

# Advantech AE Technical Share Document

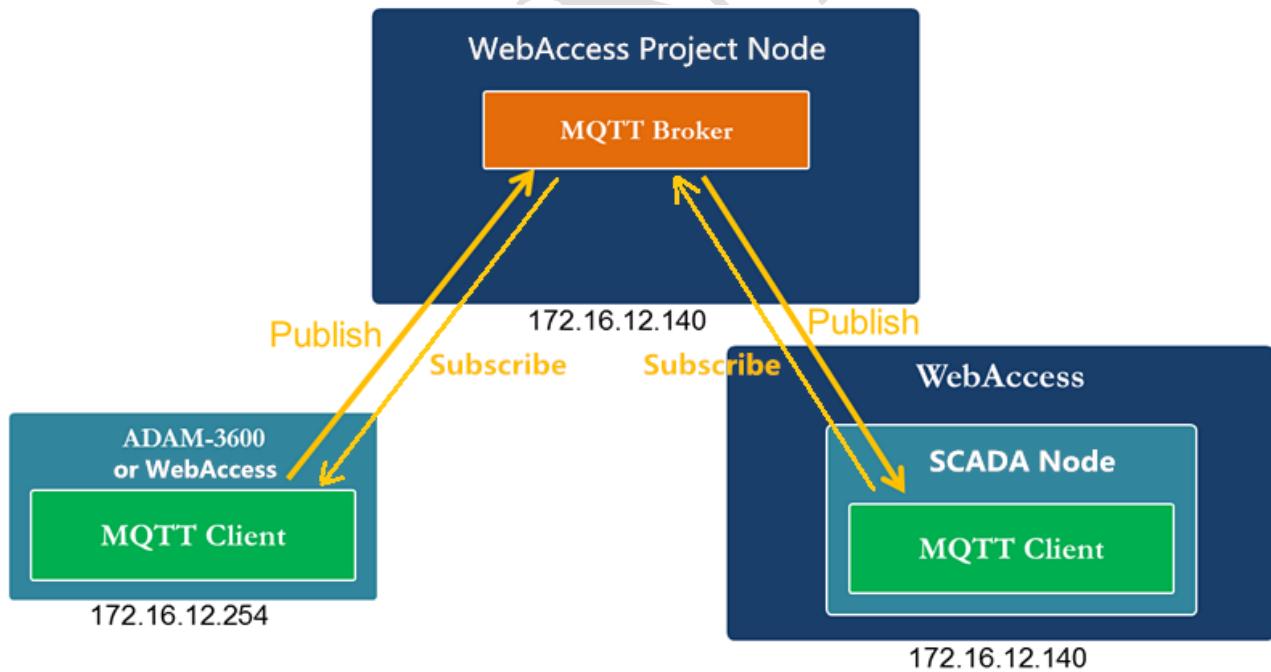
Date	2018/2/9	SR#	1-3358288537
Category	<input checked="" type="checkbox"/> FAQ <input type="checkbox"/> SOP	Related OS	N/A
Abstract	How to set up ADAM-3600 or WebAccess MQTT connection with WebAccess Broker		
Keyword	WebAccess, Cloud, Upload, Broker		
Related Product	ADAM-3600		

## ■ Problem Description:

This document explains how to set up ADAM-3600 MQTT or WebAccess connection with WebAccess. After users configure Broker connection attributes, receive service attributes, tags to upload, upload conditions and other attributes, the data of the field device can be connected to the WebAccess via ADAM-3600 or WebAccess in the way of MQTT.

## ■ Answer:

The topology of TagLink or WebAccess MQTT Client connecting with WebAccess MQTT Broker is illustrated as below drawing.



The setup procedure can be divided into 3 parts, and each step would be instructed in the following pages.

The first part is WebAccess Broker setup, which would be explained in step 1 and 2.

The second part is WebAccess MQTT Client setup, which would be explained in step 3 to 8.

The third part is ADAM-3600 MQTT Client setup, which would be explained in step 9 to 10.

If you use WebAccess as a lower machine, you should do the following steps. The first part is WebAccess Broker setup, which would be explained in step 1 and 2.

The second part is WebAccess MQTT Client (Use WebAccess as a gateway or device) setup, step 11 and step 12 need to be added in the normally collected project.

WebAccess MQTT Client which subscribing from Broker does not need to do any engineering configuration. After WebAccess MQTT Client (Data sending) is downloaded, it will automatically build a collection project in WebAccess MQTT Client.

**Prerequisite:** Install **WebAccess 8.3 2017/12/15** and later version to use MQTT Broker.

## WebAccess Broker Setup

- Click MQTT Broker in the homepage of WebAccess.

