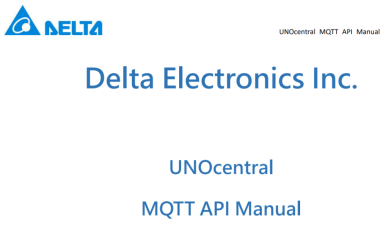

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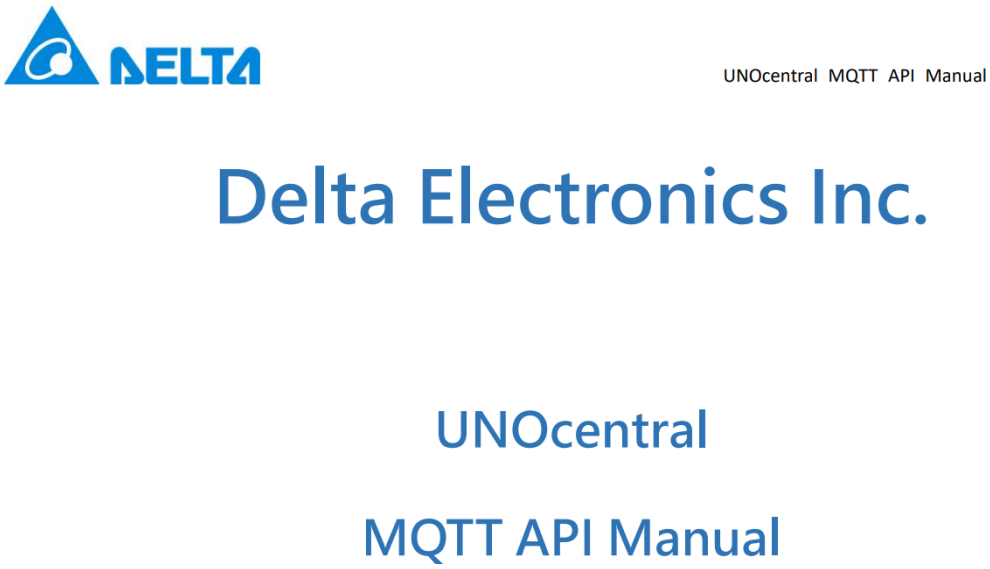


Contents

Introduction

UNOcentral is the central server to monitor the multiple UNO sensors. It provides MQTT Data Payload to retrieve the UNOnext sensor values for engineer using. Basic UNO sensor model has following sensors: Temperature (C/ F), Humidity (rH%), CO2 (ppm), PM2.5 (g/m3 PM10 (g/m3

The advance model optionally provides highly accuracy NTC temperature (C), CO (ppm), HCHO (ppm), TVOC (ppm), O3 (ppm), PM1 (g/m3
This document introduces to use MQTT client to retrieve the sensor data based on JSON format. The sensor data include real-time and average data (only air quality related sensors). Note, please upgrade your UNOcentral firmware for the latest functions support. First support firmware version is v1.3.3.

How to Use

A. Requirements

- Please use MQTT client to connect UNOcentral local broker, the connection settings are bellowed.
- **Protocol:** TCP (e.g. mqtt://)
- **IP:** follow UNOcentral network settings, may be checked by network manager or IT personnel.
- **Port:** 1883
- SSL/TLS is not supported, no certificate.
- **Username:** isdunocentral
- **Password:** hellocentralmqtt

In following figures, we use the MQTT Explorer as the demo client.

