



ESP-32 BASED WATER TANK PROJECT

USER MANUAL

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ESP32

- Create Wi-Fi connection:
 - SSID : "Wokwi-GUEST"
 - Password : "None"
- Provide Power to the device.
- Wait till the two LEDs Turn Green

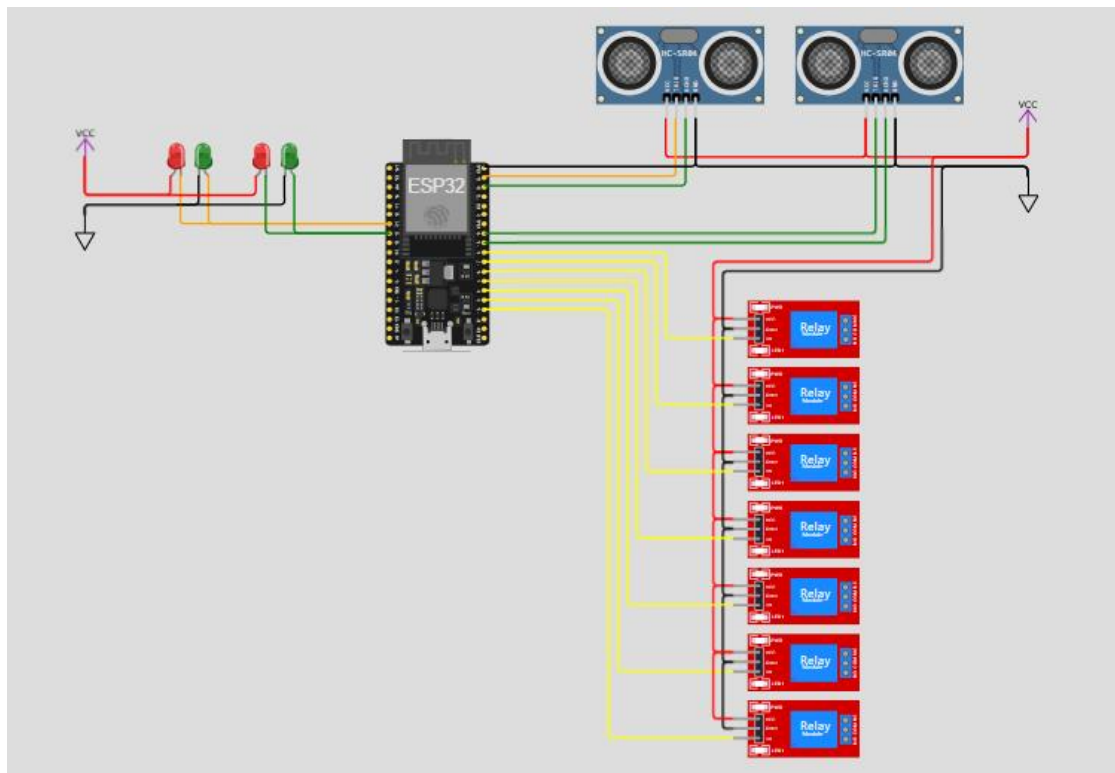


Figure 1: Proposed project circuit diagram

MOBILE APPLICATION

Before Working with Your Mobile Application,

- ✓ CAUTION: Your mobile phone must achieve minimum requirements for working with mobile applications.
 - Minimum OS: android KitKat or higher
 - Ram: 1GB.
 - Facilities: Good internet connection such as 3G or higher.

How to install the mobile application?

1. Before installing the application change some settings: -
 - a. Setting->Security->Device administration.
 - b. Untick the **unknown sources**.
2. You can install the app from **APK file**.
3. Connect your phone to internet.
4. Launch the app from your phone menu list.

How to work with application.

- ✓ After installing the mobile application, you will be able to see the main screen as follows.

