



OPC-UA Driver for iDaq

User guide

July 2018

Rev 01

Worldwide technical support and product information:

www.toolsforsmartminds.com

TOOLS for SMART MINDS Corporate headquarter

Via Padania, 16 Castel Mella 25030 Brescia (Italy)

Copyright © 2014 TOOLS for SMART MINDS. All rights reserved.

SUMMARY

Overview	5
Introduction	5
Requirements	6
Minimum hardware requirements	6
Minimum software requirements	6
Installation	7
Getting started with OPC-UA devices	7
Adding a OPC-UA device to the list of active devices	7
OPC-UA capabilities	9
Advanced Settings	10
OPC-UA channel management	11
Channel creation.....	12
Further details	13

OVERVIEW

iDaq supports installation of additional components to extend capabilities and features of iDaq itself. With additional components, new types of acquisition devices, new signals processing features, and other kinds of functionalities can be added to iDaq.

OPC-UA Driver is a component for iDaq that provide OPC-UA communication from any industrial device that support OPC-UI

INTRODUCTION

The OPC-UA protocol follows a client-server architecture. OPC-UA manages the access of data simply and flexibly. The OPC-UA driver for iDaq acts as an OPC-UA client and it can connect to OPC-UA servers.

OPC-UA driver for iDaq has the following features:

- Signals acquired from OPC-UA devices are managed by iDaq in the same way as DAQ-mx devices.
- Read and write access.
- Automatic detection of available tags.
- No special skills are required to acquire data from OPC-UA devices.
- Quick setup.

REQUIREMENTS

This section contains the list of requirements that users should know before using OPC-UA component for iDaq.

MINIMUM HARDWARE REQUIREMENTS

Ensure that your computer fulfills the following hardware requirements:

- Dual core CPU or higher.
- 2 GB RAM (4 GB is strongly recommended).
- Display resolution 1900x1080 or higher.
- Mouse or another pointing device.
- A OPC-UA slave device.

MINIMUM SOFTWARE REQUIREMENTS

Ensure that your computer fulfills the following software requirements:

- OS: Windows 7 or higher.
- iDaq Device Manager 2018 Edition or higher. You can download an evaluation copy of iDaq at the following URL:

<https://www.idaq-datalogger.com>

INSTALLATION

OPC-UA driver is distributed as .iDaq-Driver file. To install OPC-UA Driver for iDaq, view iDaq Device Manager User Guide.

GETTING STARTED WITH OPC-UA DEVICES

This section explains how to add, configure and use a OPC-UA device with iDaq.

ADDING A OPC-UA DEVICE TO THE LIST OF ACTIVE DEVICES

To add a new OPC-UA Device to the list of active devices, from the iDaq Device Manager main window, select **Add button**, as shown in figure below.

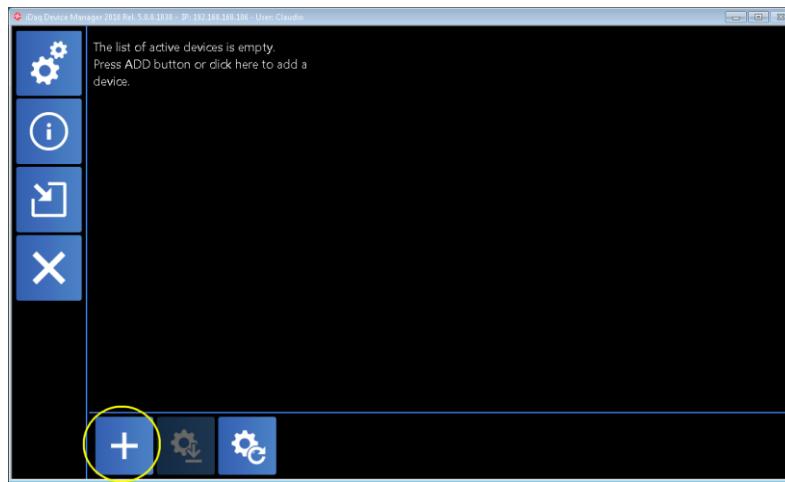


FIGURE 1 - ADDING A NEW OPC-UA IN IDAQ

A new dialog window shows the icons of available devices you can use in iDaq to acquire data. Please note that the list of device icons may be different from the image below, according to the number of components are installed.

