

Configuring the MQTT

Introduction:

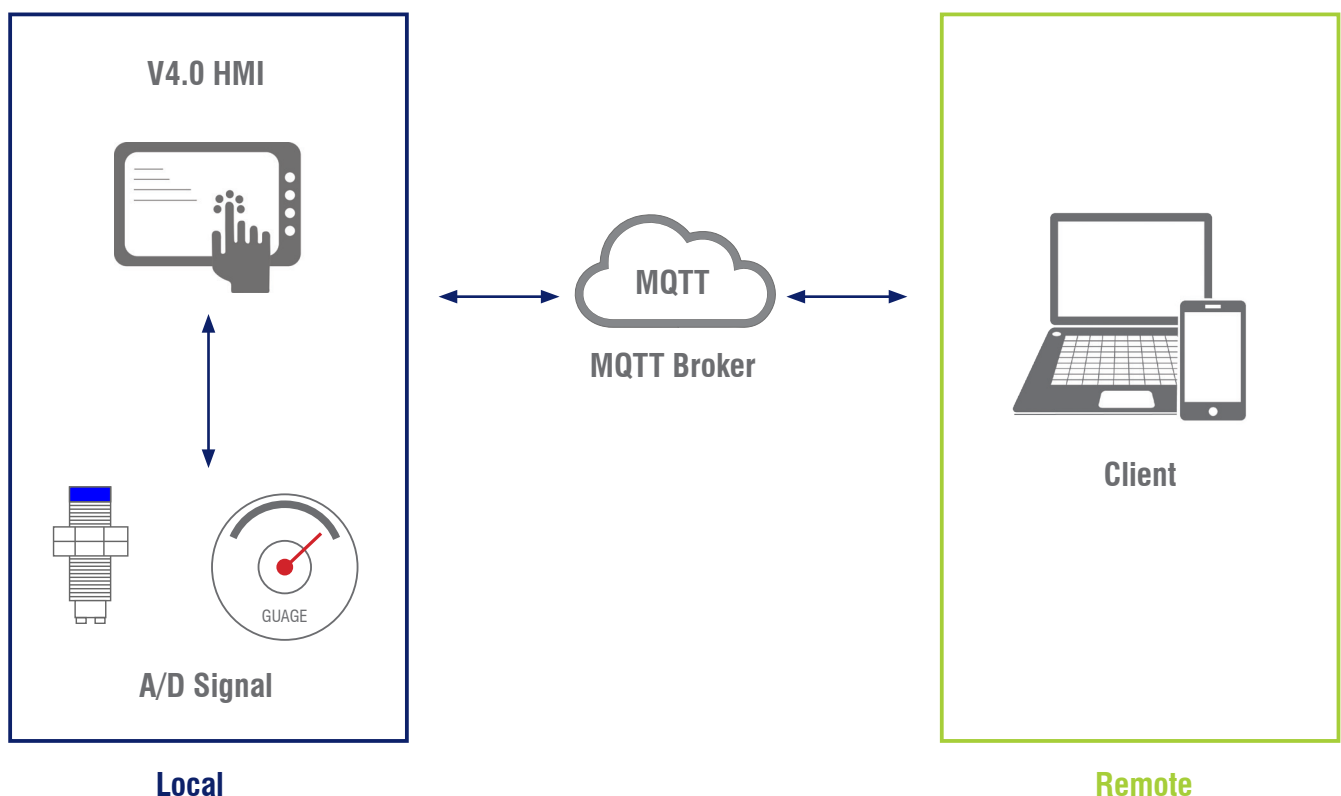
This tutorial will outline the steps needed to configure the MQTT .

