ThingsPro Software User's Manual

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ThingsPro Software User's Manual

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Table of Contents

1

Introduction

This document explains the procedure to set up the ThingsPro software for the UC-8100 series and connect Modbus devices to the UC-8100-LX-CG. The current version ThingsPro V 1.1 supports the following hardware platforms in the UC-8100 series:

- UC-8112-LX-CG
- UC-8132-LX-CG

The ThingsPro gateway operations and the process of acquiring data from the Modbus devices connected to the gateway are discussed in detail in this user's guide, which is divided into the following sections:

Getting Started

Describes the basic steps to get you started on the ThingsPro Software.

Device Configuration

Describes how you can access a gateway using ThingsPro software and remotely configure devices that are connected to the gateway.

Modbus Management Framework

Describes how to create a Modbus device template in ThingsPro and connect to Modbus devices using this template. This section also describes the two different Modbus interfaces that you can configure for peripheral Modbus devices: Modbus/TCP and Modbus/RTU.

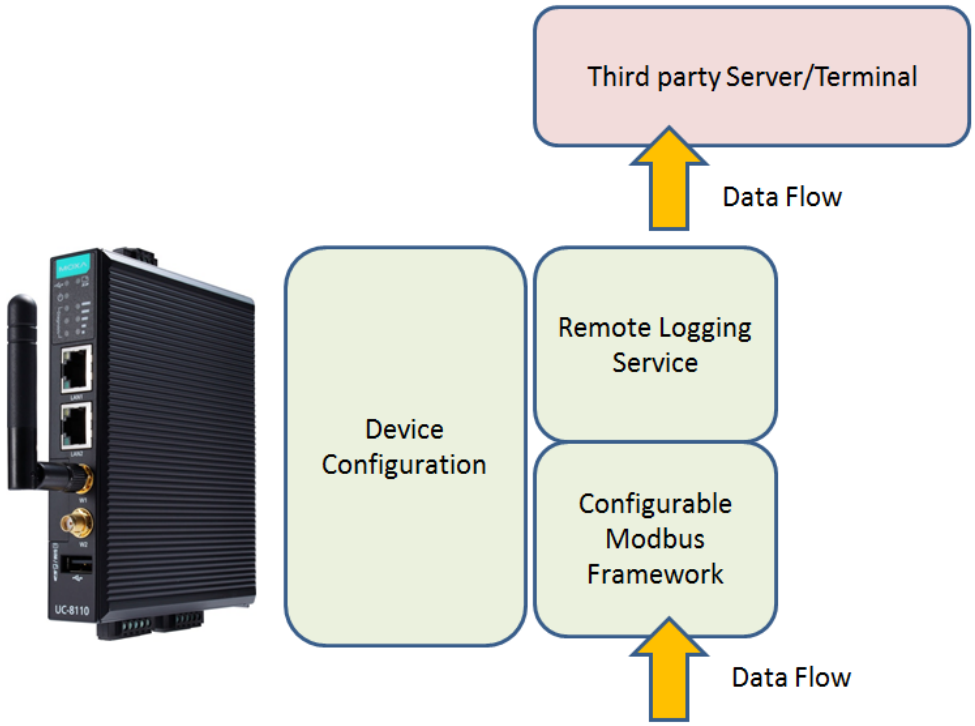
Remote Data Profile Service

After you have acquired data through the Ethernet, cellular, or serial ports and stored the data on the gateway, you can configure the *Remote Data Profile service* in ThingsPro to automatically send data from the gateway to a remote server or terminal that you specify.

Wireless Manager Relay Settings

If you have selected the Wireless Manager mode for your UC-8100-LX-CG, this chapter provides you information on how to configure the relay settings for the Wireless Manager.

The following system diagram shows an overview of the ThingsPro gateway platform:



ThingsPro gateway platform provides the framework to easily poll data from Modbus devices. The data is packed into files that are stored on the gateway in XML, CSV, or JSON format. The data files can then be transmitted from the gateway to a server that you specify based on a schedule that you can define.

2

Getting Started

This chapter describes the basic configuration steps to get you started on the ThingsPro software.

The following topics are covered in this chapter:

- **Accessing the Gateway**
- **Editing User profiles**
- **Setting the Host Name**

Accessing the Gateway

You can log in to a gateway using the web interface provided by ThingsPro.

IMPORTANT!

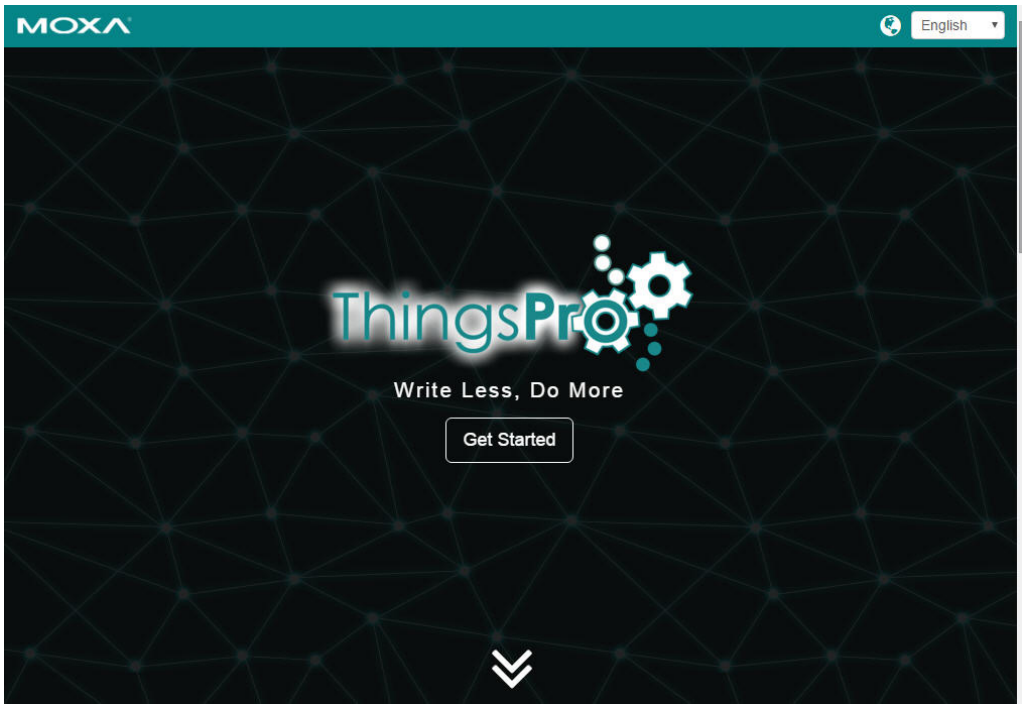
ThingsPro software works best with the Chrome browser. Some of the ThingsPro functions may not be available on other Web browsers. We recommend that you use the Chrome browser for ThingsPro software.

To log in to the gateway:

1. Access the ThingsPro web interface by connecting to the following URL on **eth1**: https://192.168.4.127

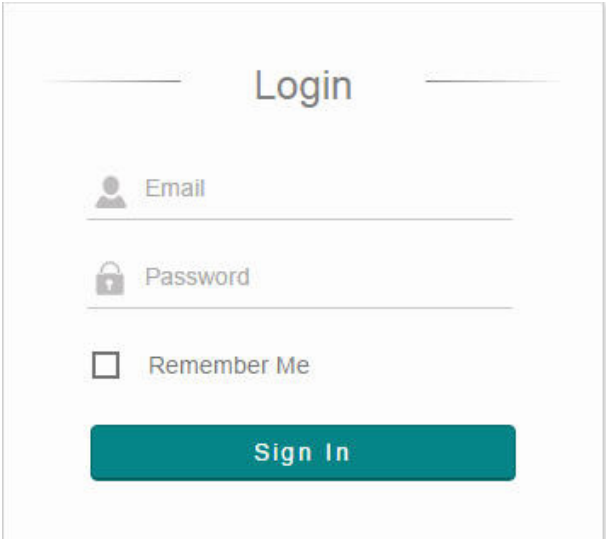
NOTE The notebook computer or PC that you use to access the web interface of the device, and the device must be on the same network subnet.

2. Click **Get Started** to open the login page.
   You can scroll down to learn more about the key features of ThingsPro Wireless Manager.



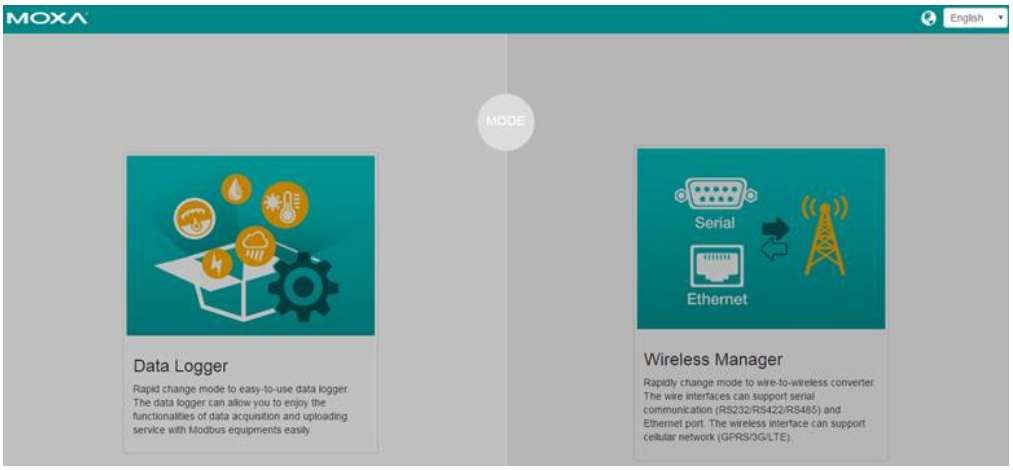
3. Use the following default user credentials to login:

   Email: admin@moxa.com
   Password: admin1234



After entering the ThingsPro homepage, you can select one of the following modes of operation:

- **Data Logger**
- **Wireless Manager**



Depending on the operation mode that you select for your gateway, you can find the configuration instructions in the following sections of this guide:

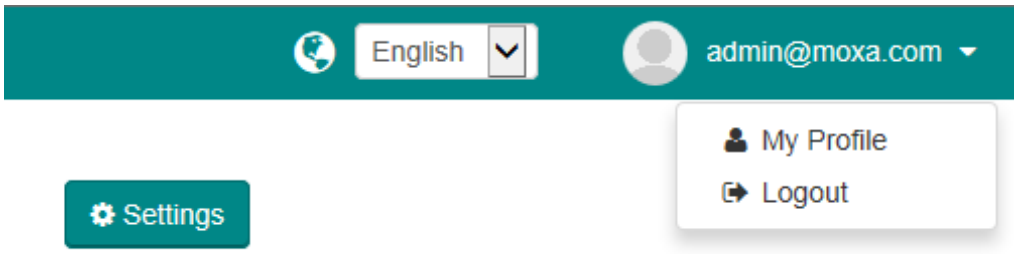
Data Logger	Chapter 3, Chapter 4, and Chapter 5
Wireless Manager	Chapter 2 (this chapter) and Chapter 6

IMPORTANT!

