

# ETIC Telecom

## Configuration for EcoStruxure Machine Advisor Communication Application Note

(Original Document)

01/2019

E100000003806.00

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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# Safety Information

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## Important Information

### NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

## **DANGER**

**DANGER** indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

## **WARNING**

**WARNING** indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

## **CAUTION**

**CAUTION** indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

## **NOTICE**

**NOTICE** is used to address practices not related to physical injury.

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## PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

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# About the Book

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## At a Glance

### Document Scope

This document describes:

- the configuration settings for communication between the controller and the ETIC Telecom via Modbus TCP.
- the configuration settings for communication between the ETIC Telecom and EcoStruxure Machine Advisor by using MQTT protocol.

### Validity Note

This document is valid for EcoStruxure™ Machine Advisor V.20180322.10.

### Product Related Information

## WARNING

### LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines.<sup>1</sup>
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

<sup>1</sup> For additional information, refer to NEMA ICS 1.1 (latest edition), "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition), "Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems" or their equivalent governing your particular location.

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Internet access allows you to monitor a controller and its application remotely, and possibly to perform various maintenance activities including modifications to data and configuration parameters, and change the state of the controller. Care must be taken to ensure that the immediate physical environment of the machine and process is in a state that will not present safety risks to people or property before exercising control remotely.

 **WARNING**

**UNINTENDED EQUIPMENT OPERATION**

- Immediately replace any default passwords by defining secure passwords, and do not allow unauthorized or otherwise unqualified personnel to use any features of the equipment and software described in the present document.
- Ensure that there is a local, competent, and qualified observer present when operating on the controller from a remote location.
- You must have a complete understanding of the application and the machine/process it is controlling before attempting to adjust data, stopping an application that is operating, or starting the controller remotely.
- Take the precautions necessary to assure that you are operating on the intended controller by having clear, identifying documentation within the controller application and its remote connection.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

**NOTE:** Schneider Electric adheres to industry best practices in the development and implementation of control systems. This includes a "Defense-in-Depth" approach to secure an Industrial Control System. This approach places the controllers behind one or more firewalls to restrict access to authorized personnel and protocols only.

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## WARNING

### UNAUTHENTICATED ACCESS AND SUBSEQUENT UNAUTHORIZED MACHINE OPERATION

- Evaluate whether your environment or your machines are connected to your critical infrastructure and, if so, take appropriate steps in terms of prevention, based on Defense-in-Depth, before connecting the automation system to any network.
- Limit the number of devices connected to a network to the minimum necessary.
- Isolate your industrial network from other networks inside your company.
- Protect any network against unintended access by using firewalls, VPN, or other, proven security measures.
- Monitor activities within your systems.
- Prevent subject devices from direct access or direct link by unauthorized parties or unauthenticated actions.
- Prepare a recovery plan including backup of your system and process information.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

### Important Information

The information provided in the present Application Note is offered as a general guideline for the implementation of third-party technologies into Schneider Electric systems, and shall not be regarded as any description of warranty of certain functionalities, merchantability, fitness for particular purposes or conditions, or quality of the technologies involved.

The present Application Note is provided for you to consult on an "as is" basis and at your own risk.

You must verify any functionality described herein in your application. Schneider Electric assumes no liability of any kind (including without limitation warranties of non-infringement of intellectual property rights of any third party) with respect to any and all information provided in the present document.

## WARNING

### UNINTENDED EQUIPMENT OPERATION

Do not include the code from any templates or examples in your machine or process and put into service without thoroughly testing your entire application.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**



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## General Information

### Overview

The ETIC Telecom connects an automation network to a cloud-based application such as EcoStruxure Machine Advisor. It is a device that pulls data from the automation network with Modbus TCP and pushes it to the EcoStruxure Machine Advisor with MQTTs.

To create an EcoStruxure Machine Advisor account, refer to the EcoStruxure Machine Advisor website <https://machine-advisor.schneider-electric.com/welcome>.

For information on creating a machine, refer to the FAQ section of the EcoStruxure Machine Advisor.



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## Components

Hardware:

- Controllers or other equipment that support the communication protocol Modbus TCP:  
PacDrive LMC Pro/Pro2 / PacDrive LMC Eco / Modicon M2•• Logic Controllers
- ETIC Telecom: RAS or IPL family with alert and display option

**NOTE:** The EcoStruxure Machine Advisor requires to change the gateway password periodically. To update the password remotely, it is possible to add the M2Me option to your ETIC Telecom RAS or IPL family.