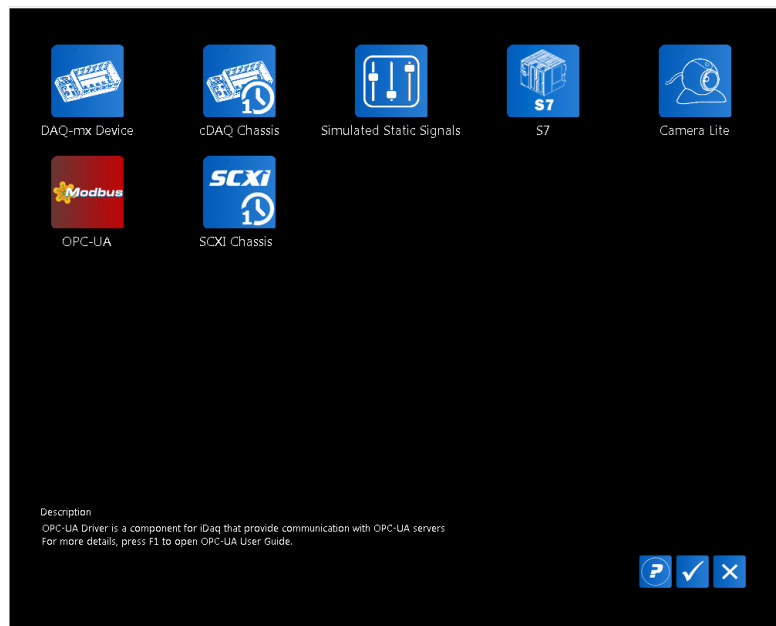


FIGURE 2 – DEVICE TYPE SELECTION WINDOW

From this window, click on **OPC-UA Device** icon and press OK button. The following window appears.

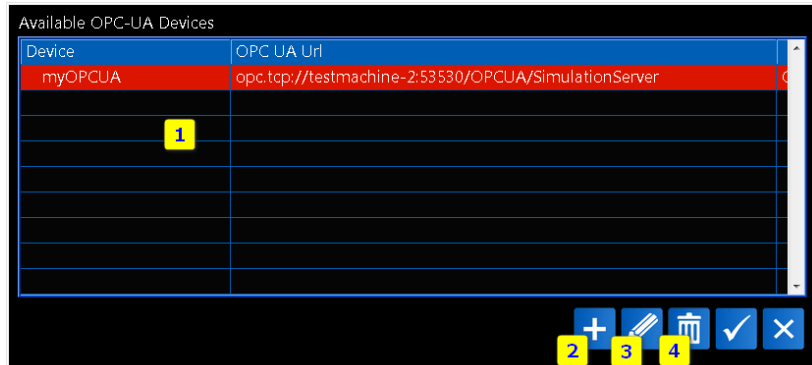


FIGURE 3 - OPC-UA DEVICE EDITOR

OPC-UA Device Editor shows the list of all created devices[1]. For each device, the following details are shown:

- **Device name.** This name must be unique because iDaq cannot manage two devices with the same name.
- **OPC UA url.** It specifies the URL of the OPC UA server

To add an existing device, highlight its row in device table and press **OK button**. It will be added to the list of active devices and the last-used settings are loaded.

To add a new OPC-UA device, press Add Button [2]. The following dialog appears:

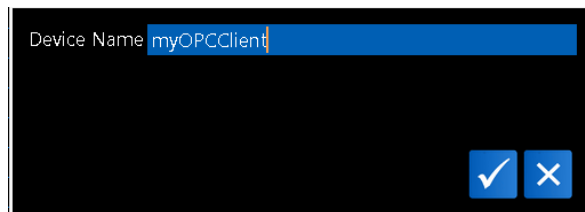


FIGURE 4 - CREATING A NEW OPC-UA DEVICE

As reported by the previous figure, you should type the following information:

1. **New device name.** Please note that the device name is used as file name and a subset of chars only is allowed (A..Z,a..z,0..9, space and '_')
2. **Communication type.** It can be TCP (Ethernet connection) or serial.

