SOFTWARE TEST REPORT

Arduino Weather Station – Humidity Out

Created by Yen Tran

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1 Introduction

1.1 Document overview

This document is the software test report of the Application Circuit and MQTT testing phase of the Arduino Weather Station software development project. It contains the results of tests, which were executed during the successful testing cases.

1.2 Abbreviations and Glossary

1.2.1 Abbreviations

LCD: liquid Crystal Display
MQTT: Message Queuing Telemetry Transport

1.2.2 Glossary

Arduino: Open-source electronic prototyping platform enabling users to create interactive electronic objects.
LCD: LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation.
MQTT: The MQTT protocol provides a lightweight method of carrying out messaging using a publish/subscribe model. This makes it suitable for Internet of Things messaging such as with low power sensors or mobile devices such as phones, embedded computers or microcontrollers.
Mosquitto: Mosquitto is lightweight and is suitable for use on all devices from low power single board computers to full servers.
Ethernet shield: allows an Arduino board to connect to the internet

1.3 References

1.3.1 Project References

#	Document Identifier	Document Title
[R1]	Test Case	Test_Case.docx

1.3.2 Standard and regulatory References

#	Document Identifier	Document Title
[STD1]	TAMK project requirements	Project_requirements_0_96.docx

2 Overview of Tests Results

2.1 Tests log

The Arduino Weather Station software (version 1) was tested on the own developed test platform located in included files when buying product, from the 2020/04/12 to the 2020/04/22. The tests of the test phase (ref. software test plan) where executed.
Testers :

- Hasan Mahmud
- Israt Jahan Sumiya

2.2 Rationale for decision

After executing a test, the decision is defined according to the following rules:

- **Pass:** The test sheet is set to "Pass" state when all steps are in "Pass" state. The real result is compliant to the expected result
- **Fail:** The test sheet is set to "Fail" state when at least one step of the test is set "Fail" state

Tests results are listed in §3.

2.3 Overall assessment of tests

- All tests with hardware interfaces passed includes Arduino, LCD, button. Ethernet shield
- All tests passed with MQTT response and sending data from MQTT broker to databases
- Real signals have not been performed yet
- Backend api got the right data format but limited data type sent

Give quantitative results.
Statistics about tests:

- 95% of tests Pass,
- 5% of tests Fail

Give also statistics about bugs and enhancements:

- Total number 2
- Number of Critical 0
- Number of Major 0
- Number of minor 1
- Number of enhancements 1

2.4 Impact of test environment

Real signal cable is not available and replaced by module cable. Therefore, the implementation of data sent and received is not trustworthy

3 Detailed Tests Results

Test environment:
Arduino is connected with computer
LCD must show the message in the format below:

- Line 1: myIP
- Line 2: Conn
- Line 3: show puls, show Freq
- Line 4:Message

Ethernet shield is connected with internet module

Date	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
30/1	Arduino working	Test file "Blink.ino" and 1 single led	Led blinks every second	Led starts blinking every one second	Pass	
9/2	LCD screen	Test file "lcd.ino"	Lcd prints " hello, hyi!" and displays number from 0 to 99	Number increments start from 0 to 99	Pass	
25/2	Ethernet module: checking IP and virtual MQTT signal	Test file "Ethernet_1_emb_systems_ws_ref_1_2020.ino" Wiring pin A0,A1,A2,A3 to GND	Showing device IP and home IP: 10.10. 206 .150, voltage and frequency	Device IP:10.10.206.124 Conn: 10.10.206.150 Voltage: 3.6V Frequency: 0 Hz	Pass	
10/3	Ethernet module: checking IP and real MQTT signal	Test file "Ethernet_1_emb_systems_ws_ref_1_2020.ino"	Showing device IP and home IP Voltage and frequency	Cannot establish	Fail	Virus pandemic Fail to get the signal Move to alternative solution
13/3	Testing MQTT response	Log in with VPN to VM: 172.16.200.88 User: iotti Pw: iotti2017 Mosquitto_sub –t Mosquitto _pub –t Topic: "ICT4_out_2020"	In subscribe terminal: My message	In subscribe terminal: My message	Pass	

		Send test message by Mosquitto _pub –t "ICT4_out_2020" –m "My message" ***See test message from*** Mosquitto_sub –t "ICT4_out_2020"				
6/4	MQTT broker from VM	Test file "Ethernet_1_emb_systems_READ_IP_3_2020.ino" Log in with VPN to VM: 172.16.200.88 User: iotti Pw: iotti2017 Mosquitto_sub –t "ICT4_out_2020" Mosquitto _pub –t "ICT4_out_2020"	See data send to MQTT broker in the type : IOTJS={"S_name":"Humidity_out","S_value": X } every one second	Connected with IP: 192.168.0.100 21:10:59.057 -> Connecting to MQTT 21:10:59.057 -> 193.167.167.59 21:10:59.810 -> Connected OK Time interval : 1 second	Pass	
12/4	MQTT broker to database	Test file "Ethernet_1_emb_systems_READ_IP_3_2020.ino" Log in with VPN to VM: 172.16.200.88 User: iotti Pw: iotti2017 Mosquitto_sub –t "ICT4_out_2020" Mosquitto _pub –t "ICT4_out_2020" ***Go to folder Embsys:*** Make main.cpp, mqtt_arduino1.cpp, mqtt_arduino1.h, mqtt.h, mqtt.cpp, SendTamk.cpp, SendTamk.h	Successful JSON data line shows up Counting number of sending	No error showed up See sending numbers	Pass	

		./goE => data is sending to database				

4 Conclusion