

# Integration Objects' OPC DA Access for Modbus Devices

# **OPC Server for Modbus**

Version 2.0 Rev.2

# **USER GUIDE**

# **OPC Compatibility**

OPC Data Access 3.00 OPC Data Access 2.05a





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# integration objects

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# PREFACE

# About this User Guide

This guide:

- Describes the main features of Integration Objects' OPC Server for Modbus.
- Lists the system requirements for installing and running the OPC Server for Modbus.
- Explains how to use and run this OPC server.
- Describes how to connect to the server using an OPC DA client.

## **Target Audience**

This document is intended for users that are looking for applications providing standard OPC DA (Data Access) connectivity to Modbus devices. Knowledge of the basics of OPC DA specification is assumed. It is also expected that you have some prior knowledge of the Modbus protocol.

# **Document Conventions**

| Convention        | Description   |
|-------------------|---|
| Bold              | Click/selection action required   |
|                   | Information to be noted   |
| Blue bold italics | Reference to other sections, or to other<br>Integration Objects user guides |

# **Customer Support Services**

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|  | www.integrationobjects.com             |



# INTRODUCTION

## 1. Overview

Integration Objects' OPC Server for Modbus is an OPC Server software designed to provide an OPC DA standard interface to Modbus compliant devices such as PLC, RTU and DCS. It establishes connection with one or more Modbus devices via TCP/IP or Serial protocol in order to collect data in real-time.

# 2. System Architecture

This OPC Server reads and updates data from/to devices such as RTU, PLC, and DCS. It can be accessed locally or remotely via DCOM by any OPC DA compliant client.

The following figure illustrates the client/server architecture and demonstrates the interaction between the OPC DA clients, the OPC Server for Modbus and the various Modbus-communicating devices.



Figure 1: System Architecture

This OPC server can collect data from Modbus devices via the Modbus TCP or Serial protocol and expose those data to OPC DA Clients.



## 3. Features

This section details the features offered by this OPC server including OPC DA server configuration.

- Intuitive user interface for Modbus tags configuration
   The OPC Server for Modbus offers an intuitive graphical user interface to configure the
   tags. This configuration will be saved in a CSV file and will be loaded at the next OPC
   server startup. After startup, the server loads the configuration file to create tags and
   build its address space. The server will then map the Modbus addresses with the OPC
   tags.
- Tags configuration per blocks
- Support of multiple OPC DA client connections
- Support of multiple Modbus TCP devices connections
- Support of multiple Modbus Serial devices connections
- Automatic reconnection to the configured Modbus TCP devices after network glitches
- Windows service capability allowing automatic restart after the restart of the host machine
- Traceability of events using log files and viewer
- Comprehensive OPC data access capabilities: This OPC server allows OPC DA Clients to retrieve in real-time the preconfigured Modbus slave devices addresses values. The following are the current supported OPC DA interfaces:

| Object        | Interface                                  | Supported |
|---------------|--|-----------|
|               | IUnknown                                   | Yes       |
|               | IOPCCommon                                 | Yes       |
|               | IOPCServer                                 | Yes       |
| OPC DA Server | IConnectionPointContainer                  | Yes       |
|               | IOPCBrowseServerAddressSpace<br>(Optional) | Yes       |
|               | IOPCItemProperties                         | Yes       |
|               | IUnknown                                   | Yes       |
|               | IOPCItemMgt                                | Yes       |
| OPC DA Group  | IOPCGroupStateMgt                          | Yes       |
|               | IOPCPublicGroupStateMgt (Optional)         | Yes       |
|               | IOPCSynclO                                 | Yes       |
|               | IOPCAsynclO                                | Yes       |

#### Table 1: Supported OPC DA Interfaces



## 4. OPC Compatibility

Integration Objects' OPC Server for Modbus implements OPC Data Access specification version 2.05 and 3.0.

# 5. Operating Systems Compatibility

This application was successfully installed and executed under the following operating systems:

- Windows Seven
- Windows Server 2008
- Windows 8
- Windows Server 2012
- Windows 10
- Windows Server 2016
- Windows Server 2019

# 6. System Requirements

The following are the minimum requirements to run the OPC Server for Modbus:

- Processor: 1 GHz (higher recommended)
- RAM: 512 MB (higher recommended)
- Disk Space: 100 MB hard disk space for full installation Required OPC DLLs (described in more details in the next chapter)
- An OPC DA client compliant with OPC DA 2.05 standard
- Modbus Slave Simulators or Devices
- .NET Framework version 4.5 or higher Click <u>here</u> if you need to download a client application or <u>here</u> for free OPC test clients download.



# **GETTING STARTED**

# **1. Pre-Installation Considerations**

In order to properly run the OPC Server for Modbus, the following software components need to be installed on the target system:

- The OPC core components 3.00 which consists of all shared OPC modules including the DCOM proxy/stub libraries, the OPC Server Enumerator, .NET wrappers, etc. You can deploy the OPC core components during the installation by checking the option "Install OPC Core Components" or after installation by using the setup available in the installation folder of the OPC Server for Modbus.
- .NET framework version 4.5 or higher.

Make sure there is no firewall or antivirus blocking the application.

# 2. Installing OPC Server

To install the OPC Server for Modbus:

1. Double-click on the Integration Objects' OPC Server for Modbus installation package.

The installation welcome dialog box will appear.



| Integration Objects' OPC Server | for Modbus - InstallShield Wizard  | x     |
|---------------------------------|--|-------|
| Integration Objects' OPC Server | for Modbus - InstallShield Wizard<br>Welcome to the InstallShield Wizard for Integration Objects' OPC Server for<br>Modbus<br>The InstallShield Wizard will install Integration Objects' OPC Server for Modbus on your compu | uter. |
|                                 |  |       |
| InstallShield                   | < <u>B</u> ack ( <u>Next</u> >) Can  | cel   |

Figure 2: Installation Welcome Dialog Box

2. Click the Next button. The license agreement will be displayed



| ntegration Objects' OPC Server<br>License Agreement<br>Please read the following licen | r for Modbus - InstallShield Wizard   | ×                                    |
|--|---|--------------------------------------|
|  | Integration Objects End-User License & Customer Support and Services Agreement<br>Integration Objects End-User License Agreement<br>PLEASE READ THIS END-USER LICENSE AGREEMENT (the "Agreement") CAREFULLY<br>BEFORE PROCEEDING. THIS AGREEMENT LICENSES THE SOFTWARE TO YOU AND<br>CONTAINS WARRANTY AND LIABILITY DISCLAIMERS. BY INSTALLING THE<br>SOFTWARE, YOU ARE CONFIRMING YOUR ACCEPTANCE OF THE SOFTWARE AND<br>AGREEING TO BECOME BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO<br>NOT WISH TO DO SO, CLICK "Do not accept" BELOW AND DO NOT INSTALL THE<br>SOFTWARE.<br>1. Definitions<br>(a) "10 Software" means the software program covered by this Agreement and all related<br>updates supplied by IO.<br>2. License<br>THE A DEPENDENT OF THE SOFTWARE AGREEMENT.<br>accept the terms of the license agreement<br>I do not accept the terms of the license agreement | <ul> <li>III</li> <li>III</li> </ul> |
| InstallShield  | < <u>B</u> ack <u>N</u> ext > Car   | icel                                 |

Figure 3: License Agreement Dialog Box

3. After reading the license agreement, **select** the first option and **click** the Next button. By proceeding, you are accepting all of the license agreement terms. Otherwise, you can cancel the installation. The customer information dialog box will then appear.



| Integration Objects' OPC Server for Modbus - InstallShield Wizard |  |       |
|---|--|-------|
| Customer Information<br>Please enter your information.            |  |       |
|   | Please enter your name and the name of the company for which you work. |       |
|   | User Name:<br>Integration Objects<br>Integration Objects               |       |
| InstallShield   | < <u>B</u> ack <u>N</u> ext > Ca                                       | ancel |

Figure 4: Customer Information Dialog Box

4. **Enter** the user name and the company name and then **click** the Next button. The dialog box for selecting the destination folder will be displayed.





Figure 5: Setup Type Dialog

- If you choose the **Complete** setup type, all features will be installed.
   If you choose **Custom** setup type, the following dialog will be displayed and you will need
  - to check the specific features that you want to install:



| Integration Objects' OPC Server                      | for Modbus - InstallShield Wizard  |
|--|--|
| Select Features<br>Select the features setup will in | nstall.  |
|  | Select the Product(s) that you want to install  PC Server For Modbus Serial PC Server For Modbus Ethernet  Description The OPC Server For Modbus Serial allows to communicate with serial Modbus devices  21.98 MB of space required on the C drive 39519 49 MB of space required on the C drive |
|  |  |
| InstallShield  | < <u>B</u> ack <u>N</u> ext > Cancel   |

Figure 6: Features Dialog

6. After selecting the features to be installed, the dialog box for choosing the destination folder will be displayed.





Figure 7: Choose Destination Folder Dialog Box

7. **Click** the Next button to continue the installation, or the Browse button to choose a different destination folder. The installation dialog box will then appear.





Figure 8: Installation Dialog Box

8. Click the Install button to start installation.

The setup will then:

- Copy the necessary files to the selected target folder,
- Create shortcut icons to launch the OPC Server for Modbus and license authorization program from the start menu and the desktop,
- Make an un-installation entry in the Programs and Features in the Control Panel.
- 9. If the OPC Core Components are not installed in your machine, you can select **Install OPC Core Components** option as shown in the figure below.





Figure 9: Install OPC Core Components Dialog Box

10. **Click** the finish button.



| Integration Objects' OPC Server for Modbus - InstallShield Wizard |  |  |  |  |
|---|--|--|--|--|
|   |  |  |  |  |
|   | InstallShield Wizard Complete  |  |  |  |
|   | Integration Objects' OPC Server for Modbus has been successfully installed on your computer. |  |  |  |
|   | Press Finish button to exit this installation.   |  |  |  |
| InstallShield   | < Back Finish Cancel   |  |  |  |

Figure 10: Installation Completed Dialog Box

## 3. Starting-up

The OPC Server for Modbus service is started automatically with the host machine restart. It can be started and stopped manually from the Windows services manager or from the OPC Server for Modbus user interface. This user interface can be launched from the start menu shortcut.

To do so, **click on** Start  $\rightarrow$  Programs  $\rightarrow$  Integration Objects  $\rightarrow$  OPC Server for Modbus  $\rightarrow$  OPC Server for Modbus



Figure 11: Launch the OPC Server for Modbus User Interface

The server can also be activated dynamically when an OPC DA client is connecting to it.



If the server is not currently running, COM will automatically launch it at the first OPC client connection.