The screenshot shows the Advantech WebAccess Project Manager interface. At the top, it says "Advantech WebAccess Project Manager". Below that is a table titled "Current Project(s)" with two rows. The first row has "Edit" links for "Dashboard" and "Description" (Project Description), and columns for "IP" (PC060607), "HTTP Port" (0), and "TCP Port" (4592). The second row also has "Edit" links for "Dashboard" and "Description" (Project Description), and columns for "IP" (127.0.0.1), "HTTP Port" (0), and "TCP Port" (0). Below the table, a message says "Please select one of above available Projects to start!!". At the bottom, there is a navigation bar with links: Project Checking, Backup, Restore, Admin/Project User, ODBC Log Data Source, WebAccess Express, Dashboard Settings, Setup HTTPS Service, **MQTT Broker** (which is circled in red), System Log, Action Log, Alarm Log, Analog Tag Log, Analog Change Log, Discrete Tag Log, Text Tag Log, Event Log, and LogData Maintenance.

- Enable MQTT Broker with option “Yes”.

The screenshot shows the "MQTT Broker" settings page. At the top, it says "MQTT Broker". Below that is a section titled "MQTT Broker Settings". It contains the following fields:
 

- "Enable": A radio button group where "Yes" is selected.
- "UserName": A text input field containing "admin".
- "Password": A text input field containing "\*\*\*\*\*".
- "TCP Port": A text input field containing "1883".
- "Autofill Project/SCADA Node IP": A text input field containing "172.16.12.140" with a close button "X".

 At the bottom, there are "[Cancel]" and "Submit" buttons.

- Set up the “UserName” and “Password” defined by the user for the broker.
- Set up port number for broker’s “TCP Port”. Usually use port 1883 as non-security TCP port.
- Fill in the “IP” (or domain name) of the server which would play as WebAccess Broker.
- After clicking “Submit”, the WebAccess MQTT Broker is supposed to start and ready to service.

## WebAccess MQTT Client Setup (SCADA node subscribes messages from broker)

The user can use the same machine to set up MQTT Broker and Client.

- Choose one project in the WebAccess homepage. (Ex. CloudProject)

Project/Node CloudProject Device Driver A101	Project Property <a href="#">Add SCADA Node</a> <a href="#">Import SCADA Node</a> <a href="#">Upload Remote Node</a> <a href="#">User</a> Project : <b>CloudProject</b> Project Name: CloudProject Project Description: Cloud Project MQTT
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#### 4. Add one SCADA Node. (Ex. Node)

Create New SCADA Node		<a href="#">[Cancel]</a>	<a href="#">Submit</a>
Node Name	<input type="text" value="Node"/>		
Node Description	<input type="text"/>		
SCADA Node IP Address	<input type="text" value="PC060607"/>		
Primary TCP Port	<input type="text" value="4592"/>	Secondary TCP Port	<input type="text" value="14592"/>
Node Timeout	<input type="text" value="0"/>		

If the device supports MQTT client publishing with **WebAccess Plug&Play** function, the following steps may not be needed in WebAccess MQTT client. However, since ADAM-3600 cannot support **WebAccess Plug&Play** in this period of time, we need to set up the device and tags manually in step 6 to 9.

In other words, **WebAccess Plug&Play** allows users no need to set up device and tags and would generate corresponding device and tags if it receives MQTT packets from the subscribed broker.

#### 5. Add New Comport as TCPIP Interface.

Create New Comport		<a href="#">[Cancel]</a>	<a href="#">Submit</a>
Interface Name	<input type="text" value="TCPIP"/>		
Comport Number	<input type="text" value="1"/>		
Description	<input type="text" value="Description"/>		
Scan Time	<input type="text" value="1"/>	<input type="radio"/> MilliSecond <input checked="" type="radio"/> Second <input type="radio"/> Minute <input type="radio"/> Hour	
Timeout	<input type="text" value="1000"/>	MilliSecond	
Retry Count	<input type="text" value="3"/>		
Auto Recover Time	<input type="text" value="60"/>	Second	
Backup Port Number	<input type="text" value="0"/>		
Scan Devices in Parallel	<input type="radio"/> Yes <input checked="" type="radio"/> No		
<a href="#">[Cancel]</a> <a href="#">Submit</a>			

#### 6. Add Device with WAMQTT Device Type.

<a href="#">Comport Property</a> <a href="#">Delete</a> <a href="#">Add Device</a>	
Comport : <b>CloudProject • Node • 1</b>	
Interface Name	TCPIP
Comport Number	1
Description	Description
Scan Time	1 Second
Timeout	1000 MilliSecond
Retry Count	3
Auto Recover Time	60 Second
Backup Port Number	0
Scan Devices in Parallel	No

		Create New Device		<a href="#">[Cancel]</a>	<a href="#">Submit</a>
Device Name	ADAM-3600				
Description	<input type="text"/>				
Unit Number	0				
Device Type	WAMQTT				
		IP Address	172.16.12.140		
	Primary	Port Number	1883		
		Device Address	if other than Unit Number		
	Secondary	IP Address	<input type="text"/>		
		Port Number	<input type="text"/>		
		Device Address	<input type="text"/>		
Heartbeat frequency (second) =	<input type="text"/> 5				
Device ID:	topic_ADAM3600				
Backup Device ID:	<input type="text"/>				
User Name:	admin				
Password:	admin				

Device Name: It's for recognition different devices in WebAccess.