Software:

- EcoStruxure Machine Advisor
- Web browser: Google Chrome or Firefox

## Configuring ETIC Telecom

### Overview

This chapter describes the steps required for configuring the ETIC Telecom gateway.

### Installation of the ETIC Telecom

Proceed as follows to install the ETIC Telecom RAS or IPL. For further information, refer to the documentation shipped with the ETIC Telecom.

Step	Action
1	Connect the power supply module to one of the two connectors following the voltage specified on the RAS/IPL.
2	Install the RAS/IPL onto a DIN rail.
3	Wait about 1 minute until the LED on the front of the RAS/IPL illuminates steady green. <b>Result:</b> The RAS/IPL is ready to work.

### Setting Up the Connection Between the ETIC Telecom and Your PC

A connection between the ETIC Telecom and your PC is a prerequisite for connecting to the web configuration environment.

The following components are required:

- A PC with a web browser (such as Google Chrome, Internet Explorer, Firefox) and an Ethernet port.
- An Ethernet cable to connect the PC with the ETIC Telecom.

**NOTE:** The following procedure describes the login procedure using default user credentials (**User** name and **Password**). To help to protect the web configuration environment against unintended access, change the default credentials after first login.

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Proceed as follows:

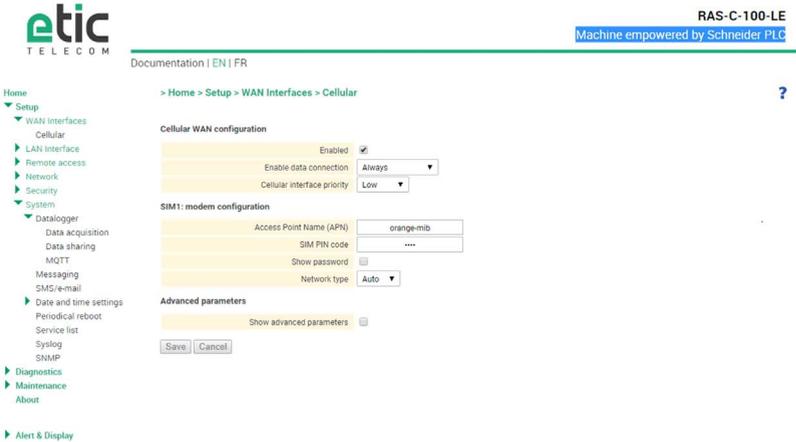
Step	Action
1	Connect the Ethernet cable to the PC and the ETIC Telecom.
2	Assign a fixed IP address of the format 192.168.0.XXX to the PC that corresponds to the default IP address of the ETIC Telecom: 192.168.0.128.
3	Open a web browser and type the address <code>http://192.168.0.128:8080/</code> in the address bar.
4	To connect to the web configuration environment, login as: <ul style="list-style-type: none"><li>● <b>User:</b> admin</li><li>● <b>Password:</b> admin</li></ul>
5	Set your administrator password after first login.
6	Go to the ETIC Telecom website and activate your account to use the <b>Alert&amp;Display</b> option.

**NOTE:** The IP 192.168.0.128 and the factory configuration are temporarily recovered by pressing for 5 s the push button on the back of the RAS. Press again the push button to return to the running configuration.

## Configuring WAN Settings

### Configuring WAN Settings

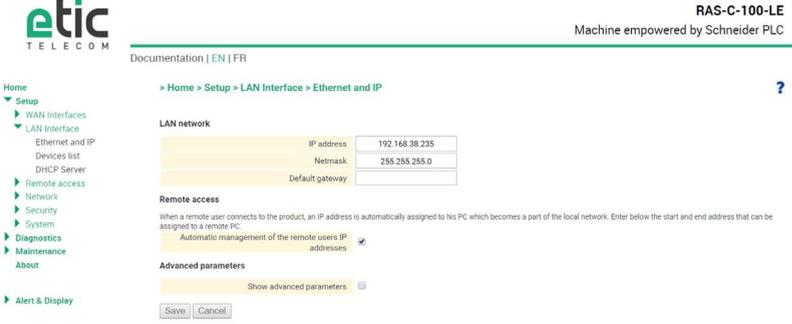
Entering the APN code given by your Internet service provider allows access to Internet and thus to the cloud based EcoStruxure Machine Advisor platform.