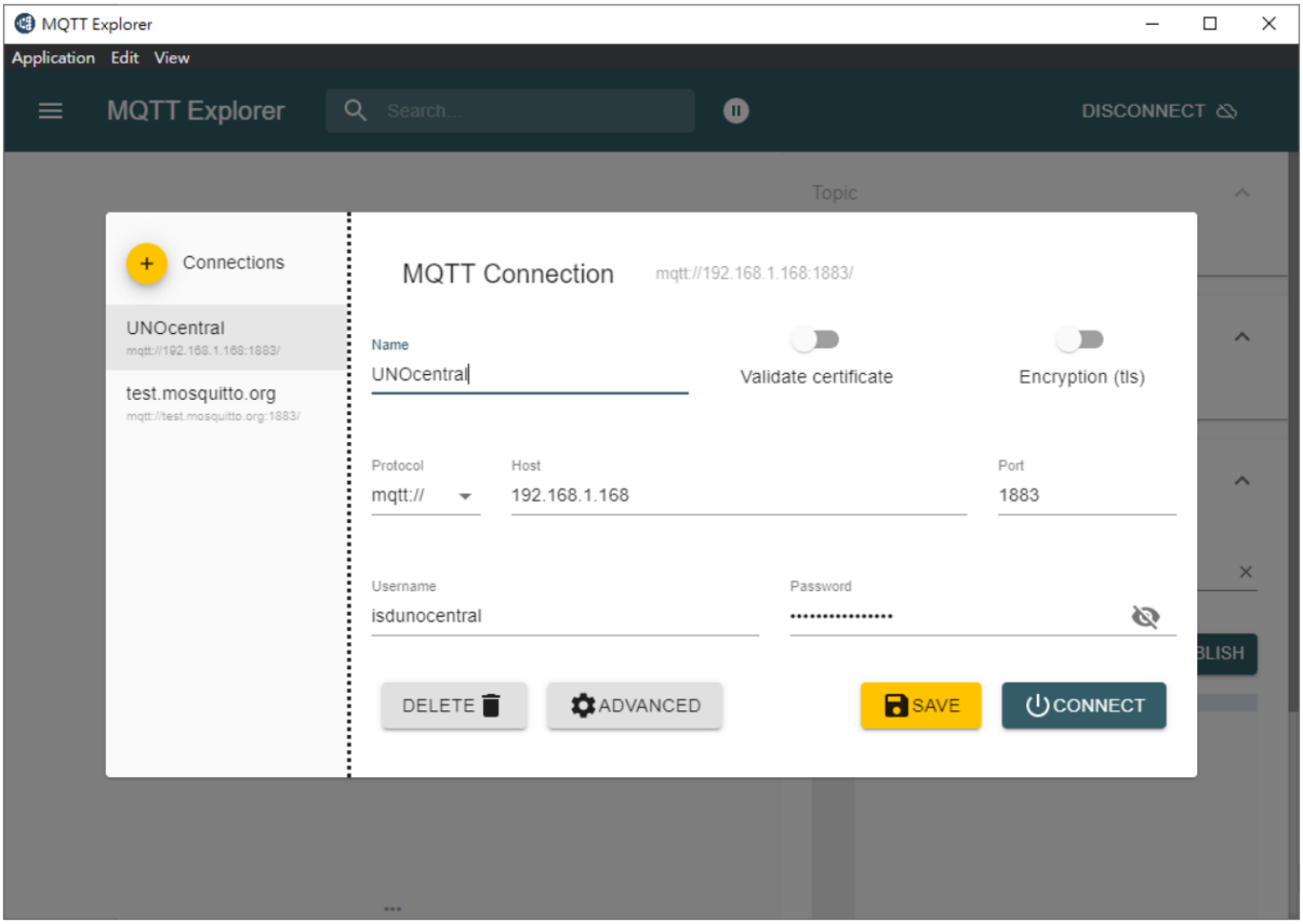


Figure : 1 MQTT Connection Settings

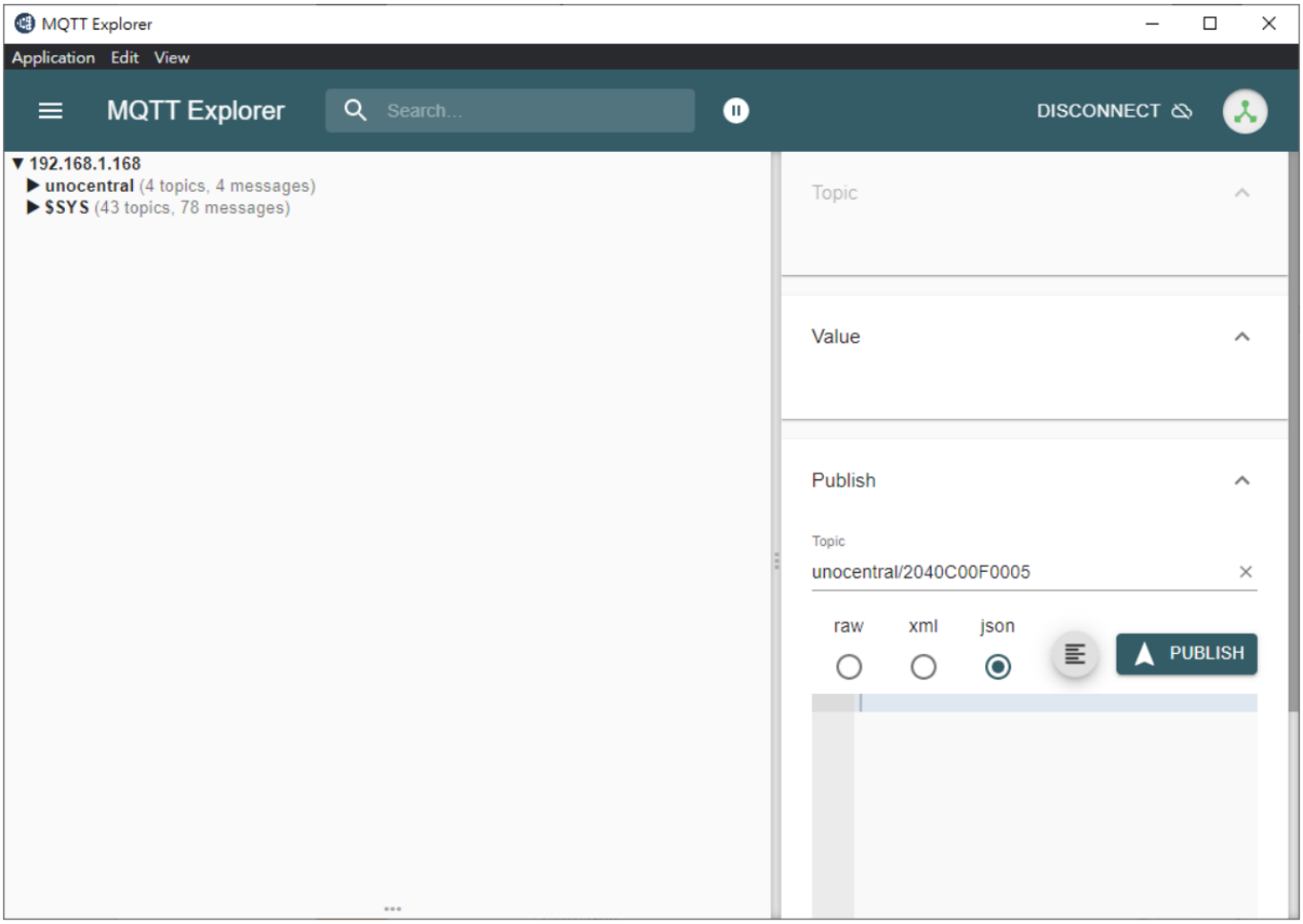


Figure : 2 Data in Explorer after Connection

B. MQTT Data Topics

When the client connects to the UNO central local broker, the topics need to be subscribed is listed, and then the client will get the data published by UNO central.

Table 1 Main MQTT topics

Topic	Description
UNO central/[**SN**]/next Data/[**IDX**]/data **E.g**. unicentral/2040C00F9999/NeXT Data/0/data	One UNO NeXT's data payload based on JSON format. [SN] means UNO central's serial number; [IDX] means the connection order of UNO next under UNO central. The range of [IDX] is from 0~15 or 0~31 based on UNO central model.
UNO central/[**SN**]/NeXT Data/data E.g .unicentral/2040C00F9999/NeXT Data/data	Array of all UNO next's data payload based on JSON format. [SN] means UNO central's serial number.

- Only the data of enabled UNO nexts in the UNO central setting will be published with topic UNO central/[SN]/next Data/[IDX]/data.
- Only the data of enabled UNO nexts in the UNO central setting will be filled into the payload of topic UNO central/[SN]/next Data/data. Otherwise the value of the array index is NULL.

The [IDX] is ranged from 0 ~ 15 (31) corresponded to the Slave ID: 208 ~ 223 (239)

or ID: 1 ~ 16 (32) according to UNOcentral which is in RS485 mode or MQTT mode as the following table.
Table : 2 The [IDX] in topic and payload array corresponds to slave Id and ID

[IDX]	UNOcentral Link Mode	
	Slave ID in RS485 mode	**ID in MQTT mode**
0	208	1
1	209	2
~		
15	223	16
~		
31	239	32

- If UNOnext publishes data to the UNOcentral broker, please refer to UNOnext MQTT user guide to understand to how to handle UNOnext data payload.
- Engineers can choose which topic they need according to customer requirements.