Overview

The MQTT (Message Queueing Telemetry Transport) is designed to be open , simple and lightweight. It is a publisher/subscriber-based communication protocol, which allows message-based transfer between applications. The MQTT is suitable for continuous monitoring of sensory data such as level, temperature, pressure, etc.,

MQTT Components:

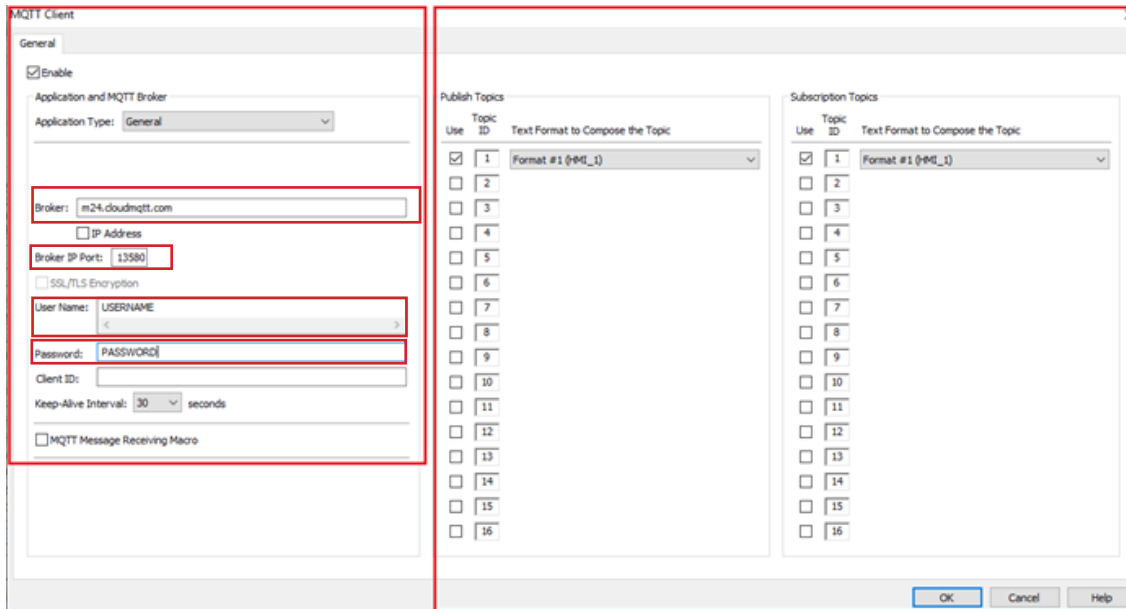
- Broker: the server that handles the data transmission between the clients.(Distributes messages between the publisher and the subscriber)
- The topic: is the subject a device want to place or retrieve a message to/from.
- The message: the data that a device receives “when subscribing” from a topic or send “when publishing” to a topic.
- Publisher : the device that sends its message to the broker.
- Subscriber : where a device retrieves a message from the broker.



Configuring the MQTT

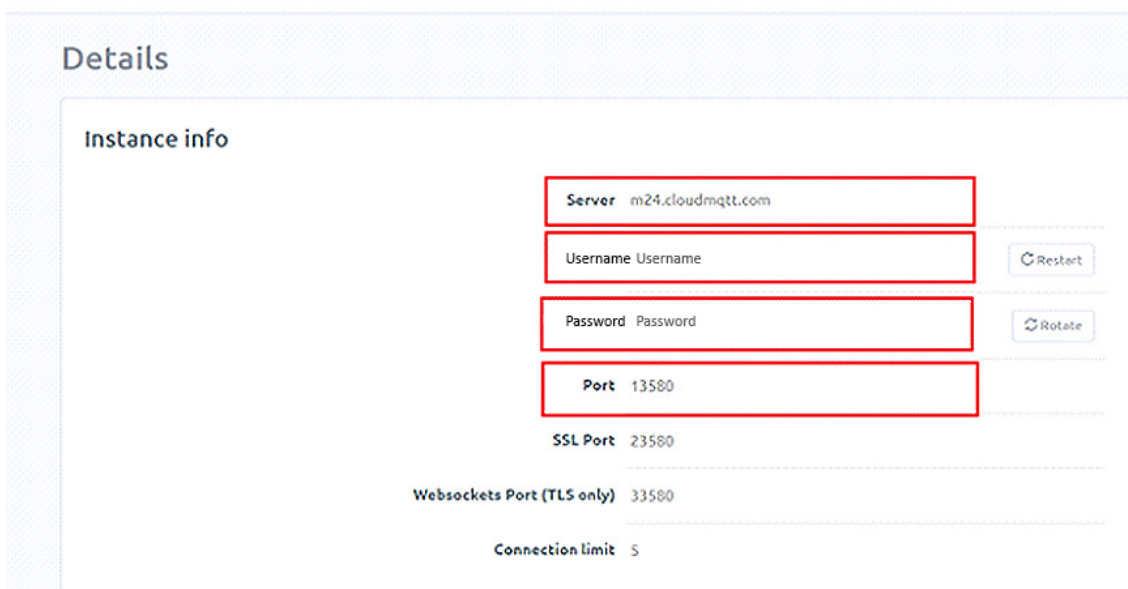
Step 1: Configuring the MQTT Client

Enter the broker domain name and “IP port”. The server will require “Username” and “Password” for authentication