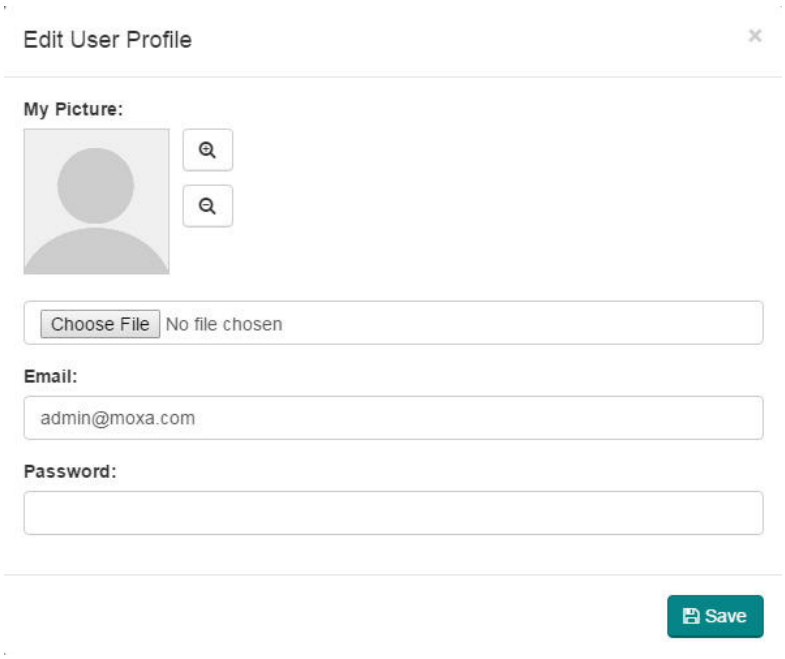
At the moment, the UC-8100 device can only be used as a data logger or as a relay. If you want to switch between the data logger and the relay functions, you need to first reset the computer to factory default, and then select the function that you want to set for your device.

Editing User profiles

The user profile page contains login credentials and personal information of the user who has logged in to the gateway. You can access the user profile page by selecting the **My Profile** option from the dropdown list at the top right side of the login page.



Edit the user profile details and click **Save**.

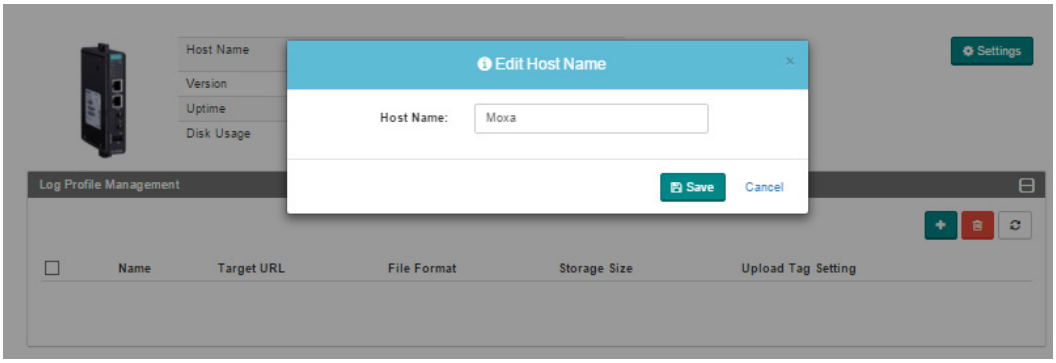


Setting the Host Name

You can set the host name of the gateway on the main page of the ThingsPro web interface.

To set the host name of the gateway, do the following:

1. Log in to the gateway.
2. Click on the **Edit** button next to the **Host Name** field.
3. Specify a host name and click **Save.**



3

Device Configuration

This chapter describes how to remotely configure the settings of peripheral devices from the gateway using ThingsPro web interface.

The following topics are covered in this chapter:

- **Configuring Ethernet**
  - Configuring IPv4 Settings for eth1
  - Configuring DHCP Server Settings
- **Configuring the Cellular Network**
- **Configuring DNS**
- **Configuring Serial Ports**
- **Setting the System Time**
- **Configuring Port Mapping**
- **Configuring Reverse Port Mapping**
- **Configuring OpenVPN Client**
- **Configuring System Control Settings**

Configuring Ethernet

To configure the Ethernet settings:

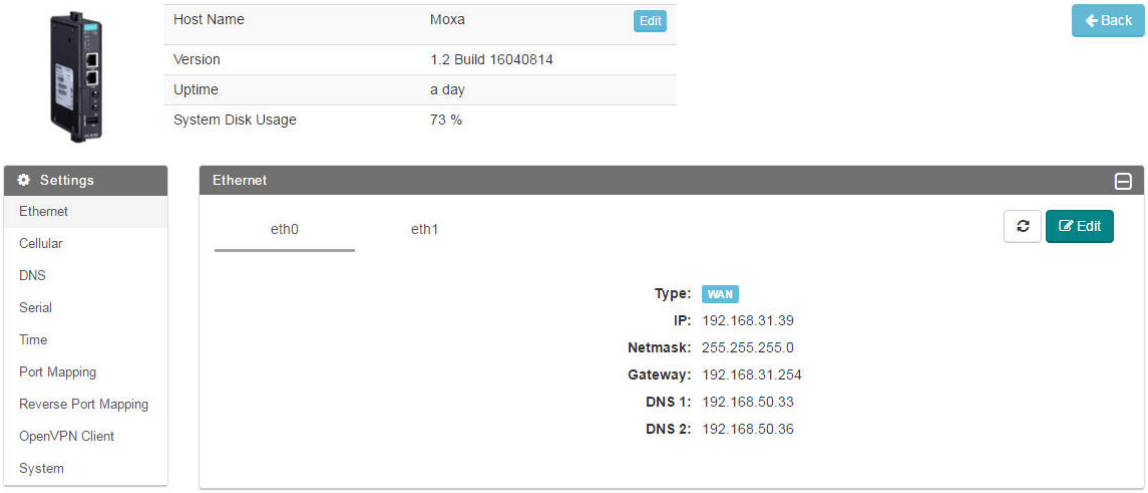
(1) Click on the **Settings** button on the top left of the Main page.

(2) In the **Settings** panel that is displayed on the left, select **Ethernet**.

(3) Click on the **Edit** button in the Ethernet section to open the configuration in the edit mode. You can configure eth0 and eth1 parameters such as the network Type, IP, Netmask, Gateway, DNS1, and DNS2 here.

(4) Update the Ethernet details.

(5) Click **Save**.



Configuring IPv4 Settings for eth1

To configure the IPv4 settings:

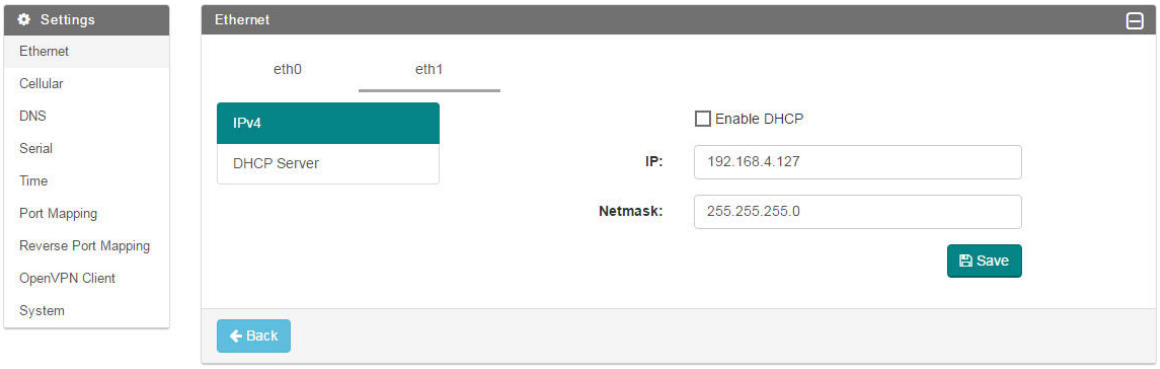
(1) Click on the **eth1** link on the **Settings** > **Ethernet** page.

(2) Select **IPv4**.

(3) Enter the **IP** address and the **Netmask** for eth1.

(4) (Optional) Select the **Enable DCHP** option, if you want to use the DHCP function.

(5) Click **Save**.



Configuring DHCP Server Settings

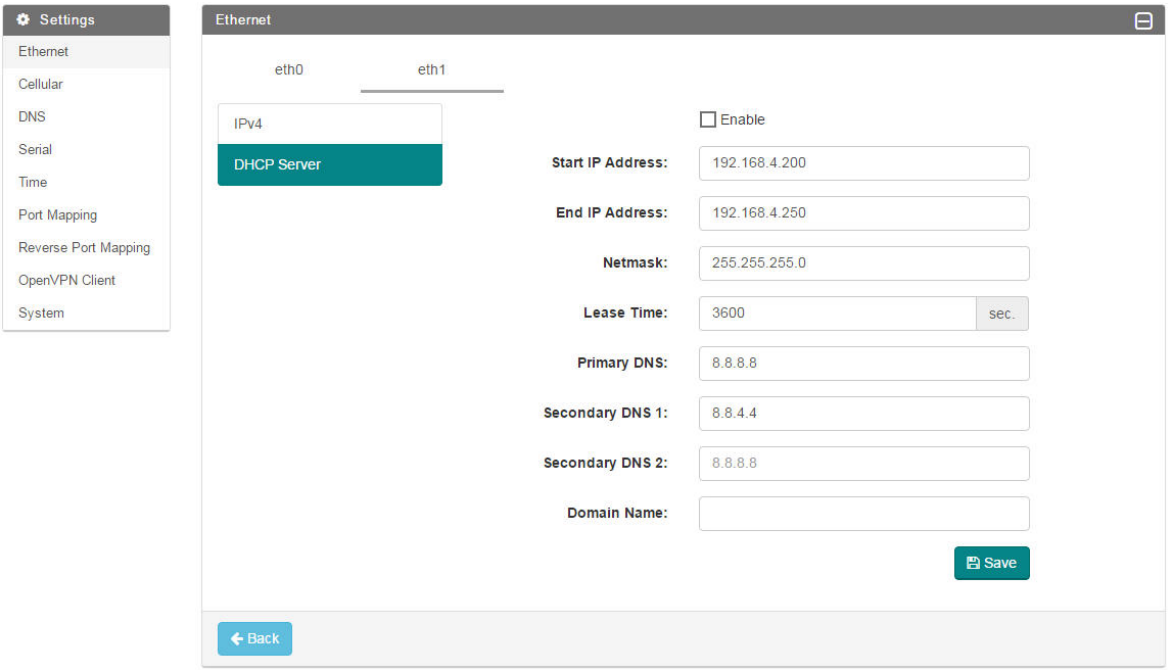
To configure the DHCP Server settings:

(1) Click on the **eth1** link on the **Settings** > **Ethernet** page.

