



The EasyGrid Protocol Testing manual provides testing procedures to confirm proper operation of the standard Nortech proprietary protocol, the standard Modbus protocol as well as the optional Ethernet capability, using Modbus TCP/IP protocol to illustrate.


## Connexion

1. Power	
<p><b>Power In</b></p>	<p><b>ON/OFF Switch</b></p>
<p>The EasyGrid requires <b>24 volts DC (<math>\pm 5\%</math>, power consumption 40W)</b>.</p> <ol style="list-style-type: none"> <li>1. Make sure that the ON/OFF switch is OFF when connecting the power supply to the unit.</li> <li>2. Wire the power input terminal block to a power supply providing the required voltage and respect polarity.</li> <li>3. Power up the unit using the ON/OFF switch.</li> </ol>	


2. Communication Cable	
<p>Unlock both screws and open the maintenance door.</p>	<p><b>USB Port</b></p> <ol style="list-style-type: none"> <li>1. Connect a USB cable to the USB port.</li> <li>2. Connect the other end of the USB cable to the PC.</li> </ol>
<p><b>RS-485 Port</b></p> <ol style="list-style-type: none"> <li>1. Configure the dip switches as shown.</li> <li>2. Connect the « EasyGrid USB to RS-485 Communication Cable » to the RS-422/485 terminal block connectors.</li> <li>3. Connect the USB end of the « EasyGrid USB to RS-485 Communication Cable » to the PC.</li> </ol>	<p><b>RS-422 Port</b></p> <ol style="list-style-type: none"> <li>1. Configure the dip switches as shown.</li> <li>2. Connect the « EasyGrid USB to RS-422 Communication Cable » to the RS-422/485 terminal block connectors.</li> <li>3. Connect the USB end of the « EasyGrid USB to RS-422 Communication Cable » to the PC.</li> </ol>

FTDI Driver	
Link	<a href="http://ftp.roctest-group.com/file/sharing/Uoe2i5kSv">http://ftp.roctest-group.com/file/sharing/Uoe2i5kSv</a>



Note	On the first connexion, Windows might need to download and install the FTDI USB driver which is available on windows update. To install the driver manually, browse the FISO ftp and launch "CDM v2.12.28 Setup.exe"	
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## Nortech Protocol Testing

<b>Nortech Client (Software &amp; Documentation)</b>		
Link	<a href="http://ftp.roctest-group.com/file/sharing/iUHpZiO1q">http://ftp.roctest-group.com/file/sharing/iUHpZiO1q</a>	
Note	Software & Documentation will be installed with the setup	

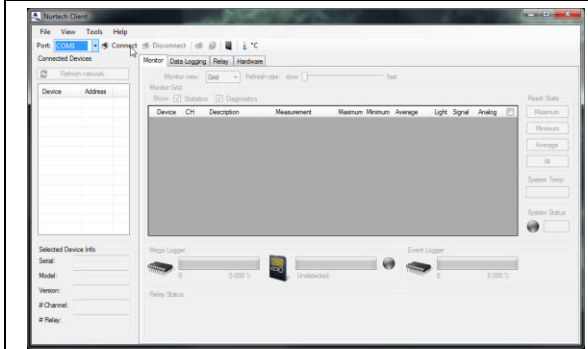
**1. Setup Nortech Protocol**

**IMPORTANT**

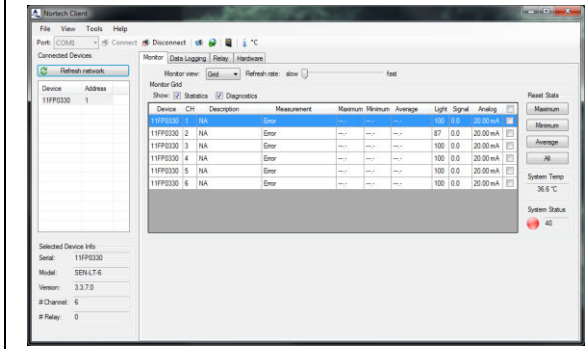
Your configuration for communication protocol should be set to "Nortech".



