

How to Build a Real-Time IoT Application with Moxa's ThingsPro and MQTT Broker

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About Moxa

Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things. With over 30 years of industry experience, Moxa has connected more than 50 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures. Information about Moxa’s solutions is available at www.moxa.com.

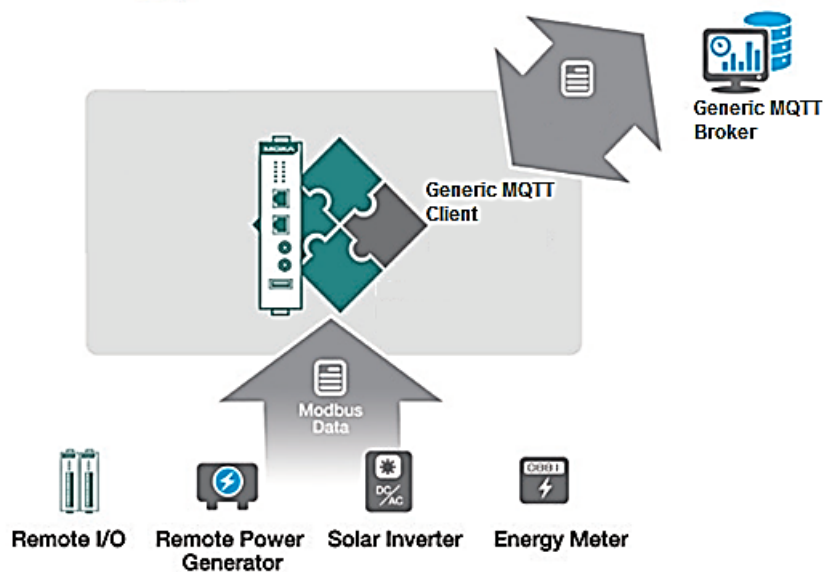
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1 Introduction

Moxa's ThingsPro™ 2 Suite simplifies the development of IoT applications and facilitates data acquisition as well as remote device management. ThingsPro provides Modbus communications, data acquisition, wireless networking, and device management, in a few simple steps, allowing users to focus on developing applications instead of complex system integration.



For users who develop data acquisition and asset management software programs on their own, ThingsPro provides the ability to transfer field data to a MQTT broker without requiring any additional programming on the gateway. ThingsPro 2.0 includes generic Modbus protocol and MQTT client support, which you can use to easily configure protocol data polling tables and MQTT broker connection settings. You can then upload the data collected to the MQTT broker in the back-end. In this article, we describe how to configure the Modbus device template in ThingsPro, retrieve data from ThingsPro, and upload the data to a remote HTTP server.

2 Application Scenario

Set up an environment to send real-time device data updates to the MQTT broker using ThingsPro 2.0. Here, ThingsPro is used as a Modbus data logger and the Generic MQTT client interface provided by ThingsPro is used to configure the connection to the MQTT broker.

3 Prerequisites

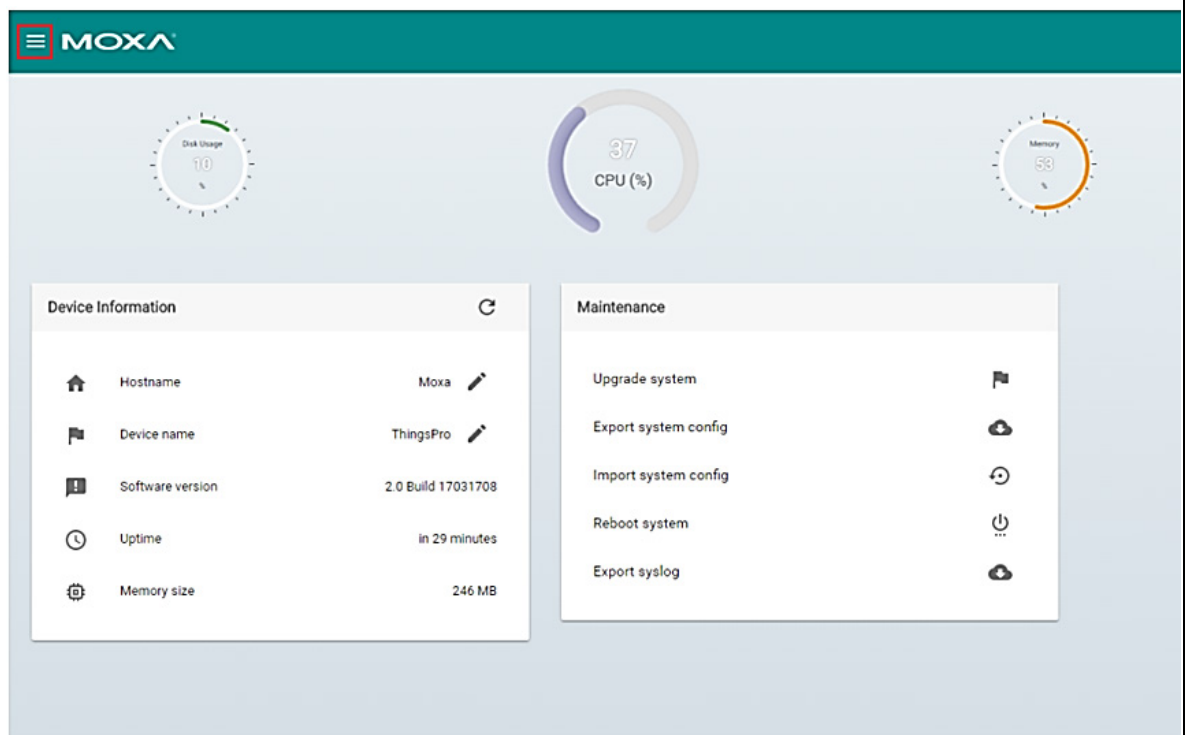
1. Moxa's UC-8112 Series gateway computer with Internet access, and ThingsPro 2 Gateway and SD card installed
For information about setting up a Moxa UC-8112 with ThingsPro, refer to the *ThingsPro Gateway Quick Installation Guide*.
2. PC/notebook with Chrome browser and [Microsoft Device Explorer](#) installed
3. Modbus device (e.g., Moxa's ioLogik-E2242)