Start screen

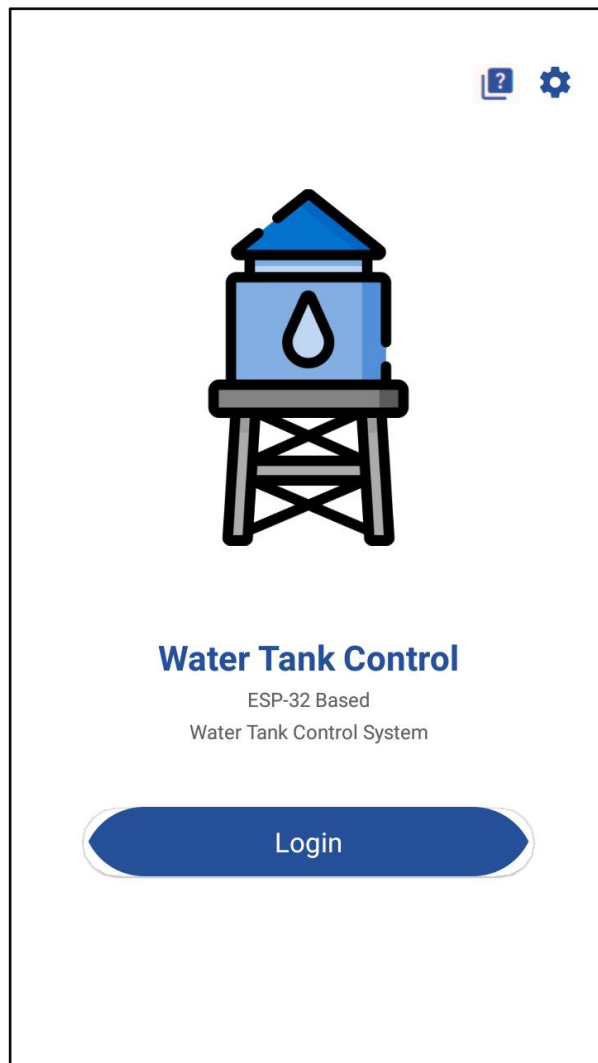




Figure 2: Main screen

1. **Login** interface provides directions to login page.
2.  **About** interface provides directions to About page.
3.  **Settings** interface provides directions to MQTT Settings page.

About screen