IP address: Fill in the IP of Broker.

Port Number: Fill in the port number of Broker.

Heartbeat frequency (second): The device send heart beat message to the Broker with this period. After several times checking the communication status without heartbeat from the device, the Broker will view this device as disconnected.

Device ID: Set the "Device ID" same as in TagLink project, which indicates the name of uploading topic.

Username and password: Broker's username and password.

## 7. Add Tag in the device.

<a href="#">Delete</a>	<a href="#">Add Tag</a>	<a href="#">Add Block</a>	Device Property		<a href="#">[Cancel]</a>	<a href="#">Submit</a>
Device Name	ADAM-3600					
Description	<input type="text"/>					
Unit Number	0					
Device Type	WAMQTT					
		IP Address	172.16.12.140			
	Primary	Port Number	1883			
		Device Address	if other than Unit Number			
	Secondary	IP Address	<input type="text"/>			
		Port Number	<input type="text"/>			
		Device Address	<input type="text"/>			
Heartbeat frequency (second) =	<input type="text"/> 5					
Device ID:	topic_ADAM3600					
Backup Device ID:	<input type="text"/>					
User Name:	admin					
Password:	admin					

8. Create New Tag with the monitored Tag Name and Address in the device. (The address is the name of tag in TagLink).

Create New Tag [Cancel] Submit

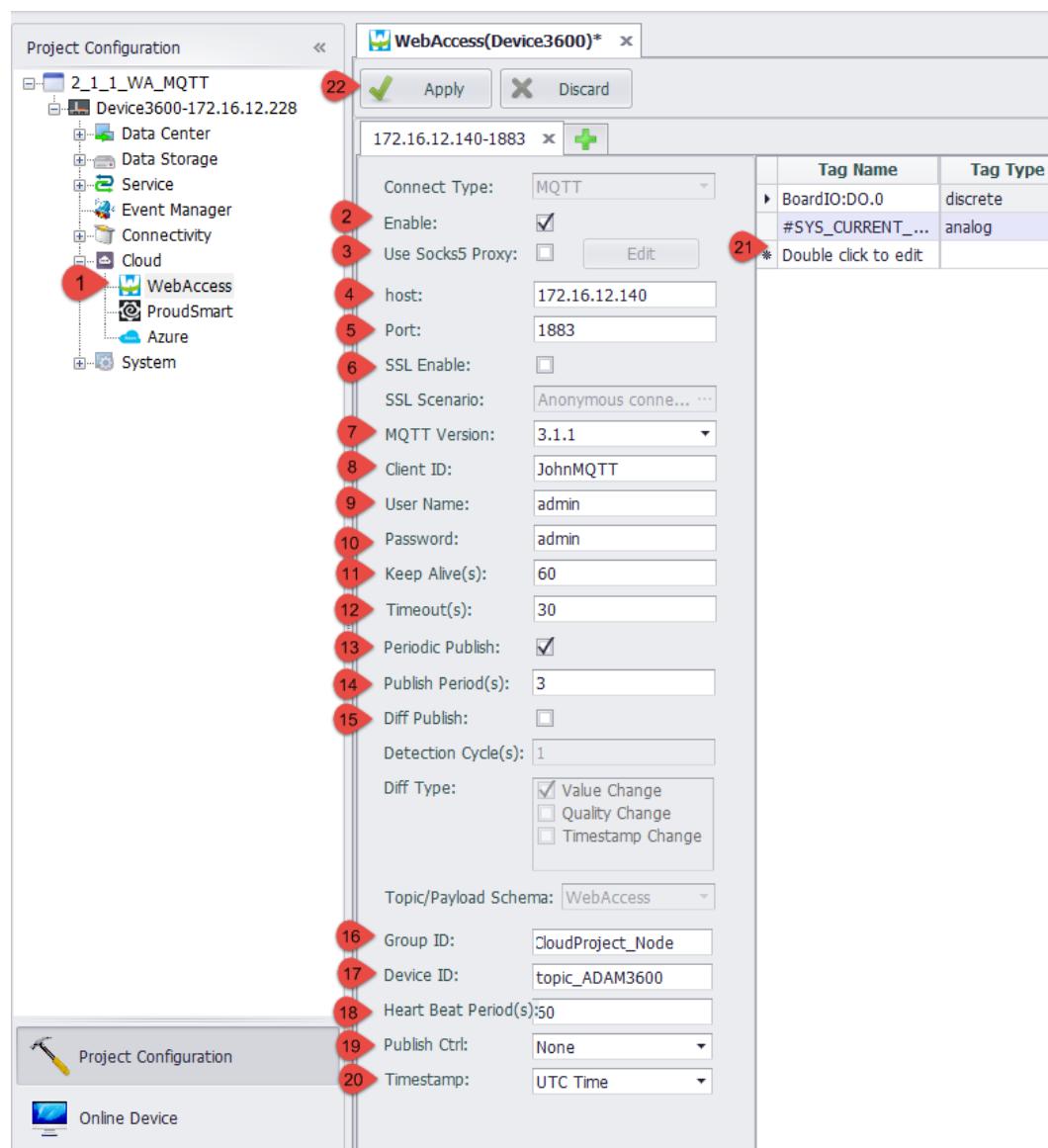
Parameter	AI	Point (analog)
Alarm	No Alarm	
Tag Name	SYS_CURRENT_TIME	
Description	AI	
Scan Type	Constant Scan	
Address	#SYS_CURRENT_TIME	
Conversion Code	AUTO	
Start Bit	0	
Length	16	
Signal Reverse	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Scaling Type	No Scale	
Scaling factor 1	0	
Scaling factor 2	0	
Log Data	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Data Log Dead Band	3	%
Write Action Log	<input checked="" type="radio"/> Yes <input type="radio"/> No	
Read Only	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Keep Previous Value	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Initial Value	0	
Security area	0	
Security level	0	
Span high	100	
Span low	0	
Value Clamp	<input type="checkbox"/> Clamp to Span High <input type="checkbox"/> Clamp to Span Low <input type="checkbox"/> Clamp to Zero	
Output High Limit	100	
Output Low Limit	0	
Eng Unit		
Display digits(integer)	4	
Display digits(fraction)	2	
Log To ODBC Frequency	0	<input type="radio"/> Second <input checked="" type="radio"/> Minute
Analog Change Log	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Analog Change Log Dead Band	0	%
ODBC Log Data Source	Default	
Array Size	0	