Step	Action
1	<p>In the ETIC Telecom web configuration environment, select <b>Home</b> → <b>Setup</b> → <b>WAN Interface</b> → <b>Cellular</b> and configure the WAN settings as indicated in the figure:</p>  <ul style="list-style-type: none"><li>● Select the option <b>Enabled WAN</b>.</li><li>● In the box <b>APN</b>, insert the information provided by your SIM card manufacturer.</li><li>● In the <b>SIM PIN code</b> box, enter the pin code of your SIM card.</li></ul>
2	<p>Click the <b>SAVE</b> button.</p>

## Configuring LAN Network

### Configuring LAN Network

The ETIC Telecom device and Schneider Electric machines are in the same machine network. The LAN configuration (IP address and Netmask) is done as described:

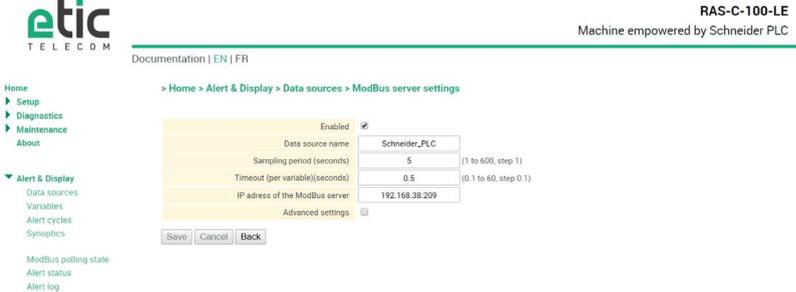
Step	Action
1	<p>In the ETIC Telecom web configuration environment, select <b>Home</b> → <b>Setup</b> → <b>LAN Interface</b> → <b>Ethernet and IP</b>.</p>  <ul style="list-style-type: none"><li>● In the <b>IP address</b> box, enter the IP address.</li><li>● In the <b>Netmask</b> box, enter the netmask value.</li></ul>
2	Click the <b>SAVE</b> button.

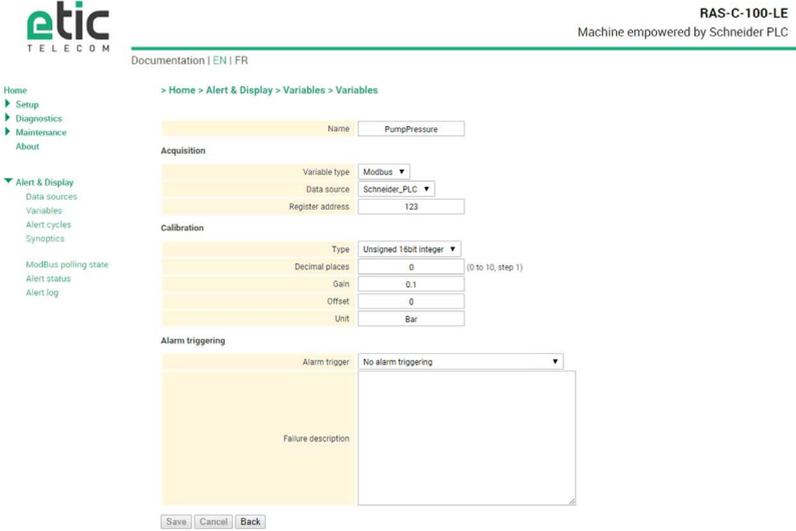
## Data Collection

### Data Collection

The ETIC Telecom device collects data from the PLC by using the Modbus protocol.

The data source must be configured as follows:

Step	Action
1	<p>In the ETIC Telecom web configuration environment, select <b>Home</b> → <b>Alert &amp; Display</b> → <b>Data Sources</b> → <b>ModBus server settings</b> → <b>Add</b>.</p>  <ul style="list-style-type: none"><li>● Enter all necessary values.</li></ul>
2	Click the <b>Save</b> button.