About page serves as a hub for copyright information. Here, users can find details on intellectual property rights, usage guidelines, and any necessary disclaimers. We aim to ensure clarity and compliance while providing a transparent and informative experience for our users.

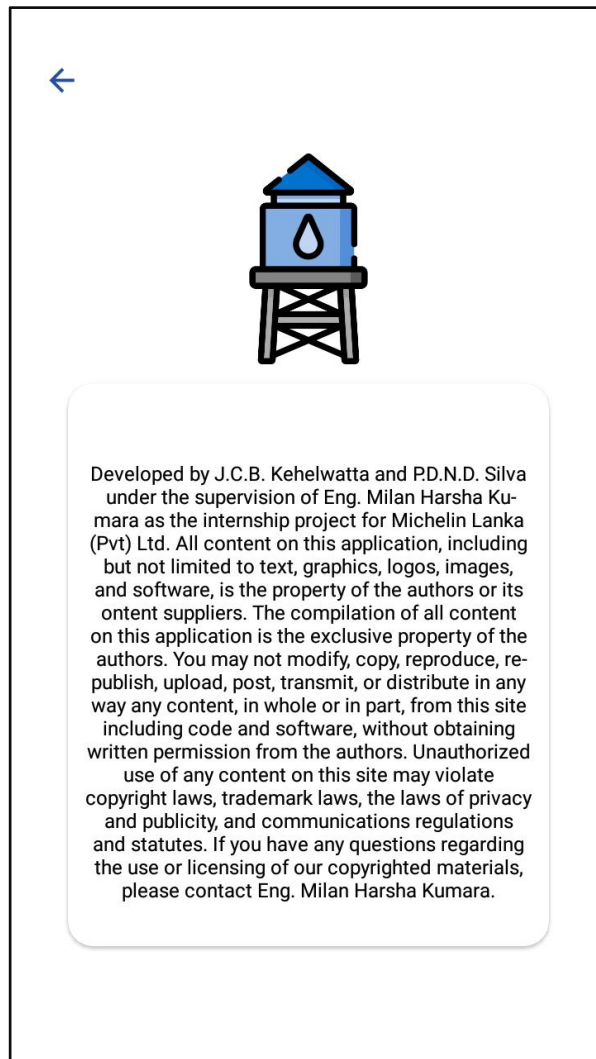
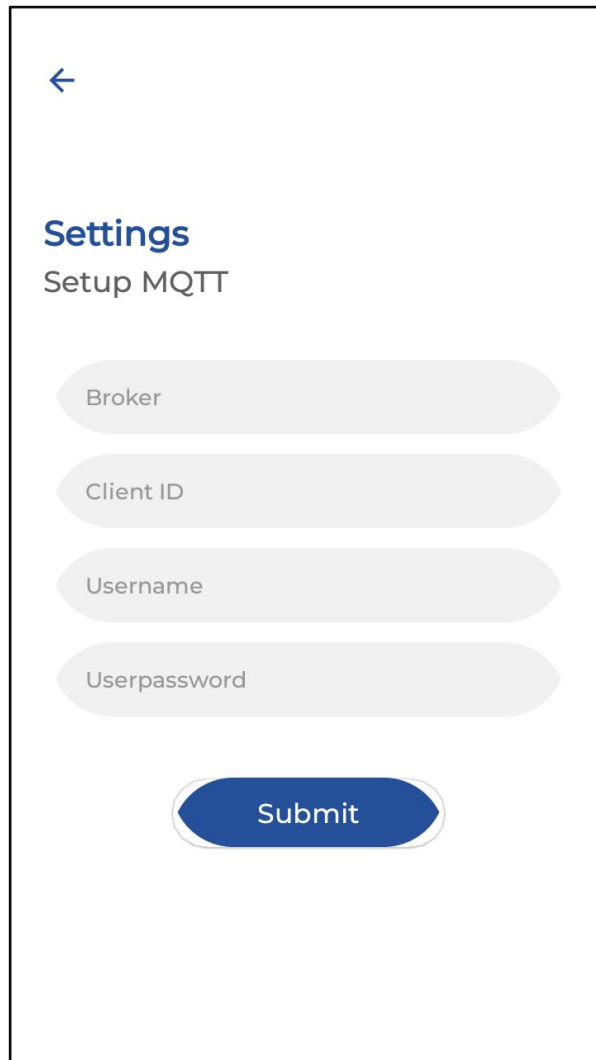


