# Inveo Nano In

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## Contents




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# 1 Background

This equipment note describes how to use an impHub to collect pulse data using the Inveo Nano In and Inveo Nano In PoE.

The Nano In uses a PoE injector (12-24VDC), supplied with the device. However, it does not work with standard PoE voltage. It shows pulse activity with an indicator light.

The Nano In PoE can work with as standard PoE voltage (33-57V POE IEEE 802.3af). Alternatively, it can be powered from a DC power supply (10-24VDC) connected to the terminal blocks at the top of the device. It shows pulse activity on the LED display on the front of the device. It can also show the IP address on this display.

**Nano Digital Input PoE**


**Nano Digital Input**


The Nano In PoE variant is slightly more expensive, but is more versatile, so we recommend this variant.

**Relevant Links**

Manufacturer: https://inveo.com.pl/input-output-modules/compact-modules/nano-in-en/

Web Shop: https://www.audon.co.uk/ethernetrelay/nano_in_poe-ethernet-digital-input-unit-with-pulse-counting-web-snmp-modbus-tcp-led-display-poe.html

# 2 Configuring the Nano In

## 2.1 Networking

The nano in needs to be configured with password and network settings. You will need to either get as fixed IP or a DHCP reserved IP address for the Nano In. Contact your network administrator, for as reserved IP you will need to supply the MAC address of the device. You can read the MAC address from the "Network" page of the Inveo web interface, which we come to later in this section.

The Nano In comes with default settings:

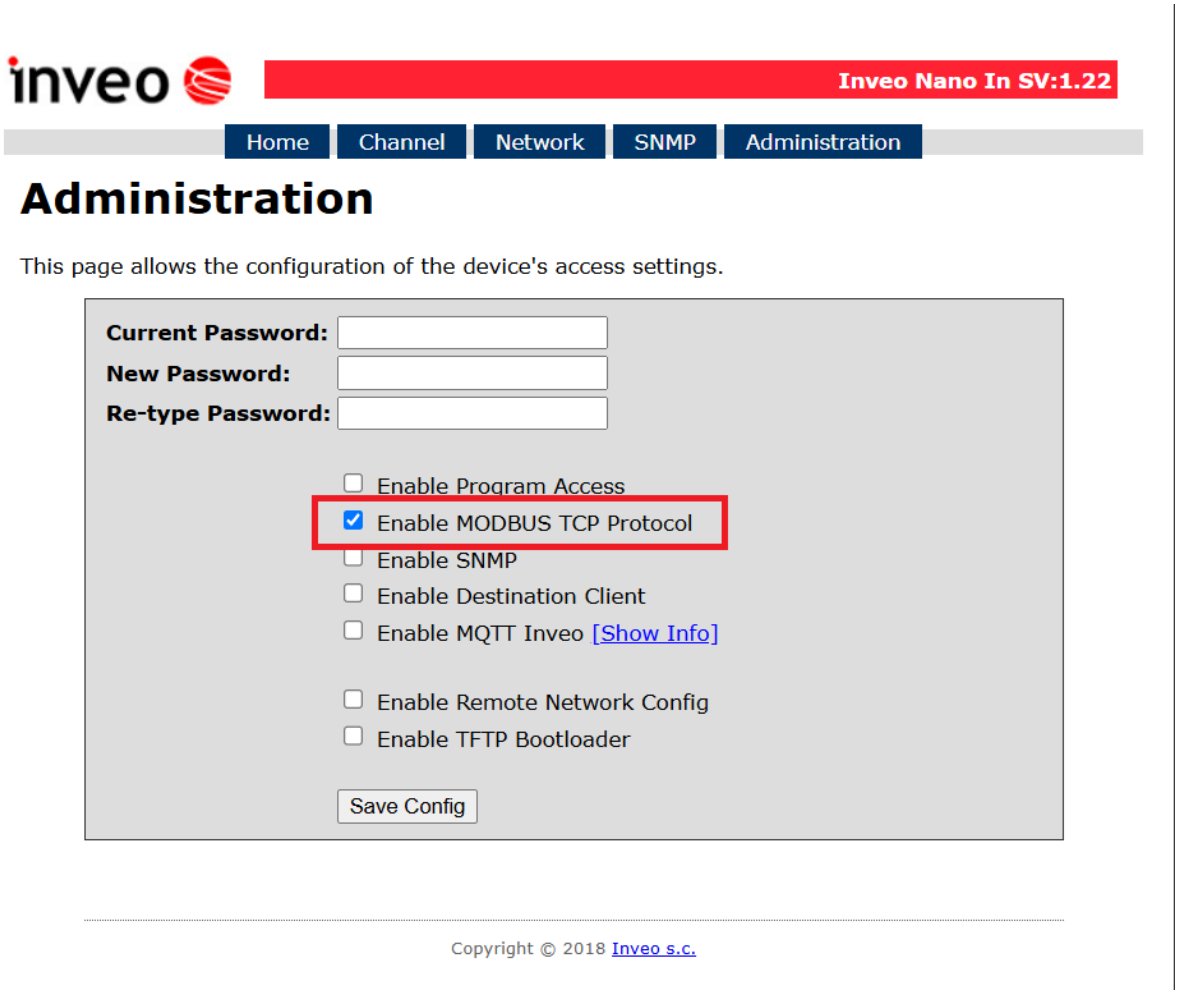
IP: 192.168.111.15

User: admin

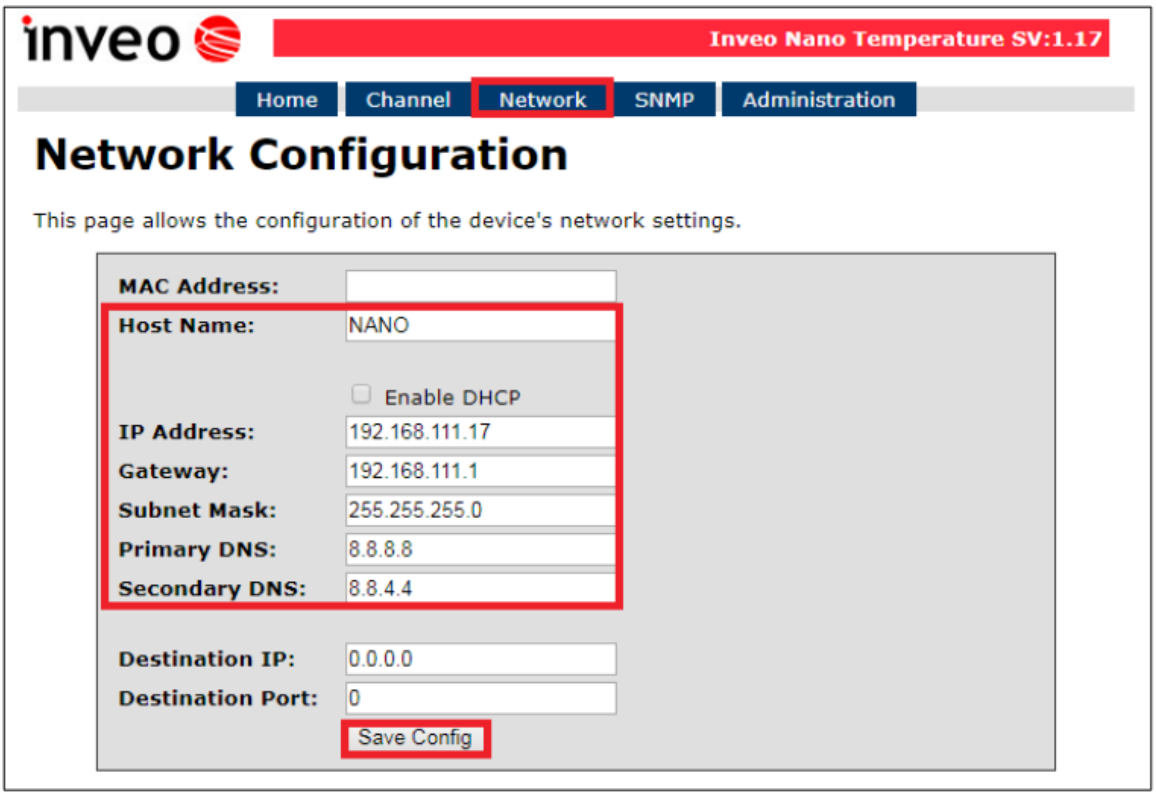
Pass: admin00

Make a direct ethernet connection from your PC to the Nano In. Set your PC ethernet address to a fixed IP of 192.168.111.1 with subnet mask 255.255.255.0. Use a web browser, such as Chrome, and navigate to 192.168.111.15.

Go to the “Administration Page”. Update the password to secure password and store that in your secure password vault. Enable ModBUS TCP Protocol, this will be used for communication with the impHub.




Goto the Network page. Update the network settings, either setting the Inveo Nano to the allocated fixed IP or configuring DHCP.




## 2.2 Wiring

All electrical wiring must be undertaken by a qualified electrician. You need to identify the pulse output terminals from the meter. The Nano In requires a voltage free input, it will detect impedance changes for the pulses. Therefore, it needs to be connected to