The image shows the MQTT Client configuration window. The General tab is selected. The 'Enable' checkbox is checked. The 'Application Type' is set to 'General'. The 'Broker' field is set to 'm24.cloudmqtt.com'. The 'Broker IP Port' is set to '13580'. The 'User Name' is set to 'USERNAME' and the 'Password' is set to 'PASSWORD'. The 'Client ID' is empty. The 'Keep-Alive Interval' is set to '30' seconds. The 'MQTT Message Receiving Macro' checkbox is unchecked. The 'Publish Topics' and 'Subscription Topics' sections are also visible, both with 'Topic 1' selected and 'Format #1 (%M_1)' chosen.

Below you can find the authentication details that any device will need to connect to the broker. We are interested only in the first 4 parameters. Many free MQTT brokers for PC and portable devices can be found on the web.



The image shows the 'Details' page of the CloudMQTT interface. Under the 'Instance info' section, the following details are listed:

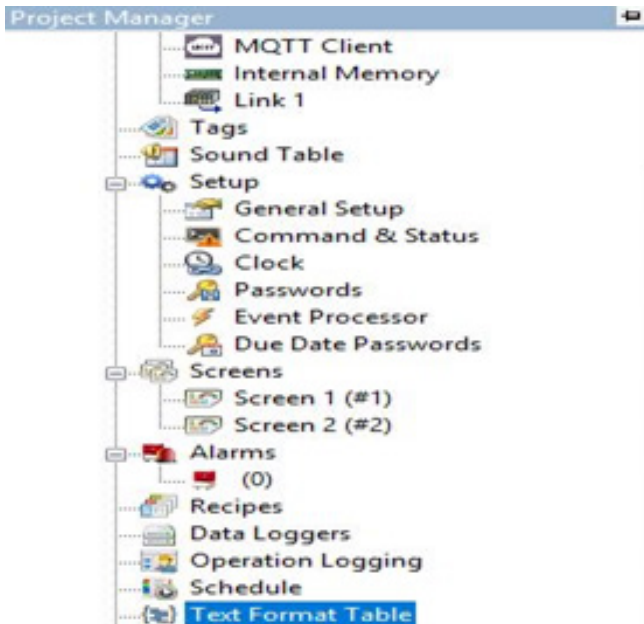
- Server: m24.cloudmqtt.com
- Username: Username
- Password: Password
- Port: 13580
- SSL Port: 23580
- Websockets Port (TLS only): 33580
- Connection limit: 5

Buttons for 'Restart' and 'Rotate' are visible next to the Username and Password fields.

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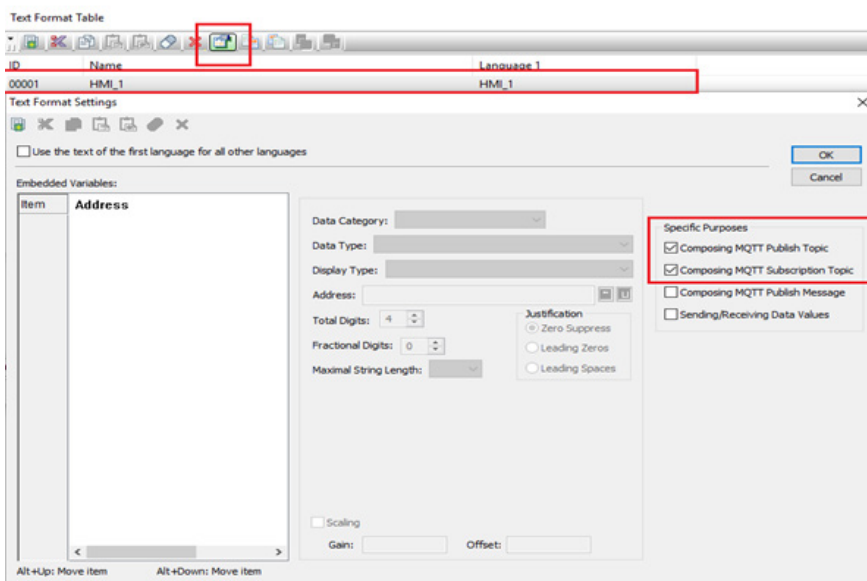
Step 2: Text Format Table

The data and the messages can be configured in the Text Format Table.



