



### **MQTT - Gateway**

(Order Code: AT-MQTT Gateway)

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#### **Benefits and Main Features:**

Very easy to configure

Power Supply 5V DC and 2A

Temperature range: -40°C/+85°C (-40°F/+185°F)

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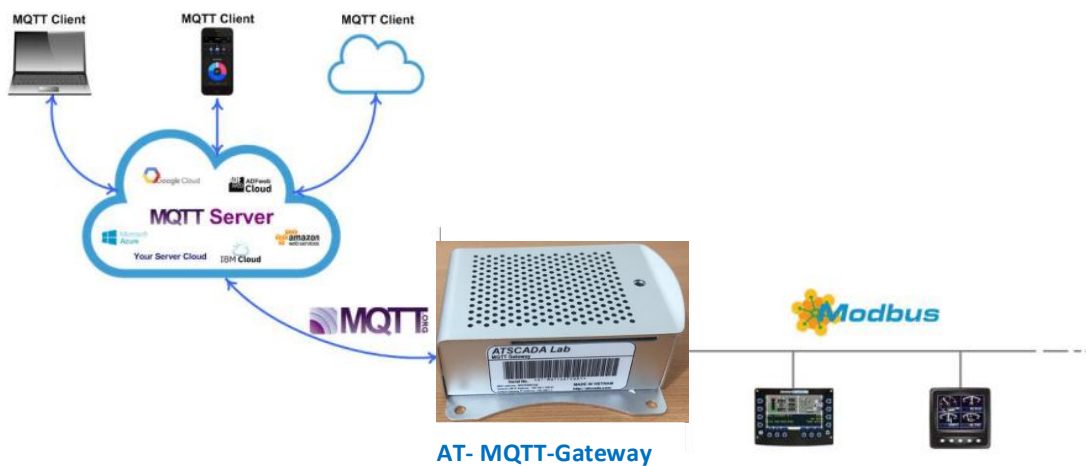
## INTRODUCTION

The **AT-MQTT Gateway** is Modbus RTU master to MQTT Converter.

It allows to publish the data read from Modbus Slaves into MQTT Server.

The gateway allows fast and easy access to IoT world and is compatible with IoT Servers that support MQTT protocol.

Example of connection:



## CONFIGURATION

### Prerequisites

Before configuring communication parameters via Web Interface, you need to connect the gateway to internet network by wire or Wi-Fi connection. For changing IP of the gateway, kindly search on <http://atscada.com> “how to change raspberry IP”.

### Gateway configuration

You need to access to web Interface (the server runs on your gateway) in order to perform the following:

- Define the parameter of MQTT.
- Define the parameter of Modbus RTU channel.
- Define which Modbus memory addresses sent to MQTT server
- Change your account and password.
- Reboot the gateway to update your configuration.

**Step 1:** Access Web interface with url: “IP:9000”, if you use default LAN IP, the url is “192.168.1.100:9000”.

# LOGIN

<b>User</b>	<b>admin</b>
<b>Password</b>	•••••

LOGIN

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You are prompted to enter username and password. The default user name is “admin”, the default password is “admin”. Then click Login button and you will be logged into web interface:

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SOLUTIONS OF MANAGEMENT SYSTEMSMODBUS RTU TO MQTTLog out

ModbusRTUCommunication	MQTTCommunication	Tags	Account
Port Name	<input type="text" value="/dev/ttyUSB0"/>		
Baud Rate	<input type="text" value="9600"/>		
Databits	<input type="text" value="8"/>		
Parity	<input type="text" value="None"/>		
Stopbits	<input type="text" value="1"/>		
ResponseTimeout (ms)	<input type="text" value="3000"/>		
Period (ms)	<input type="text" value="1000"/>		
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>			

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The page is divided in different sections in order to define the different parameters of the gateway:

- ModbusRTUCommunication
- MQTTCommunication
- Tags
- Account

*Step 2:* Define the parameter of Modbus channel.

ModbusRTUCommunication	MQTTCommunication	Tags	Account
<b>Port Name</b>	<input type="text" value="/dev/ttyUSB0"/>		
<b>Baud Rate</b>	<input type="text" value="9600"/>		
<b>Databits</b>	<input type="text" value="8"/>		
<b>Parity</b>	<input type="text" value="None"/>		
<b>Stopbits</b>	<input type="text" value="1"/>		
<b>ResponseTimeout (ms)</b>	<input type="text" value="3000"/>		
<b>Period (ms)</b>	<input type="text" value="1000"/>		
	<input type="button" value="Apply"/>		<input type="button" value="Cancel"/>

- ❖ “Port Name”: the port name to use (/dev/tty/USB0)
- ❖ “Baud Rate”: the baud rate of the serial line.
- ❖ “Databits”: the data bits of the serial line.
- ❖ “Parity”: the parity of the serial line.
- ❖ “Stopbits”: the stop bits of the serial line.
- ❖ “Response Timeout”: the time out of the serial line.
- ❖ “Period”: the period is the Cycle of Modbus master-slave query-response.

Click “Apply” to update your configuration.