[Cancel] Submit

After download and run the Node, you may receive the tag value if the device publishes to the WebAccess Broker.

## ADAM-3600 MQTT Client setup

9. Set up TagLink project for ADAM-3600, which is one MQTT client.



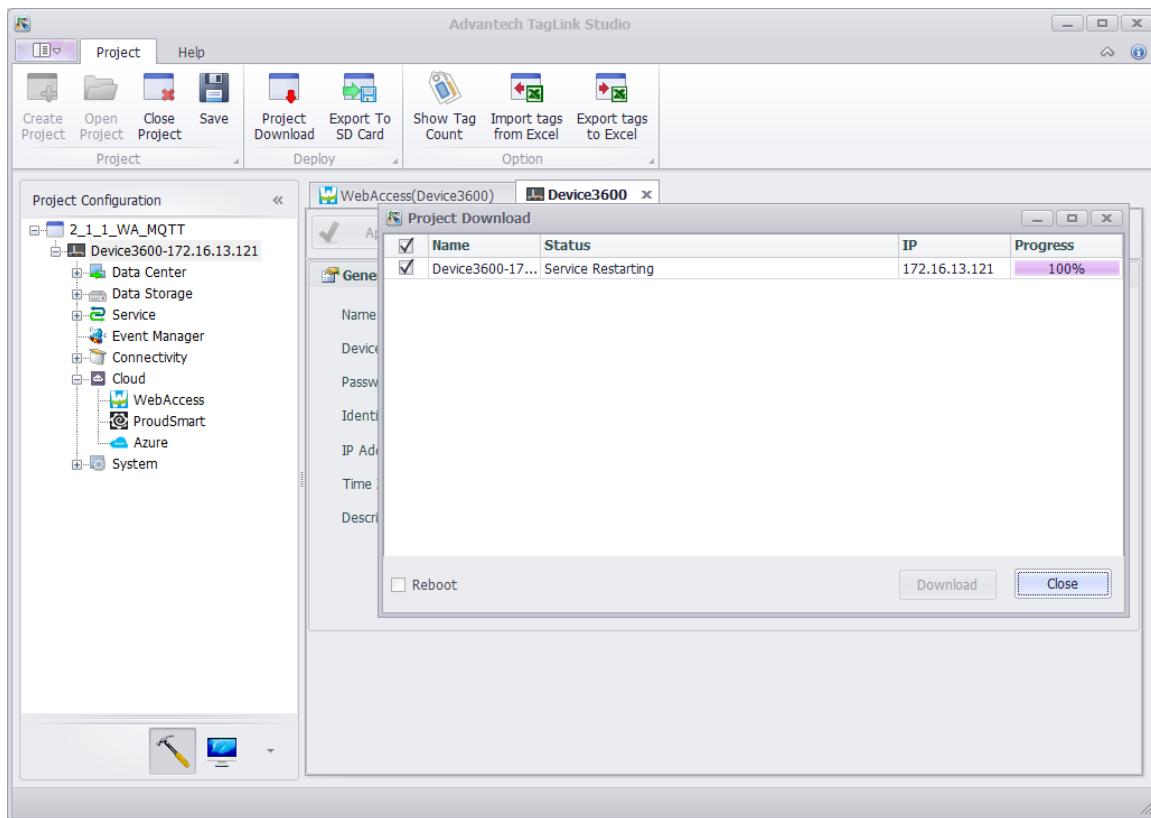
- 9.1 Choose “WebAccess” in the categories of cloud service.
- 9.2 In TagLink Cloud setting, enable WebAccess Cloud.
- 9.3 Leave it disabled as default if you don’t use SOCKS5 proxy server. If user wants to enable it, click the Enable selection box and click the “Edit” button to set the SOCKS server information in the pop-up box, including the server IP address, port number, user name and password information.
- 9.4 “host”: Fill the Broker’s IP or domain name.
- 9.5 “Port”: Set the port number the same as WebAccess Broker’s port.
- 9.6 Choose whether to enable SSL. Connection does not enable SSL secure connection by default. If click the Enable selection box to enable SSL, user can choose three authentication methods: Anonymous Connection, Server Authentication, and Mutual Authentication. You can leave it

unchecked as default if you don't need authentication. Use default Anonymous connection if the cloud and the client do not require certificate authentication.