Default Messages: Topic

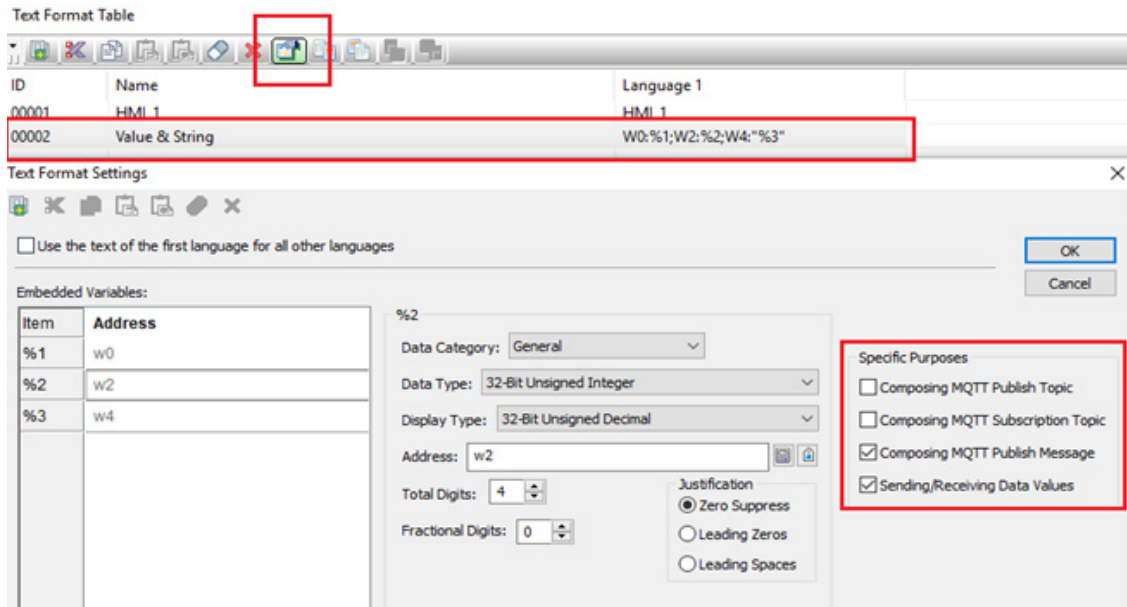
- The topic name can be user-defined. in this tutorial, the name of the topic used is “HMI_1”.
- Click **Property** then tick “Composing MQTT Publish Topic “ and “Composing MQTT Subscription Topic”
- If you would like to publish and subscribe to the same ID.



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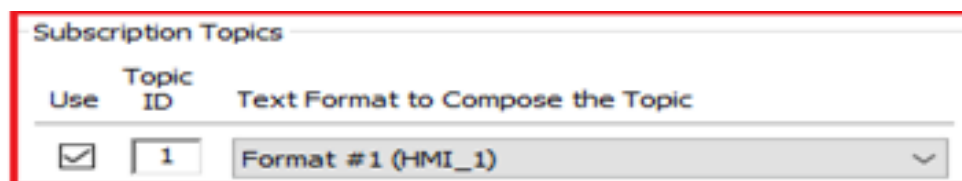
Topic Publisher Settings

The address can be consecutive or non-consecutive, and of different data type and length as shown in the image



Step 3: MQTT Message Receiving Macro

- Line 0: “MqttGET” this command is used to capture the **Length** and **Content** of the Topic and the Message when some information being published, then save them to a variable.
- Line 2: “MqttChkTopic” this command will compare the Length and the content of the Topic with subscriber.
- Line 4: If 0\topicID is equal to 1, the message will be received.