# 4. Server Registration

In compliance with the OPC and COM specifications, the OPC Server for Modbus creates the following registry entries under HKEY\_CLASSES\_ROOT when installed on the target system. These entries will be removed when the server is uninstalled.

| Registry Entry                            | Description  |  |  |
|---|--|--|--|
| IntegrationObjects.OPC.Modbus.1           | Integration Objects' OPC Server for Modbus;<br>http://www.integrationobjects.com |  |  |
| IntegrationObjects.OPC.Modbus.1\C<br>LSID | { <i>CLSID</i> } = { 66A0F806-7490-46CB-A3D5-40EC8C9F80DF }                      |  |  |
| CLSID\{ <b>CLSID</b> }                    | Integration Objects' OPC Server for Modbus; http://www.integrationobjects.com    |  |  |
| CLSID\{ <b>CLSID</b> }\AppID              | {CLSID}  |  |  |
| CLSID\{ <b>CLSID</b> }\ProgID             | IntegrationObjects.OPC.Modbus.1  |  |  |

Table 2: OPC Server for Modbus Registry Entries

# 5. Removing the OPC Server

You can remove the server from your machine by clicking the **Uninstaller** shortcut from the start menu.



Figure 12: Start Menu – Uninstaller Shortcut

This OPC Server can also be removed manually as follows:

- 1. Click on the Start Menu
- 2. Select the Settings
- 3. Click on the Control panel
- In the Add/Remove programs dialog box, select "Integration Objects' OPC Server for Modbus"
- 5. Click the Change/Remove button and then OK



If you are using Windows 10, Windows Server 2012 or Windows Server 2016 operating systems, the uninstaller needs to be run from the start menu as illustrated below.







Figure 13: Windows 10 Startup Menu - Uninstall Shortcut



# **USING OPC SERVER FOR MODBUS**

In this section, you will find an overview of the OPC Server for Modbus user interface as well as the steps required to configure and use the application.

## 1. User Interface Overview

Users can configure the OPC Server for Modbus with an intuitive graphical user Interface.



Figure 14: OPC Server for Modbus – Main Interface

The main user interface includes four main sections:

- Menu bar (1): contains the file menu, the server menu, the settings menu and the help menu.
- Server address space tree view (2): allows to configure the OPC Server address space.
- **Tag & Device properties display (3):** The Tag Tab displays the tags' properties selected from the server address space tree view and the device tab displays the selected device properties.



- Server status summary (4): displays server status (running or suspended), the number of connected clients, the number of created groups, the number of created items and the last updated time.
- Log messages (5): displays the log messages including the Modbus requests and responses exception messages.

# 2. File Menu



Figure 15: File Menu

Using the File menu, you can:

- Create new configuration by clicking on **New**,
- Open an existing configuration by clicking on **Open** and selecting the appropriate CSV configuration file,
- Save your current configuration by clicking on Save or Save As,
- Close the application by clicking the Exit button.

## 3. OPC Server Menu

The OPC Server is registered automatically during the installation. The end user can also use the OPC Server menu in the user interface to manually register and unregister the server.

In the same OPC Server menu, you can start and stop the OPC Server for Modbus service by using the right buttons.



Figure 16: OPC Server Menu

## 4. Settings Menu

Using the Settings menu, you can:



- **Define** the default configuration that will be loaded automatically when you restart the server.
- **Remove** the default configuration,
- Set up the configuration parameters through the displayed window when you click on the "Configuration" button.
- Select the style of the graphical user interface, which is set by default to "Office2007Blue".
- Configure the server setting when clicking the **Configure** button



Figure 17: Settings Menu

When the user clicks the **Configure** button, the window below will be prompted:

| 👗 Settings Configuration     |   |   |
|------------------------------|---|---|
|                              | Lo  | og Configuration  |
| 🖃 🌸 Configuration            | Auto Append *                             | 🗷 True  |
| - 🥃 Application              | Buffer Size                               | 200   |
| Service                      | File Extension *                          | log   |
|                              | File Max Size                             | 10  |
|                              | File Name *                               | LogServerforModBusGUI                                     |
|                              | Folder Path *                             | C:\Program Files (x86)\Integration Objects\Integrati      |
|                              | Level                                     | Error   |
|                              | <ul> <li>Maximum Files</li> </ul>         | 6   |
|                              | Save Timeout                              | 10  |
| * Restart the application    | for the changes to take effect.           |   |
|                              | Ser                                       | ver Configuration   |
| Server Rate (ms) :           | 500 - Write Mode :                        | Synchronous V Check Device Status Period (ms) : 60000     |
| Default Configuration File : | C:\Program Files (x86)\Integration Object | cts\Integration Objects' OPC Server for Modbus\Config.csv |
|                              |   | OK Cancel   |

Figure 18: Settings Configuration Windows

In this window, you can configure the following parameters:



| Parameter                  | Description   | Default Value   |
|----------------------------|---|---|
| Server Rate                | The frequency at which the<br>server handles the<br>asynchronous reads/updates  | 500 ms (milliseconds)   |
| Write Mode                 | <ul> <li>Synchronous writes<br/>perform a write operation<br/>on the Modbus slave and<br/>wait for it to complete.</li> <li>Asynchronous writes<br/>perform a write on the<br/>Modbus slave but do not<br/>wait for the write to<br/>complete.</li> </ul> | Synchronous   |
| Check device status period | The frequency at which the server will check the device connection status   | 60 000 ms   |
| Default configuration file | The full path of the server CSV configuration file  | Empty   |
| Log Configuration for bo   | oth Application & Service   |   |
| Auto append                | Set to true to continue writing<br>log messages in the existed<br>log file or to false to create a<br>new file.   | True  |
| Buffer size                | The maximum number of<br>messages to be stored in the<br>runtime memory before<br>launching writes action in the<br>hard disk. It must be greater<br>than 100.  | 200   |
| File extension             | The log file extension  | log   |
| File max size              | The maximum size of the log file (in Mb)  | 10 Mb   |
| File name                  | The log file name   | <ul> <li>LogServerforModBus<br/>GUI: log file of the<br/>configuration user<br/>interface</li> <li>LogServerforModBus<br/>Service: log file of the<br/>service</li> </ul> |
| Folder path                | The application folder path   | Installation Folder   |
| Level                      | The type of log messages to be logged. The value can be   | Error   |



|                   | Control, Error, Warning, Inform, and Debug.          |    |
|-------------------|--|----|
| Maximum files     | Maximum number of files                              | 5  |
| Auto save timeout | Time to wait to read all<br>messages from the buffer | 10 |

#### **Table 3: Settings**

# 5. Server Configuration

The Server address space can be configured from the tree view at the left side from the main interface.

| Integration Objects' OPC Server for M  | odbus  |                 |            |               |              |              |              |              |                  |                     | - =        | x |
|--|--------|-----------------|------------|---------------|--------------|--------------|--------------|--------------|------------------|---------------------|------------|---|
| File OPC Server Settings Help          | )      |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
| New Open Save Save Exit                |        |                 |            |               |              |              |              |              |                  |                     |            |   |
| As                                     |        |                 |            |               |              |              |              |              |                  |                     |            |   |
| Open Exit                              |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  | Device | Tag             |            |               |              |              |              |              |                  |                     |            | • |
| Moddress Space                         | Name   | / IP<br>Address | Port Slave | DWord<br>Swap | Word<br>Swap | Byte<br>Swap | Bit<br>Order | Base<br>Addr | Reg Base<br>Addr | 32 bit<br>registers | Connection |   |
|  |        | 7 1001000       | 10         | onup          | onap         | ondp         | 01001        | 7 10 01      | 760              | rogiatoro           | millout    |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  | 4      |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  | 4      |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  | 4      |                 |            |               |              |              |              |              |                  |                     |            | • |
| Server Status : Bunning                |        |                 |            |               |              | Log Messages | 3            |              |                  |                     |            | * |
| Client Number 0                        |        | Date            | Message    |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |
| Group Number: 0                        |        |                 |            |               |              |              |              |              |                  |                     |            |   |
| Item Number: 0                         |        |                 |            |               |              |              |              |              |                  |                     |            |   |
| Last Update Time : 04/12/2015 16:39:51 |        |                 |            |               |              |              |              |              |                  |                     |            |   |
|  |        |                 |            |               |              |              |              |              |                  |                     |            |   |

Figure 19: OPC Server for Modbus Address Space Tree View

The sections below describe how to add, edit and delete Modbus devices and tags.

## 5.1. ADD DEVICE

Right click on the Address Space node, select New Device as illustrated below.



Figure 20: Add a New Device



Then, the following dialog screen will appear as shown below:



Figure 21: Add New Device Wizard

• <u>Step 1: Connection Parameters</u> Click the **Next** button. The following window will be displayed:



| P New Device                 | x        |
|------------------------------|----------|
| Device Connection            |          |
| Connection Parameters        |          |
| Device Type: TCP Port: 502   | ÷        |
| Name : SERIAL                |          |
| IP Address : 127.0.0.1       |          |
| Slave Identifier : 1         | <b></b>  |
| Connection Timeout (s) : 3   | <b>•</b> |
| Timeouts Number : 3          | -        |
| Request Timeout (ms) : 1000  | -        |
| Request Timeouts Number : 10 | -        |
| Disable Diagnostics          | tion     |
| Inter Request Delay (ms): 5  | <b>÷</b> |
|                              |          |
|                              |          |
|                              |          |
| < Back Next > Ca             | ancel    |

Figure 22: Select Device Connection Configuration

Depending on the selected features during the installation, you can configure the communication with the following Modbus devices types:

- TCP/IP Modbus Device
- Serial Modbus Device

You will then configure the port with reference to the selected type.

• For the Modbus TCP/IP protocol, enter the listening TCP port reserved for the Modbus device communications. The default value is 502.



| New Device                   | x     |
|------------------------------|-------|
| Device Connection            |       |
| Connection Parameters        |       |
| Name : Device 0              |       |
| IP Address : 127.0.0.1       |       |
| Slave Identifier : 1         | ÷     |
| Connection Timeout (s) : 3   | ÷     |
| Timeouts Number : 3          | -     |
| Request Timeout (ms) : 1000  | -     |
| Request Timeouts Number : 10 | -     |
| Disable Diagnostics          | tion  |
| Inter Request Delay (ms): 5  | ÷     |
|                              |       |
|                              |       |
| < Back Next > C:             | ancel |
|                              |       |

Figure 23: Select the TCP/IP Listening Modbus Port

For the Modbus serial protocol, Click on the **Port Settings** button as shown below:



| 🚽 New Device                     | x                              |
|----------------------------------|--------------------------------|
| Device Connec                    | tion                           |
| Connecti<br>Device Type : SERIAL | on Parameters<br>Port Settings |
| Name : Device                    | e_Serial                       |
| COM Port: COM                    | 1                              |
| Slave Identifier : 1             | ÷                              |
| Connection Timeout (s) :         | 3                              |
| Timeouts Number :                | 3                              |
| Request Timeout (ms) :           | 1000                           |
| Request Timeouts Number :        | 10                             |
| Disable Diagnostics              | Test Connection                |
| Inter Request Delay (ms):        | 5                              |
| Response Delay (ms):             | 0                              |
| Transmission Mode: RTU           | <b>•</b>                       |
| < Ba                             | ick Next > Cancel              |

Figure 24: Select the Serial COM Modbus Port



| 🕂 Port Settings      |      | x      |
|----------------------|------|--------|
| Port ID :            | COM1 | •      |
| Baud Rate:           | 9600 | •      |
| Data Bit :           | 8    | •      |
| Parity :             | Odd  | •      |
| Stop Bits :          | 1    | •      |
| Flow Control :       | None | •      |
| Read Timeout (ms) :  |      | 1000 🌲 |
| Write Timeout (ms) : |      | 1000 🌲 |
| Test Port            | ОК   | Cancel |

