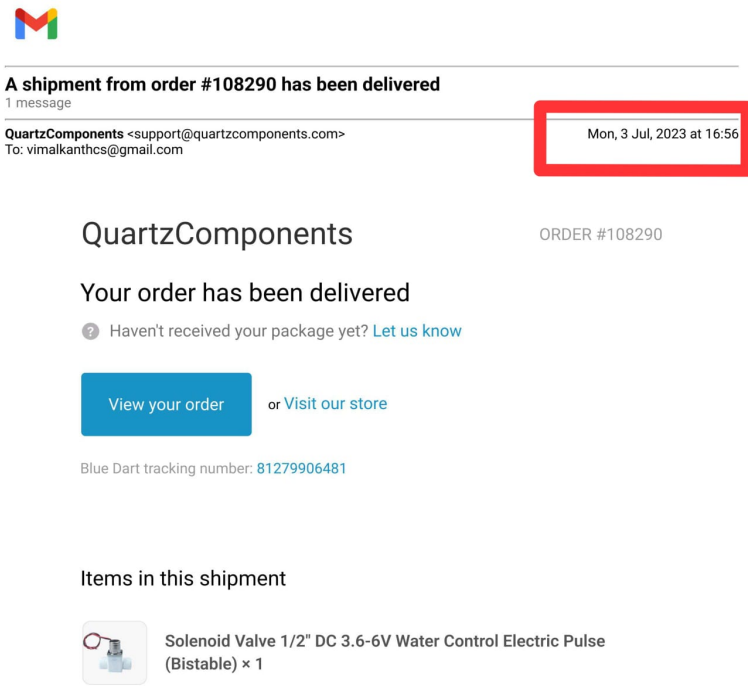
https://github.com/Vimalkanth-MJ/Smart-Water-Meter/tree/main/2.%20Version%201

DAY 5: 03rd JULY:

★ Today, I focused on developing the control mechanism. Initially, I attempted to integrate a 12V Solenoid Valve using an SPDT Relay. However, I encountered a setback as the relay consumed more power than the ESP32 MCU could provide. Subsequently, I tried using an SI2301 MOSFET to activate and deactivate the Solenoid Valve. Unfortunately, this approach also failed because the Solenoid Valve did not receive enough voltage to trigger.

★ Please note that throughout these attempts, the entire circuit was running on an 11.1V battery. I used a buck converter to obtain 5V for the circuit and used 11.1V to trigger the relay.

★ After facing these challenges, I got the Latching Solenoid Valve at around 17:00 IST and began working on it.



A shipment from order #108290 has been delivered
1 message

QuartzComponents <support@quartzcomponents.com>
To: vimalkanthcs@gmail.com
Mon, 3 Jul, 2023 at 16:56

QuartzComponents ORDER #108290

Your order has been delivered

Haven't received your package yet? Let us know

View your order or Visit our store

Blue Dart tracking number: 81279906481

Items in this shipment

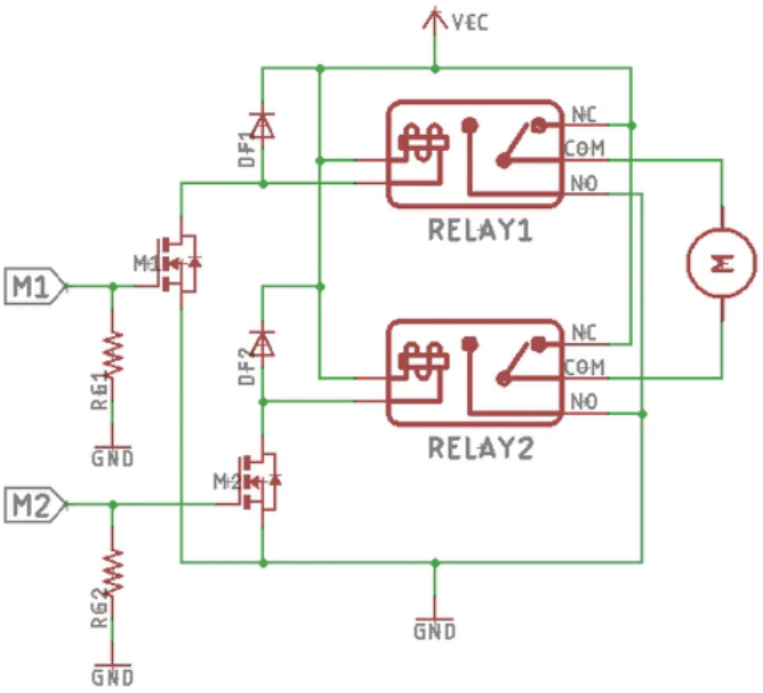
Solenoid Valve 1/2" DC 3.6-6V Water Control Electric Pulse (Bistable) × 1

PROGRESS REPORT

★ I discovered that the Latching Solenoid Valve required a positive pulse of (3.6 - 6) Volts for 25 ms and a corresponding negative pulse to trigger its on and off states.

★ To address this, I researched and learned about a Reversing Polarity Circuit, specifically the H-Bridge circuit. I purchased an L293D and started working with it. However, I encountered a partial success, as the circuit only generated a positive pulse that turned on the valve, but the negative pulse did not work. After exploring forums, I discovered that H-Bridge drivers using Darlington pair or BJT for switching, such as the L293/L293D, are not suitable for driving a Latching solenoid valve with a 5V supply due to high internal voltage drop.

★ As a solution, I designed a Relay Module-based H-Bridge Circuit that successfully controlled the circuit's on and off states.



Driving circuit for Solenoid Valve using Relays

However, I anticipate that this solution may not be ideal, as the relay module will consume more power than the ESP32 can afford. Therefore, I will need to find a better solution for the valve mechanism.

PROGRESS REPORT

Day 05 - 04th July

★ After careful research on the power consumption, Internal Voltage drop of L298N motor driver, I tested L298N and successfully implemented a control mechanism for the Smart prepaid water meter using Latching solenoid valve and L298 Motor Driver.

★ Successfully completed version 2 prototype satisfying all the requirements as per the problem statement which includes well-documented code, a comprehensive demo, and accompanying documentation. The entire project, along with all its resources, has been made available on GitHub:

https://github.com/Vimalkanth-MJ/Smart-Water-Meter/tree/main/3.%20Version%202

★ Started working on Final Version with M5 Stack Development module.