- Line 8-13: This command “MqttProcMsg” will compare the content of the received msg from the broker with the HMI, then analyze message and save it to an internal memory.

```
0 0\msgLen = MqttGet(0\topic[0], 0\msg[0], 0\topicLen) // Get the Subscribe information
1
2 0\topicId = MqttChkTopic(0\topic[0], 0\topicLen, 0) // Check and get the topic information
3
4 if 0\topicId == 1 // The topic ID is 1 and OK
5
6
7
8     0\result = MqttProcMsg(2, 0\msg[0], 0\msgLen)/* Process the message according
9         to the text format #2 */
10
11     if 0\result == 0 // OK
12     endif
13 endif
14
```

Configuring the MQTT

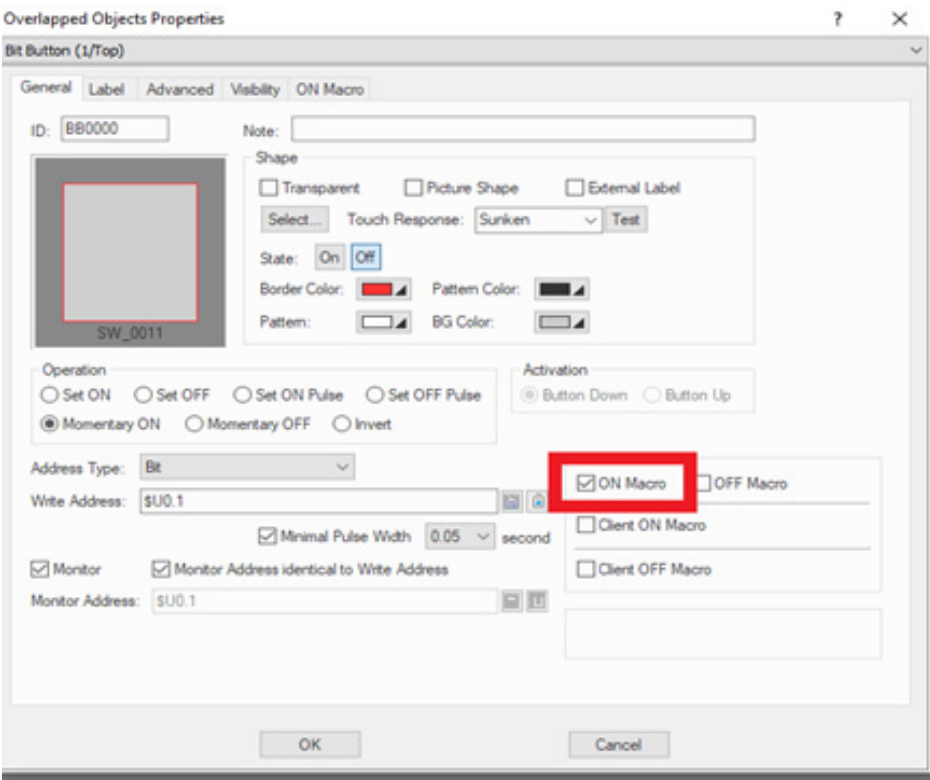


If the message received from the MQTT broker contains the following:
W0:234.56,W2:-6789,W4:"ASCII", The command "**MqttProcMsg**" will compare the message with the content of ID02 in the **Text Format Table**. If both message's length and content are equal, the **0\result** will be 0.

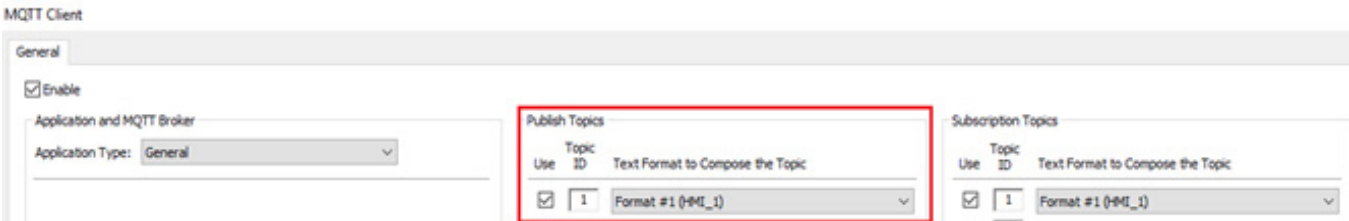
00002	Value & String	W0:%1;W2:%2;W4:"%3"
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Step 4: Publish

This command "**MqttP_IF**" will Publish the **Topic ID 1** and the **Message ID 2** when the \$U0.1 is pressed. If this command is been executed successfully, **0\Result** will be 0.