**2. Test Nortech Protocol**



Select your "Port" and click "Connect"



All the device information should appear or else Click "Refresh network"



# Modbus Protocol Testing

Modbus Reader (Software & Documentation)		
Link	<a href="http://ftp.roctest-group.com/file/sharing/ivSz9PyTc">http://ftp.roctest-group.com/file/sharing/ivSz9PyTc</a>	
Note	Software & Documentation will be installed with the setup	

### 1. Setup Modbus Protocol

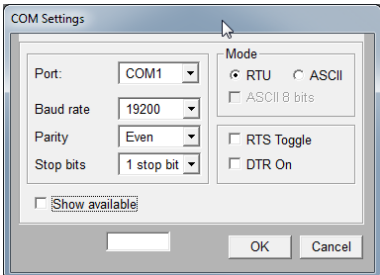
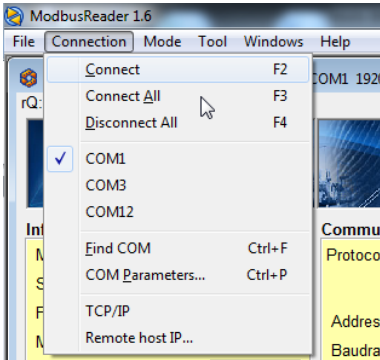
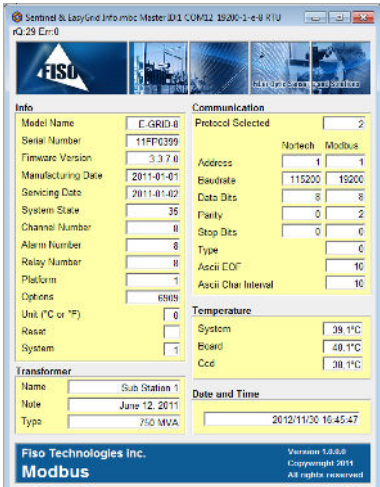
**IMPORTANT**

Your configuration for communication protocol should be set to **"MODBUS RTU"**


### 2. Test Modbus Protocol

	<p>Go to <b>"File"</b> menu and click <b>"Open"</b> to select the file <b>"*.mbc"</b> for your device and then click <b>"Open"</b></p>
	<p>Go to <b>"Mode"</b> menu to configure Modbus mode</p> <ol style="list-style-type: none"> <li>1. Select <b>"Master"</b></li> <li>2. Select <b>"Auto Requests Enable"</b></li> <li>3. Click on <b>"Master Settings"</b> to set <b>"Slave address"</b> to your device address</li> </ol>
	<p>Go to <b>"Connection"</b>, select your <b>"COM"</b> and click <b>"COM Parameters"</b> to configure it</p>





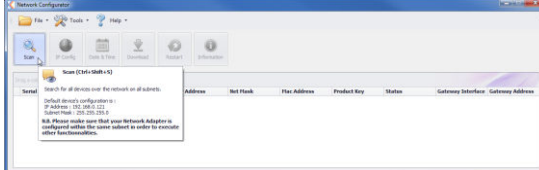
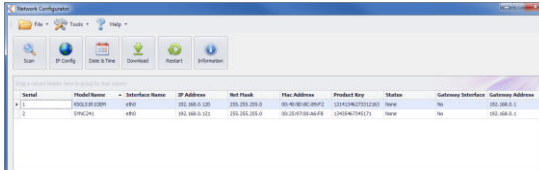
	<p>Set the following settings</p> <ul style="list-style-type: none"> <li>• Baud rate = 19200</li> <li>• Parity = Even</li> <li>• Stop bits = 1 stop bit</li> <li>• Mode = RTU</li> <li>• RTS Toggle = Uncheck</li> <li>• DTR On = Uncheck</li> <li>• Show available = Uncheck</li> </ul>
	<p>Finally, click on <b>“Connect All”</b> to start the test</p>
	<p>All the device information should appear</p>

## Ethernet Communication Scan for All Ethernet Protocol

<b>Network Configurator (Software &amp; Documentation)</b>		
Link	<a href="http://ftp.roctest-group.com/file/sharing/Bt3g5R3C">http://ftp.roctest-group.com/file/sharing/Bt3g5R3C</a>	
Note	Software & Documentation will be installed with the setup	