(2) Select **DHCP Server.**

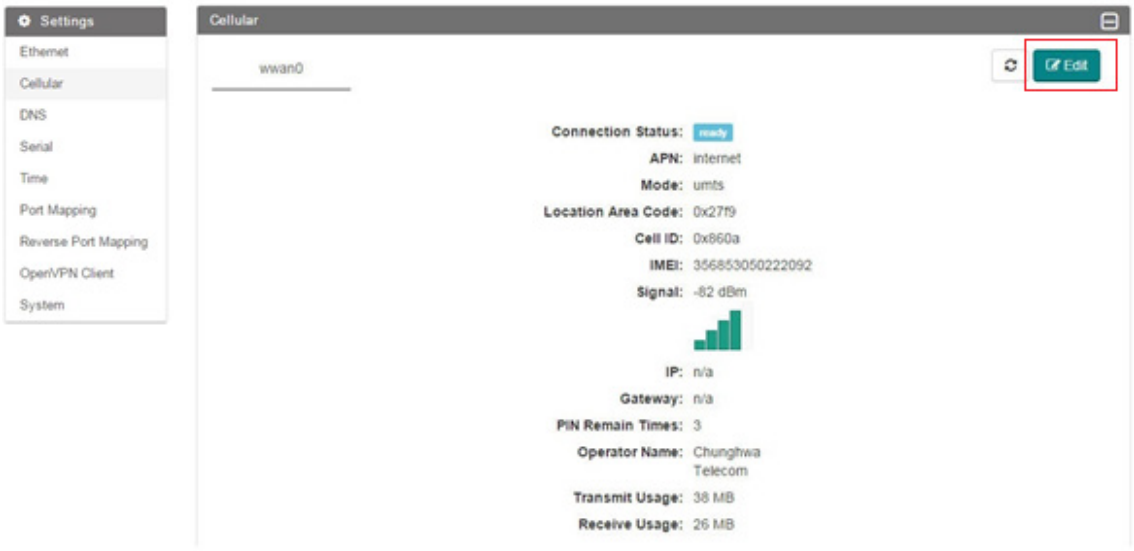
(3) Provide all the necessary information in the fields.

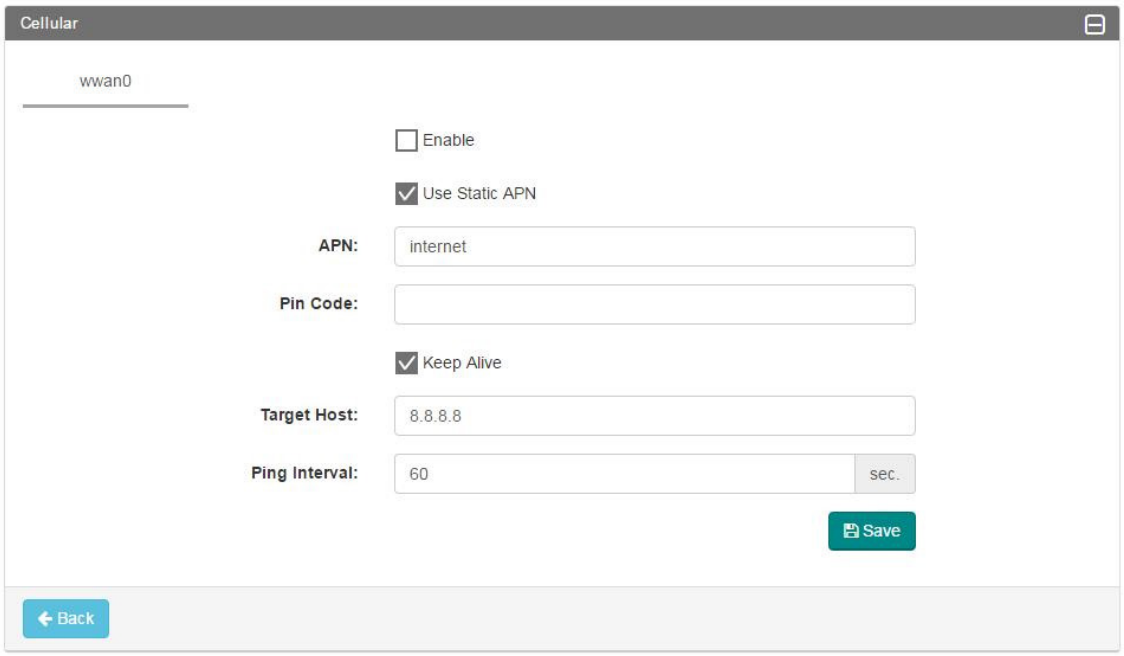
(4) Click **Save**.



Configuring the Cellular Network

To access the cellular configuration, click on **Cellular** in the **Settings** panel**.** You can view the status of the cellular connection. To edit the configuration settings of the cellular network, click **Edit**.





You can configure the following cellular network parameters:

Parameter	Description
Enable	Enables the cellular network
Use Static APN	Selected by default. This option enables you to use the APN (access point name) of the cellular carrier.
PDP CID	Packet Data Protocol Context ID- Instead of using a static APN, you can specify a number in the range 1 to 16 here. Your cellular carrier will set an APN based on the PDP CID that you specify. For example, the PDP CID value for Verizon's private network service is "3".
Pin Code	Specifies a numeric access code for the device. This code is used to restrict access to the device provided the PIN (Personal Identification Number) security feature in the device is turned ON.

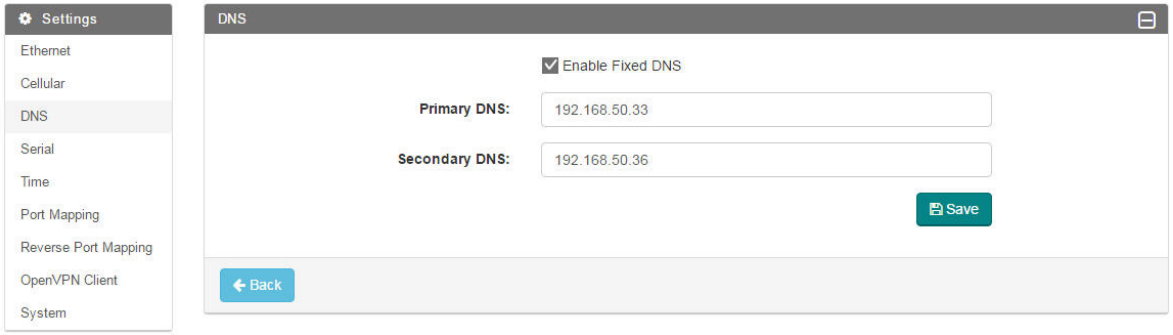
Parameter	Description
Keep Alive	Check this option to activate connection checks to the target host **NOTE**: When you select this option and click on the **Save** button, the cellular connection will be reconnected.
Target Host	Specifies the target host to connect to
Ping Interval	Specifies the interval between the connection checks (ping commands)

Update the cellular details and click **Save**.

When cellular communication has been activated and connected, the WAN interface switches to the cellular network. If you do not activate the cellular connection, the WAN interface will be on the eth0 Ethernet network.

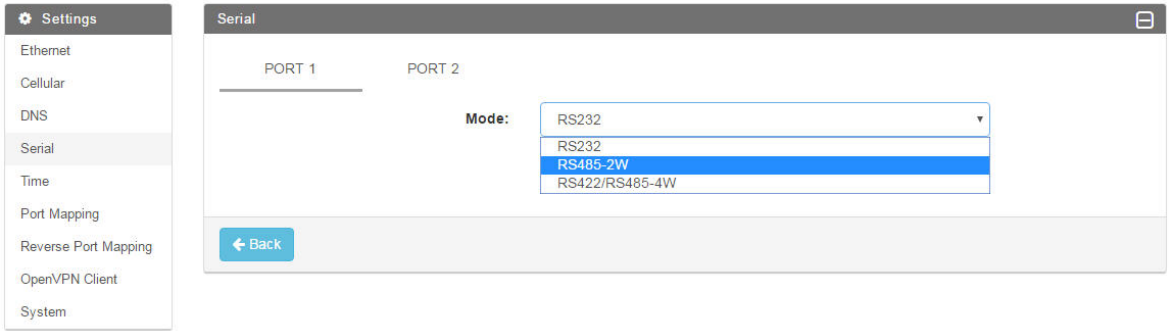
Configuring DNS

To access the DNS configuration, click on **DNS** in the **Settings** panel. Check the **Enable Fixed DNS** if you want to use a fixed DNS and type in the **Primary DNS** and **Secondary DNS**. Click **Save** to save the configuration.



Configuring Serial Ports

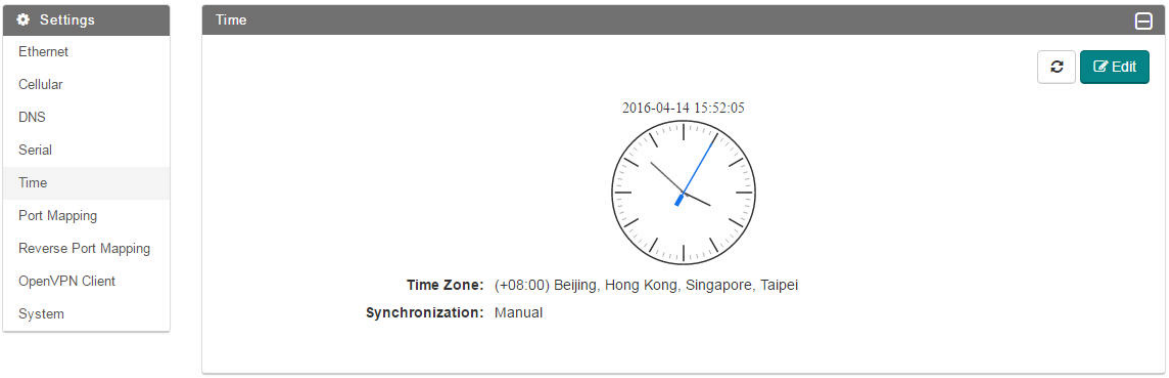
To access the serial port configuration, click on **Serial** in the **Settings** panel**.** Click **Edit** to change the configuration settings**.** You can choose one of the following serial communication protocols for PORT 1 and PORT 2 of the serial interface: RS-232, 2-wire RS-485, 4-wire RS422/RS485



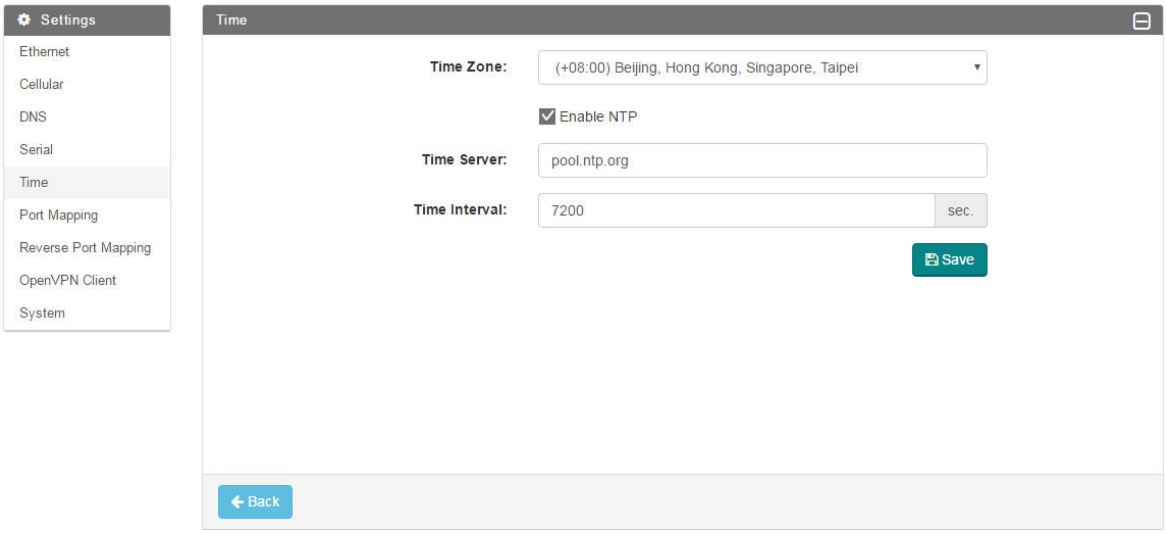
Setting the System Time

You can set the system time manually by editing the time zone or set up automatic time synchronization with a time server. For automatic time synchronization, the UC-8100-LX-CG can sync-up with a specified time server, at intervals that you specify.