OPC-UA CAPABILITIES

As shown in the following figure, to edit settings of an OPC-UA device, click on the device icon, OPC-UA device editor will be displayed as indicated in following figure.

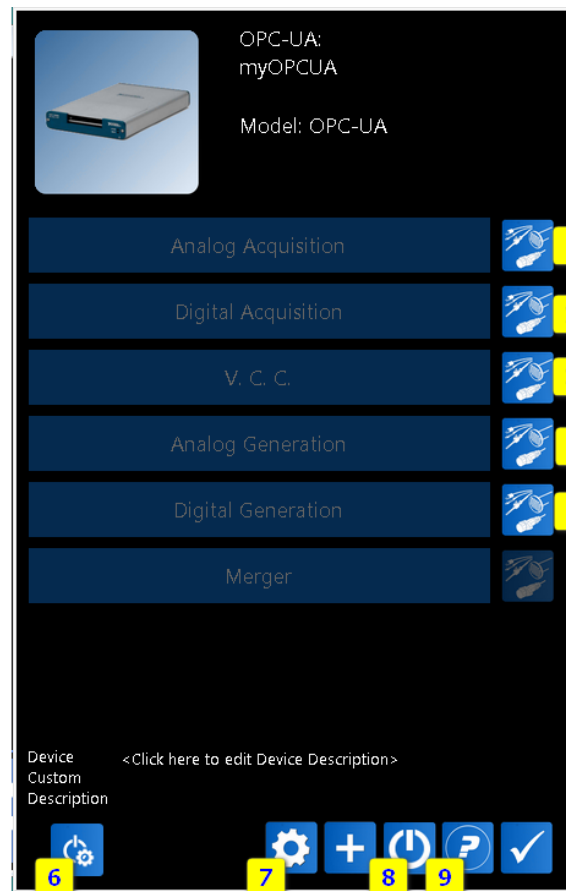


FIGURE 5 – OPC-UA DEVICE EDITOR

OPC-UA devices has several capabilities:

- Analog acquisition. It is used to create analog input channels starting from OPC-UA data.
- Digital acquisition. It is used to create digital input channels starting from either register or coil OPC-UA data.
- VCC. It allows the definition of virtual channels calculated from analog real channels.
- Analog generation. It is used to create analog output channels starting from OPC-UA data.
- Digital acquisition. It is used to create digital output channels starting from either register or coil OPC-UA data.

Referring to the previous figure, *OPC-UA device editor* is composed of the following elements:

1. **Channel editor (Analog input).** It allows the management of analog input channels.
2. **Channel editor (Digital input).** It allows the management of digital input channels.
3. **Virtual Channel editor.** It allows the management of virtual channels.

4. **Channel Editor (Analog Output).** It allows the management of analog output channels.
5. **Channel Editor (Digital Output).** It allows the management of digital output channels
6. **Description.** Reboot settings.
7. **Advanced settings.** For more details view section *Advanced Settings*.
8. **Device reboot.**
9. **User guide.**

ADVANCED SETTINGS

Advanced Settings are available from the *OPC-UA device editor* and allows you to set up server connection data.