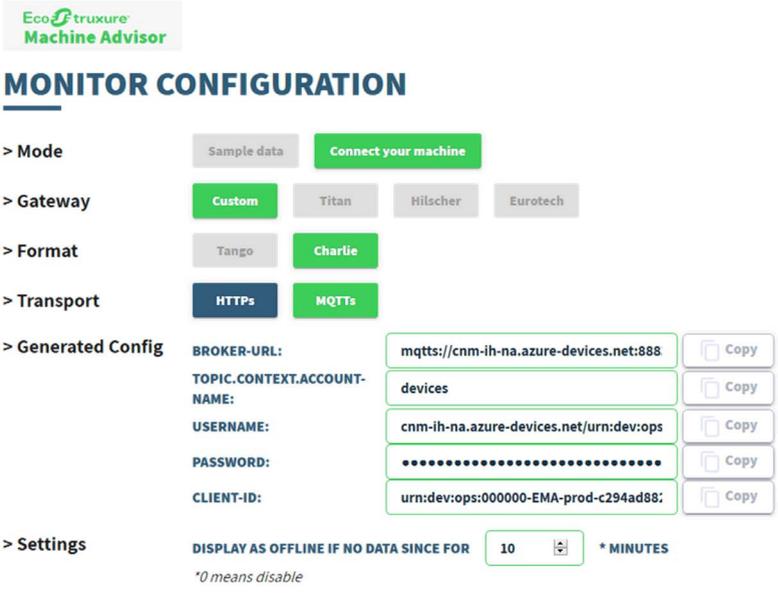
Step	Action
3	<p>To map your data select <b>Home → Alert &amp; Display → Variables → Variables</b>.</p>  <p>● Enter the necessary values.</p> <p><b>NOTE:</b> The variable is sent to the EcoStruxure Machine Advisor after the internal processing. For instance, the raw value of an unsigned 16-bit integer is sent to the EcoStruxure Machine Advisor after being processed with gain and offset.</p> <p><b>NOTE:</b> As EcoStruxure Machine Advisor expects numerical values, values like FALSE or TRUE are rejected. When the type of your variable is bit, make sure to fill the field <b>Value when 0</b> with 0 and the field <b>Value when 1</b> with 1.</p>

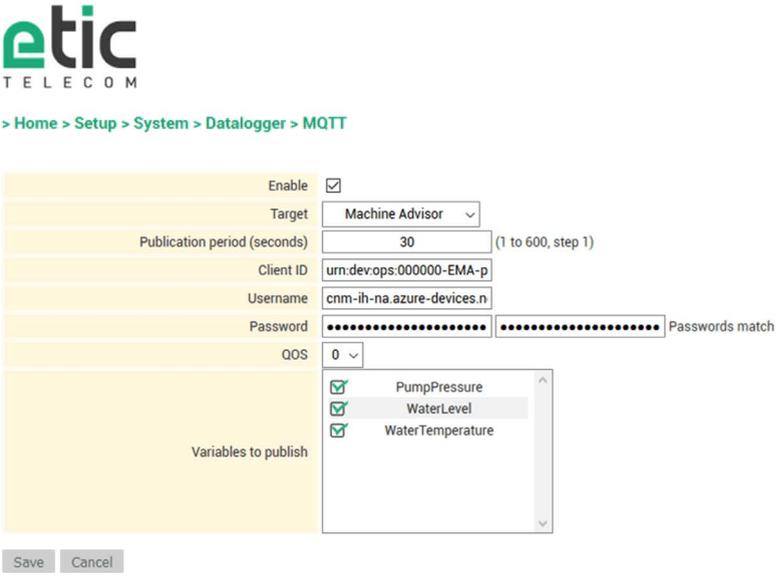
Step	Action
4	<p>Click the <b>Save</b> button.</p> <p><b>Result:</b> The variables are presented in the <b>Variables table</b> as follows:</p>

## Configuring the MQTT Client

### Configuring the MQTT Client

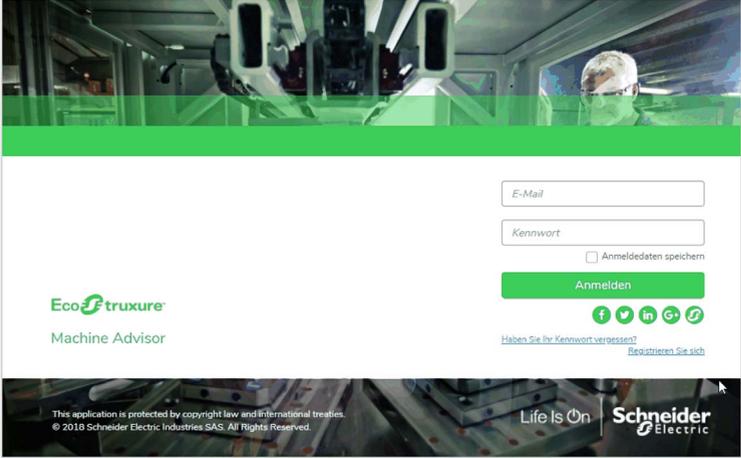
Step	Action
1	Log in to EcoStruxure Machine Advisor, and select the <b>MONITOR</b> tab to copy the monitor settings.