### Obtaining the device IP address



	<p>Connect the device to your network with a RJ-45 connector cable.</p>																														
	<p>Open "Network Configurator"</p>																														
	<p>Click on « Scan », so your device should appear in the list</p>																														
 <table border="1"> <thead> <tr> <th>Serial</th> <th>Manufacturer</th> <th>Interface Name</th> <th>IP Address</th> <th>Net Mask</th> <th>IP Address</th> <th>Product Key</th> <th>Status</th> <th>Gateway Interface</th> <th>Gateway Address</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>893L3P13081</td> <td>ef0</td> <td>192.168.0.120</td> <td>255.255.255.0</td> <td>30.4530.4530.4530</td> <td>(11110407512120)</td> <td>None</td> <td>No</td> <td>192.168.0.1</td> </tr> <tr> <td>2</td> <td>893C21</td> <td>ef0</td> <td>192.168.0.121</td> <td>255.255.255.0</td> <td>30.2047330.46210</td> <td>(1049474117)</td> <td>None</td> <td>No</td> <td>192.168.0.1</td> </tr> </tbody> </table>	Serial	Manufacturer	Interface Name	IP Address	Net Mask	IP Address	Product Key	Status	Gateway Interface	Gateway Address	1	893L3P13081	ef0	192.168.0.120	255.255.255.0	30.4530.4530.4530	(11110407512120)	None	No	192.168.0.1	2	893C21	ef0	192.168.0.121	255.255.255.0	30.2047330.46210	(1049474117)	None	No	192.168.0.1	<p>Take note of your "IP Address" and close "Network Configurator"</p>
Serial	Manufacturer	Interface Name	IP Address	Net Mask	IP Address	Product Key	Status	Gateway Interface	Gateway Address																						
1	893L3P13081	ef0	192.168.0.120	255.255.255.0	30.4530.4530.4530	(11110407512120)	None	No	192.168.0.1																						
2	893C21	ef0	192.168.0.121	255.255.255.0	30.2047330.46210	(1049474117)	None	No	192.168.0.1																						



# Ethernet Communication Testing using Modbus TCP/IP Protocol

Modbus Reader (Software & Documentation)		
Link	<a href="http://ftp.roctest-group.com/file/sharing/ivSz9PyTc">http://ftp.roctest-group.com/file/sharing/ivSz9PyTc</a>	
Note	Software & Documentation will be installed with the setup	

## 1. Setup Ethernet Protocol

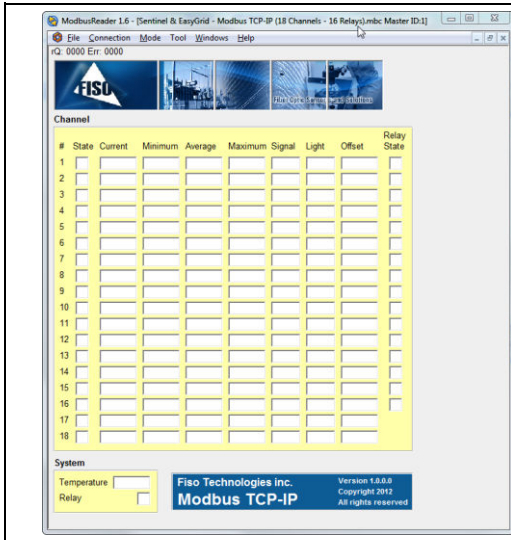
**IMPORTANT**

Your configuration dip switches for communication protocol should be set to **“Ethernet”** as in the picture below.

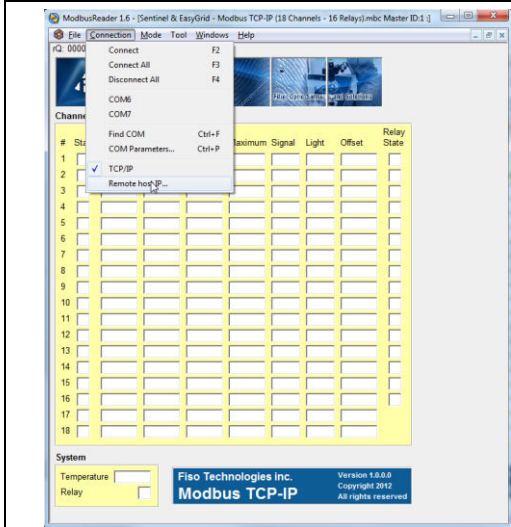
Your configuration for communication protocol should be set to **“MODBUS TCP-IP”** in the device.