Figure 25: Select the COM Port Settings

The table below summarizes the parameters to configure the serial COM port:

| Parameter     | Description  |  |
|---------------|--|--|
| Port ID       | The port ID  |  |
| Baud Rate     | The baud rate to be used to configure the com port |  |
| Data Bits     | The number of data bits per data word              |  |
| Parity        | The type of parity for the data                    |  |
| Stop Bits     | The number of stop bits per data word              |  |
| Flow Control  | Defines how the RTS and DTR control lines are used |  |
| Read Timeout  | The read timeout                                   |  |
| Write Timeout | The write timeout                                  |  |

#### **Table 4: COM Port Settings Parameters**

After choosing the device type, enter the connection parameters.



| New Device                   | x             |
|------------------------------|---------------|
| Device Connection            |               |
| Connection Parameters        |               |
| Device Type: TCP Port        | : 502 🜲       |
| Name : Device_TCP            |               |
| IP Address : 127.0.0.1       |               |
| Slave Identifier : 1         | <b>+</b>      |
| Connection Timeout (s) : 3   | +             |
| Timeouts Number : 3          | -             |
| Request Timeout (ms) : 1000  |               |
| Request Timeouts Number : 10 | -             |
| Disable Diagnostics          | st Connection |
| Inter Request Delay (ms): 5  | -             |
|                              |               |
|                              |               |
|                              |               |
| < Back Next >                | Cancel        |

### Figure 26: Select the TCP/IP Device Connection Parameters

| Parameter          | Description   |
|--------------------|---|
| Name               | The device name   |
| IP Address         | The Modbus device IP address  |
| Slave Identifier   | The Identifier of the slave device  |
| Connection Timeout | The waiting period for an unresponsive server   |
| Timeout Number     | The allowed timeouts number when the server does not respond                                  |
| Request Timeout    | The amount of seconds that the OPC Server will wait before setting the OPC Tag quality to bad |



| Request Timeouts<br>Number | The allowed request timeouts number before starting the reconnection procedure to the device   |  |
|----------------------------|--|--|
| Disable Diagnostics        | <ul> <li>When unchecked, it means that the diagnostics<br/>function will be used to check the device<br/>communication status.</li> </ul>  |  |
|                            | <ul> <li>When checked, it means that the diagnostics function<br/>will not be used to check the device communication<br/>status</li> </ul> |  |
| Inter Request Delay        | Specifies the amount of time between two read requests   |  |

Table 5: TCP/IP Device Connection Parameters

| Device Co                | nnection            |          |
|--------------------------|---------------------|----------|
| Co<br>Device Type : SERI | nnection Parameters | ettings  |
| Name :                   | Device_Serial       |          |
| COM Port:                | COM1                | -        |
| Slave Identifier :       | 1                   | <b>•</b> |
| Connection Timeout (s    | ): 3                | <b>•</b> |
| Timeouts Number :        | 3                   | -        |
| Request Timeout (ms)     | : 1000              | -        |
| Request Timeouts Nur     | mber : 10           | -        |
| 🗷 Disable Diagnostic     | s Test Co           | nnection |
| Inter Request Delay (m   | ns): 5              | -        |
| Response Delay (ms):     | 0                   | -        |
| Transmission Mode:       | RTU                 | -        |

Figure 27: Select the Serial Device Connection Parameters



| Parameter                  | Description   |
|----------------------------|---|
| Name                       | The device name   |
| COM Port                   | The serial communication port   |
| Slave Identifier           | The Identifier of the slave device  |
| Connection Timeout         | The waiting period for an unresponsive server   |
| Timeout Number             | The allowed timeouts number when the server does not respond  |
| Request Timeout            | The amount of seconds that the OPC Server will wait before setting the OPC Tag quality to bad   |
| Request Timeouts<br>Number | The allowed request timeouts number before starting the reconnection procedure to the device  |
| Transmission Mode          | The transmission mode. It can be either the RTU mode or the ASCII mode  |
| Disable Diagnostics        | <ul> <li>When unchecked, it means that the diagnostics function will be used to check the device communication status.</li> <li>When checked, it means that the diagnostics function will not be used to check the device communication status</li> </ul> |
| Inter Request Delay        | Specifies the amount of time between two read requests  |
| Response Delay             | Specifies the amount of time to wait a response from the target device. This delay may be useful in case of devices with slow performance   |

### **Table 6: Serial Device Connection Parameters**

You can test the availability of the Modbus Device by clicking on the **Test Connection** button. If the Modbus device is available, a message box will be displayed:



Figure 28: Test Connection with Modbus Device



### Step 2: Data Access and Swapping Mode Configuration

Once the device connection parameters are configured, click the **Next** button and the following window will be displayed.

| 🕂 New Device  | X  |
|---|----|
| Data Access and Swapping Mode                                     |    |
| Data Access Settings  |    |
| Use zero based bit addressing                                     |    |
| Use zero based bit addressing within registers                    |    |
| Use holding register bit mask writes                              |    |
| Use write single register function to write to multiple registers | 5  |
| Use write single coil function to write to multiple coils         |    |
| 32 bit registers addressing mode                                  |    |
|   |    |
| Swapping Mode   |    |
| DWord Swap  |    |
| Byte Swap Modicon Bit Ordering                                    |    |
|   |    |
|   |    |
| < Back Next > Cance   | el |

### Figure 29: Select Device Data Access & Swapping Mode Parameters

The data access parameters are described in the below table:

| Parameter                        | Description   |
|----------------------------------|---|
| Use zero based bit<br>addressing | • False (unchecked): The Modbus device address numbering starts at 1 which makes the starting address sent in the Modbus frames request will have one subtracted. |
|                                  | • True (checked): The Modbus device address numbering starts at 0 and the starting address included in the Modbus frame request will remain the same.             |



| Use zero based bit<br>addressing within<br>registers          | This option is used with bits within registers referenced as Boolean  |
|---|---|
|   | <ul> <li>False (unchecked): The first bit within register begins<br/>at one</li> </ul>  |
|   | <ul> <li>True (checked): The first bit within register begins at zero</li> </ul>  |
|   | This option is used to write in a bit within register using the boolean datatype with holding registers.  |
| Use holding register<br>bit mask writes                       | <ul> <li>False (unchecked): The OPC Server will use a read<br/>/Write operation to update the bit of interest.</li> </ul>   |
|   | • True (checked): The OPC Server will use function 22 to update the bit of interest.  |
|   | This option is related to 32 bits and 64 bits OPC tags.   |
| Use write single<br>register function to<br>write to multiple | <ul> <li>False (unchecked): The OPC Server will use the<br/>function 16 to write to multiple registers.</li> </ul>  |
| Use write single coil   | <ul> <li>True (checked): The OPC Server will use function 06<br/>to write into multiple registers.</li> </ul>   |
|   | <ul> <li>False (unchecked): The OPC Server will use the<br/>function 15 to write to multiple coils.</li> </ul>  |
| function to write to multiple coils                           | <ul> <li>True (checked): The OPC Server will use function 05<br/>to write into multiple coils.</li> </ul>   |
|   | This check box determines how floating points and long integer values are handled:  |
| 32 bit Registers<br>Addressing Mode                           | <ul> <li>When unchecked, it means that the Modbus device<br/>allocates two 16 bit registers for containing a floating<br/>point or long integer value.</li> </ul> |
|   | • When checked, it means that the device allocates one 32 bit register for the value.   |
| Enable synchronous communication                              | <ul> <li>When unchecked, it means that the asynchronous<br/>communication will be used read/write data from/to<br/>Modbus device</li> </ul>                       |
|   | <ul> <li>When checked, it means that the synchronous<br/>communication will be used read/write data from/to<br/>Modbus device</li> </ul>                          |
|   |   |

### Table 7: Device Data Access Parameters



You can also select the swapping mode with reference to the below description:

| Parameter            | Description  |
|----------------------|--|
| DWord Swap           | <ul> <li>False (unchecked): Higher dword is sent/received first for double values.</li> <li>True (checked): Lower dword is sent/received first for double values.</li> </ul>   |
| Word Swap            | <ul> <li>False (unchecked): Higher word is sent/received first for long, unsigned long or float values.</li> <li>True (checked): Lower word is sent/received first for long, unsigned long or float values.</li> </ul>   |
| Byte Swap            | <ul> <li>False (unchecked): Higher byte is sent/received first for integer, unsigned integer, long, unsigned long or float values.</li> <li>True (checked): Lower byte is sent/received first for integer, unsigned integer, long, unsigned long or float values.</li> </ul>                                 |
| Modicon Bit Ordering | <ul> <li>False (unchecked): Higher bit is sent/received first for<br/>Boolean, integer, unsigned integer, long, unsigned<br/>long or float values.</li> <li>True (checked): Lower bit is sent/received first for<br/>Boolean, integer, unsigned integer, long, unsigned<br/>long or float values.</li> </ul> |

### Table 8: Device Swapping Mode Parameters

Step 3: Auto-demotion, Block Sizes and Error Handling

After configuring the device data access and swapping mode, click the **Next** button and the following window will be displayed.



| New Device                                   | x           |
|--|-------------|
| Communication Failure Handling               |             |
| Auto-Demotion                                |             |
| Enable auto device demotion on communication | on failures |
| Failures Number :                            | 3 🜲         |
| Demotion Period (ms) : 10                    | 0000        |
| Discard write requests during the demotion   | on period   |
| Block Sizes                                  |             |
| Output Coils: 2000 Holding Registers         | : 32 🖨      |
| Input Coils : 2000 Input Registers :         | 32 🐳        |
| Error Handling                               |             |
| Deactivate tags on illegal address exception |             |
|  |             |
|  |             |
|  |             |
|  |             |
|  |             |
|  |             |
| < Back Finish                                | Cancel      |
|  |             |

Figure 30: Select Communication Failure Handling Parameters

In addition to the connection parameters, the communication failure is al handled using the Auto-Demotion, the block sizes and the error handling parameters. Below are the descriptions of each option:

| Parameter  | Description   |
|--|---|
| Enable auto device<br>demotion on<br>communication<br>failures | When checked, This option allows to demote a device<br>for a specific period of time when communication<br>failures reaches an already configured limited number. |
| Failures Number  | The number of successive failures before demoting the device  |



| Demotion Period   | During this period ,no read request will be sent to the device                       |
|---|--|
| Discard write requests<br>during the demotion<br>period | When checked, no write request will be sent to the device during the demotion period |

### **Table 9: Auto-Demotion Parameters**

| Parameter         | Description   |
|-------------------|---|
| Output Coils      | Specifies the number of output coils in the Modbus frame requests     |
| Input Coils       | Specifies the number of input coils in the Modbus frame requests      |
| Input Registers   | Specifies the number of output registers in the Modbus frame requests |
| Holding Registers | Specifies the number of input registers in the Modbus frame requests  |

 Table 10: Device Block Sizes Parameters



After updating the block size properties, you need to restart the service so the changes take effects.

| Parameter                    | Description  |  |  |
|------------------------------|--|--|--|
| Deactivate tags on           | <ul> <li>False (unchecked): When illegal data address error is<br/>occurred with a block addresses. The OPC Server<br/>remains sending read requests to the Modbus device</li> </ul> |  |  |
| illegal address<br>exception | <ul> <li>True (checked): When illegal data address error is<br/>occurred with a block addresses. The OPC Server<br/>stops sending read requests to the Modbus device</li> </ul>      |  |  |

 Table 11: Device Error Handling Parameters

Step 4: Click the **Finish** button and the device will be then added to tree view.