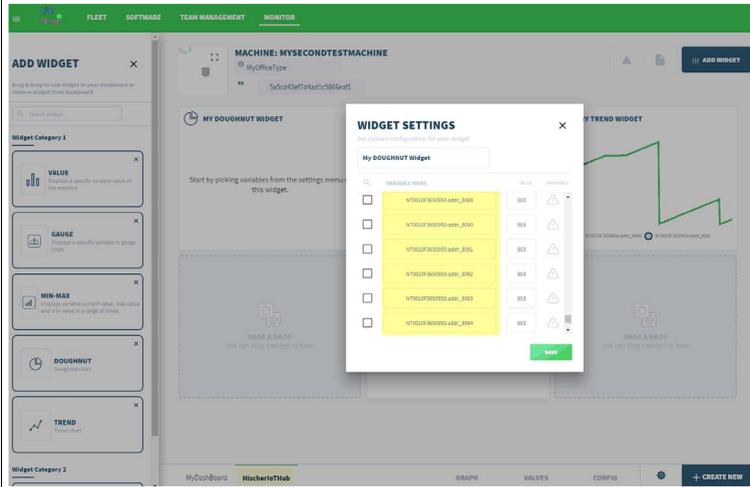
Step	Action															
2	<p>Select <b>Connect your machine</b> → <b>Custom</b> → <b>Charlie</b> → <b>MQTTs</b>:</p>  <p><b>MONITOR CONFIGURATION</b></p> <p>&gt; Mode: Sample data   <b>Connect your machine</b></p> <p>&gt; Gateway: <b>Custom</b>   Titan   Hilscher   Eurotech</p> <p>&gt; Format: Tango   <b>Charlie</b></p> <p>&gt; Transport: <b>HTTPs</b>   <b>MQTTs</b></p> <p>&gt; Generated Config</p> <table border="1"> <tr> <td>BROKER-URL:</td> <td>mqttps://cnm-ih-na.azure-devices.net:888</td> <td>Copy</td> </tr> <tr> <td>TOPIC.CONTEXT.ACCOUNT-NAME:</td> <td>devices</td> <td>Copy</td> </tr> <tr> <td>USERNAME:</td> <td>cnm-ih-na.azure-devices.net/urn:dev:ops</td> <td>Copy</td> </tr> <tr> <td>PASSWORD:</td> <td>.....</td> <td>Copy</td> </tr> <tr> <td>CLIENT-ID:</td> <td>urn:dev:ops:000000-EMA-prod-c294ad88:</td> <td>Copy</td> </tr> </table> <p>&gt; Settings</p> <p>DISPLAY AS OFFLINE IF NO DATA SINCE FOR: 10 <input type="text"/> * MINUTES</p> <p><i>*0 means disable</i></p> <ol style="list-style-type: none"> <li>1 Click the <b>Copy</b> button of the <b>USERNAME</b> field to copy the user name of the server and save it to a .txt file.</li> <li>2 Click the <b>Copy</b> button of the <b>PASSWORD</b> field to copy the password information and save it to a .txt file.</li> <li>3 Click the <b>Copy</b> button of the <b>CLIENT-ID</b> field to copy the client information and save it to a .txt file.</li> </ol>	BROKER-URL:	mqttps://cnm-ih-na.azure-devices.net:888	Copy	TOPIC.CONTEXT.ACCOUNT-NAME:	devices	Copy	USERNAME:	cnm-ih-na.azure-devices.net/urn:dev:ops	Copy	PASSWORD:	.....	Copy	CLIENT-ID:	urn:dev:ops:000000-EMA-prod-c294ad88:	Copy
BROKER-URL:	mqttps://cnm-ih-na.azure-devices.net:888	Copy														
TOPIC.CONTEXT.ACCOUNT-NAME:	devices	Copy														
USERNAME:	cnm-ih-na.azure-devices.net/urn:dev:ops	Copy														
PASSWORD:	.....	Copy														
CLIENT-ID:	urn:dev:ops:000000-EMA-prod-c294ad88:	Copy														
3	<p>In the ETIC Telecom web configuration environment, select <b>Home</b> → <b>Setup</b> → <b>System</b> → <b>Datalogger</b> → <b>MQTT</b>.</p>															