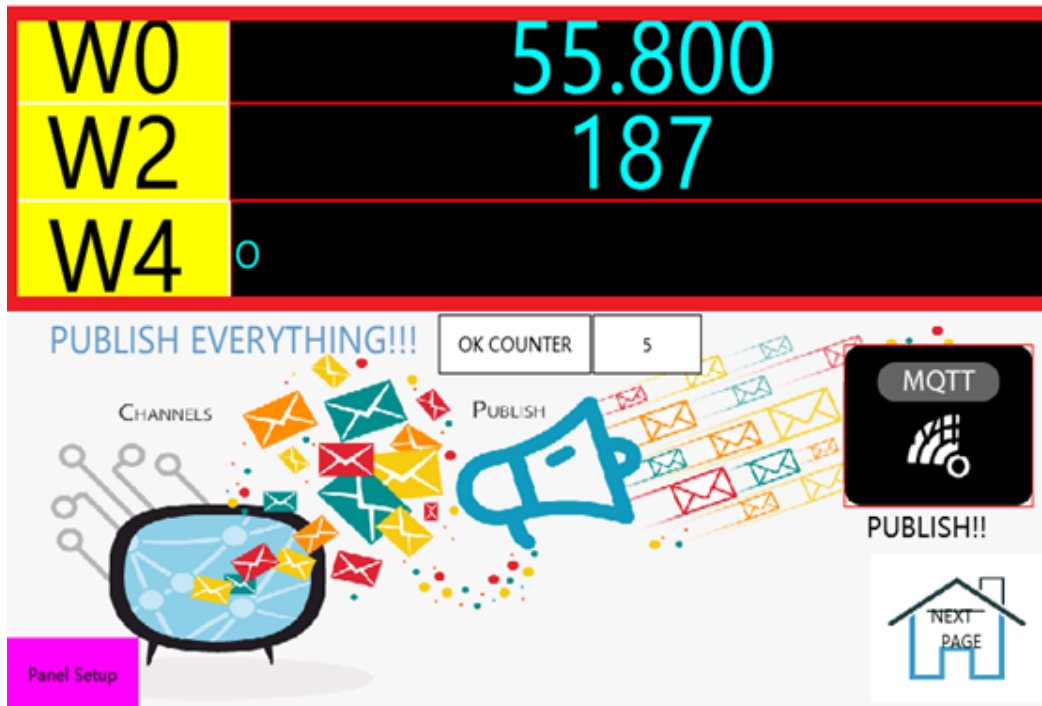
```
0 0\result = MqttP_IF(1, 2, 0)
1 //The 1 is the topic ID , see MQTT Client setting page.
2 //The 2 is the text order, see Text Format Table
3
```