## 5.2. EDIT DEVICE

You can edit the device configuration parameters by right clicking on its node and selecting the **Edit** option from the displayed menu.







Figure 31: Edit Device

Then, the Edit Device dialog box will be displayed as illustrated below:

| 🔀 Edit Device                  | x   |  |  |
|--------------------------------|---|--|--|
| Properties                     | Data Access Settings  |  |  |
| Name : Device_Serial           | Use zero based bit addressing                                     |  |  |
| COM Port: COM1 Edit            | Use zero based bit addressing within registers                    |  |  |
| Transmission Mode: RTU 💌       | Use holding register bit mask writes                              |  |  |
| Slave Identifier : 1           | Use write single register function to write to multiple registers |  |  |
|                                | Use write single coil function to write to multiple coils         |  |  |
|                                | 32 bit registers addressing mode                                  |  |  |
| Timeouts Number : 3            | J   |  |  |
| Request Timeout (ms) : 1000 🖨  | Error Handling  |  |  |
| Request Timeouts Number : 10 🚔 | Deactivate tags on illegal address exception                      |  |  |
| Disable Diagnostics            | Auto-Demotion   |  |  |
| Inter Request Delay (ms) : 5   | Enable auto device demotion on communication failures             |  |  |
| Response Delay (ms) : 0 🐳      | Failures Number : 3   |  |  |
|                                | Demotion Period (ms) : 10000                                      |  |  |
| Block Sizes                    | Discard write requests during the demotion period                 |  |  |
| Output Coils: 2000 🚔           |   |  |  |
| Input Coils : 2000 ਦ           | Swapping Mode   |  |  |
| Input Registers : 32 荣         | DWord Swap Word Swap  |  |  |
| Holding Registers : 32 🛬       | Byte Swap Modicon Bit Ordering                                    |  |  |
|                                | OK Cancel   |  |  |

Figure 32: Edit Serial Device Dialog Box



| 🔀 Edit Device                  | x   |  |  |
|--------------------------------|---|--|--|
| Properties                     | Data Access Settings  |  |  |
| Name : Device_TCP              | Use zero based bit addressing                                     |  |  |
| IP Address : 127.0.0.1         | Use zero based bit addressing within registers                    |  |  |
| Port : 502 🜩                   | Use holding register bit mask writes                              |  |  |
| Slave Identifier : 1           | Use write single register function to write to multiple registers |  |  |
|                                | Use write single coil function to write to multiple coils         |  |  |
| Connection Timeout(s) .        | 32 bit registers addressing mode                                  |  |  |
| Timeouts Number : 3            | Enable synchronous communication                                  |  |  |
| Request Timeout (ms) : 1000    | Error Handling  |  |  |
| Request Timeouts Number : 10   | Deactivate tags on illegal address exception                      |  |  |
| 🗷 Disable Diagnostics          | Auto-Demotion   |  |  |
| Inter Request Delay (ms) : 5 🚔 | Enable auto device demotion on communication failures             |  |  |
|                                | Failures Number : 3   |  |  |
|                                | Demotion Period (ms) : 10000                                      |  |  |
| Block Sizes                    | Discard write requests during the demotion period                 |  |  |
| Output Coils: 2000 🚔           |   |  |  |
| Input Coils : 2000 🚔           | Swapping Mode   |  |  |
| Input Registers : 32 🚔         | DWord Swap Word Swap  |  |  |
| Holding Registers : 32 ਦ       | Byte Swap Modicon Bit Ordering                                    |  |  |
|                                | Test Connection OK Cancel   |  |  |

Figure 33: Edit TCP/IP Device Dialog Box

## 5.3. DELETE DEVICE

You can remove the selected device by right clicking on its node and selecting on the **Delete** option from the displayed menu.







Figure 34: Delete Device

You can also delete multiple devices simultaneously by selecting the devices to be deleted or clicking the **Delete All Devices** option to remove all the devices. To select multiple devices in the address space tree, use the Shift or Ctrl keys.



Figure 36: Delete All Devices

## 5.4. ADD GROUP

You can add groups under the device node in order to build hierarchal organization of the server address space. A group belongs to a device and contains one or more OPC tags. It can also contain other sub-groups.



Right click on the device node and then select the **New Group** option from the displayed menu.



Figure 37: New Group

Then, the New Group dialog box will be displayed as illustrated below. You can have to specify the group name.

| 🐈 New Goup     | x      |
|----------------|--------|
| Name : Group_0 |        |
| ОК             | Cancel |

Figure 38: New Group Dialog Box

## 5.5. EDIT & REMOVE GROUP

You can edit the group name by right clicking on the group node and then select the **Edit** option as shown in the following figure.

| Address Space |   |               |          |
|---------------|---|---------------|----------|
|               | J | New Group     |          |
| C             |   | New Tag       | Ins      |
| E             |   | New Tag Block | Ctrl+Ins |
| 6             | 2 | Edit          |          |
| é             | 3 | Delete        |          |

Figure 39: Edit Group



The Edit Group dialog box will be then displayed as below:

| 💫 Edit Group   | x      |
|----------------|--------|
| Name : Group_0 |        |
| ОК             | Cancel |

Figure 40: Edit Group Dialog Box

You can also remove the selected group by right clicking on its node and then selecting on the **Delete** option from the displayed menu. The Group node and all its tags and subgroups will be removed from the address space.



Figure 41: Delete Group

The end user can delete multiple groups simultaneously by selecting the groups using the Shift or Ctrl keys and clicking the **Delete** option available in the right click menu.







Figure 42: Delete Multiple Groups

## 5.6. ADD TAG

A tag can be added directly to a device (address space flat organization) or to a group. The figure below shows how to add a new tag to a device or to a group of tags.



Figure 43: New Tag

Once the **New Tag** option is selected, a dialog box will be displayed allowing the user to configure the tag parameters.





| 🐈 New Tag             | x                          |
|-----------------------|----------------------------|
| Name :                | Tag_0                      |
| Location Type :       | Coils (bit,read/write)     |
| Address :             | 1 🗭 Range : 165534         |
| Data Type :           | VT_BOOL (Boolean)          |
| Bit Range :           | 1 Range:116                |
| Data Length (Bytes) : | 1                          |
| Access Right:         | Read + Write     Read Only |
| Byte Swap             |                            |
| Add                   | OK Cancel                  |

Figure 44: New Tag Dialog Box

The table below summarizes the parameters to configure your tags:

| Parameter     | Description  |  |  |  |
|---------------|--|--|--|--|
| Name          | The tag name   |  |  |  |
| Location Type | <ul> <li>The Modbus address type, which can be:</li> <li>Coils</li> <li>Discrete Inputs</li> <li>Holding Registers</li> <li>Input Registers</li> </ul> Refer to the Location Type table for more details.  |  |  |  |
| Address       | The address from where the data will be extracted or modified. The value should be between 1 and 65534.  |  |  |  |
| Bit Range     | This is enabled with Boolean tags whose address type is<br>Holding Register or Input Register. It denotes the range of<br>a bit in one register.   |  |  |  |
| Data Type     | <ul> <li>The type of data, which can be:</li> <li>VT_I2: Variable type is 2-byte signed integer</li> <li>VT_I4: Variable type is 4-byte signed integer</li> <li>VT_R4: Variable type is 4-byte real</li> <li>VT_R8: Variable type is 8-byte double</li> <li>VT_UI2: Variable type is an unsigned integer</li> <li>VT_UI4: Variable type is an unsigned long</li> <li>VT_BSTR: Variable type is binary string</li> <li>VT BOOL: Variable type is Boolean</li> </ul> |  |  |  |

| Data Length  | The bytes number of the selected data type   |  |  |  |
|--------------|--|--|--|--|
| Access Right | The data access right, which can be read only or read/write                                      |  |  |  |
| Bute Swan    | <ul> <li>False (unchecked): Higher byte is sent/received first<br/>for string values.</li> </ul> |  |  |  |
| Byte owap    | <ul> <li>True (checked): Lower byte is sent/received first for<br/>string values.</li> </ul>     |  |  |  |

#### Table 12: Tag Parameters

| Name              | Object Type | Access Right | Description   |
|-------------------|-------------|--------------|---|
| Coils             | Single bit  | Read-Write   | This type of data can be altered by an application program. |
| Discrete Inputs   | Single bit  | Read-Only    | This type of data can be provided by an I/O system.         |
| Holding Registers | 16-bit word | Read-Write   | This type of data can be altered by an application program. |
| Input Registers   | 16-bit word | Read-Only    | This type of data can be provided by an I/O system          |

Table 13: Location Type

## 5.7. ADD TAG PER BLOCK

You can add simultaneously multiple tags having the same location type and access right but different addresses. Right click on the group or device node and then select the **Add Tag Block** option.

| ⊡ 🎯 Addres | ss Spac | e             |          | ⊡ 🏈 Address S<br>⊡ 📗 Device | pace<br>0 |               |          |
|------------|---------|---------------|----------|-----------------------------|-----------|---------------|----------|
|            |         | New Group     |          |                             |           | New Group     |          |
|            |         | New Tag       | Ins      |                             | O         | New Tag       | Ins      |
|            |         | New Tag Block | Ctrl+Ins |                             |           | New Tag Block | Ctrl+Ins |
|            |         | Edit          |          |                             |           | Edit          |          |
| (          | •       | Delete        |          |                             | $\odot$   | Delete        |          |

Figure 45: New Tag Block

The New Tag Block dialog box will be displayed as following:



| 🐈 New Tag Block       | x                        |
|-----------------------|--------------------------|
| Base Tag Name :       | Tag_                     |
| Starting Address :    | 1 Range 165534           |
| Number of Tags :      | 1                        |
| Location Type :       | Coils (bit,read/write)   |
| Data Type :           | VT_BOOL (Boolean)        |
| Bit Range :           | 1 🚔 Range:116            |
| Data Length (Bytes) : | 1                        |
| Access Right:         | Read + Write   Read Only |
| Byte Swap             |                          |
| ОК                    | Cancel                   |

Figure 46: New Tag Block Dialog Box

| Parameter        | Description   |  |  |  |  |
|------------------|---|--|--|--|--|
| Base Tag Name    | The pattern used to generate the name of the tags   |  |  |  |  |
| Location Type    | <ul> <li>The Modbus address type, which can be :</li> <li>Coils</li> <li>Discrete Inputs</li> <li>Holding Registers</li> <li>Input Registers</li> </ul> Refer to the Location Type table for more details.  |  |  |  |  |
| Starting Address | The address of the first tag. Its value should be between 1 and 65534.  |  |  |  |  |
| Number of Tags   | The number of the tags to be added  |  |  |  |  |
| Data Type        | <ul> <li>The type of data, which can be:</li> <li>VT_I2: Variable type is 2-byte signed integer</li> <li>VT_I4: Variable type is 4-byte signed integer</li> <li>VT_R4: Variable type is 4-byte real</li> <li>VT_UI2: Variable type is an unsigned integer</li> <li>VT_UI4: Variable type is an unsigned long</li> <li>VT_BSTR: Variable type is binary string</li> <li>VT_BOOL: Variable type is Boolean</li> </ul> |  |  |  |  |
| Data Length      | The bytes number of the selected data type  |  |  |  |  |



| Access Right | The data access right, which can be read only or read/write                                      |
|--------------|--|
| Buto Swan    | <ul> <li>False (unchecked): Higher byte is sent/received first<br/>for string values.</li> </ul> |
| Byte Swap    | <ul> <li>True (checked): Lower byte is sent/received first for<br/>string values</li> </ul>      |

**Table 14: Tag Block Properties** 

## 5.8. EDIT TAG

You can update a tag configuration by clicking on the **Edit** option in the right click menu.