Step	Action
4	<p>In the <b>MQTT</b> screen, set up the communication settings by pasting the data copied in step 2 to the following boxes:</p>  <p>The screenshot shows the MQTT configuration interface with the following details:</p> <ul style="list-style-type: none"> <li><b>Enable:</b> <input checked="" type="checkbox"/></li> <li><b>Target:</b> Machine Advisor</li> <li><b>Publication period (seconds):</b> 30 (1 to 600, step 1)</li> <li><b>Client ID:</b> urn:dev:ops:000000-EMA-p</li> <li><b>Username:</b> cnm-ih-na.azure-devices.n</li> <li><b>Password:</b> [masked] [masked] Passwords match</li> <li><b>QoS:</b> 0</li> <li><b>Variables to publish:</b> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> PumpPressure</li> <li><input checked="" type="checkbox"/> WaterLevel</li> <li><input checked="" type="checkbox"/> WaterTemperature</li> </ul> </li> <li><b>Buttons:</b> Save, Cancel</li> </ul> <ol style="list-style-type: none"> <li>1. Select EcoStruxure Machine Advisor as <b>Target</b>.</li> <li>2. Enter a value for the <b>Publication period</b> (1..600 seconds).</li> <li>3. Paste the client information into the <b>Client ID</b> field.</li> <li>4. Paste the username information into the <b>Username</b> field.</li> <li>5. Paste the password into the <b>Password</b> field.</li> <li>6. Select all of the variables necessary for the application.</li> </ol>
5	Save the configuration by clicking the <b>Save</b> button.
6	Restart the ETIC Telecom for the modifications to become effective.

## Verifications in EcoStruxure Machine Advisor

### Retrieving Modbus Registers in EcoStruxure Machine Advisor

Step	Action									
1	<p>Enter <code>https://machine-advisor.schneider-electric.com/</code> in the address bar of your browser to open EcoStruxure Machine Advisor web site and log on.</p> 									
2	<p>Go to the <b>MONITOR</b> → <b>VALUES</b> page to display the Modbus registers which were configured in the Modbus TCP client settings.</p>  <table border="1" data-bbox="360 1036 1081 1141"> <tbody> <tr> <td>NT0010F3650950:addr_8089</td> <td>2018-02-14T16:22:36Z</td> <td>1003</td> </tr> <tr> <td>NT0010F3650950:addr_8090</td> <td>2018-02-14T16:22:36Z</td> <td>1003</td> </tr> <tr> <td>NT0010F3650950:addr_8099</td> <td>2018-02-14T16:22:36Z</td> <td>0</td> </tr> </tbody> </table>	NT0010F3650950:addr_8089	2018-02-14T16:22:36Z	1003	NT0010F3650950:addr_8090	2018-02-14T16:22:36Z	1003	NT0010F3650950:addr_8099	2018-02-14T16:22:36Z	0
NT0010F3650950:addr_8089	2018-02-14T16:22:36Z	1003								
NT0010F3650950:addr_8090	2018-02-14T16:22:36Z	1003								
NT0010F3650950:addr_8099	2018-02-14T16:22:36Z	0								

Step	Action														
3	<p>The Modbus registers can be connected to a Widget.</p>  <p>The screenshot displays the 'ADD WIDGET' screen in a monitoring application. On the left, there are options for widget categories and types: VALUE, GAUGE, MIN-MAX, DOUGHNUT, and TREND. The main area shows a 'MY DOUGHNUT WIDGET' configuration window. A 'WIDGET SETTINGS' dialog is open, showing a list of Modbus registers to be added to the widget. The registers listed are:</p> <table border="1"> <thead> <tr> <th>Register Address</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>17101LP30000000000000000000</td> <td>000</td> </tr> </tbody> </table> <p>The background shows a dashboard for 'MACHINE: MYSECONDESTMACHINE' with various widgets and a 'CREATE NEW' button at the bottom right.</p>	Register Address	Unit	17101LP30000000000000000000	000										
Register Address	Unit														
17101LP30000000000000000000	000														
17101LP30000000000000000000	000														
17101LP30000000000000000000	000														
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