Figure 3: About screen


1.  **Back:** navigate to the start screen.

Settings screen



The image shows a mobile application screen titled 'Settings' with the subtitle 'Setup MQTT'. At the top left is a blue back arrow. Below the title are four light gray rounded rectangular input fields labeled 'Broker', 'Client ID', 'Username', and 'Userpassword'. At the bottom center is a blue rounded rectangular button with the text 'Submit'.

Figure 4: Settings screen

1.  **Back:** navigate to the start screen.
2. **Broker:** Insert host address for MQTT broker connection.
3. **Client ID:** Insert the MQTT Client ID for MQTT broker connection.
4. **Username:** Insert the username for MQTT client authentication.
5. **Userpassword:** Insert the password for MQTT client authentication.

Default Settings:

Broker	: <i>mqtt-dashboard.com</i>
Client ID	: <i>clientId-YDpZVhf6fm</i>
Username	: <i><None></i>
Userpassword	: <i><None></i>

Login screen

The login page is the gateway to our app's ecosystem, where users can securely access their accounts and unlock personalized experiences. Designed with simplicity and security in mind, it prompts users to input credentials (email address and password).

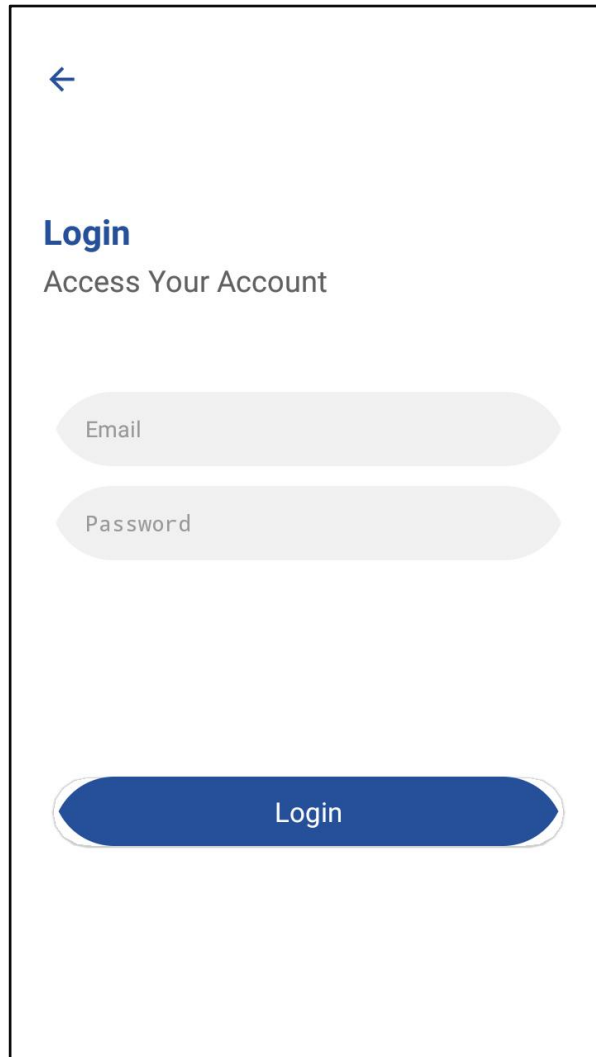

A mobile app login screen mockup. At the top left is a blue back arrow icon. Below it, the word "Login" is in bold blue, followed by "Access Your Account" in a smaller grey font. There are two light grey rounded rectangular input fields: the first is labeled "Email" and the second is labeled "Password". At the bottom is a large blue rounded rectangular button with the word "Login" in white text.

Figure 5: Login screen

1.  **Back:** navigate to the start screen.
2. **Email:** Insert the email address to login to the system.
3. **Password:** Insert the password to login to the system.

Default Settings:

Email	: seuintern2024@outlook.com
Password	: Test123

Main screen

The main screen of our app serves as the command center, offering users real-time insights and control over their water management infrastructure. Through intuitive controls and indicators, users can monitor and adjust settings to optimize water usage, ensuring efficient operation and conservation.

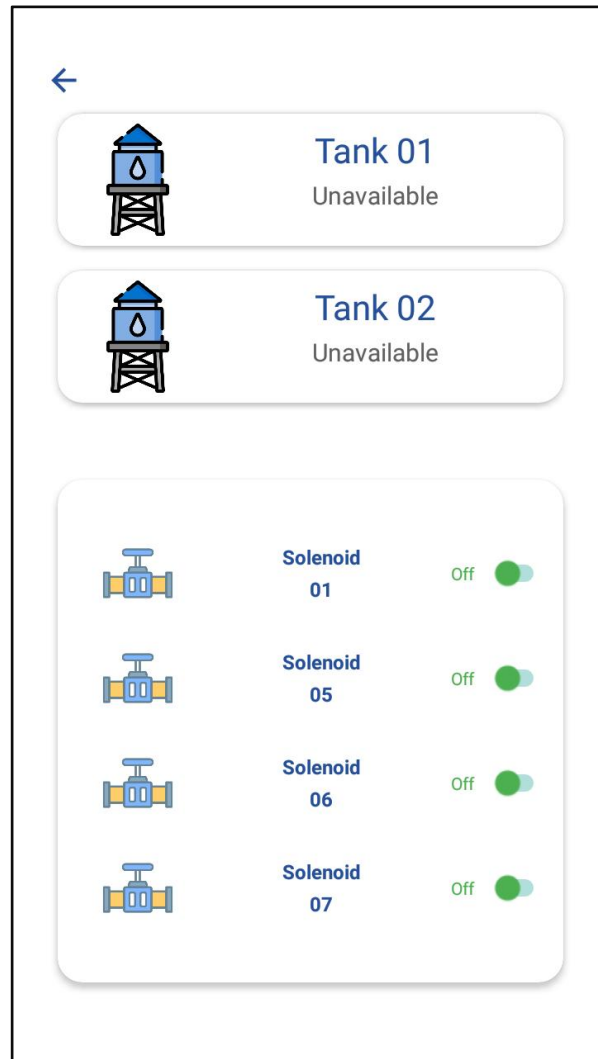


Figure 6: Main screen

1. **Back**: navigate to the start screen.
2. **Tank 1**: Indicate the water level in Tank 1
3. **Tank 2**: Indicate the water level in Tank 2
4. **Solenoid Control Panel**: Provide option to change driver solenoid status.

WEBSOCKETS CLIENT



How to use the web server?