- 9.7 Select the MQTT version number consistent with the cloud. For WebAccess 8.3 2017/12/15, which is MQTT 3.1.1 by default.
- 9.8 Fill in one Client ID following the spec of the broker. Randomly generated name is fine. MQTT 3.1.1 supports Anonymous Connection, so we can leave it empty as well.
- 9.9 “*Username*”: Fill in WebAccess Broker’s user name.
- 9.10 “*Password*”: Fill in WebAccess Broker’s password.
- 9.11 “*Keep Alive*”: The client sends heartbeat messages (PING) to the broker with this timeframe to keep the connection alive with the broker.
- 9.12 “*Timeout*”: The maximum interval in seconds for the client to establish connection with the broker. If the client has not received a response over time after sending a message to the broker, the client will interrupt the connection initiatively.
- 9.13 “*Periodic Publish*” is one option of uploading conditions. The client can choose to upload the tag’s information regularly.
- 9.14 “*Publish Period*”: Set up the interval to publish data. For demonstration, check Periodic Publish and set Publish Period as 3 seconds.
- 9.15 “*Diff Publish*” is another option of uploading conditions. The client can choose to upload information when the tag changes. It checks the Tag status (value, communication quality, and timestamp) every Detection Cycle. Two uploading conditions can be selected at the same time.
- 9.16 “*Group ID*”: The project name added bottom line with the node name in the WebAccess MQTT Client. (Ex. MyProject\_MySCADANode).
- 9.17 “*Device ID*”: Fill in the device name, which is the topic that WebAccess MQTT Client would subscribe in as “Device ID” in WebAccess device property. (Ex. Device3600).
- 9.18 “*Heart Beat Period*”: The interval of TagLink sends heart beat message to WebAccess MQTT Client.
- 9.19 “*Publish Ctrl*”: If enable “Publish Ctrl”, WebAccess Node can control TagLink device to publish or not by using “DON/DOF” command. When WebAccess Node starts, it will send DON to broker, then ADAM-3600 can subscribe it to start publishing. When WebAccess Node stops, it will send DOF to broker, then ADAM-3600 can subscribe it to stop publishing.
- 9.20 “*Timestamp*”: Choose the published message contains timestamp with UTC or local time.
- 9.21 You may create some tags for observation. In Cloud setting, add Tag by Double click the column and select the tag you created.

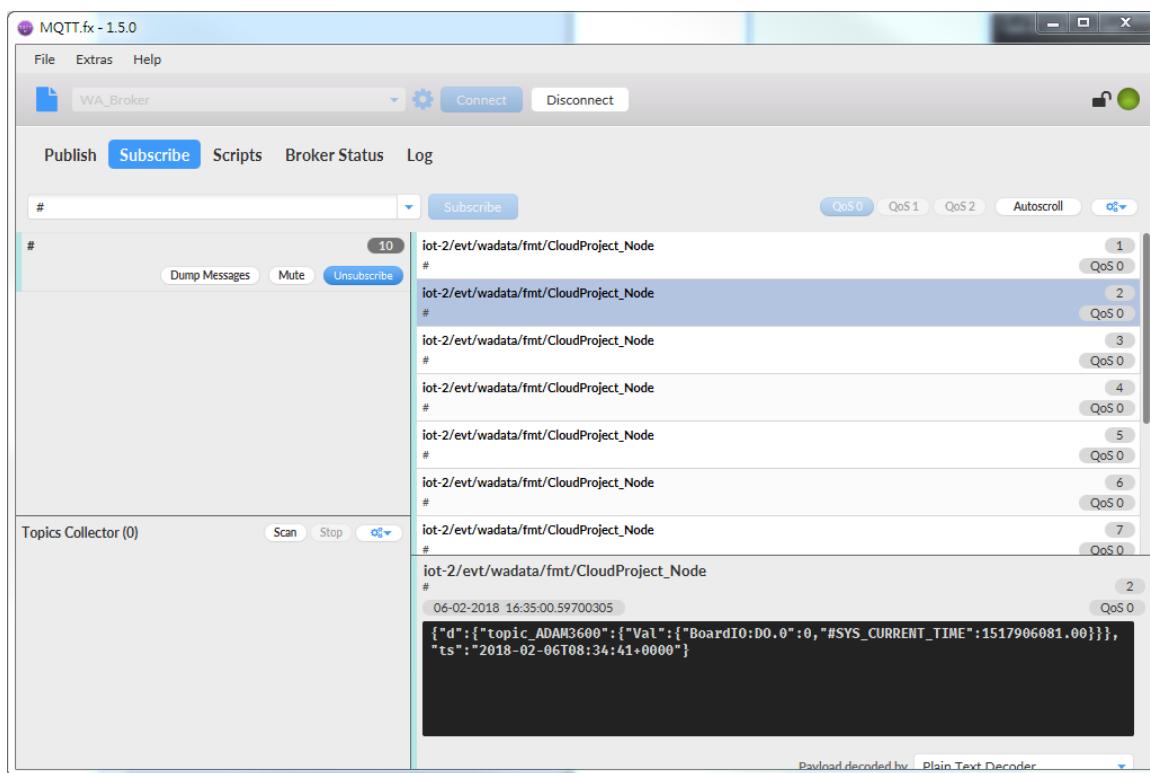
9.22 Click **Apply** for saving the setting.