4 Solution

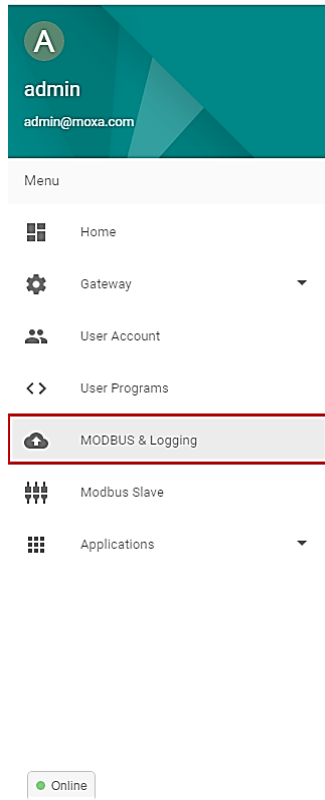
Complete the following steps to create your IoT application using ThingsPro and a MQTT broker:

1. Choose an equipment template.

- a. In the ThingsPro Gateway web page, click  (Menu).



- b. In the ThingsPro Gateway menu, click on the **Modbus & Logging** link.



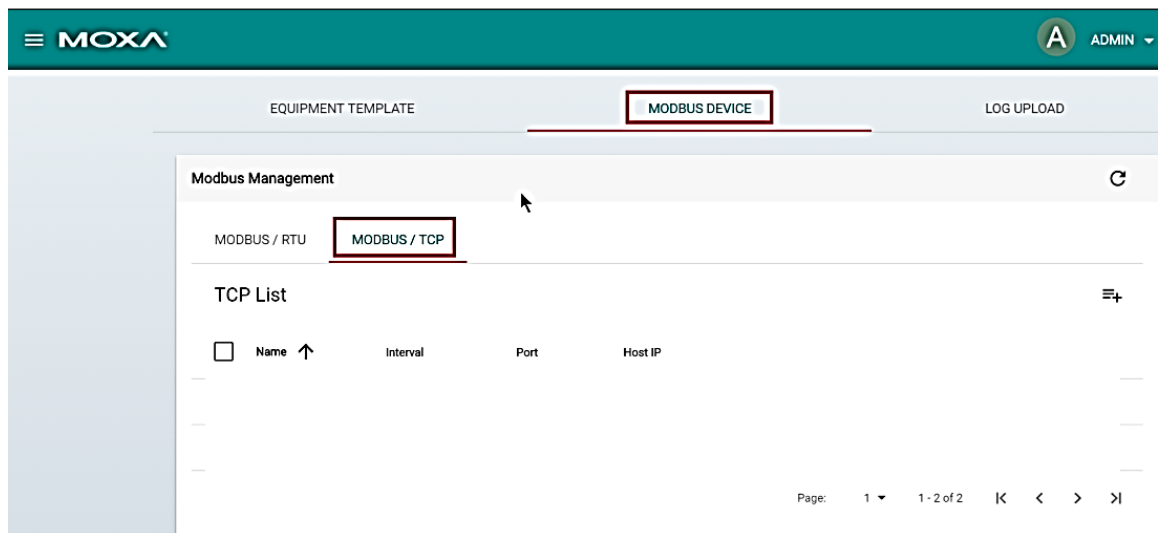
- c. Open the **EQUIPMENT TEMPLATE** tab
- d. Browse through the **Template List** to locate the template corresponding to the Modbus device or create a new template.
For details on creating a new template, refer to the *ThingsPro Software Suite User's Manual*.