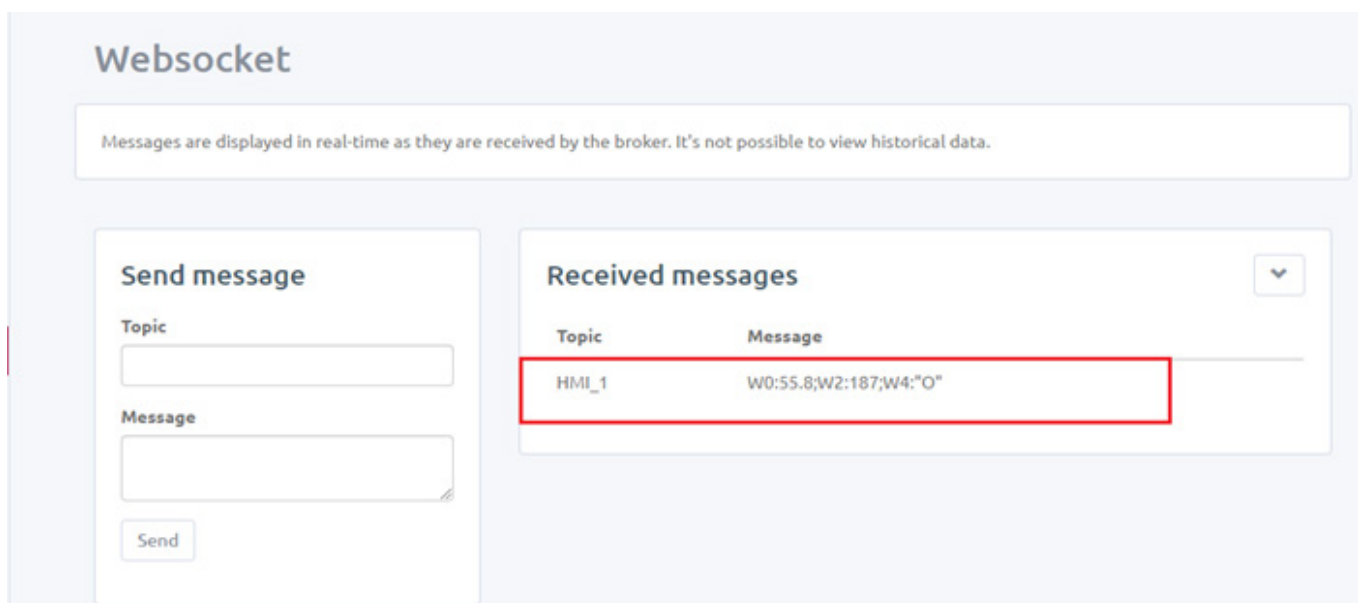
Configuring the MQTT

Step 5: Broker

Publishing data to the topic HMI_1 to the broker.

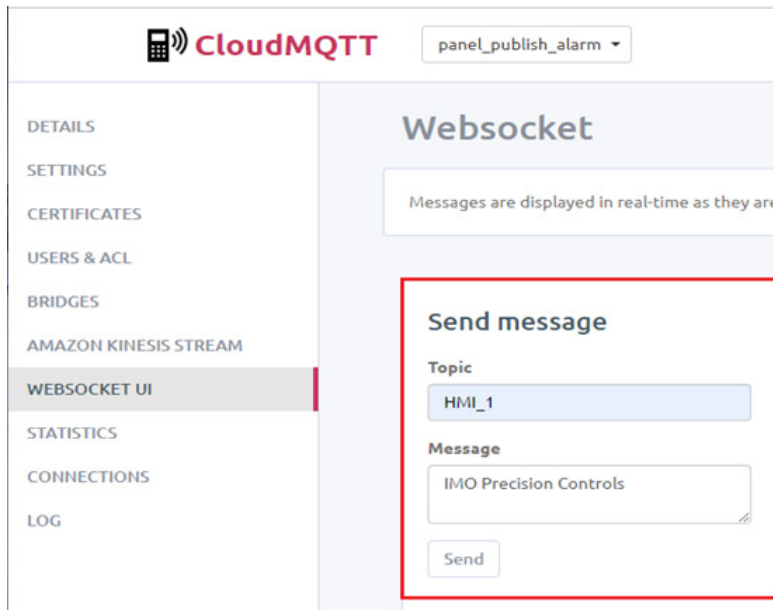


Once successfully subscribed to the Topic , when there are MQTT messages updates, they will be received and displayed on the main screen.



Configuring the MQTT

Sending ASCII Data to the Topic HMI_1 from the Broker



CloudMQTT panel_publish_alarm ▼

DETAILS
SETTINGS
CERTIFICATES
USERS & ACL
BRIDGES
AMAZON KINESIS STREAM
WEBSOCKET UI
STATISTICS
CONNECTIONS
LOG

Websocket

Messages are displayed in real-time as they are:

Send message

Topic
HMI_1

Message
IMO Precision Controls

Send

OPEN MQTT SETTING PAGE	
\$GS1031.0 Subscription Status	ON
nUnprocessedMsg (\$GS1128)	0
Total (\$GS1032)	6
NG (\$GS1034)	0
OK (\$GS1036)	6

0\topic[0]	HMI_1
0\msg[0]	IMO Precision Controls

This tutorial gives information about MQTT and its configuration. This application can be used for different systems to enable real time communication between a sensor and iView HMI over remote solutions.



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