C. Data Format
The main data topics are listed.

- **Single Data Format:** UNOcentral/[SN]/nextData/[IDX]/data From IDX = 0 to IDX = 15 (31), publish one data once per second or per 0.5 second, and all data will be published one round about 16 ~ 20 seconds
- **All Packed Data Format:** UNOcentral/[SN]/nextData/data

Pack all UNOnext data into the array and publish per 16 ~ 20 seconds. The index in the array is corresponded to [IDX].
Table 1 Presents the valid/un-valid values to help engineer to check the sensor status.

Topic: UNOcentral/[SN]/nextData/[IDX]/data

Payload Format
One UNOnext data based on JSON format.

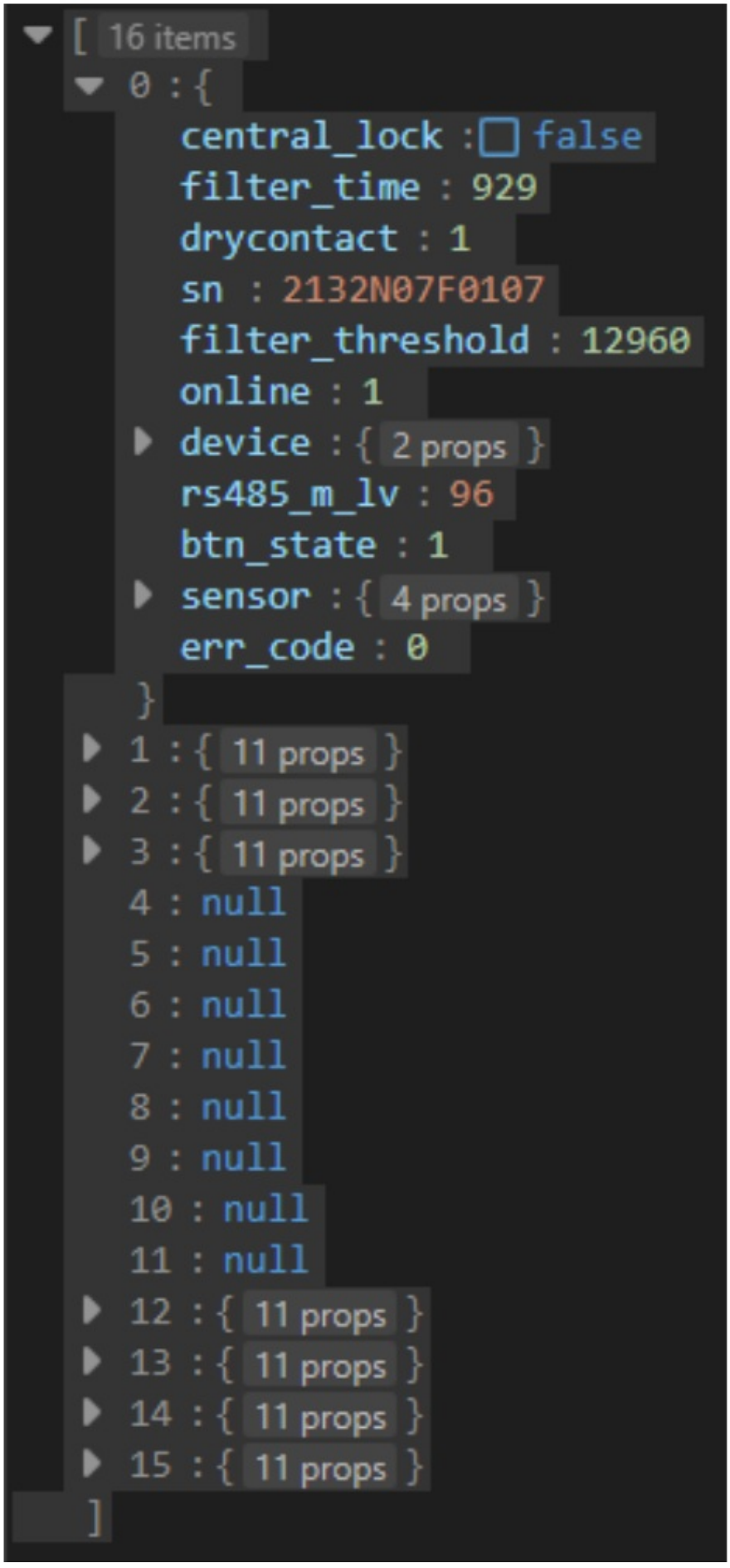
Important Keys Description	
Key	Description
sn	Serial number of UNO next/ UNO lite
online	1 means online, and 0 means offline
error_ code	The UNO next error code.
	Array of environment sensor data. E.g.: [v0, v1, v2, v3, v4, v5].