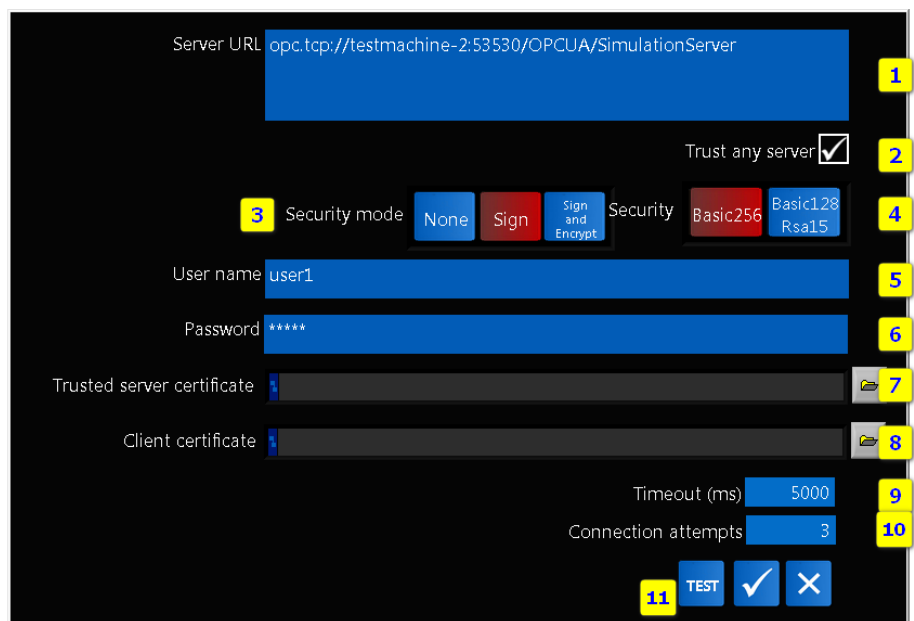


FIGURE 6 ADVANCED SETTINGS EDITOR

As reported by the following figure, *Advanced Setting editor* is composed of:

1. **Server URL.** It is the URL address of the OPC-UA server.
2. **Trust any server.**
3. **Security mode:**
 - a. **None.** The OPC UA client and OPC UA server do not need to trust each other.
 - b. **Sign.** The OPC UA server supports signed messages but not encrypted messages.
 - c. **Sign and Encrypt.** The OPC UA server supports signed and encrypted messages.
4. **Security:**
 - a. **Basic256**
 - b. **Baric128Rsa15.**
5. **6. Username and password.** They specify the username and password to authenticate when you create a connection to an OPC UA server. You must specify username/password if the OPC UA server requires authentication. Username

specifies the username for connecting to the OPC UA server. Password specifies the password for connecting to the OPC UA server.

7. **Trusted server certificate.** It specifies the path of the public keys that the OPC UA client trusts.
8. **Client certificate.** It specifies the path or name of the public key. The file extension of the file you specify must be *.der*. The public key and private key must have the same name and reside in the same folder.
9. **Timeout.** It is the communication timeout expressed in ms.
10. **Connection attempts.** It is the number of reconnection attempts. Overcome this value, the driver returns an error.
11. **Test communication.**

OPC-UA CHANNEL MANAGEMENT

At first use, the lists of analog/digital input/output channels are empty. Channels must be created starting from OPC-UA tags published by the server.

The following figure shows the *Channel Editor* for analog input channels; editors of other channel lists are same.