Figure 47: Edit Tag

The Edit Tag Dialog Box will be displayed as illustrated below:

| 📩 Edit Tag            | x                           |
|-----------------------|-----------------------------|
| Name :                | Tag_1                       |
| Location Type :       | Coils (bit,read/write)      |
| Address :             | 1 🚔 Range : 165534          |
| Data Type :           | VT_BOOL (Boolean)           |
| Bit Range :           | 1 🚔 Range:116               |
| Data Length (Bytes) : | 1 🛋                         |
| Access Right:         | Read + Write      Read Only |
| Byte Swap             |                             |
| ОК                    | Cancel                      |

Figure 48: Edit Tag Dialog Box



## 5.9. DELETE TAG

You can delete a tag from the address space by clicking the **Delete** option in the right click menu.



Figure 49: Delete Tag

You can delete more than one tag simultaneously by selecting the tags to be removed using the Shift or Ctrl keys and then selecting the **Delete** option in the right click menu.



Figure 50: Delete Multiple Tags

## 5.10. VIEW TAGS PROPERTIES

Click on the group, device or tag node in the address space tree view and the tags properties will be displayed in the grid view on the right. In the figure below, we can see that only the tags under the selected groups are displayed in the grid view.



| Integration Objects' OPC Server for Mo | dbus        |                           |                             |                                 |                               |   |  | - 🗆 X              |
|--|-------------|---------------------------|-----------------------------|---------------------------------|-------------------------------|---|--|--------------------|
| File OPC Server Settings Help          |             |                           |                             |                                 |                               |   |  |                    |
| New Open Save Save As                  |             |                           |                             |                                 |                               |   |  |                    |
| Open Exit                              |             |                           |                             |                                 |                               |   |  |                    |
|  | Device Tag  |                           |                             |                                 |                               |   |  | •                  |
| Address Space                          | Device Name | Group Name                | Tag Name                    | VarType                         | Access Right                  | Address Type                            | Address                                | Bit Range          |
| Er Crown 0                             | Device 0    | Group ()                  | Tag 3                       | VT BOOL (1 byte)                | READ WRITE                    | OUTPUT COIL                             | 3                                      | 1                  |
| Tag 1                                  | Device 0    | Group 0                   | Tan 19                      | VT_BOOL (1 byte)                | READ WRITE                    | OUTPUT COIL                             | 19                                     | 1                  |
|  | Device 0    | Group_0                   | Tag 18                      | VT_BOOL (1 byte)                | READ WRITE                    | OUTPUT COIL                             | 18                                     | 1                  |
| 🔛 Tag_3                                | Device 0    | Group 0                   | Tag 17                      | VT BOOL (1 byte)                | READ WRITE                    | OUTPUT COIL                             | 17                                     | 1                  |
| Tag_4                                  | Device_0    | Group_0                   | Tag_16                      | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 16                                     | 1                  |
|  | Device_0    | Group_0                   | Tag_15                      | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 15                                     | 1                  |
|  | Device_0    | Group_0                   | Tag_14                      | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 14                                     | 1                  |
| 🚟 Tag_8                                | Device_0    | Group_0                   | Tag_13                      | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 13                                     | 1                  |
| Tag_9                                  | Device_0    | Group_0                   | Tag_12                      | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 12                                     | 1                  |
| Tag_10                                 | Device_0    | Group_0                   | Tag_11                      | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 11                                     | 1                  |
|  | Device_0    | Group_0                   | Tag_10                      | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 10                                     | 1                  |
| Tag 13                                 | Device_0    | Group_0                   | Tag_9                       | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 9                                      | 1                  |
| 🚟 Tag_14                               | Device_0    | Group_0                   | Tag_8                       | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 8                                      | 1                  |
| 🔛 Tag_15                               | Device_0    | Group_0                   | Tag_7                       | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 7                                      | 1                  |
| Tag_16                                 | Device_0    | Group_0                   | Tag_6                       | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 6                                      | 1                  |
| 1ag_1/                                 | Device_0    | Group_0                   | Tag_5                       | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 5                                      | 1                  |
|  | Device_0    | Group_0                   | Tag_4                       | VT_BOOL (1 byte)                | READ_WRITE                    | OUTPUT_COIL                             | 4                                      | 1                  |
|  |             |                           |                             |                                 |                               |   |  |                    |
| Server Status : Running                |             |                           |                             | Log Messag                      | ges                           |   |  | *                  |
| Client Number: 0                       | 0           | Date 2015 (12/04 17/02/50 | Message                     | A Distance of BOOLUNA           | terre output coulin           | a addaes all ID addaes a sub-suite      | Must an an ann Emañada 24              |                    |
| Group Number: 0                        |             | 2015/12/04 17:02:56       | Read Calls (Device Name :De | vice_oj.[valype:vT_BOOL].[Add   | dees type .00 PUT_COIL][3t    | at address 11 (Perinters number: 10     | unit recurs an error: Error Code (2.1) | syar uata audress! |
| Item Number: 0                         |             | 2010/12/04 17:02:10       | Read Calls (Device Name :De | vice_oj.[vaitype :VT_BOOL].[Add | dess type .00 PUT_COIL][St    | an auuress . ij.(negisters number:4)    | returns an error. Error Code :2.lleg   |                    |
| Last Update Time : 04/12/2015 16:39:51 |             | 2015/12/04 17:00:39       | Head Colls:[Device Name :De | vice_uj.[vartype :V1_BOOL].[Add | aress type :001P01_C01LJ,[Sta | art address : i j.[Hegisters number: ]] | returns an error: Error Code :2.lleg   | ai data address!   |
|  |             | 2015/12/04 17:00:39       | Reconnection To the Modbus  | Device [Device_0] Succeeded.    |                               |   |  | -                  |

Figure 51: Display Tags of Selected Groups

| 🐨 Integ | Integration Objects' OPC Server for Modbus X |            |           |             |                     |                         |                                  |                            |                                     |                                  |                               |     |
|---------|--|------------|-----------|-------------|---------------------|-------------------------|----------------------------------|----------------------------|-------------------------------------|----------------------------------|-------------------------------|-----|
| File    | OPC Server                                   | Setting    | s Help    |             |                     |                         |                                  |                            |                                     |                                  |                               |     |
| New     | Open Save                                    | Save<br>As | 0<br>Exit |             |                     |                         |                                  |                            |                                     |                                  |                               |     |
|         | Open   |            | Exit      |             |                     |                         |                                  |                            |                                     |                                  |                               |     |
|         |  | 0          | 3         | Device Tag  |                     |                         |                                  |                            |                                     |                                  |                               | •   |
|         | Address Space                                |            | Ê         | Device Name | Group Name          | Tag Name                | VarType                          | Access Right               | Address Type                        | Address                          | Bt Range                      | Ē   |
|         | Group_0                                      |            |           | Device_0    | Group_0             | Tag_1                   | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 1                                | 1                             |     |
|         | 🚟 Tag_1                                      | 1          | _         | Device_0    | Group_0             | Tag_2                   | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 2                                | 1                             | =   |
|         | 🔤 Tag_2                                      | 2          |           | Device_0    | Group_0             | Tag_3                   | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 3                                | 1                             |     |
|         | Tag_3  | 3          |           | Device_0    | Group_0             | Tag_4                   | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 4                                | 1                             |     |
|         | Tan P  | +<br>5     |           | Device_0    | Group_0             | Tag_5                   | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 5                                | 1                             |     |
|         | Tag_6  | 6          |           | Device_0    | Group_0             | Tag_6                   | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 6                                | 1                             |     |
|         | 📟 Tag_7                                      | 7          |           | Device_0    | Group_0             | Tag_7                   | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 7                                | 1                             |     |
|         | 🚟 Tag_8                                      | в          |           | Device_0    | Group_0             | Tag_8                   | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 8                                | 1                             |     |
|         | 😁 Tag_9                                      | 9          |           | Device_0    | Group_0             | Tag_9                   | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 9                                | 1                             |     |
|         |  | 10         |           | Device_0    | Group_0             | Tag_10                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 10                               | 1                             |     |
|         |  | 12         |           | Device_0    | Group_0             | Tag_11                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 11                               | 1                             |     |
|         | 💮 Tag_1                                      | 13         |           | Device_0    | Group_0             | Tag_12                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 12                               | 1                             |     |
|         | 🚟 Tag_1                                      | 14         |           | Device_0    | Group_0             | Tag_13                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 13                               | 1                             |     |
|         | 🚟 Tag_1                                      | 15         |           | Device_0    | Group_0             | Tag_14                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 14                               | 1                             | _   |
|         | Tag_1  | 16         |           | ↓ Device_0  | Group_0             | Tag_15                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 15                               | 1                             |     |
|         |  | 1/         |           | Device_0    | Group_0             | Tag_16                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 16                               | 1                             | - 1 |
|         | Tag 1  | 19         |           | Device_0    | Group_0             | Tag_17                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 17                               | 1                             | _   |
|         | 🔤 Tag_2                                      | 20         |           | Device_0    | Group_0             | Tag_18                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 18                               | 1                             | - 1 |
|         | 📟 Tag_2                                      | 21         |           | Device_0    | Group_0             | Tag_19                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 19                               | 1                             | - 1 |
|         | 🔤 Tag_2                                      | 22         |           | Device_0    | Group_0             | Tag_20                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 20                               | 1                             | - 1 |
|         | Tag_2  | 23         |           | Device_0    | Group_0             | Tag_21                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 21                               | 1                             | - 1 |
|         | Tag_2  | 24<br>25   | -         | Device_0    | Group_0             | Tag_22                  | VT_BOOL (1 byte)                 | READ_WRITE                 | OUTPUT_COIL                         | 22                               | 1                             | -   |
| Server  | Status : Run                                 | ning       |           | 1           |                     |                         | Log Mess                         | ages                       |                                     |                                  |                               | *   |
| Client  | lumber · 0                                   |            |           |             | Date                | Message                 |                                  |                            |                                     |                                  |                               | -   |
| Group   | Number: 0                                    |            |           | •           | 2015/12/04 17:02:56 | Read Coils:[Device Name | :Device_0].[Vartype :VT_BOOL].[A | ddress type :OUTPUT_COIL]. | [Start address :1].[Registers numbe | er:104] returns an error: Error  | Code :2.Illegal data address! | ! = |
| Item N  | umber: 0                                     |            |           | 8           | 2015/12/04 17:02:10 | Read Coils:[Device Name | :Device_0].[Vartype :VT_BOOL].[A | ddress type :OUTPUT_COIL]. | [Start address :1].[Registers numbe | er:4] returns an error: Error Co | de :2.llegal data address!    |     |
| Laet    | vriate Time : 0//1                           | 12/2015 1  | 6:39:51   | •           | 2015/12/04 17:00:39 | Read Coils:[Device Name | :Device_0],[Vartype :VT_BOOL],[A | ddress type :OUTPUT_COIL]. | (Start address :1).[Registers numbe | er:1] returns an error: Error Co | .de :2.llegal data address!   |     |
| 20510   | paule Time .04/1                             | 2013 1     | 0.00.01   | 0           | 2015/12/04 17:00:39 | Reconnection To the Mod | bus Device [Device_0] Succeeded  | d.                         |                                     |                                  |                               | -   |