<table>
<tr><td rowspan="8">sensor. environment</td><td>Index</td><td>Sensor Value</td><td colspan="2">Unit</td></tr>
<tr><td>0</td><td>Temperature</td><td colspan="2">°C</td></tr>
<tr><td>1</td><td>Temperature NTC</td><td colspan="2">°C</td></tr>
<tr><td>2</td><td>Humidity</td><td colspan="2">%rH</td></tr>
<tr><td>3</td><td>Lux</td><td colspan="2">Lux</td></tr>
<tr><td>4</td><td>Temperature</td><td colspan="2">°F</td></tr>
<tr><td>5</td><td>Temperature NTC</td><td colspan="2">°F</td></tr>
<tr><td colspan="4">Please refer to Table 3 if the value is error code.</td></tr>
<tr><td rowspan="10">Sensor .real time</td><td colspan="4">Array of real-time IAQ sensor data.
E.g.: [v0, v1, v2, v3, v4, v5, v6, v7].</td></tr>
<tr><td>Index</td><td>Sensor</td><td colspan="2">Unit</td></tr>
<tr><td>0</td><td>CO2</td><td colspan="2">ppm</td></tr>
<tr><td>1</td><td>CO (opt.)</td><td colspan="2">ppm</td></tr>
<tr><td>2</td><td>HCHO (opt.)</td><td colspan="2">ppm</td></tr>
<tr><td>3</td><td>TVOC (opt.)</td><td colspan="2">ppm</td></tr>
<tr><td>4</td><td>O3 (opt.)</td><td colspan="2">ppm</td></tr>
<tr><td>5</td><td>PM10</td><td colspan="2">mg/m3</td></tr>
<tr><td>6</td><td>PM2.5</td><td colspan="2">mg/m3</td></tr>
<tr><td>7</td><td>PM1 (opt.)</td><td colspan="2">mg/m3</td></tr>
<tr><td colspan="4">Please refer to Table 3 if the value is error code.</td></tr>
<tr><td rowspan="10">sensor. regulation</td><td colspan="4">Array of real-time IAQ sensor data.
E.g.: [v0, v1, v2, v3, v4, v5, v6, v7].</td></tr>
<tr><td>Index</td><td>Sensor</td><td>Unit</td><td>Moving Average</td></tr>
<tr><td>0</td><td>CO2</td><td>ppm</td><td>8 hours</td></tr>
<tr><td>1</td><td>CO (opt.)</td><td>ppm</td><td>8 hours</td></tr>
<tr><td>2</td><td>HCHO (opt.)</td><td>ppm</td><td>1hour</td></tr>
<tr><td>3</td><td>TVOC (opt.)</td><td>ppm</td><td>1hour</td></tr>
<tr><td>4</td><td>O3 (opt.)</td><td>ppm</td><td>8 hours</td></tr>
<tr><td>5</td><td>PM10</td><td>mg/m3</td><td>24 hours</td></tr>
<tr><td>6</td><td>PM2.5</td><td>mg/m3</td><td>24 hours</td></tr>
<tr><td>7</td><td>PM1 (opt.)</td><td>mg/m3</td><td>24 hours</td></tr>
<tr><td colspan="4">Please refer to Table 3 if the value is error code.</td></tr>
</table>

Topic: UNOcentral/[SN]/nextData/data

Payload Format

All UNOnext data packed into an array based on JSON format.



Size of array is 16 or 32, and the index is from 0 to 15 or 0 to 31 referred to Table 2. Data format of each item in

this array is same as the **single data format.** The null value of one index means the UNOnext is not enabled.

Table 3 Sensor Value Description

Name	Value	Description
SENSOR_ERROR_CODE	-99999	Sensor Initialized.
SENSOR_UNMOUNTED	-40000	Sensor unmounted
DATA_ABNORMAL	-50000	Sensor data abnormal
SENSOR_INIT_CODE	< -30000	Other error code
NORMAL_DATA	Others	Normal data

Documents / Resources

	DELTA UNOcentral UNO IAQ Solution App [pdf] User Guide UNOcentral UNO IAQ Solution App, UNOcentral, UNO IAQ Solution App, IAQ Solution App, Solution App, App

References

- User Manual