a meter with a passive pulse output, which is usually the type of pulse on meters. If the meter you are connecting to has an active pulse output, with a voltage, then you will need to use that output to switch a relay before connecting to the Nano In.

Note that the Nano In positive voltage is on the left hand input pin, so where the pulse output of the meter is includes any directional components, like a diode you may need to switch the direction of the connection. Once connected, you should see the input indicator flashing or the LED display showing “ON/OFF”. If this doesn’t happen then check the wiring and polarity.

**Nano Digital Input PoE**


**Nano Digital Input**

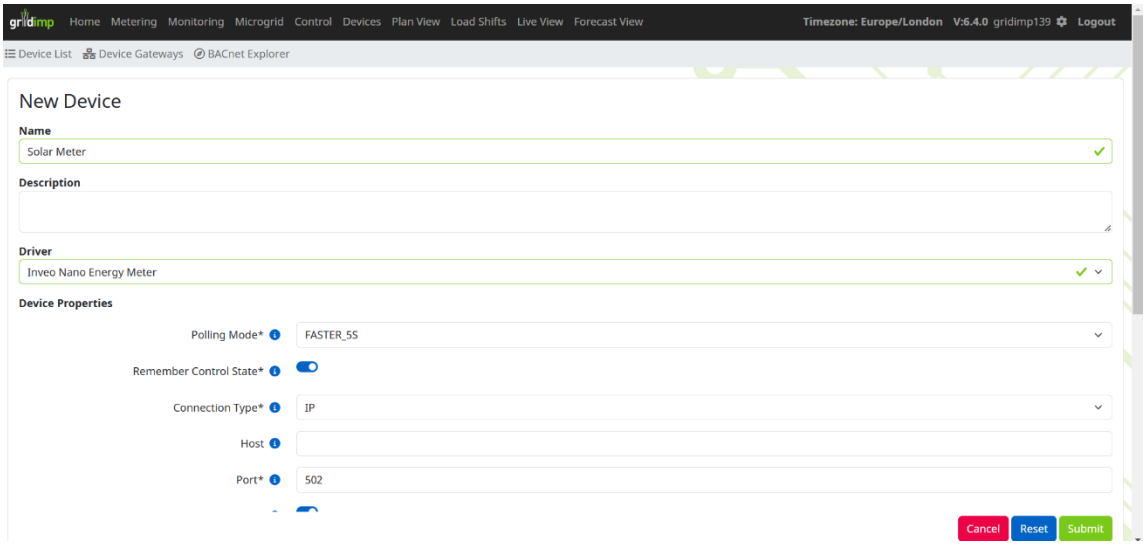

 

# 3 Configuring the impHub

You will need to first add a new device with the correct IP and pulses per kWh configuration. Then you need to add the new meter to the metering hierarchy and any control blocks that need it for plant metering.