To access the time zone configuration, click on **Time** in the **Settings** panel.



Click **Edit** to change the configuration settings**.**

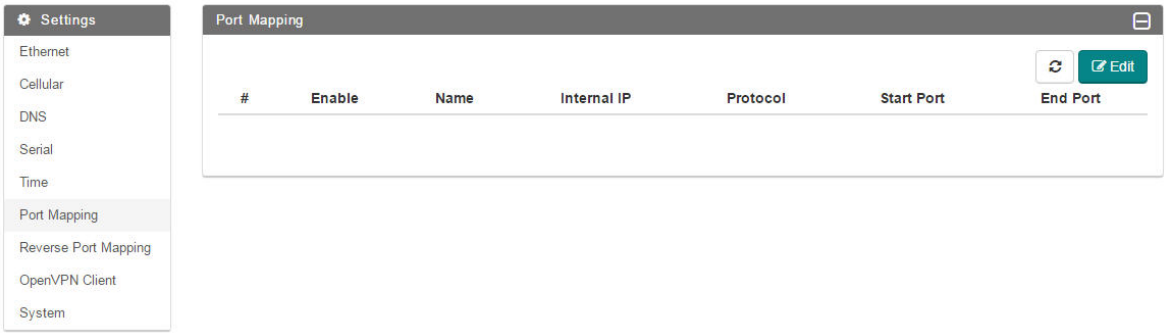


Update the time details and click **Save**.

Configuring Port Mapping

Port mapping is a network address translation (NAT) technique, which is most commonly used to make services on a host residing within a protected or internal network available to hosts on the opposite side of the gateway (external network) by remapping the destination IP address and port number to the internal host.

To access the port mapping configuration, click on **Port Mapping** in the **Settings** panel. Click **Edit** to change the configuration settings.



Fill in the port mapping details and click + to add the mapping details to the database.

NOTE If you want to enable a port mapping entry, select the **Enable** checkbox in the port mapping details.

NOTE An **Internal IP** is the destination IP of a device that is connected to the gateway. The **Start Port** and **End Port** specify the designated port range that an external device can connect to. The port range setting for the different **Internal IP**s should be totally exclusive that is, there should not be any overlap of the port numbers.

Configuring Reverse Port Mapping

To access the reverse port mapping configuration page, click **Reverse Port Mapping** in the **Settings** panel. Click **Edit** to change the configuration settings.

Fill in the details and click + to add the mapping details to the database.

NOTE If you want to enable a reverse port mapping entry, select the **Enable** checkbox.

NOTE The NAT function is enabled by default.
The **Internal IP** is the source IP of the device connected to the gateway. And, the **Port** is the source port number. We do not recommend using the same port number for different **Internal IP**s.

Configuring OpenVPN Client

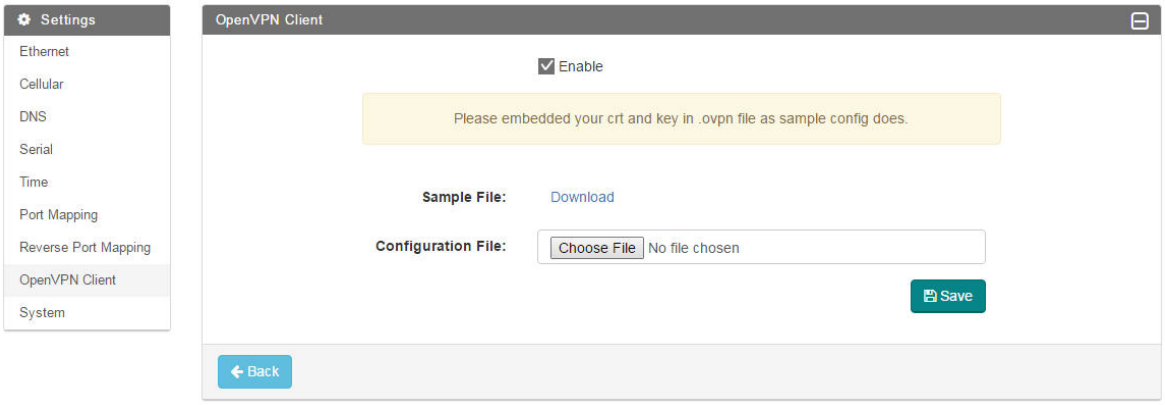
OpenVPN is an open-source software application that implements virtual private network (VPN) techniques to create secure network connections. ThingsPro offers an OpenVPN Client function that helps you connect to an OpenVPN server to establish secure data communication.

To configure the OpenVPN client in ThingsPro, do the following:

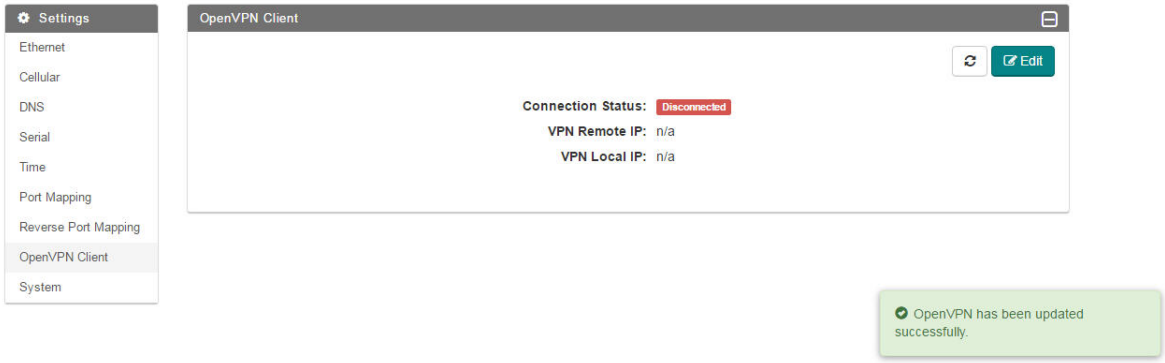
1. Click on **OpenVPN Client** in the **Settings** panel.
2. On the **OpenVPN Client** page, select the **Enable** option and then click **Choose File** to browse to and upload an OpenVPN configuration file.

NOTE The configuration file must contain the certificate and key information and must be saved in the `*.ovpn` format. You can click on **Download** to view a sample OpenVPN configuration file.

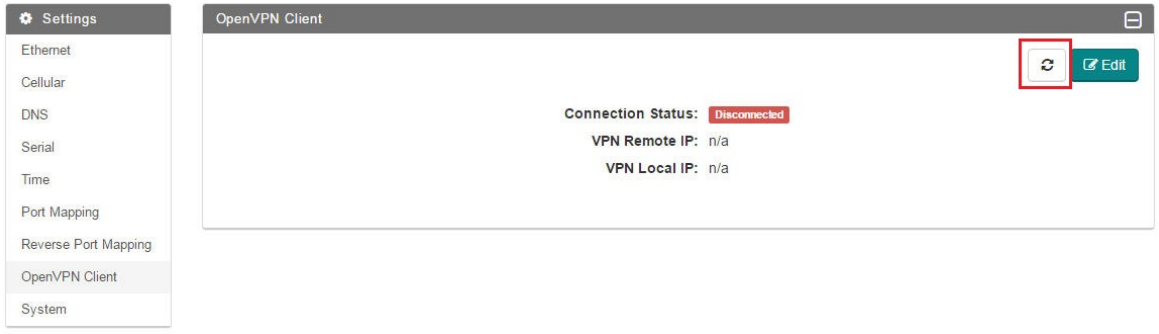
3. Click **Save.**



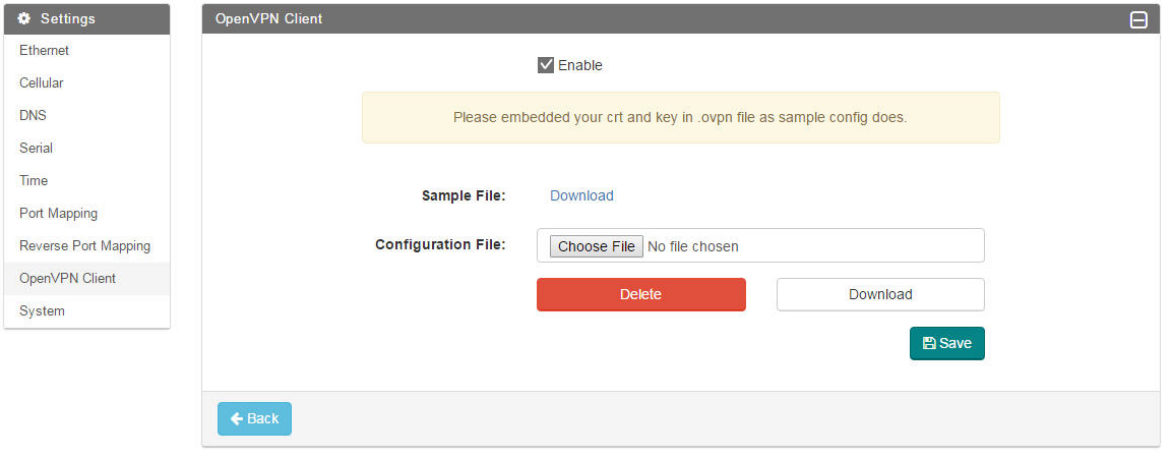
A message indicating that the OpenVPN client has been successfully updated is displayed as shown below:



If you want to update the OpenVPN client settings, click on the **Refresh** button.



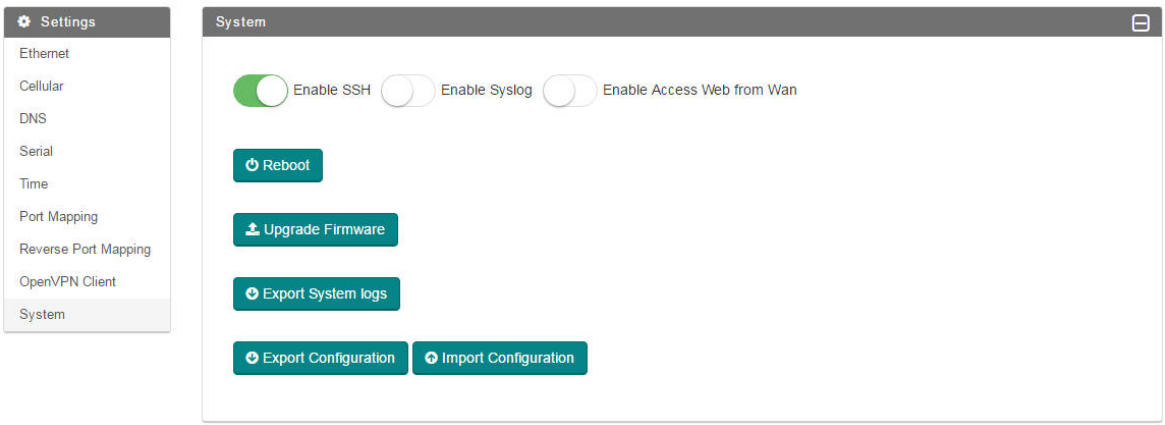
If you want to delete the configuration file, click on **Delete**, or click on the **Download** button next to the Delete button to replace the configuration file.



After you have successfully updated the configuration file, you can view the connection status of the client in the **Connection Status** field.