Figure 52: Display Tags of a Selected Device

## 5.11. SAVE CONFIGURATION

Save your configuration using the **Save As** or **Save** button available in the file menu. The Save File As dialog box is then displayed to choose the path where the configuration will be saved.





| Save File As  |                 |                         |        |           | x               |
|---|-----------------|-------------------------|--------|-----------|-----------------|
| Save in:  | <u>]</u> Config |                         |        | - 🕲 - 🔁 🔍 | 🗙 📸 🖬 🕇 Tools 🕶 |
| Bureau<br>Difference<br>Mes documents<br>Difference<br>Ordinateur | Nom             | Modifié le<br>aceMB.csv | Туре   | Taille    |                 |
|   | File name:      | AddressSpace            | MB.csv |           | Save            |
|   | Files of type:  | CSV File                |        |           | Cancel          |

Figure 53: Save File As Dialog Box

The configuration will be then saved in CSV file format. The configuration is divided into three sections;

- COM port
- Devices
- Tags

The table below describes the fields of the COM port configuration section.

|   | Field         | Description  |  |  |  |  |  |
|---|---------------|--|--|--|--|--|--|
| 1 | Port ID       | The port ID  |  |  |  |  |  |
| 2 | Baud Rate     | The baud rate to be used to configure the com port |  |  |  |  |  |
| 3 | Data Bits     | The number of data bits per data word              |  |  |  |  |  |
| 4 | Parity        | The type of parity for the data                    |  |  |  |  |  |
| 5 | Stop Bits     | The number of stop bits per data word              |  |  |  |  |  |
| 6 | Flow Control  | Defines how the RTS and DTR control lines are used |  |  |  |  |  |
| 7 | Read Timeout  | The read timeout                                   |  |  |  |  |  |
| 8 | Write Timeout | The write timeout                                  |  |  |  |  |  |

#### Table 15: COM Port Configuration Section Format



The table below describes the fields of the devices configuration section.

|    | Field                  | Description  |  |  |  |  |  |
|----|------------------------|--|--|--|--|--|--|
| 1  | Туре                   | The device type (SERIAL/TCP)   |  |  |  |  |  |
| 2  | Serial Port            | The serial com port ID   |  |  |  |  |  |
| 3  | Device Name            | The device name  |  |  |  |  |  |
| 4  | IP Address             | The Modbus device IP address   |  |  |  |  |  |
| 5  | Slave ID               | The Identifier of the slave device   |  |  |  |  |  |
| 6  | Port                   | The listening TCP port reserved for the Modbus device communications. The default value is 502.  |  |  |  |  |  |
| 7  | Connection<br>Timeout  | The waiting period for an unresponsive server  |  |  |  |  |  |
| 8  | Timeouts Nbr           | The allowed timeouts number when the server does not respond   |  |  |  |  |  |
| 9  | Request Timeout        | The amount of seconds that the OPC Server will wait when using the diagnostics function to check the Modbus Device availability.   |  |  |  |  |  |
| 10 | In Coils Blck Size     | Specifies the number of input coils in the Modbus frame requests   |  |  |  |  |  |
| 11 | Out Coils Blck<br>Size | Specifies the number of output coils in the Modbus frame requests  |  |  |  |  |  |
| 12 | In Reg Blck Size       | Specifies the number of input registers in the Modbus frame requests   |  |  |  |  |  |
| 13 | H Reg Blck Size        | Specifies the number of output registers in the Modbus frame requests  |  |  |  |  |  |
| 14 | DWord Swap             | <ul> <li>False (unchecked): Higher dword is sent/received first for double values.</li> <li>True (checked): Lower dword is sent/received first for double values.</li> </ul>   |  |  |  |  |  |
| 15 | Word Swap              | <ul> <li>False (unchecked): Higher word is sent/received first for<br/>long, unsigned long or float values.</li> <li>True (checked): Lower word is sent/received first for long,<br/>unsigned long or float values.</li> </ul> |  |  |  |  |  |



| 16 | Byte Swap                 | <ul> <li>False (unchecked): Higher byte is sent/received first for<br/>integer, unsigned integer, long, unsigned long or float<br/>values.</li> </ul>            |
|----|---------------------------|--|
|    |                           | • True (checked): Lower byte is sent/received first for integer, unsigned integer, long, unsigned long or float values.  |
| 17 | Bit Order                 | <ul> <li>False (unchecked): Higher bit is sent/received first for<br/>Boolean, integer, unsigned integer, long, unsigned long or<br/>float values.</li> </ul>    |
|    |                           | <ul> <li>True (checked): Lower bit is sent/received first for Boolean,<br/>integer, unsigned integer, long, unsigned long or float<br/>values.</li> </ul>        |
| 18 | Base Address              | • False (unchecked):The Modbus device address numbering starts at 1 which makes the starting address sent in the Modbus frames request will have one subtracted. |
|    |                           | • True (checked): The Modbus device address numbering starts at 0 and the starting address included in the Modbus frame request will remain the same.            |
| 19 | Reg Base<br>Address       | This option is used with bits within registers referenced as Boolean   |
|    |                           | • False (unchecked): The first bit within register begins at one   |
|    |                           | • True (checked): The first bit within register begins at zero   |
| 20 | H Reg Bit Mask            | This option is used to write in a bit within register using the Boolean data type with holding registers.  |
|    |                           | • False (unchecked): The OPC Server will use a read /Write operation to update the bit of interest.  |
|    |                           | • True (checked): The OPC Server will use function 22 to update the bit of interest.   |
| 21 | Only Single Reg           | This option is related to 32 bits and 64 bits OPC tags.  |
|    | Write                     | • False (unchecked): The OPC Server will use the function 16 to write to multiple registers.   |
|    |                           | • True (checked): The OPC Server will use function 06 to write into multiple registers.  |
| 22 | Only Single Coil<br>Write | • False (unchecked): The OPC Server will use the function 15 to write to multiple coils.   |
|    |                           | • True (checked): The OPC Server will use function 05 to write into multiple registers.  |
| 23 | Double Register           | This check box determines how floating points and long integer values are handled:   |



|    |                        | • When unchecked, it means that the Modbus device allocates two 16 bit registers for containing a floating point or long integer value.  |
|----|------------------------|--|
|    |                        | • When checked, it means that the device allocates one 32 bit register for the value.  |
| 24 | Auto Demotion          | When checked, This option allows to demote a device for a specific period of time when communication failures reaches an already configured limited number.                          |
| 25 | Failures Nbr           | The number of successive failures before demoting the device   |
| 26 | Demotion Period        | During this period ,no read request will be sent to the device   |
| 27 | Discard Write          | When checked, no write request will be sent to the device during the demotion period   |
| 28 | Deactivate Tags        | <ul> <li>False (unchecked): When illegal data address error is<br/>occurred with a block addresses. The OPC Server remains<br/>sending read requests to the Modbus device</li> </ul> |
|    |                        | <ul> <li>True (checked): When illegal data address error is occurred<br/>with a block addresses. The OPC Server stops sending read<br/>requests to the Modbus device</li> </ul>      |
| 29 | Tr Mode                | The transmission mode (RTU/ASCII)  |
| 30 | Synchronous            | <ul> <li>When unchecked, it means that the asynchronous<br/>communication will be used read/write data from/to Modbus<br/>device</li> </ul>  |
|    | Enabled                | <ul> <li>When checked, it means that the synchronous<br/>communication will be used read/write data from/to Modbus<br/>device</li> </ul>   |
| 31 | Diagnostic             | • When unchecked, it means that the diagnostics function will be used to check the device communication status.  |
|    | Enabled                | • When checked, it means that the diagnostics function will not be used to check the device communication status   |
| 32 | Request Timeout<br>Nbr | The allowed request timeouts number before starting the reconnection procedure to the device   |

Table 16: Devices Configuration Section Format

The table below describes the fields of the tags configuration section.

|    | Field        | Description   |  |  |  |  |  |  |
|----|--------------|---|--|--|--|--|--|--|
| 1  | Device       | The device name   |  |  |  |  |  |  |
| 2  | Group        | The group name  |  |  |  |  |  |  |
| 3  | Tag Name     | he tag name   |  |  |  |  |  |  |
| 4  | AddressType  | <ul> <li>The Modbus address type, which can be:</li> <li>Discrete Inputs</li> <li>Coils</li> <li>Input Registers</li> <li>Holding Registers</li> </ul> Refer to the Location Type table for more details. |  |  |  |  |  |  |
| 5  | Access Right | The access right, which can be read only or read/write  |  |  |  |  |  |  |
| 6  | VarType      | <ul> <li>The type of data, which can be:</li> <li>VT_I2</li> <li>VT_I4</li> <li>VT_R4</li> <li>VT_UI2</li> <li>VT_UI4</li> <li>VT_BSTR</li> <li>VT_BOOL</li> </ul>  |  |  |  |  |  |  |
| 7  | Address      | The address of the configured tag. The value should be between 1 and 65534.   |  |  |  |  |  |  |
| 8  | Bit Range    | It denotes the range of a bit in one register.  |  |  |  |  |  |  |
| 9  | Data Length  | The Bytes number of the corresponding Var Type  |  |  |  |  |  |  |
| 10 | Block ID     | It denotes the block index to which the tag is belonging. A block represents a group of adjacent addresses sent and received in one message.  |  |  |  |  |  |  |