## 2. Test Ethernet Modbus TCP/IP Protocol

Go to **“File”** menu and click **“Open”** to select the file **“\*.mbc”** for your device and then click **“Open”**

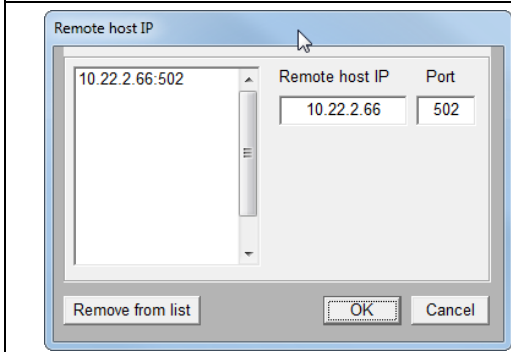


You will then get a display similar to this one

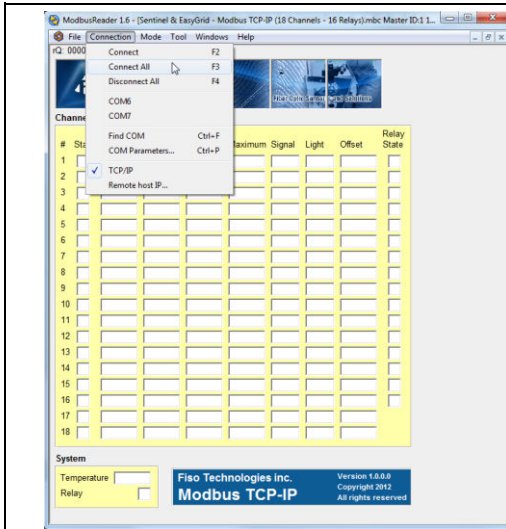


Under the “**Connection**” menu, select “**TCP/IP**”

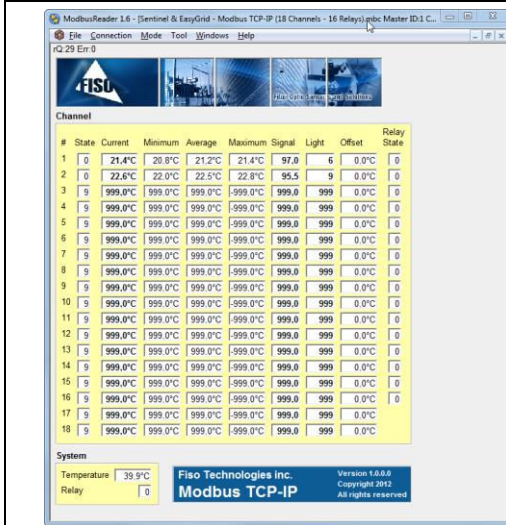
Then again under the “**Connection**” menu select “**Remote Host**”



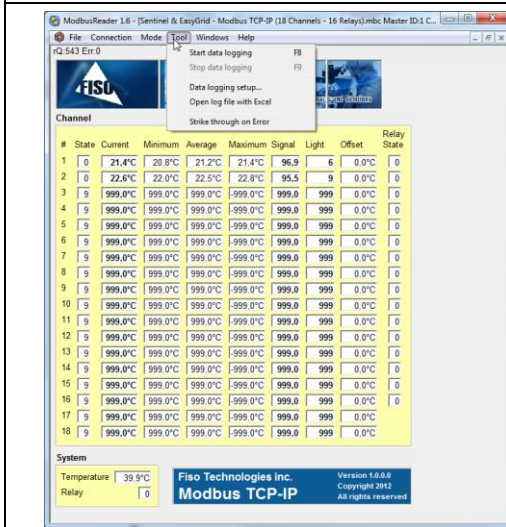
Type in the device “**IP address**” then select “**OK**”



Then under the **“Connection”** menu, select **“Connect All”**



All the device information should appear



Data logging tools are available if you wish to log data using Modbus Reader, under the **“Tool”** menu



# IEC 61850 Communication Testing using Omicron IEDScout v3.0

Omicron (Software & Documentation)		
Link	<a href="http://ftp.roctest-group.com/file/sharing/TnkcNyysl">http://ftp.roctest-group.com/file/sharing/TnkcNyysl</a>	
Note	Software & Documentation will be installed with the setup	

### 1. Setup Ethernet Protocol

**IMPORTANT**  
Your configuration dip switches for communication protocol should be set to **"Ethernet"** as in the picture below.