Configuring System Control Settings

To access the system configuration, click on the **Settings** option in the left pane of the ThingsPro main page and then select **System.** You can configure the following system control settings: **Reboot, Upgrade Firmware, Export Syslog, and Export/Import Configuration.**



NOTE The SSH server will be activated by default. If you have any security concern, we suggest you disable the SSH server by clicking on the **Enable SSH** button.

In addition, if you want to access the web from a WAN interface, you must enable **Access Web** from **WAN** function.

4

Modbus Management Framework

This chapter describes how you can use templates and tags in ThingsPro to configure and manage Modbus devices that are connected to a gateway.

The following topics are covered in this chapter:

- **Equipment Template and Data Tag Management**
- **Downloading a Template**
- **Uploading a Template**
  - Defining a Device Tag
  - Defining a New Template
  - Deleting a Template
  - Adding a Modbus/TCP Device
- **Retrieving the Current Information of the Remote Modbus/TCP Device**
  - Managing Modbus/RTU devices

Equipment Template and Data Tag Management

You can use Modbus compatible templates to configure field devices in ThingsPro, and connect the devices to the gateway. By default, ThingsPro software includes preconfigured templates for Moxa's ioLogik series. You can modify the ioLogik templates to set up connections to Modbus /RTU or Modbus /TCP devices.

You can add, remove, or update equipment templates in the **Equipment Template List** section on the **Settings** page.

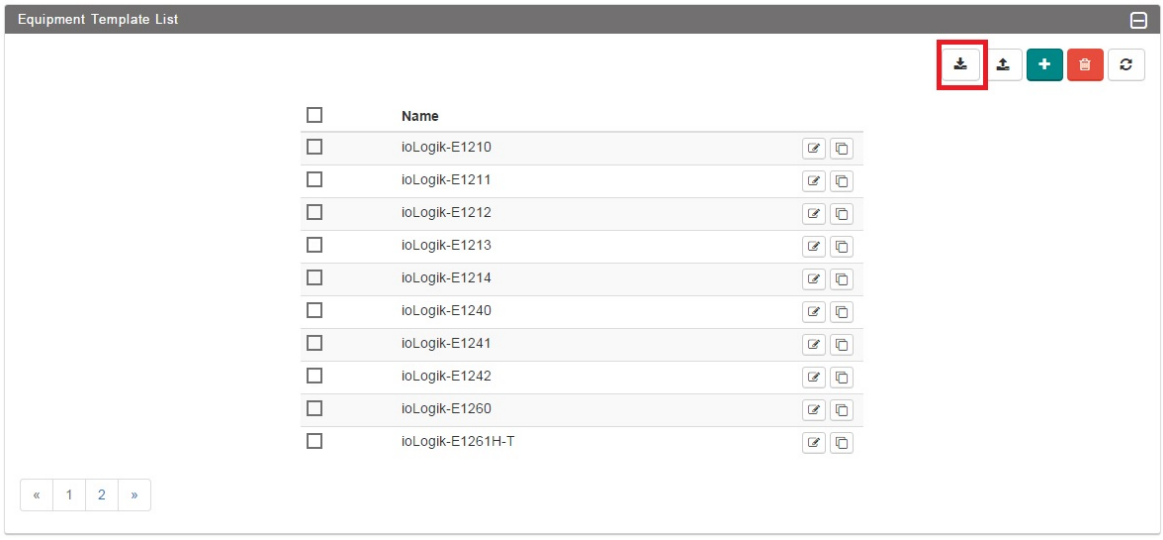
To configure a Modbus device in ThingsPro and connect it to the gateway, do the following:

1. Select a template from the **Equipment Template List**
   or
   Create a new template in the **Equipment Template List**.
2. Define a tag for the device in the template, and specify the device details.
3. Add the device to the ThingsPro system.

Downloading a Template

To download an equipment template, do the following:

In the **Equipment Template List**, click the button to download the current template to your local computer.



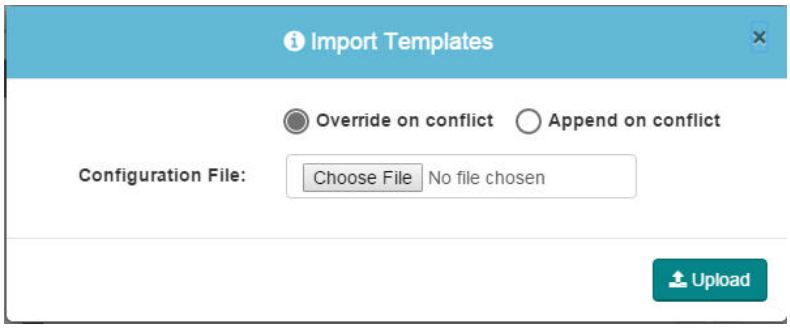
NOTE To download a specific template or a set of templates, select the template (s) in the **Equipment Template List** and click .

Uploading a Template

To upload your equipment template to the database, click in the **Equipment Template List,** browse to the location of the template in your local folder and click on the **Upload** button to complete the upload process.

NOTE Only upload templates that you have previously downloaded from ThingsPro. Uploading templates from external systems might corrupt your equipment data.

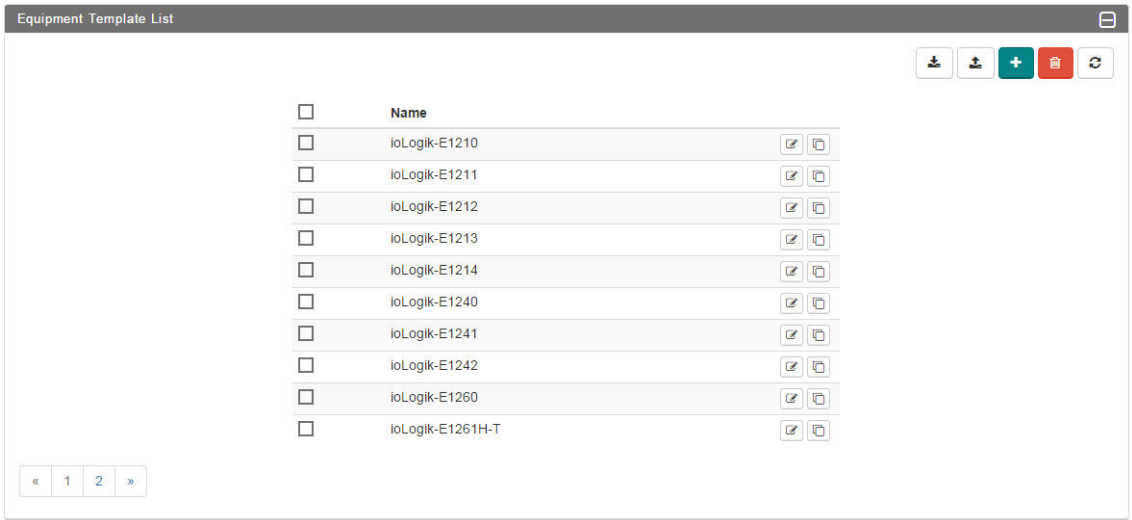
Use the **Override on conflict** and **Append on conflict** options to avoid uploading duplicate templates.



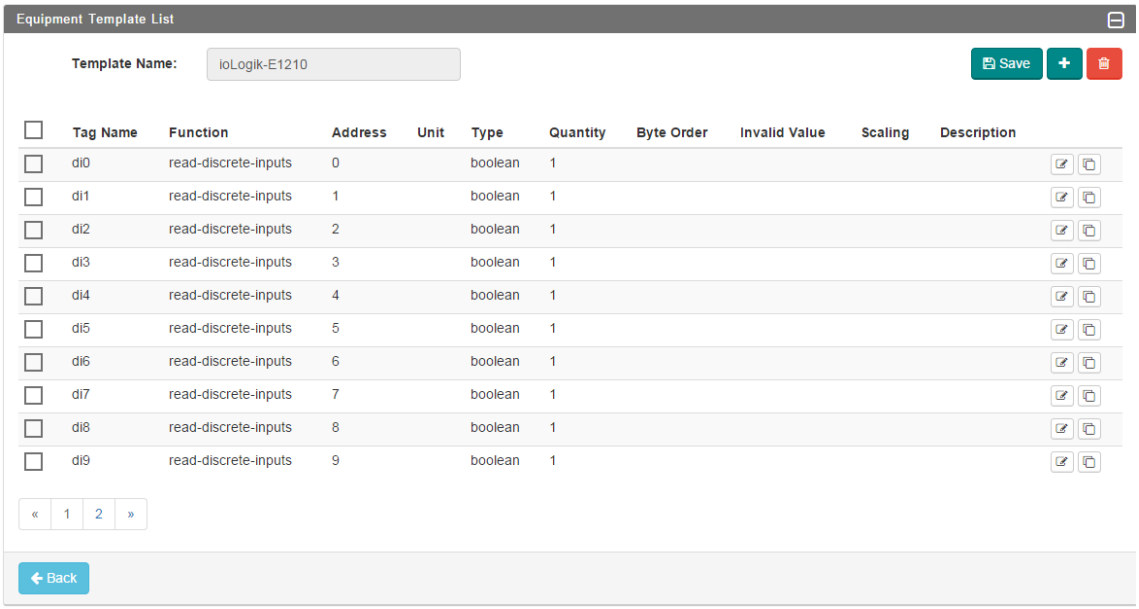
Defining a Device Tag

To set up a template and define a tag for a Modbus device, do the following:

1. In the **Equipment Template List**, click the  button corresponding to the template that you want to configure.



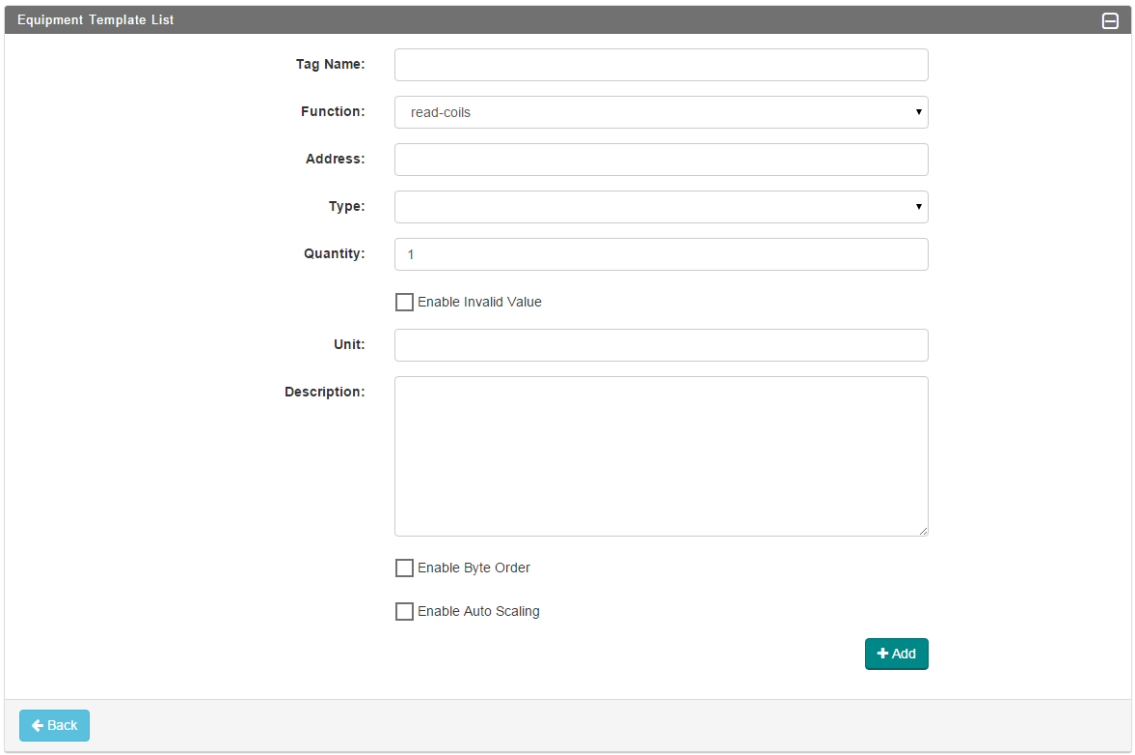
2. Click + to add a tag in the template for the Modbus device.