Table 17: Tags Configuration Section Format



| till ☐ ★ ★ 🖉 ≠ ModbusTestConfig.csv- Excel ? T<br>FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER Acrobat TEAM Ime |           |                           |                              |                               |   |              |                    |                            |                          |   | ? 📧 🗕<br>Imene Khen | niri - 🖸         |   |            |           |            |
|---|-----------|---------------------------|------------------------------|-------------------------------|---|--------------|--------------------|----------------------------|--------------------------|---|---------------------|------------------|---|------------|-----------|------------|
| Pa  | tipboar   | y ▼<br>nat Painter<br>d ⊑ | Calibri<br>B I L             | - 11<br>↓ -   ⊞ -   🏠<br>Font | A <sup>*</sup> A <sup>*</sup> ≡ 3<br>* <u>A</u> * ≡ 3 | = <b>-</b>   | Wrap Text          | General<br>* % *<br>Number | Conditiona<br>Formatting | al Format as Cell<br>Table * Styles *<br>Styles | Insert D            | elete Format     | AutoSum · A<br>Fill · Sort &<br>Clear · Filter<br>Editing | k Find &   |           |            |
| D   | 11        | • : >                     | $\langle \checkmark \rangle$ | f <sub>x</sub> output         | _COIL   |              |                    |                            |                          |   |                     |                  |   |            |           | ¥          |
|   | A         | В                         | с                            | D                             | E   | F            | G                  | н                          | I                        | J   | к                   | L                | м   | N          | 0         | P 🔺        |
| 1   | Port ID   | Baud Rate                 | Data Bit                     | Parity                        | Stop Bits   | Flow Control | Read Timeout       | Write Timeout              |                          |   |                     |                  |   |            |           |            |
| 2   | COM1      | 9600                      | 1                            | 8 Odd                         | One   | RTU          | 1000               | 1000                       |                          |   |                     |                  |   |            |           |            |
| 3   | [Devices] |                           |                              |                               |   |              |                    |                            |                          |   |                     |                  |   |            | _         |            |
| 4   | Туре      | Serial Port               | Device N                     | a IP Address                  | Slave ID  | Port         | Connection Timeout | Timeouts Nbr               | Request Timeout          | In Coils Blck Size                              | Out Coils           | In Reg Blck Size | H Reg Blck Size   | DWord Swap | Word Swap | Byte Sv    |
| 5   | тср       |                           | тср                          | 127.0.0.1                     | 1   | L 502        | 5                  | 3                          | 1000                     | 2000  | 2000                | 3                | 2 32  | FALSE      | FALSE     | FALS       |
| 6   | SERIAL    | COM1                      | Serial                       | 127.0.0.1                     | 1   | L 502        | 5                  | 3                          | 1000                     | 2000  | 2000                | 3                | 2 32  | FALSE      | FALSE     | FALS       |
| 7   | [Tags]    |                           |                              |                               |   |              |                    |                            |                          |   |                     |                  |   |            |           |            |
| 8   | Device    | Group                     | Tag Nam                      | e Address Type                | Access Right  | VarType      | Address            | Bit Range                  | Data Length              | Block Index                                     |                     |                  |   |            |           |            |
| 9   | тср       | Coils                     | Tag_1                        | OUTPUT_COIL                   | READ_WRITE  | VT_BOOL      | 1                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 10  | TCP       | Coils                     | Tag_2                        | OUTPUT_COIL                   | READ_WRITE  | VT_BOOL      | 2                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 11  | тср       | Coils                     | Tag_3                        | OUTPUT_COIL                   | READ_WRITE  | VT_BOOL      | 3                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 12  | тср       | Coils                     | Tag_4                        | OUTPUT_COIL                   | READ_WRITE  | VT_BOOL      | 4                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 13  | тср       | Coils                     | Tag_5                        | OUTPUT_COIL                   | READ_WRITE  | VT_BOOL      | 5                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 14  | тср       | Coils                     | Tag 6                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 6                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 15  | тср       | Coils                     | Tag 7                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 7                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 16  | тср       | Coils                     | Tag 8                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 8                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 17  | тср       | Coils                     | Tag 9                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 9                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 18  | тср       | Coils                     | Tag 10                       | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 10                 | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 19  | Serial    | Coils                     | Tag 1                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 1                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 20  | Serial    | Coils                     | Tag 2                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 2                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 21  | Serial    | Coils                     | Tag 3                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 3                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 22  | Serial    | Coils                     | Tag 4                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 4                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 23  | Serial    | Coils                     | Tag 5                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      |                    | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 24  | Serial    | Coils                     | Tag 6                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 6                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 25  | Sorial    | Coils                     | Tag 7                        |                               | READ WRITE  | VT BOOL      | 7                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 26  | Sorial    | Coils                     | Tag 8                        |                               | READ WRITE  | VT BOOL      | 8                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 27  | Serial    | Coils                     | Tag 9                        | OUTPUT COIL                   | READ WRITE  | VT BOOL      | 9                  | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 20  | Sorial    | Coils                     | Tag 10                       | OUTPUT COIL                   |   | VT BOOL      | 10                 | 1                          | 1                        | 1   |                     |                  |   |            |           |            |
| 20  | ocridi    | 00115                     | 108_10                       | 001101_0012                   | THE WITCH   | V5502        | 10                 |                            |                          |   |                     |                  |   |            |           |            |
| 30  |           |                           |                              |                               |   |              |                    |                            |                          |   |                     |                  |   |            |           |            |
| 50  |           | M                         |                              |                               |   |              |                    |                            |                          |   |                     |                  |   |            | _         | <b>\</b> • |
| _   | 4 P       | Modbus                    | siestConf                    | 1g (+)                        |   |              |                    |                            |                          | : •   |                     |                  |   |            |           | •          |
| RE/   | NDY 🛅     |                           |                              |                               |   |              |                    |                            |                          |   |                     |                  | ## E  | · · · ·    |           | + 100 %    |

Figure 54: Configuration File Example

After saving your configuration, you need to set the default configuration, which will be loaded automatically at the OPC Server for Modbus Service start-up. To define a default configuration, click the Define button available in the Settings Menu.

# 6. Errors Management

The OPC Server for Modbus handles both OPC and Modbus protocols related errors. All errors are tracked in the service log file and in the log messages view in the graphical user interface, as illustrated below:



| Integration Objects' OPC Server for Mo | dbus     |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      | -                   |           | х        |
|--|----------|-----------|------|----------------|----------|-------------------|------------------|----------------|------------------|-----------------|-----------------------|----------------------------|----------------------|---------------------|-----------|----------|
| File OPC Server Settings Help          |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| 🗎 📘 🛄 🔘                                |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| New Open Save Save Exit                |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| As                                     |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| Open Exit                              | Denine   | T         |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           | _        |
|  | Device   | Tag       |      | ~              | D        |                   |                  | 0.             |                  |                 | 001.0                 | 0                          |                      |                     |           |          |
| Hr Address Space                       | Name 🛆   | Address   | Port | ID             | Swap     | Swap              | Swap             | Order          | Addr             | Addr Addr       | 32 bit<br>registers   | Timeout                    | Nbr                  | Timeout             | Si        | ze block |
| Group_0                                | Device_0 | 127.0.0.1 | 502  | 1              | False    | False             | False            | False          | 1                | 1               | False                 | 5                          | 3                    | 1000                | 20        | 00       |
| 😅 Tag_1                                |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| 😁 Tag_2                                |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
|  |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| Tag_4                                  |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| Tag_5                                  |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| Tag_0                                  |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
|  |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| 🔐 Tag_9                                |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| 🚟 Tag_10                               |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| 😁 Tag_11                               |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| Tag_12                                 |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
|  | 4        |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
|  |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| Tag_15                                 |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
|  | 4        |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
|  |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| 🚟 Tag_19                               |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| 📟 Tag_20                               |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| 🔤 Tag_21                               |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| 🔤 Tag_22                               |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
|  |          |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| Tag_24                                 | 4        |           |      |                |          |                   |                  |                |                  |                 |                       |                            |                      |                     |           |          |
| Server Status : Running                |          |           |      |                |          |                   |                  | Log            | Messages         |                 |                       |                            |                      |                     |           | *        |
| Climat Numbers 0                       |          |           | Date |                | Messa    | age               |                  |                |                  |                 |                       |                            |                      |                     |           | -        |
| Chent Number: 0                        |          | 8         | 201  | 5/12/04 17:02  | 56 Read  | Coils:[Device Nam | ne :Device_0].[V | artype :VT_BO  | OL].[Address typ | e :OUTPUT_COIL] | [Start address :1].[F | Registers number:104] rel  | ums an error: Error  | Code :2.llegal da   | sta addre | :ss!     |
| Group Number: 0                        |          | 8         | 201  | 5/12/04 17:02  | 10 Read  | Coils:[Device Nam | ne :Device_0].[V | artype :VT_BO  | OL].[Address typ | e :OUTPUT_COIL] | [Start address :1].[F | Registers number:4] retur  | ns an error: Error C | ode :2.llegal data  | address   |          |
| Item Number: 0                         |          | 8         | 201  | 5/12/04 17:00: | 39 Read  | Coils:[Device Nam | ne :Device_0].[V | artype :VT_BO  | OL].[Address typ | e :OUTPUT_COIL] | [Start address :1],[F | Registers number: 1) retur | ns an error: Error C | ode :2.Illegal data | address   | 1        |
| Last Update Time : 04/12/2015 16:39:51 | _        | 0         | 201  | 5/12/04 17:00  | 39 Recor | nection To the M  | odbus Device [[  | levice_0] Succ | eeded.           |                 |                       |                            |                      |                     |           |          |

Figure 55: OPC Server for Modbus Log Messages

When sending the Modbus request to slave devices via the OPC Server for Modbus exception responses may happen and error codes will be sent in the response message and will be recorded in the software log file. These errors are described in the table below.

| Code<br>Dec/Hex | Name                    | Meaning  |
|-----------------|-------------------------|--|
| 01/0x01         | Illegal Function        | The function code received in the query is not an allowable<br>action for the server (or slave). This may be because the<br>function code is only applicable to newer devices, and was not<br>implemented in the unit selected. It could also indicate that the<br>server (or slave) is in the wrong state to process a request of<br>this type, for example because it is not configured and is being<br>asked to return register values. |
| 02/0x02         | Illegal Data<br>Address | The data address received in the query is not an allowable<br>address for the server (or slave). More specifically, the<br>combination of reference number and transfer length is invalid.<br>For a controller with 100 registers a request of offset 96 and a<br>length of 5 will generate exception 02.  |
| 03/0x03         | Illegal Data<br>Value   | The value contained in the query data field is not an allowable<br>value for the server (or slave). This indicates a fault in the<br>structure of the remainder of a complex request, such as that<br>the implied length being incorrect. It specifically does NOT   |



|         |  | mean that a data item, submitted for storage in a register, has<br>a value outside the expectation of the application program,<br>since the MODBUS protocol is unaware of the significance of<br>any particular value of any particular register.   |
|---------|--|---|
| 04/0x04 | Failure In<br>Associated<br>Device               | An unrecoverable error occurred while the server (or slave) was attempting to perform the requested action.   |
| 05/0x05 | Acknowledge                                      | Specialized in conjunction with programming commands.<br>The server (or slave) has accepted the request and is<br>processing it, but long duration of time will be required to do<br>so. This response is returned to prevent a timeout error from<br>occurring in the client (or master). The client (or master) can<br>next issue a poll program complete message to determine if<br>processing is completed. |
| 06/0x06 | Busy, Rejected<br>Message                        | Specialized use in conjunction with programming commands.<br>The server (or slave) is engaged in processing a long-duration<br>program command. The client (or master) should retransmit<br>the message later when the server (or slave) is free.   |
| 10/0x0A | Gateway Path<br>Unavailable                      | Specialized use in conjunction with gateways.<br>It indicates that the gateway was unable to allocate an internal<br>communication path from the input port to the out port for<br>processing the request.  |
| 11/0x0B | Gateway<br>Target Device<br>Failed to<br>Respond | Specialized use in conjunction with gateways.<br>It indicates that no response was obtained from the target<br>device. Usually means that the device is not present on the<br>network.  |

| Table 18: | Modbus | Response | Exceptions |
|-----------|--------|----------|------------|
|-----------|--------|----------|------------|