*Step 3:* Define the parameter of MQTT

ModbusRTUCommunication	<b>MQTTCommunication</b>	Tags	Account
<b>MqttClient ID</b>	<input type="text" value="B827EB087532"/>		
<b>Server Url</b>	<input type="text" value="103.48.195.37"/>		
<b>Server Port</b>	<input type="text" value="1883"/>		
<b>Username</b>	<input type="text" value="USER"/>		
<b>Password</b>	<input type="text" value="PASS"/>		
<b>Cleansession</b>	<input type="text" value="True"/>		
<b>Keep Alive (Seconds)</b>	<input type="text" value="20"/>		
<b>Retain</b>	<input type="text" value="True"/>		
<b>QoS</b>	<input type="text" value="2"/>		
	<input type="button" value="Apply"/>	<input type="button" value="Cancel"/>	

The section is used to define the main parameters of MQTT. Meaning of each row:

- ❖ “MqttClient ID”: Mac address of your gateway and cannot be changed.
- ❖ “Server Url”: Url or the IP Address of the defined MQTT server.
- ❖ “Server Port”: the port used for defined MQTT communication.
- ❖ “Username”: the username for the connection to MQTT server.
- ❖ “Password”: the password for the connection to the MQTT server.
- ❖ “Clean Section”: if set to “True”, the last MQTT message is deleted by the server and the client in case of missing ACK. If it is set to “false”, the Server and the client hold the last MQTT messages and , in case of incorrect disconnection or missing ACK, they try to send again since all the ACK messages are exchanged correctly (valid only for QoS 1 and QoS 2).
- ❖ “Keep Alive”: the delay which the keep alive message is sent on MQTT.

- ❖ “Retained”: if set to “true”, the retained flag is enabled. The MQTT server will hold the last topic published.
- ❖ “QoS”: the QoS level.

Click “Apply” to update your configuration.

**Step 4:** Define which Modbus memory addresses are sent to MQTT server

ModbusRTUCommunication	MQTTCommunication	Tags	Account																				
<table border="1"> <thead> <tr> <th>Tagname</th> <th>Slave Id</th> <th>Type</th> <th>Address</th> <th>Number Point</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>Holding Register ▾</td> <td></td> <td></td> <td>Add</td> </tr> </tbody> </table>				Tagname	Slave Id	Type	Address	Number Point				Holding Register ▾			Add								
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<table border="1"> <thead> <tr> <th>Tag Name</th> <th>Slave Id</th> <th>Type</th> <th>Address</th> <th>Number Point</th> <th></th> </tr> </thead> <tbody> <tr> <td>t1</td> <td>1</td> <td>Holding Register</td> <td>0</td> <td>2</td> <td>Edit Delete</td> </tr> <tr> <td>t2</td> <td>5</td> <td>Holding Register</td> <td>0</td> <td>2</td> <td>Edit Delete</td> </tr> </tbody> </table>						Tag Name	Slave Id	Type	Address	Number Point		t1	1	Holding Register	0	2	Edit Delete	t2	5	Holding Register	0	2	Edit Delete
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t2	5	Holding Register	0	2	Edit Delete																		

Meaning of each field:

- ❖ “Tag Name”: the name of tag. This name must be unique.
- ❖ “Slave Id”: the address of the Modbus device.
- ❖ “Type”: the data type of the Tag. It is possible to choose between the following :
  - Coil Status
  - Input Status
  - Holding Register
  - Input Register
- ❖ “Address”: the starting address of the Tag.
- ❖ “Number Point”: the number of consecutive points.

Click “Add” to create new tag.

Click “Edit” to redefine tag.

Click “Delete” to delete tag.

**Step 5:** After completely configure the Gateway, Log out of Web Interface and Reboot your Gateway.



Subscribe and publish the MQTT topic associate with each Tag.

Each Tag is sent by gateway to MQTT server by publishing to a MQTT topic. These topics have name in format: Mac address/slave Id/Tag Name.

For writing value to each Tag, gateway subscribes to a MQTT topic. These topics have name in the format: Write/Mac address/slave Id/Tag Name.

For Example: A gateway has Mac address is “B827EB087532”. If you define a Tag named “Tag 1” and your Modbus Slave ID is “1”, The value of Tag is published to topic name : “B827EB087532/1/Tag1 “ and subscribed to topic name: “Write/ B827EB087532/1/Tag1”.

Data Format is in byte array: timestamp (8 byte), Value of Tag, Status (1 byte). The Status byte means: 1 is for good connection, 0 is for bad connection.

Other MQTT clients read data of Tag by subscribing to the topic that gateway has published to MQTT server.

Other MQTT clients write data to Tag by publishing value to Topic that gateway has subscribed. The Value is written to Tag must be the same type with type of Tag.

## Change your Web Interface Account

ModbusRTUCommunication	MQTTCommunication	Tags	Account
Current User	<input type="text"/>		
Current Password	<input type="text"/>		
New User	<input type="text"/>		
New Password	<input type="text"/>		
Re-Type New Password	<input type="text"/>		
	<input type="button" value="Update Account"/>	<input type="button" value="Cancel"/>	

The default User name is “admin” and the default Password is “admin”. After logging in to Web interface you can change your user name and password then click “Update Account” to update your account.