<input type="checkbox"/>	Name ↑	Tag Count	Template Action	Tag Action
<input type="checkbox"/>	ioLogik-E1210	16		
<input type="checkbox"/>	ioLogik-E1211	31		
<input type="checkbox"/>	ioLogik-E1212	32		
<input type="checkbox"/>	ioLogik-E1213	28		
<input type="checkbox"/>	ioLogik-E1214	18		
<input type="checkbox"/>	ioLogik-E1240	8		
<input type="checkbox"/>	ioLogik-E1241	8		
<input type="checkbox"/>	ioLogik-E1242	20		
<input type="checkbox"/>	ioLogik-E1260	6		

In this example, we use the Modbus device **E2242**, which is already listed in the **Template List**.

2. Create an instance of the Modbus device.


- a. Open the **MODBUS DEVICE** tab.
- b. Configure the Modbus device with a communication interface (serial or Ethernet).
Because the connected device (E2242) uses Modbus TCP protocol, click on the **MODBUS/TCP** tab.







- i. Click (Add TCP interface).

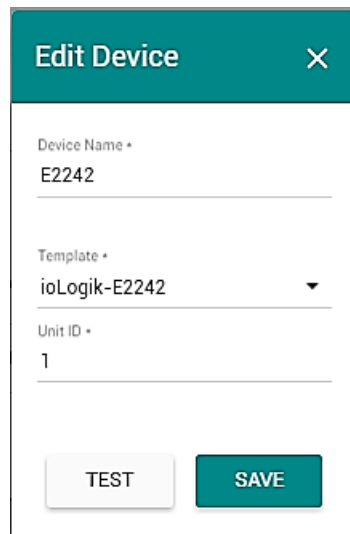
- ii. Fill in the TCP interface settings and click **SAVE**.

The Modbus/TCP interface for E2242 is added to the **TCP List**.

- iii. Click on the  (Add connected device) button corresponding to E2242 to add a connected device.

<input type="checkbox"/>	Name ↑	Interval	Port	Host IP	
<input type="checkbox"/>	E2242	1 sec	502	192.168.4.123	   

- iv. Fill in the **Device Name**.
- v. Select a **Template** to combine the Modbus/TCP interface with the Modbus device.
- vi. Specify the **Unit ID** for the device and click **SAVE**.



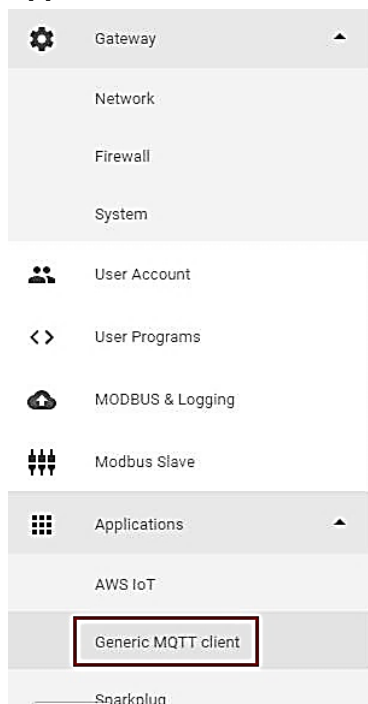
ThingsPro will now start continuously polling data from the device.

To check the status, click  (Show connected devices).


If the **Request Status** is green, ThingsPro is able to send requests to the Modbus device and receive data.

3. Use a MQTT broker for real-time data update.

- a. In the ThingsPro Gateway menu, click on the **Generic MQTT client** link in the **Applications** section.



b. Fill in the MQTT broker details.

Generic MQTT Client 

Enable

Update on change

Target Host *

Port *

1883

Keepalive (sec.)

60

User Name

Password (include no., alphabet and >5 characters)

Topic *

00:90:e8:57:c0:fd

QoS

0

Client ID

00:90:e8:57:c0:fd

Retain

Clean Session

More Options

Enable TLS

SAVE

c. Select the **Enable** option to enable the MQTT client.

d. Click **SAVE**.

The MQTT client interface will use the information provided to create a connection with the MQTT broker. Once the connection is established, the client will upload data to the MQTT broker in real time.