10. Download the project to your ADAM-3600 device. After downloading, the MQTT service would restart automatically.

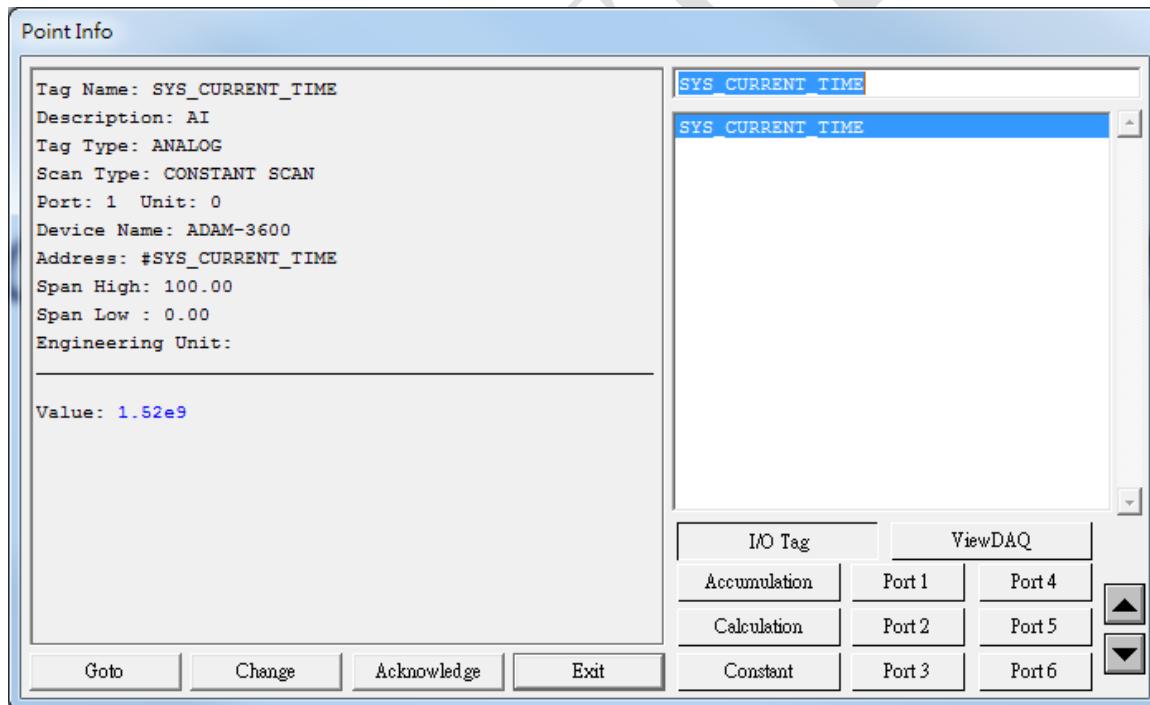


After finishing above settings, the ADAM-3600 MQTT Client may publish to WebAccess Broker, and you may monitor it on another WebAccess Node as MQTT Client.

You may also use other 3<sup>rd</sup> party MQTT client software (ex. MQTT-fx) to subscribe the WebAccess MQTT broker and check the published result of ADAM-3600.

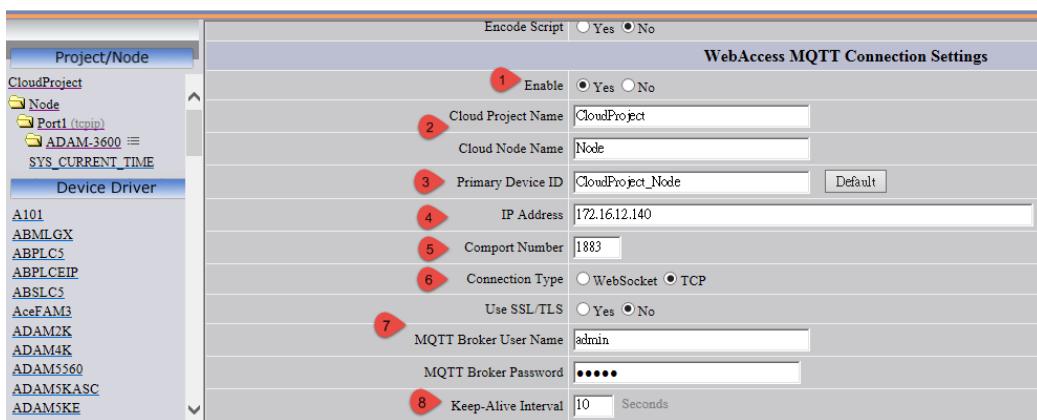


You may also view the upload result in ViewDAQ of WebAccess.