Your configuration for communication protocol should be set to **"IEC 61850"** in the device.

### 2. Omicron IEDScout

IEDScout.exe

Open **"IEDScout"**

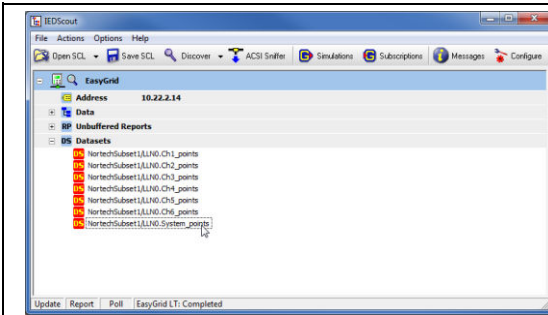
Click **"Configure"** to setup the Name and IP Address of your device



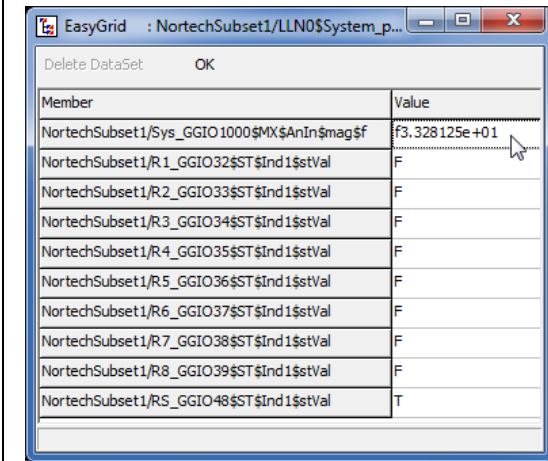
	<p>Set a <b>“Name”</b> to your <b>“IEDScout”</b> configuration and set the <b>“IP Address”</b> of your device</p>
	<p>Click on <b>“Apply”</b> to save your <b>“IEDScout”</b> configuration</p>
	<p>Click on <b>“OK”</b> to close this window</p>



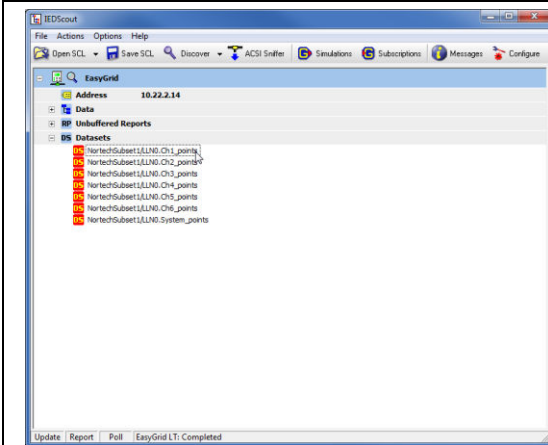
	<p>Click on <b>“Discover”</b> to show <b>“IEDScout”</b> configuration list</p>						
	<p>Select your configuration</p>						
	<p>Click on <b>“Connect”</b> to start the <b>“Discovery Process”</b></p>						
<table border="1" data-bbox="280 842 763 1003"> <thead> <tr> <th>Device</th> <th>State</th> <th>Discovery Transactions</th> </tr> </thead> <tbody> <tr> <td>EasyGrid</td> <td>Querying Server</td> <td>8</td> </tr> </tbody> </table> <p>Trying to Connect</p>	Device	State	Discovery Transactions	EasyGrid	Querying Server	8	<p><b>“Discovery Process”</b> is on <b>“Progress”</b> when you see in State Column <b>“Querying Server”</b></p>
Device	State	Discovery Transactions					
EasyGrid	Querying Server	8					
<table border="1" data-bbox="280 1249 763 1411"> <thead> <tr> <th>Device</th> <th>State</th> <th>Discovery Transactions</th> </tr> </thead> <tbody> <tr> <td>EasyGrid</td> <td>Done</td> <td>2904</td> </tr> </tbody> </table> <p>Done</p>	Device	State	Discovery Transactions	EasyGrid	Done	2904	<p><b>“Discovery Process”</b> is on <b>“Done”</b> when you see in State Column <b>“Done”</b></p>
Device	State	Discovery Transactions					
EasyGrid	Done	2904					