For details on creating a new template, see *Defining a New Template*.

3. Fill in the Modbus device details.

Field	Description
Tag Name	Assigns a tag name for the device
Function	Selects the Modbus read function for the device. The read functions supported include read-coils, read-input-registers, read-discrete-inputs, and read-holding-registers.
Address	Specifies the read address of the device
Type	Specifies the data type of the read operation for the device. For example: uint16, uint8, uint32, float32, float64
Quantity	Specifies the amount of data read per read operation
Enable Invalid Value	Sets the specified number as an invalid value. First select the **Enable Invalid Value** option and then specify the value that you want to set as invalid in the field.
Unit	Specifies the unit for the invalid value
Description	Provides additional description for the tag.
Enable Byte Order	Enables byte ordering of the composite data frame.
Enable Auto Scaling	Enables auto scaling of the value read from the device.



4. Click Add to add the tag that you just defined to the template.

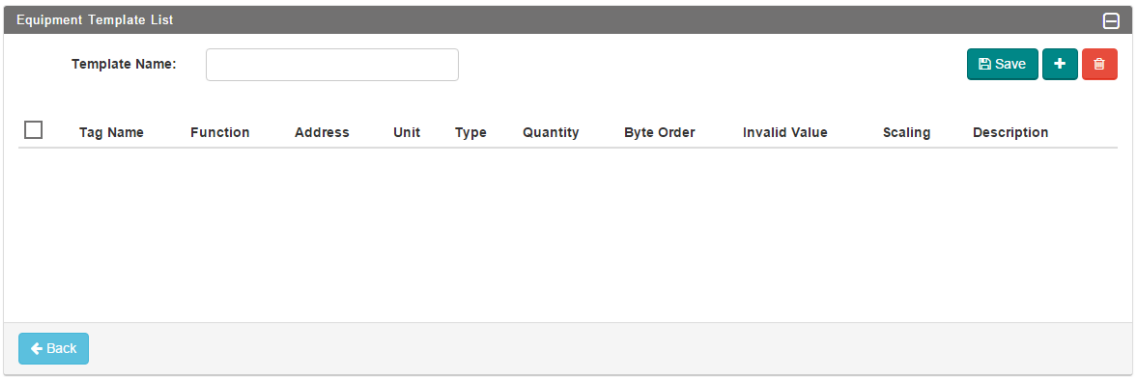
5. Click Save.

Defining a New Template

You can define a new template and use it to configure devices in ThingsPro. The new template that you define is empty and contains no device tags. Before you can use the template, you must add data tags for the type of devices that you want to configure in the template.

To create a new template, do the following:

1. Click on the + button in the **Equipment Template List**.
2. Enter the **Template Name** and click +.



3. Enter the device details and click Add.

4. Click Save.

   The new template is saved and available in the **Equipment Template List**.

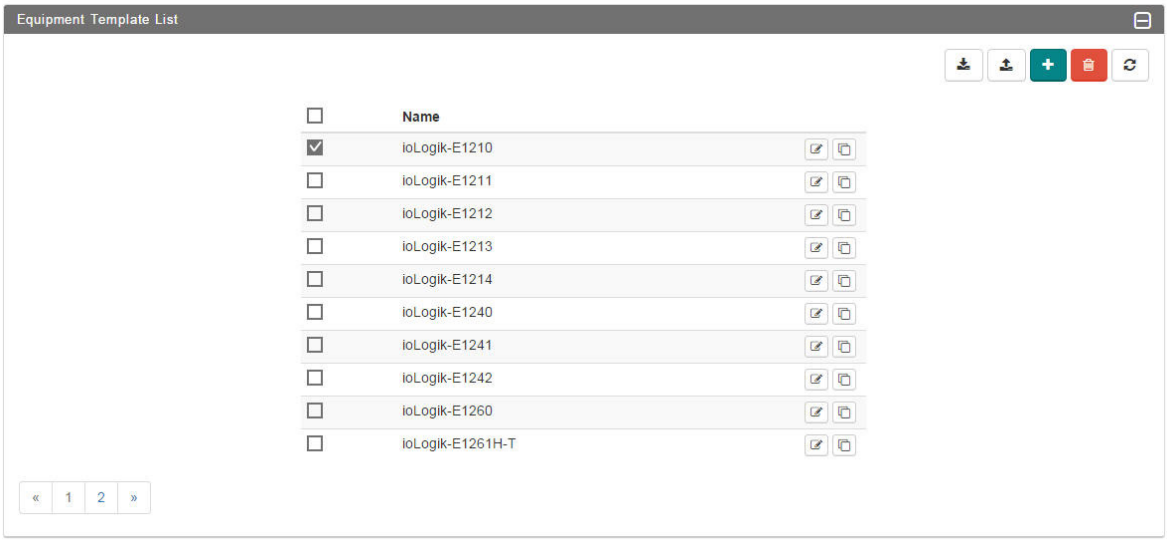
NOTE You can use an existing equipment template to define a new template as follows:

Click the button next to an existing template to create a copy of the template. Specify a **Template Name** and click Save.

5. Define data tags for the devices that you want to configure in the template.

Deleting a Template

To delete a template, select the template from the **Equipment Template List** and click .



Updating a Template or a Tag

To update a template or a tag,

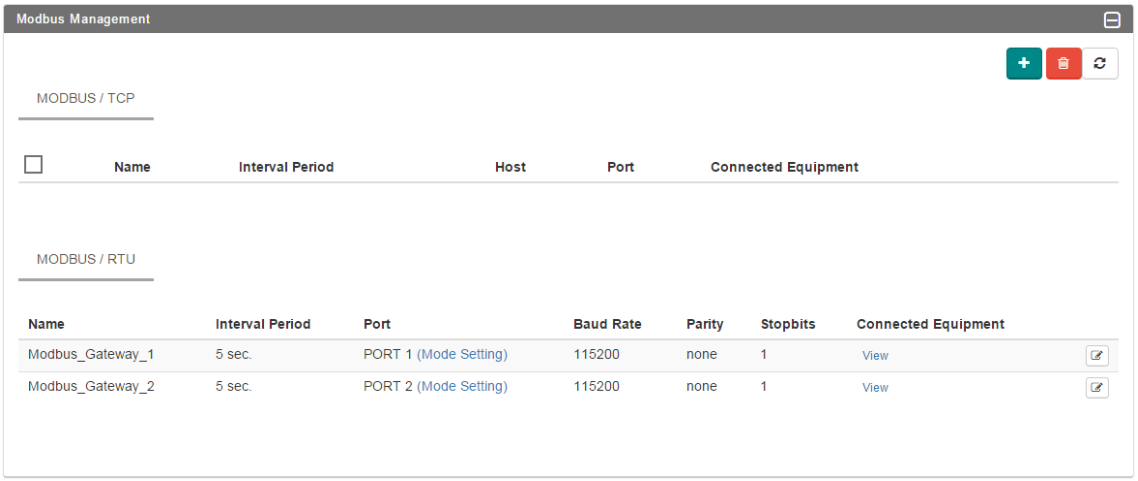
1. Select the template or the tag from the **Equipment Template List**
2. Click
3. Edit the device details.
4. Click Save.

Adding a Modbus/TCP Device

You can add Modbus/TCP devices with different interfaces to the ThingsPro gateway platform.

To add a Modbus/TCP device, do the following:

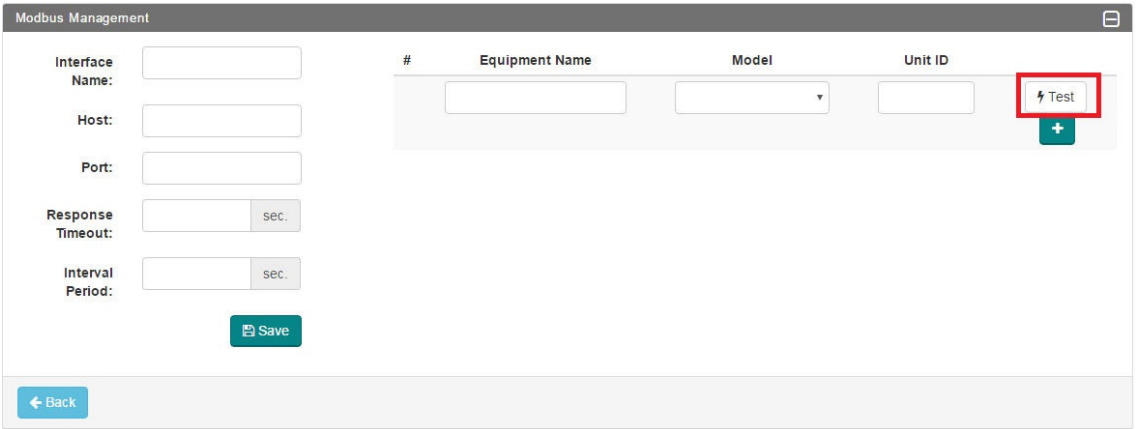
1. Click + in the **Modbus Management** section of the **Settings** page.



2. Enter the device details.

Field	Description
Interface Name	Specifies the name of the Modbus /TCP interface to be used to connect with the Modbus device
Host	Host IP address
Port	Specifies a TCP listen port.
Interval Period	Polling time for the Modbus device
Equipment Name	Specifies the name of the device/equipment that will connect to this interface.
Model	Selects a model from a list of existing template
Unit ID	The identification of the connecting data channel

3. Select the equipment template for the device from the list of templates in **Model**.



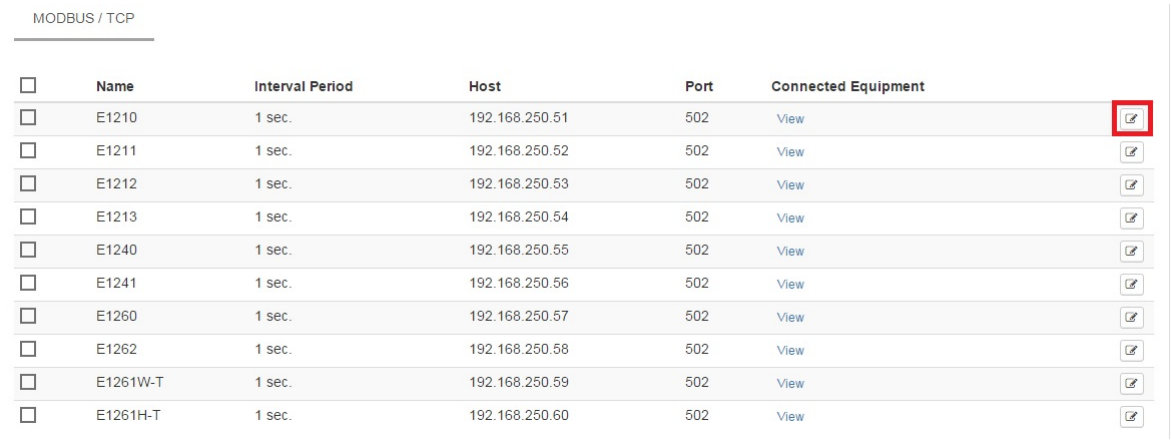
4. (optional) Click on **Test** to check if the device is valid.
5. Click + to add the device to the gateway using the template specified in **Model.**
6. Click Save to add the Modbus/TCP interface data to the gateway.