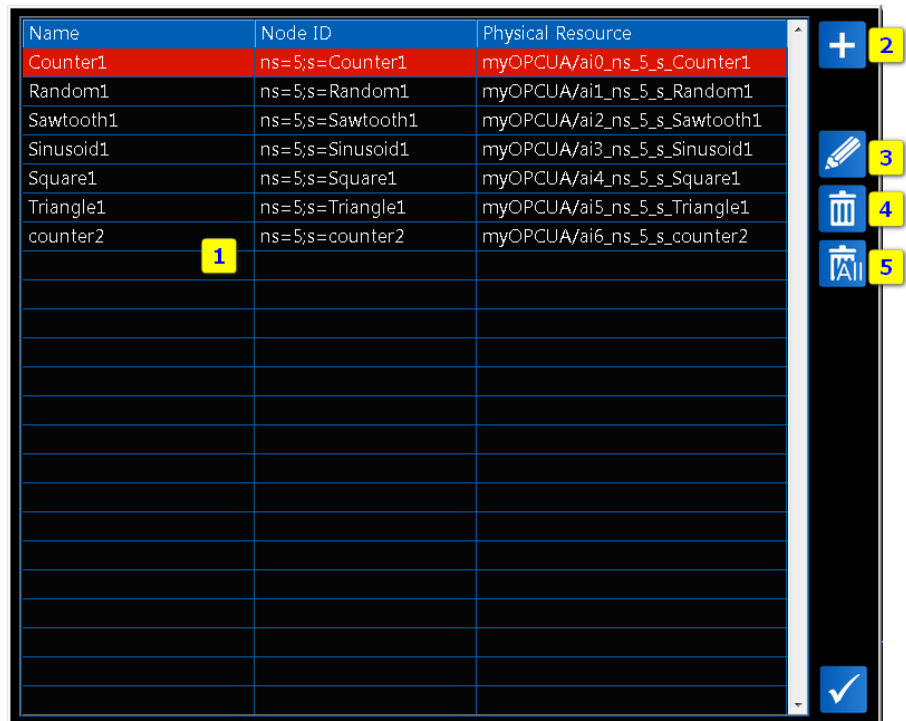


FIGURE 7 - CHANNEL EDITOR (ANALOG INPUT)

Referring to the previous figure, the *Channel Editor* is composed of the following elements:

1. **Channel list.** It is the list of defined channels. For each channel, Node ID and physical resource is reported.

2. **Import channels button.** Use this button to import channels. For more details, view the section.
3. **Edit button.** Use this button to edit the channel highlighted in the list.
4. **Remove button.** Use this button to delete the channel highlighted in the list.
5. **Remove All button.** Use this button to delete all the channels in the list.

CHANNEL CREATION

To create channels, press **Import channels button** from the *Channel Editor (Analog Input Capability)*. The *Import channel window* will appear.

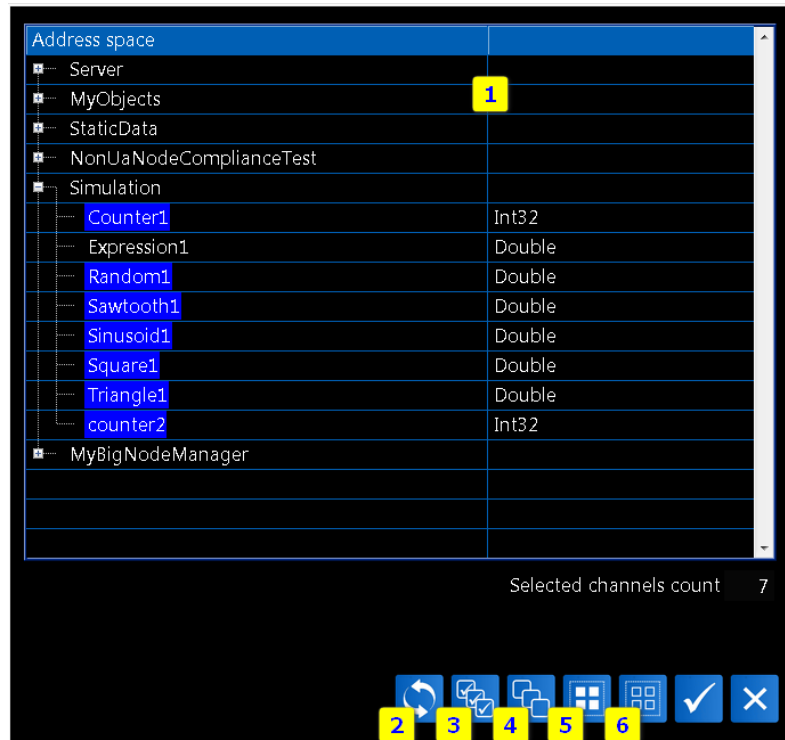


FIGURE 8 IMPORT CHANNEL

When the windows is shown, the OPC-UA server will be queried in order to obtain the list of available data.

Elements in this window are:

1. **Available data.** It contains the list of data published by the OPC-UA server.
2. **Refresh.** It refreshes the list of available data.
3. **Select.** It selects the highlighted quantities.
4. **Unselect.** It selects the highlighted quantities.
5. **Highlight all.**
6. **Highlight none.**

Notice that the selected quantities (selected with the button **Select**) will be imported.

FURTHER DETAILS

iDaq product page: <https://www.idaq-datalogger.com/idaq.php>

iDaq ADD-ON Store <https://www.idaq-datalogger.com/addons.php>

Support: <https://www.idaq-datalogger.com/support.php>