1. Put the server URL on the web browser.

Server URL: <https://www.hivemq.com/demos/websocket-client/>

Connection

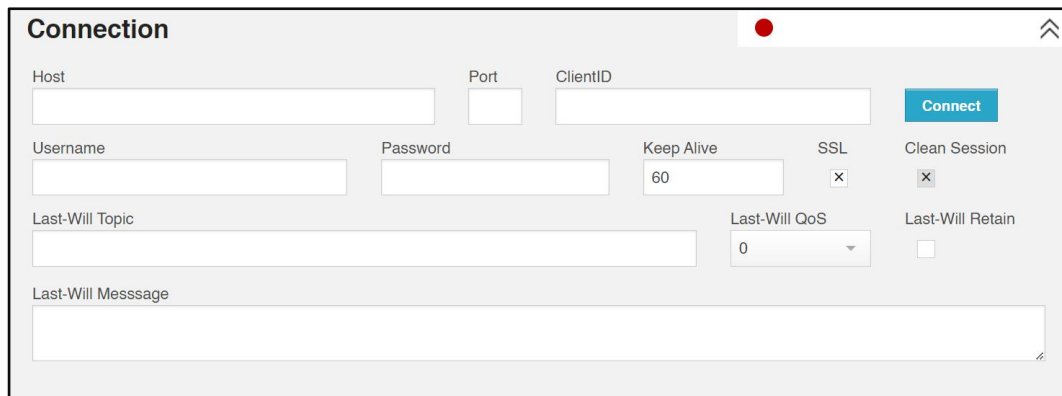


Figure 7: Connection panel

1. **Host:** Insert host address for MQTT broker connection.
2. **Port:** Insert the port for MQTT broker connection.

HiveMQ uses port 1883 (for standard MQTT) and 8883 (for MQTT + TLS) by default.
3. **ClientID:** Insert the MQTT Client ID for MQTT broker connection.
4. **Username:** Insert the username for MQTT client authentication.
5. **Password:** Insert the password for MQTT client authentication.
6. **Keep Alive:** Insert the number of seconds that the broker permits between when a client finishes sending one MQTT packet and starts to send the next.
7. **SSL:** Enable/Disable SSL Server.
8. **Clean Session:** Request a non-persistent session.
9. **Last-Will Topic:** Insert the topic that should automatically be published by the broker on their behalf, if or when an unexpected disconnection occurs.
10. **Last-Will QoS:** Set Quality of Service for Last-Will.
11. **Last-Will Retain:** Enable/Disable the storage of last-will message retained.
12. **Last-Will Message:** Insert the message that should automatically be published by the broker on their behalf, if or when an unexpected disconnection occurs.

Water Tank Project MQTT Connection Settings:

Host: *mqtt-dashboard.com*

Port: *8884*

ClientID: *clientId-dvG4snHTZr*

Username: *<None>*

Password: *<None>*

Keep Alive: *60*

SSL: *Enable SSL Server.*

Clean Session: *Request a non-persistent session.*

Last-Will Topic: *<None>*

Last-Will QoS: *0*

Last-Will Retain: *Disable the storage of last-will message retained.*

Last-Will Message: *<None>*

Publish

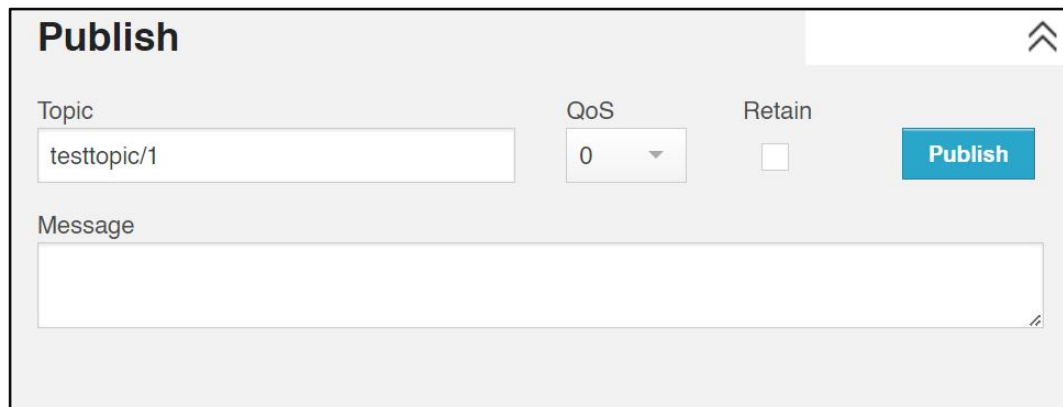
A screenshot of the MQTT Publish panel. The panel has a title bar with the word "Publish" and a close button. Below the title bar, there are four fields: "Topic" with a text input containing "testtopic/1", "QoS" with a dropdown menu showing "0", "Retain" with an unchecked checkbox, and a blue "Publish" button. Below these fields is a large text area labeled "Message" for entering the message content. A small icon is visible in the bottom right corner of the message area.