To update a specific Modbus/TCP device, select the device from the list and click . After you have completed the changes, click Save to update ThingsPro.

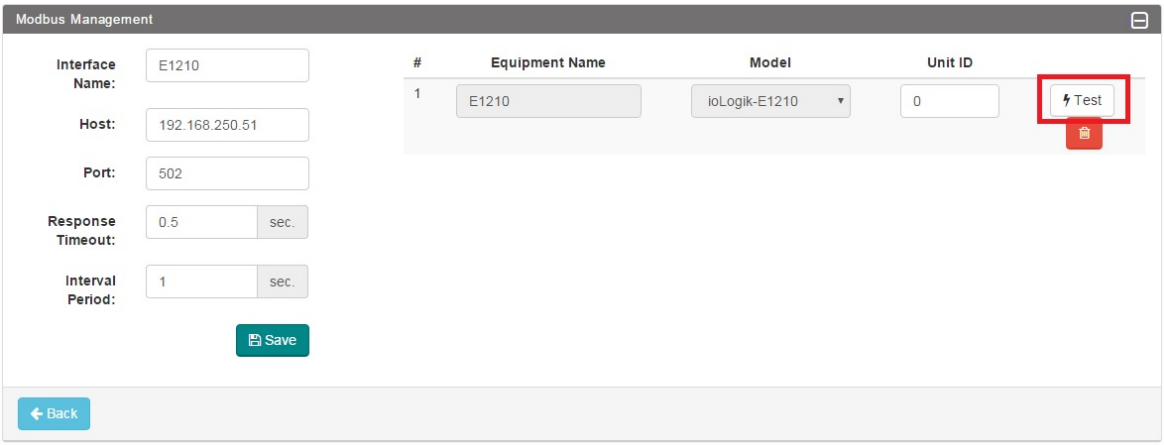
To delete a device, select the device and click

Retrieving the Current Information of the Remote Modbus/TCP Device

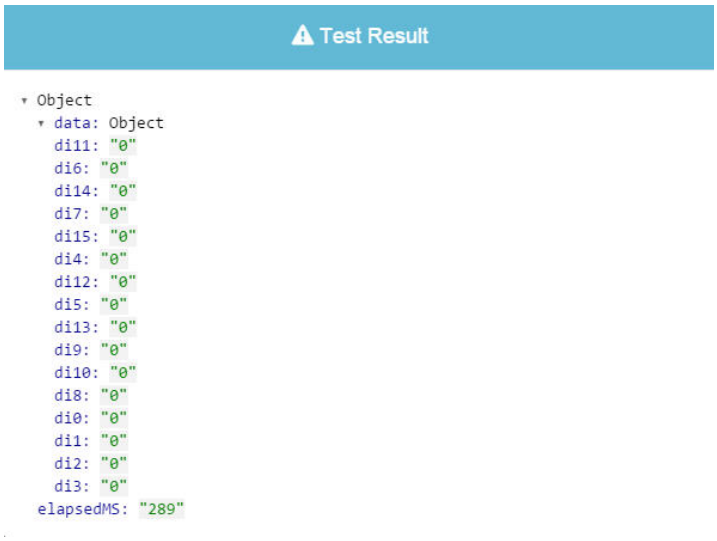
To retrieve information regarding a Modbus/TCP device, click on the button corresponding to the device.



Click the **Test** button to update the device information.



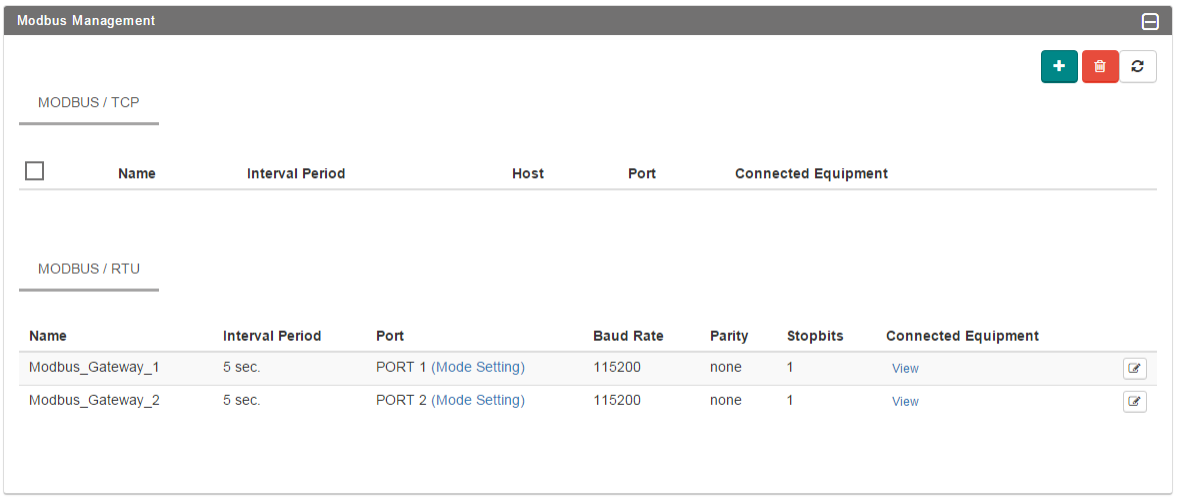
The results are displayed as follows:



To exit the screen, click anywhere outside the **Test Result** box.

Managing Modbus/RTU devices

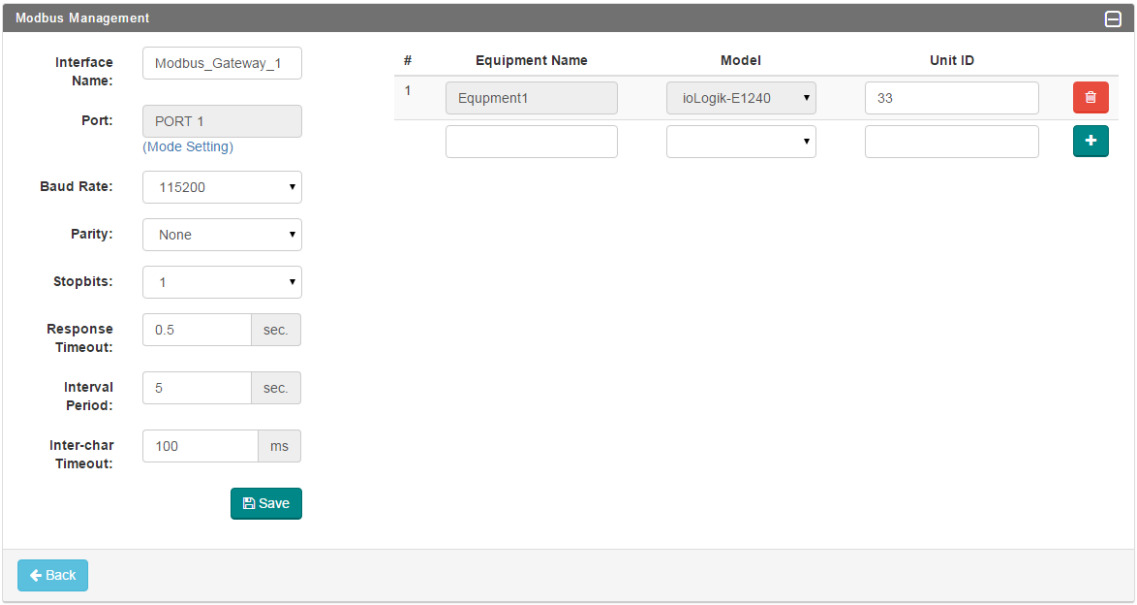
The UC-8100 platform supports only two Modbus/RTU interfaces. You can manage multiple Modbus/RTU devices using these two Modbus/RTU interfaces.



To update the Modbus/RTU interface details or add devices to the interface, do the following:

1. In the **Modbus Management** section of the **Settings** page, click the button next to the Modbus/RTU interface that you want to update.

2. Update the Modbus/RTU interface details for the serial port.



3. Specify the **Equipment Name**, **Model**, and **Unit ID** of the device(s) that you want to add, and click to add the device(s) to the Modbus/RTU interface.

4. Click Save.

5

Remote Data Profile Service

This chapter describes how to configure the remote data profile service in ThingsPro. You can use this service to send data log files from the UC-8100-LX-CG to remote servers. The formats supported are XML, JSON, and CSV.

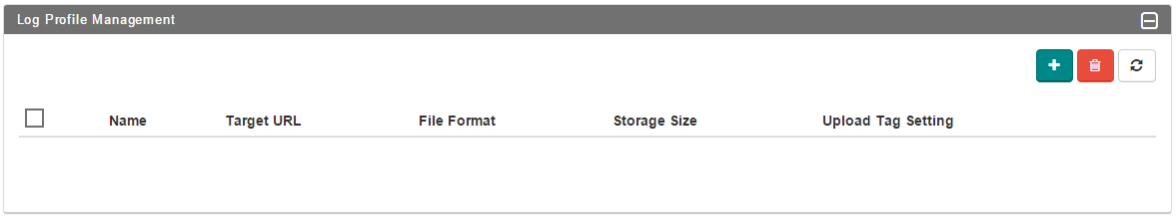
The following topics are covered in this chapter:

- **Managing Log Profiles**
  - Adding a Log Profile
  - Updating a Log Profile
  - Uploading a Log Profile

Managing Log Profiles

Log profiles are used to configure storage instructions for data files generated by ThingsPro. Once you have created a log profile, you can use it to automatically send data log files to a specified remote server. For example, you can connect a Modbus I/O module to a gateway, pull in data from the field devices and censors connected to the I/O module, and store the data in the gateway. You can configure a log profile in ThingsPro to specify the remote server to which the data log files should be sent and the interval at which to send them. ThingsPro will send the log files to the remote server at the intervals that you have specified in the log profile.

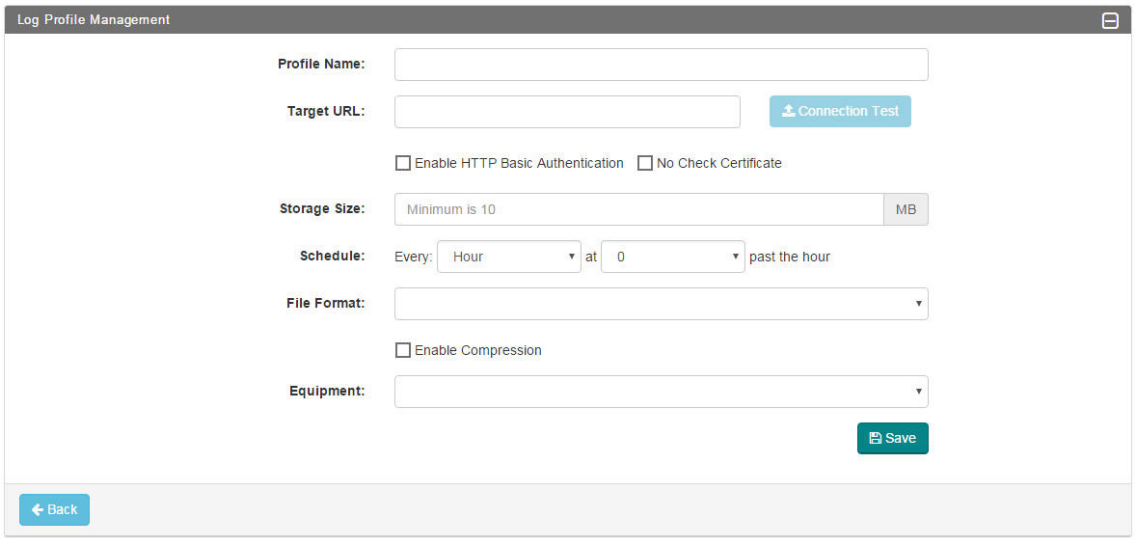
To configure a log profile, update an existing one, or delete a log profile, go to the **Log Profile Management** section of the main page.