## 7. Connection to the OPC Server

Once the OPC Server is configured, the next step will be the connection to the OPC Server and reading/writing data. To do so, you only need to:

- 1. Launch your OPC DA Client as administrator.
- 2. Enter the IP address of the machine where the OPC Server is installed
- 3. Connect to the OPC Server with the following progID: "IntegrationObjects.OPC.ModBus.1"
- 4. Add a group and select the items to be read



| 🖉 Integration Objects' OPC Server   | for Mo | dbus     |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      | -                   |           | х              |
|-------------------------------------|--------|----------|---------------|--------|---------------|---------------|-------------------|------------------|----------------|------------------|------------------|---------------------|---------------------------|----------------------|---------------------|-----------|----------------|
| File OPC Server Settings            | Help   |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
|                                     |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| Register Unregister Start Store     | p      |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
|                                     |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| Regsitration Service                |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 9                                   | •      | Device   | Tag           |        |               |               |                   | 1                |                |                  |                  |                     |                           |                      |                     |           | •              |
| Address Space                       | Â      | Name 🖌   | IP<br>Address | Port   | Slave<br>ID   | DWord<br>Swap | Word<br>Swap      | Byte<br>Swap     | Bit<br>Order   | Base<br>Addr     | Reg Base<br>Addr | 32 bit<br>registers | Connection<br>Timeout     | Timeouts<br>Nbr      | Request<br>Timeout  | Co        | ils Block<br>e |
| Group_0                             |        | Device_0 | 127.0.0.1     | 502 1  |               | False         | False             | False            | False          | 1                | 1                | False               | 5                         | 3                    | 1000                | 200       | 00             |
| 📟 Tag_1                             |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 🔤 Tag_2                             |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| Tag_3                               |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
|                                     |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 📟 Tag_6                             |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 🔤 Tag_7                             |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| Tag_8                               |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
|                                     |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 📟 Tag_11                            |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 📟 Tag_12                            |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| Tag_13                              |        | 1        |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
|                                     |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 🚟 Tag_16                            |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 🔤 Tag_17                            |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 😁 Tag_18                            |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
|                                     |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
|                                     |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 🚟 Tag_22                            |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| 🚟 Tag_23                            |        |          |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           |                |
| Tag_24                              | -      | •        |               |        |               |               |                   |                  |                |                  |                  |                     |                           |                      |                     |           | Þ              |
| Server Status : Running             | _      |          |               |        |               |               |                   |                  | Log            | Messages         |                  |                     |                           |                      |                     |           | *              |
| Client Number 0                     |        |          |               | Date   |               | Messa         | ge                |                  |                |                  |                  |                     |                           |                      |                     |           | -              |
| Chenic Number : 0                   |        |          | 8             | 2015/1 | 12/04 17:02:5 | 6 Read 0      | Coils:[Device Nan | ne :Device_0].[V | /artype :VT_BC | OL].[Address typ | e :OUTPUT_COIL]  | [Start address :1]  | [Registers number:104] re | stums an error: Erro | r Code :2.llegal da | ta addre: | ss!            |
| Group Number: 0                     |        |          | 8             | 2015/1 | 12/04 17:02:1 | 0 Read 0      | Coils:[Device Nan | ne :Device_0].[V | /artype :VT_BC | OL].[Address typ | e :OUTPUT_COIL]  | [Start address :1]  | [Registers number:4] retu | ms an error: Error C | ode :2.llegal data  | address!  |                |
| Item Number: 0                      |        |          | 3             | 2015/1 | 12/04 17:00:3 | 9 Read (      | Coils:[Device Nan | ne :Device_0].[V | /artype :VT_BC | OL].[Address typ | e :OUTPUT_COIL]  | [Start address :1]  | [Registers number:1] retu | ms an error: Error C | ode :2.llegal data  | address!  |                |
| Last update Time : 04/12/2015 16:39 | 101    |          | 0             | 2015/1 | 12/04 17:00:3 | 9 Recon       | nection To the M  | odbus Device [[  | Device_0] Suc  | ceeded.          |                  |                     |                           |                      |                     |           | -              |

Figure 56: OPC DA Client Connected to the OPC Server for Modbus

In case the local connection to the OPC Server for Modbus failed due to an access deny you need to follow the steps below:

- 1. Open the windows service manager
- 2. Select the Integration Objects' OPC Server for Modbus Service.
- 3. Right click and select the Log on tab.
- 4. Check the "This account" radio button.
- 5. Enter your administrator account credentials as shown in the following figure:





| Integration Objects' OPC                    | Server for Modbus Service P | roperties (L 💌   |
|---|-----------------------------|------------------|
| General Log On Reco                         | overy Dependencies          |                  |
| Log on as:                                  |                             |                  |
| Local System account<br>Allow service to in | nt<br>nteract with desktop  |                  |
| This account:                               | .\Admin                     | <u>B</u> rowse   |
| Password:                                   | •••••                       |                  |
| Confirm password:                           | •••••                       |                  |
| Help me configure user                      | account log on options.     |                  |
|   |                             |                  |
|   |                             |                  |
|   |                             |                  |
|   |                             |                  |
|   |                             |                  |
|   |                             |                  |
|   | OK Cano                     | el <u>A</u> pply |

Figure 57: OPC Server for Modbus Service Administrator LogON

6. Click the OK button.



# TROUBLESHOOTING

## Case 1: Cannot launch the OPC Server for Modbus

If you are using an evaluation license, you should first check the license validity by launching the License Authorization tool. You can start it directly from the startup menu:



#### Figure 58: Open License Authorization Tool

If the License Authorization tool shows that the demo has expired and you want to activate it using your full activation license, you should in this case follow the steps below:

1. Run the License Authorization tool using an administrator account

| Integration Objects' License Authorization Tool   |  | ×                      |
|---|--|------------------------|
| Product Name: Integration Objects' OPC Server for Modbus<br>User Name: Admin  | Product Version: 2.0.1                       | integration<br>objects |
| Company Name: Integration Objects   |  |                        |
| Step1: Generate your user ID<br>Select the features you want to activate and click on the Ger                             | nerate button in order to generate your user | r ID                   |
| Installed Features:   |  |                        |
| Feature   | License Status                               | Activate               |
| Integration Objects' OPC Server for Modbus Ethemet  | The Demo has expired                         |                        |
| Integration Objects' OPC Server for Modbus Serial   | The Demo has expired                         |                        |
| Tag Number 50 💭<br>User ID  |  | <u>G</u> enerate       |
| Step2: Enter your activation code   |  |                        |
| Send a request for activation by e-mail to our customer servi<br>Enter the received key and click on the Register button. | ce including the generated user ID above.    | Register               |
|   |  |                        |
| Support: <u>customerservice@integrationobjects.com</u>  |  | Liose                  |

#### Figure 59: Demo License Expired

2. Choose the features you want to activate



### 3. Click the Generate button

- 4. Copy and send the User ID to the sales team {<u>sales@integrationobjects.com</u>} so they can generate the dedicated activation code.
- 5. Enter the given Activation Code

| 🐉 Integration Objects' License Authorization Tool   |   | x                      |
|---|---|------------------------|
| Product Name: Integration Objects' OPC Server for Modbus<br>User Name: Admin  | Product Version: 2.0.1                      | integration<br>objects |
| Company Name: Integration Objects Step1: Generate your user ID Select the features you want to activate and click on the Gene | erate button in order to generate your user | ·ID                    |
| Installed Features:   |   |                        |
| Feature   | License Status                              | Activate               |
| Integration Objects' OPC Server for Modbus Ethemet  | The Demo has expired                        |                        |
| Integration Objects' OPC Server for Modbus Serial   | The Demo has expired                        |                        |
| Tag Number 50   |   | <u>G</u> enerate       |
| Send a request for activation by e-mail to our customer servic<br>Enter the received key and click on the Register button.    | e including the generated user ID above.    | Copy Button            |
| Activation Code   |   | Register               |
| Support: customerservice@integrationobjects.com   | Enter Activation C                          | ode Here Close         |

#### Figure 60: Activate License

6. Click the Register button

### Case 2: Cannot start the OPC Server for Modbus Service?

In case the local connection to the OPC Server for Modbus failed due to an access deny you need to follow the steps below:

- 1. Open the windows service manager
- 2. Select the Integration Objects' OPC Server for Modbus Service.
- 3. Right click and select the **Log On** tab.
- 4. Check the "This account" radio button.
- 5. Enter your administrator account credentials as shown in the following figure:



| ntegration Objects' OPC                              | Server for Modbus Service Properties (L |
|--|---|
| General Log On Recov                                 | very Dependencies                       |
| Log on as:   |   |
| Local System account<br>Allow service to information | t<br>teract with desktop                |
| This account:  | .\Admin Browse                          |
| <u>P</u> assword:                                    | •••••                                   |
| <u>C</u> onfirm password:                            | •••••                                   |
| Help me configure user a                             | ccount log on options.                  |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  | OK Cancel <u>A</u> pply                 |

Figure 61: OPC Server for Modbus Service Properties

6. Click the **OK** button.

### Case 3: The OPC Server ProgID cannot be displayed by the OPC Client.

In case the OPC Client is not able to display the server ProgID then you need to check the following items:

- Make sure that the OPC Core Components are installed in your machine
- Make sure that a user with local administrative rights installs the OPC server so that it is able to create the necessary entries in the registry.
- Ensure that the OPCEnum is registered as a service, DCOM permissions are configured properly, and the OPCEnum service is running.
- Make sure that the client is running as a user that has read access to the registry

#### Case 4: Why does the connection to the TCP IP Modbus device fail?

In case the connection to the TCP\IP Modbus device fails, you need to check the following items:

- The port is not locked by another Modbus master
- The IP address and the ID of the Modbus slave are correct



### Case 5: Why does the connection to the serial Modbus device fail?

In case the connection to the serial Modbus device fails, you need to check that The COM port is not locked by another Modbus master.

### Case 6: Why do the read/write from/to the serial Modbus device timeout?

In case the reads and writes time out, you need to check your configuration and make sure it matches the configuration of your Modbus device for the following parameters:

- Device ID
- Device Transmission Mode
- COM Port Baud Rate
- COM Port Data Bit
- COM Port Parity
- COM Port Stop Bits
- COM Port Flow Control

#### Case 7: Why do I get wrong values from the Modbus device?

In case the reads and writes values are wrong, you need to check your configuration and make sure that the data access settings and the swapping mode match the configuration of your Modbus device.





For additional information on this guide, questions or problems to report, please contact:

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