## WebAccess MQTT Client Setup (Upload messages to Broker)

11. In *Node Property*, set up WebAccess MQTT Connection Settings.

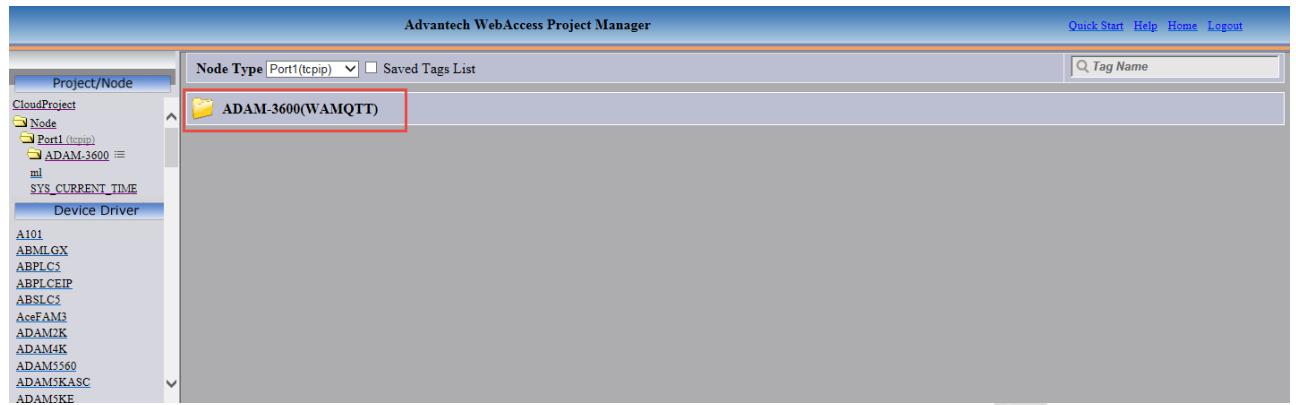


- 11.1 Enable MQTT Connection function by clicking “Yes” in “Enable.”
- 11.2 Set up the “Cloud Project Name” and “Cloud Node Name”. (Ex. CloudProject/ Node)
- 11.3 Set up the “Primary Device ID” by clicking Default button.
- 11.4 Fill in the “IP” (or domain name) of the server which would play as WebAccess Broker.
- 11.5 Fill in the “Comport Number” following the port number of broker.
- 11.6 If the WebAccess MQTT Client is installed in Windows 7, WebAccess 8.3.0 can only support TCP “Connection Type” in this period of time.
- 11.7 Follow MQTT Broker settings to set up “Use SSL/TLS”, “MQTT Broker User Name”, and “MQTT Broker Password.”
- 11.8 “Keep Alive” is defined as the maximum time interval in seconds that a cloud broker receives messages from a client and stay connection. The client will send heartbeat messages to the cloud in this timeframe. User may leave the default 10 seconds for setup.
- 11.9 Clicking “Submit” to finish the setup of Node Property.

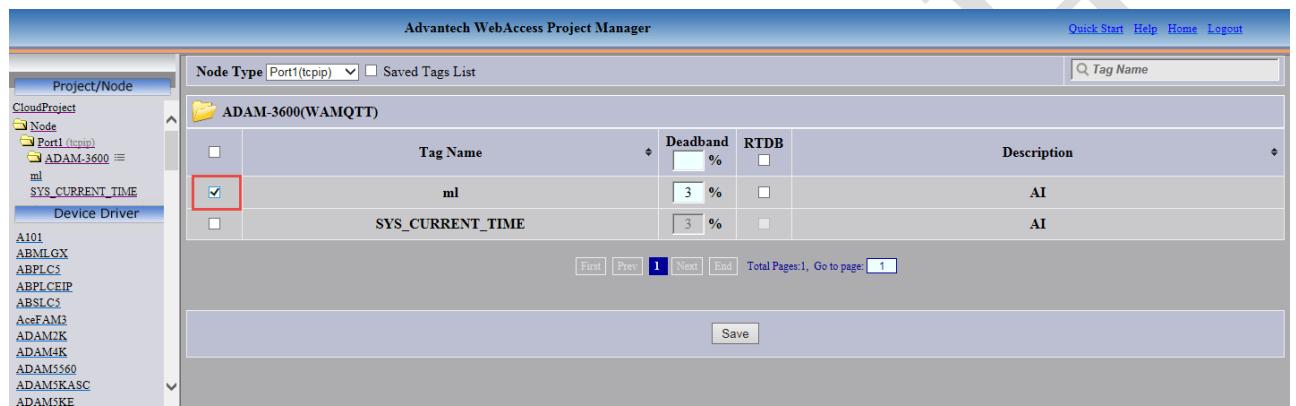
## 12. Select the tags that need to be uploaded to WebAccess MQTT Broker in the *WebAccess Cloud Whitelist*.