Adding a Log Profile

To create a new log profile, do the following:

1. Click  on the **Log Profile Management** page.

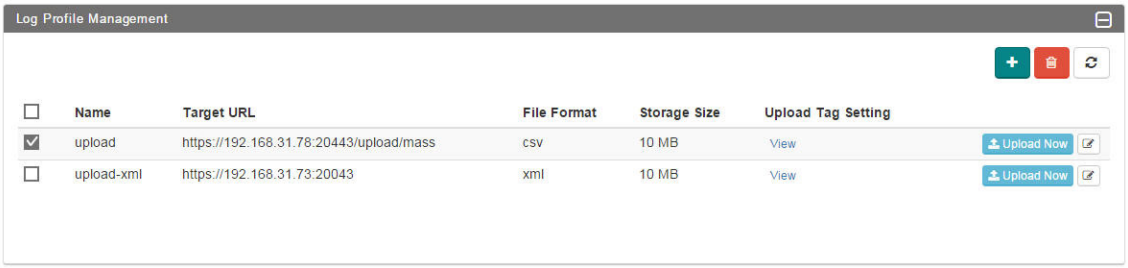


2. Enter the following details for the new log profile:

Field	Description
Profile Name:	Specify a name for the new log profile. Length: 3-255 characters Format: a-z, A-Z, 0-9, '_', '-'
Target URL:	Specify the complete URL of the remote server to which the data log files associated with this profile should be uploaded.
Enable HTTP Basic Authentication	Select this option to enable HTTP basic authentication
No Check Certificate	Select this option to skip the certificate check on the HTTPS connection.
Storage Size:	Set the maximum data pool size Configure a data pool size based on the number and size of the data profiles that will be used concurrently in the ThingsPro system.
Schedule:	Set an upload schedule for the data log files. For example, daily at a specified time, hourly, or even every minute.
File Format	Select a file format: XML, JSON, or CSV NOTE: These formats are not that of the device log file, but are the file formats that you can use to download/upload data from the data logger.
Enable Compression	Enable file compression of the data files.
Equipment	Select the field equipment whose data should be polled. For details on adding equipment to the ThingsPro gateway platform, see *Equipment Template and Data Tag Management.*

3. Click C**onnection Test** to make sure that the target URL is valid.
4. Click **Save**.

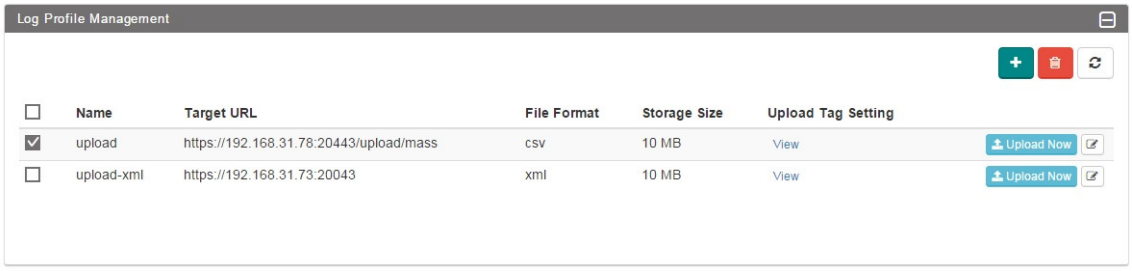
To delete a specific log profile, select it from the list of profiles and click .



Updating a Log Profile

To update an existing log profile, do the following:

Scroll to the log profile and click on the icon at the end of the row.

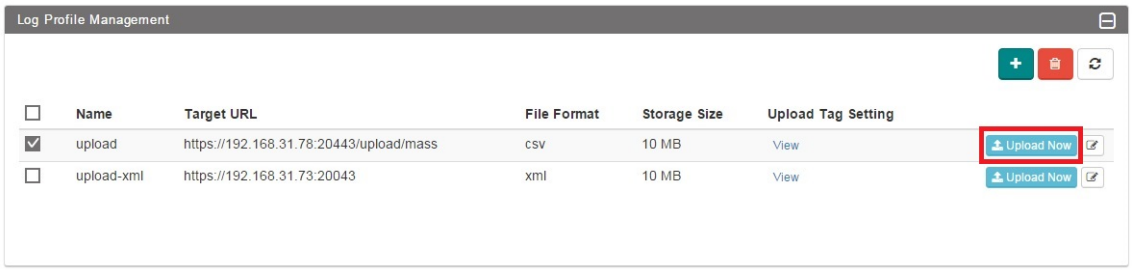


1. Update the profile data.
2. Click **Save**.

Uploading a Log Profile

To upload a log profile to a specific device, do the following:

1. Select the log profile in the **Log Profile Management** page.



2. Click **Upload Now** to upload the log profile file to the database.

6

Wireless Manager Relay Settings

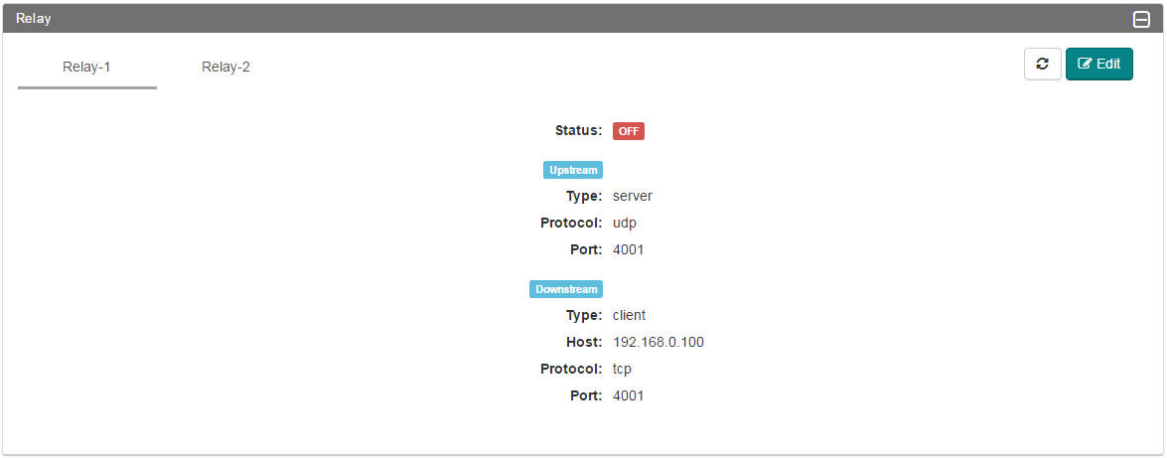
This chapter describes how to configure the relay settings for the Wireless Manager function in the UC-8100-LX-CG.

The following topics are covered in this chapter:

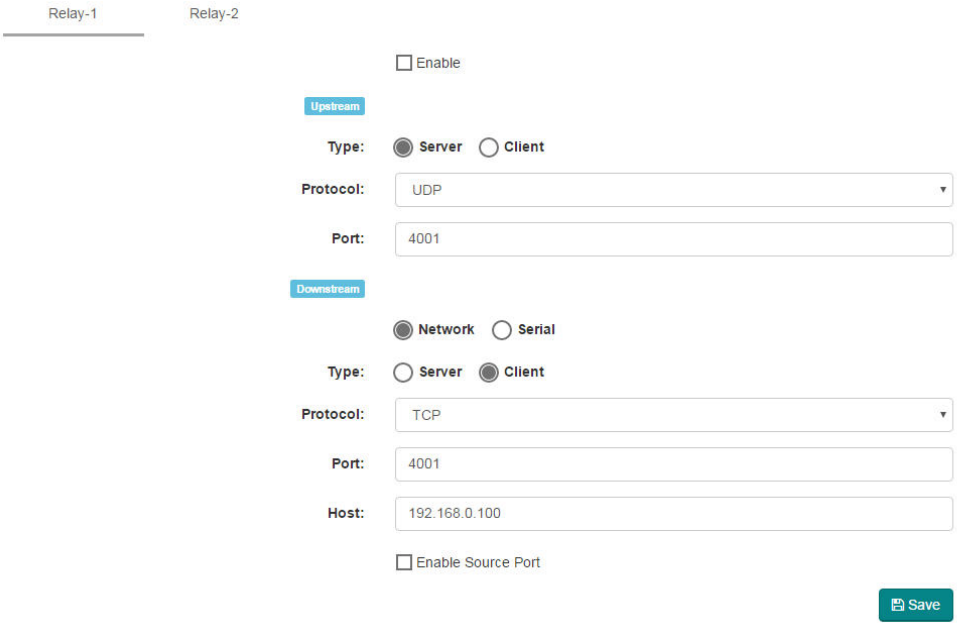
- **Configuring Relay Settings**

Configuring Relay Settings

After you have completed the initial configuration of the device and have selected the **Wireless Manager** mode, select the **Relay** tab and click on **Edit** to configure relay settings.



Select **Enable** to activate the relay and provide all necessary information for both upstream and downstream communication. To enable the source port, check the **Enable Source Port** option. Click on **Save** to complete the configuration and save the information.



A

ThingsPro API Reference

The UC-8112-LX-CG is provided with RESTful APIs that give you access to the gateway configuration. Developers can use these APIs to interact with and to integrate their software with ThingsPro. Excluding web account operations, you can use these RESTful APIs for all other gateway operations.

The following topics are covered in this appendix:

- **API Reference**

API Reference

This section gives you an overview of the ThingsPro configuration RESTful APIs. For full details on using the APIs such as the resources available, the HTTPS methods supported, and the content of the requests and responses, refer to the *ThingsPro REST API Documentation.* You can download the documentation from the product page on www.moxa.com.

Name	Description
bootstrap	A resource bundle used to select the gateway mode: Data Logger and Wireless Manager. **NOTE**: You must use this API to set the gateway mode when you use ThingsPro for the first time.
cellular	Provides the cellular configuration interface
Custom-equipment	Manages customized equipment tags
dhcpd	Handles the DHCP configuration
dns	Handles the gateway DNS settings
ethernet	Handles the Ethernet interfaces
firmware	Manages the firmware upgrade function
import-export	Manages the import/export of configuration files
iptables	Manages iptables rules
logprofile	Handles log profile configuration
modbus	Handles Modbus framework configuration
openvpn	Handles the configuration of the OpenVPN service
relay	Provides the relay service
route	Handles the routing table
serial	Provides the utility to set the serial mode
service	Manages the system service configuration
system-status	Provides system status information
time	Provides the system-time management function