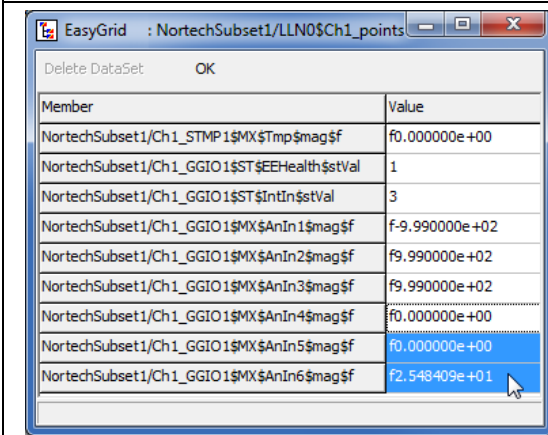
Expand the tree view to see “**Datasets IED Object**”  
 Double click onto “**System\_points**” IED Object



You could now verify your “**System Temperature**” and after Close this window  
 In this example : 3.328125e+01 → 33.28125 °C



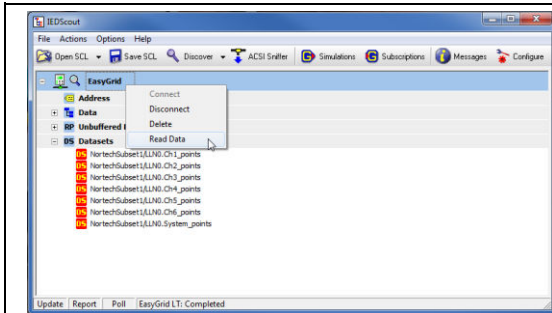
Double click onto “**Ch1\_points**” IED Object



You could now verify your “**Signal and Light**” and after Close this window

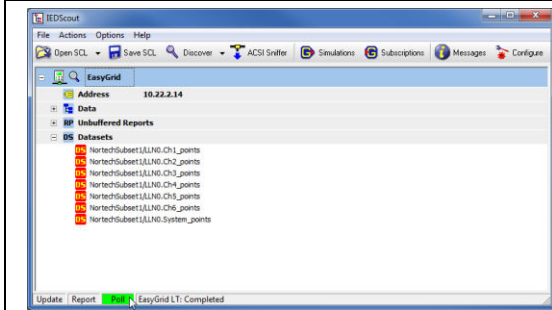
In this example :  
 Signal : 0.000000e+00 → 00.00000 %  
 Light : 2.548409e+01 → 25.48409 %

**P.S. No sensor is connect**

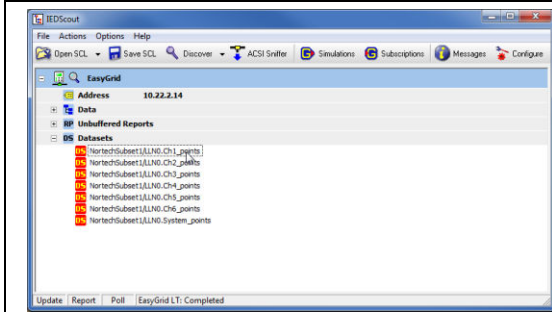


Connect a sensor into the **“Channel 1”**

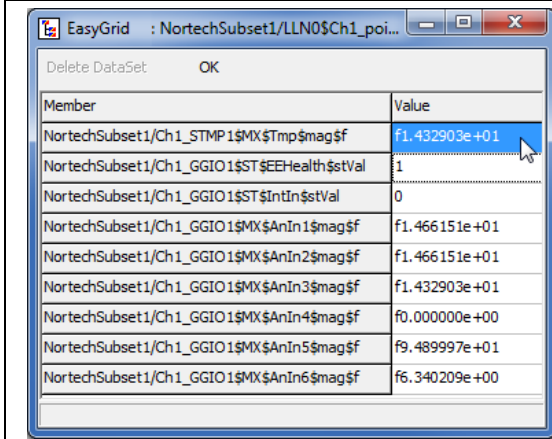
Right click on your IEDScout configuration name and click on **“Read Data”** to read again the data from your device



The **“Reading Process”** is on progress until the **“Poll”** indicator is **“Green or Yellow”**



Double click onto **“Ch1\_points”** IED Object



You could now verify your **“Temperature”** and after Close this window

In this example : 1.432903e+01 → 14.32903 °C