Node	Node Name	Node Description	SCADA Node IP Address	Primary TCP Port	Secondary TCP Port	Node Timeout	Remote Access Code	Outgoing Email (SMTP) Server	Email Port	Use SSL/TLS
CloudProject	Node		PC060607	4592	14592	0		PC060607	0	No
Port1 (tcpip)										
ADAM-3600										
ml										
SYS_CURRENT_TIME										

Click the directory of the device.

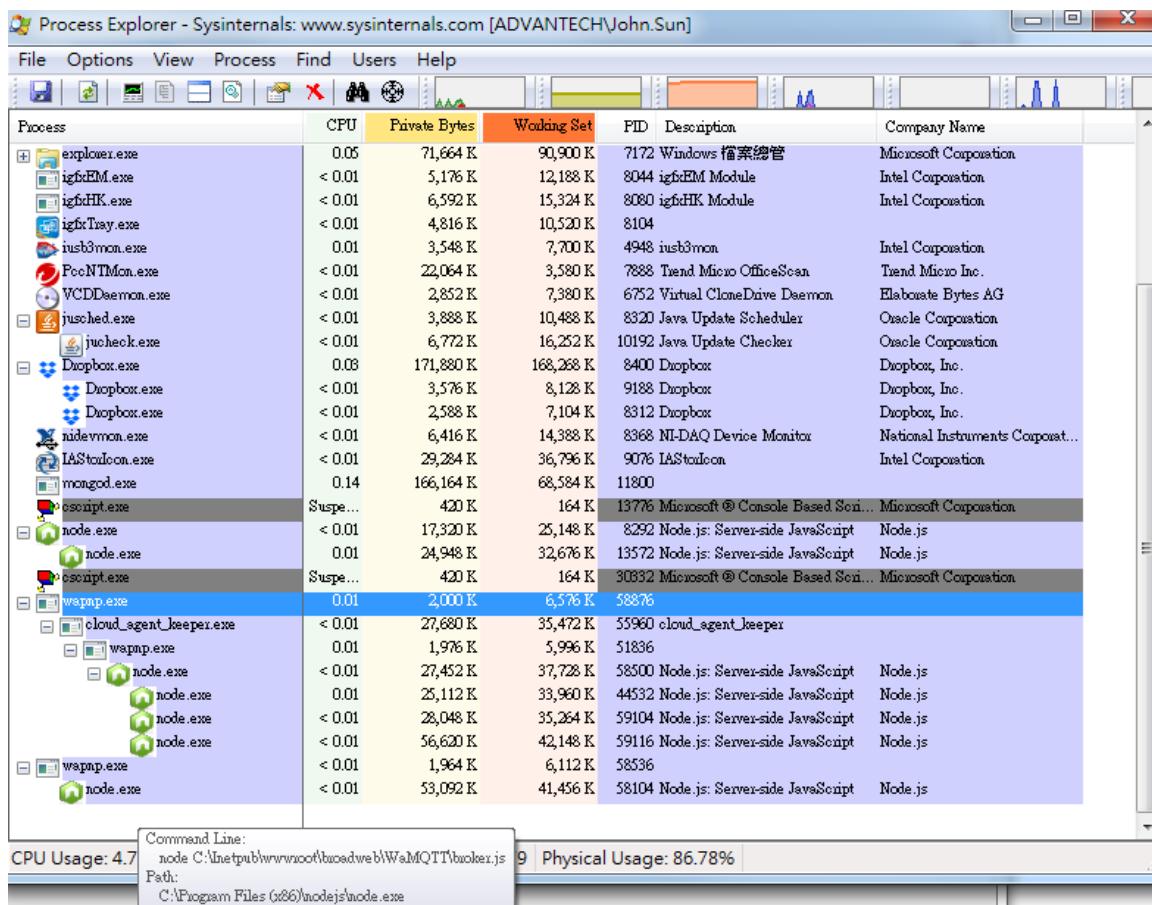


Enable the tag you want to upload.



### [Trouble shooting]

After enable WebAccess MQTT Broker, if you want to check whether Broker is starting or not, you may use tool such as “Process Explorer” to check the proecess of WaMQTT Broker.



If the MQTT Broker does not start successfully, `cloud_agent_keeper.exe` and related `node.exe` would not appear.

During installing WebAccess 8.3, Node.js 6.10.3 will be installed.

If you have installed higher version of Node.js (ex. Version 8.9.1) may be not compatible to WebAccess broker. You may need to remove Node.js version above 6.10.3 before installing WebAccess 8.3.

The method to check your installed Node.js is using command “`node -v`” in command line.