## 3.1 Adding the Device

From the impHub engineering console navigate to “Devices > Device List” and click on “New Device”. Choose the driver “Inveo Nano Energy Meter”.



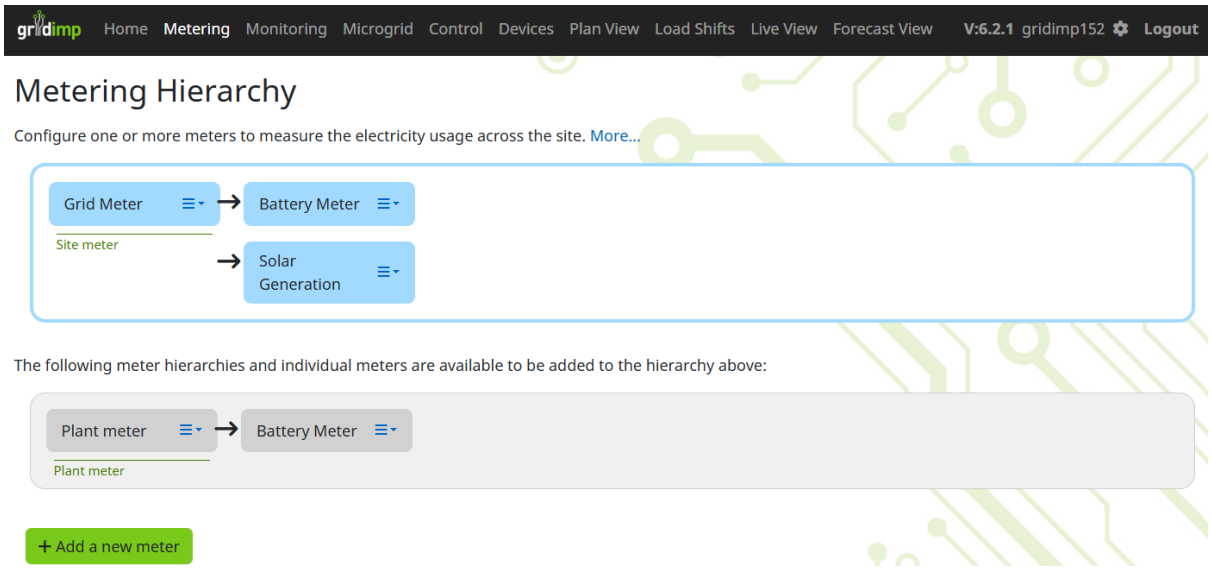

As you scroll down the page you access the list of properties. Use the following settings:

| Setting | Recommended Value |
|---|---|
| Polling Mode | FASER_5S |
| Remember Control State | True |
| Connection Type | IP |
| Host | The IP of the Inveo |
| Port | 502 |
| Keep Alive | True |
| Baud Rate | N/A |
| Data bits | N/A |
| Stop bits | N/A |
| Parity | N/A |
| Unit Id | 1 |
| Pulses Per Kwh | Number of pulses recorded by the counter for each KwH. For this look at the meter specification. |
| Sub Meters | None |
| Energy Flow Direction | Select IMPORTED/EXPORTED depending on the direction of the meter that is being monitored. For energy loads this will be IMPORTED for generation meters this will be EXPORTED. |
| Power Every Minute | AUTO |
| Power Smoothing Minutes | 1 |

## 3.2 Metering Hierarchy

Next you need to configure the metering hierarchy. Navigate to the page “Metering” and select the parent meter, the parent meter is the meter directly above the new metering. Then add below this the meter that you created.

The metering hierarchy below is one example, so for example if the meter you just added was to monitor solar generation, then you would add it underneath the grid meter.




## 3.3 Control Block Metering

If the new meter you just added is a plant meter for a control block, then navigate to “Control”, select the relevant control block and add this meter as the meter for the control block. For example, if the new meter is monitoring solar generation, then add it as the meter for the solar control block.