Figure 8: Publish panel

1. **Topic:** Insert the topic that should be published.
2. **QoS:** Set Quality of Service of publishing message.
3. **Retain:** Enable/Disable the storage of message retained.
4. **Message:** Insert the message that should be published.

Water Tank Project MQTT Topics:

Tank-1 Water Level	: "testtopic/101"
Tank-2 Water Level	: "testtopic/102"
Solenoid-1	: "Solenoid/1"
Solenoid-5	: "Solenoid/5"
Solenoid-6	: "Solenoid/6"
Solenoid-7	: "Solenoid/7"

Subscriptions

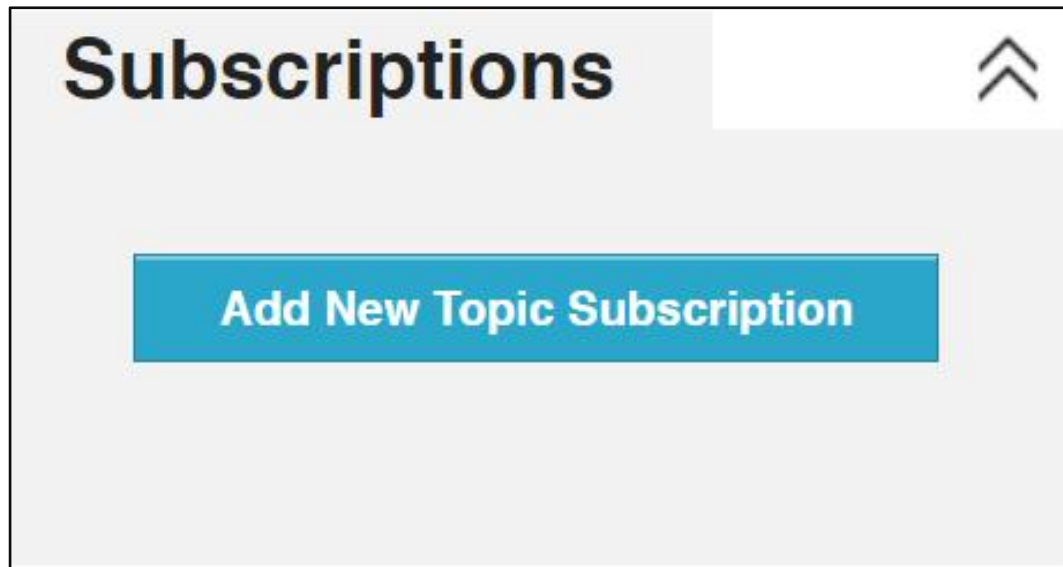


Figure 9: Subscribe panel

- Click Add New Topic Subscription.
- Set the topic and QoS that should be subscribed to in the pop-up window.
- Assign a color for the topic.
- Repeat for every topic.

Water Tank Project MQTT Topics:

Tank-1 Water Level	: "testtopic/101"
Tank-2 Water Level	: "testtopic/102"
Solenoid-1	: "Solenoid/1"
Solenoid-5	: "Solenoid/5"
Solenoid-6	: "Solenoid/6"
Solenoid-7	: "Solenoid/7"

Messages

This panel displays messages of the subscribed topics.

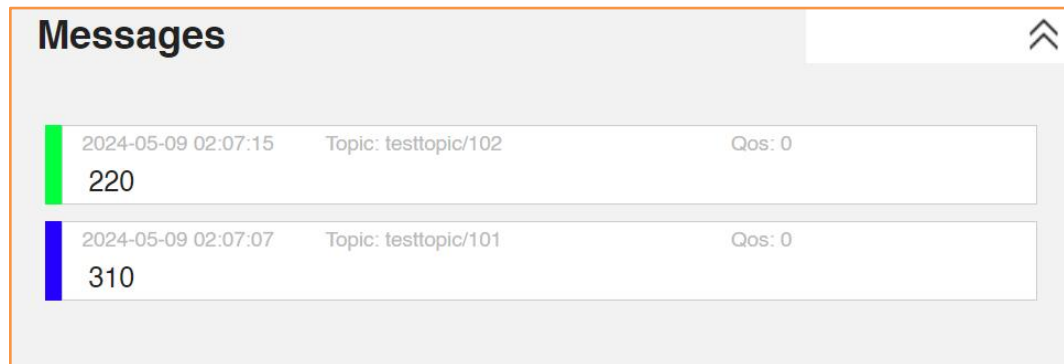


Figure 10: Message panel