

User Manual: Modbus Plugin for FlexLogger

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**User Manual: Modbus Plugin for
FlexLogger**



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HISTORY

Version	Date	Auteur	Modification
1.0	28/04/2020	Raphael Fortin	First edition of the manual

SUMMARY

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Glossary

1 Objective of the document

The goal of this document is to explain the different functions of the plugin to a User and how to navigate the plugin within the FlexLogger environment.

2 Reference Documents

Document	Writer	Date	Ref

3 General Description

3.1 Modbus Plugin For FlexLogger

The Plugin add to the FlexLogger application the possibility to integrate within a project a Modbus device channel, that can exchange data with a Modbus compatible I/O controller.

The plugin allows the user to specify the IP address of the controller and navigate and control the following Registers:

- Coil output
- Digital input
- Analog input
- Holding

4 Usage Guide

4.1 Installation of the plugin

To install the plugin, simply double-click on the .nipkg file or open it using the NI Package Manager.

The package **installs** the plugin in the Flexlogger plugin directory:

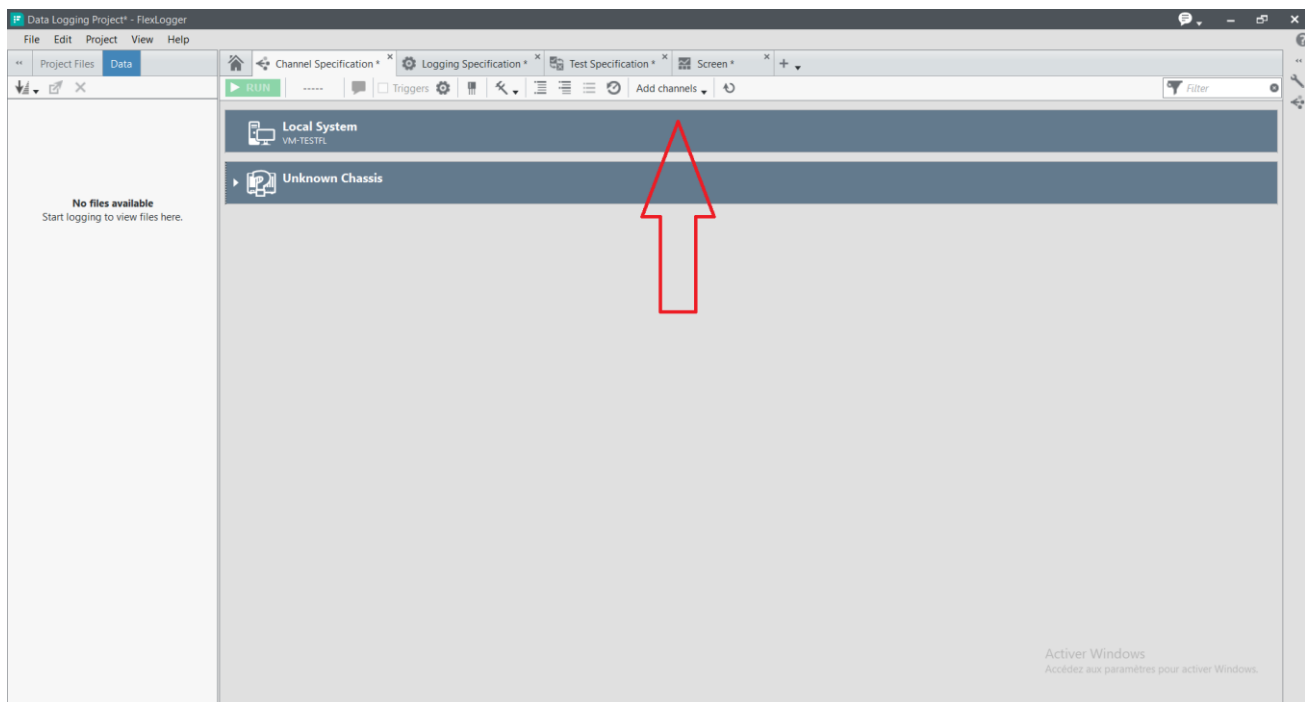
C:\Users\Public\Documents\National Instruments\FlexLogger\Plugins\IOPlugins

4.2 Add Modbus to your project

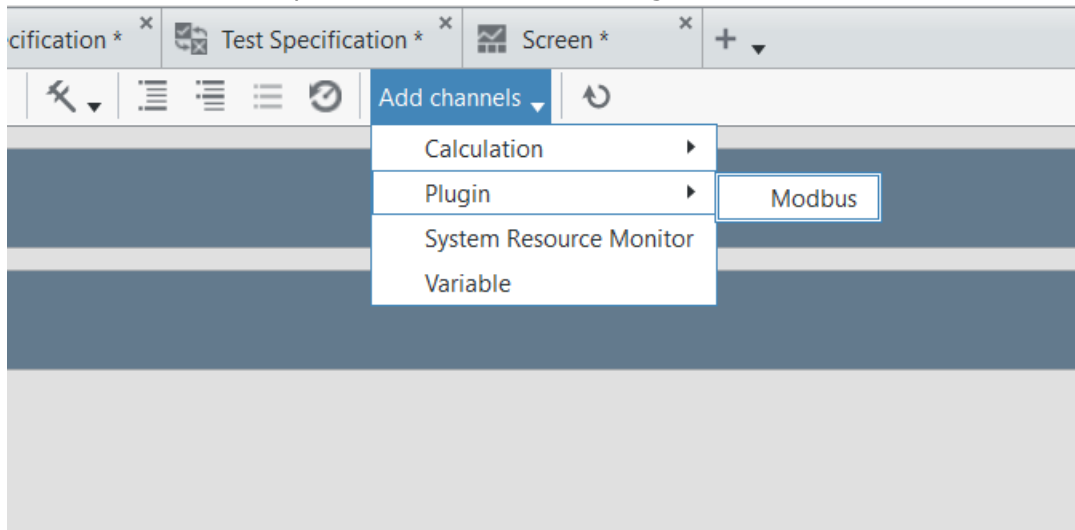
4.2.1 Creation of a channel cluster (device channel)

A channel cluster can contain multiple I/O channel, but each channel cluster can only access one register and do one access operation (Read or Write). Create has many channels cluster has needed.

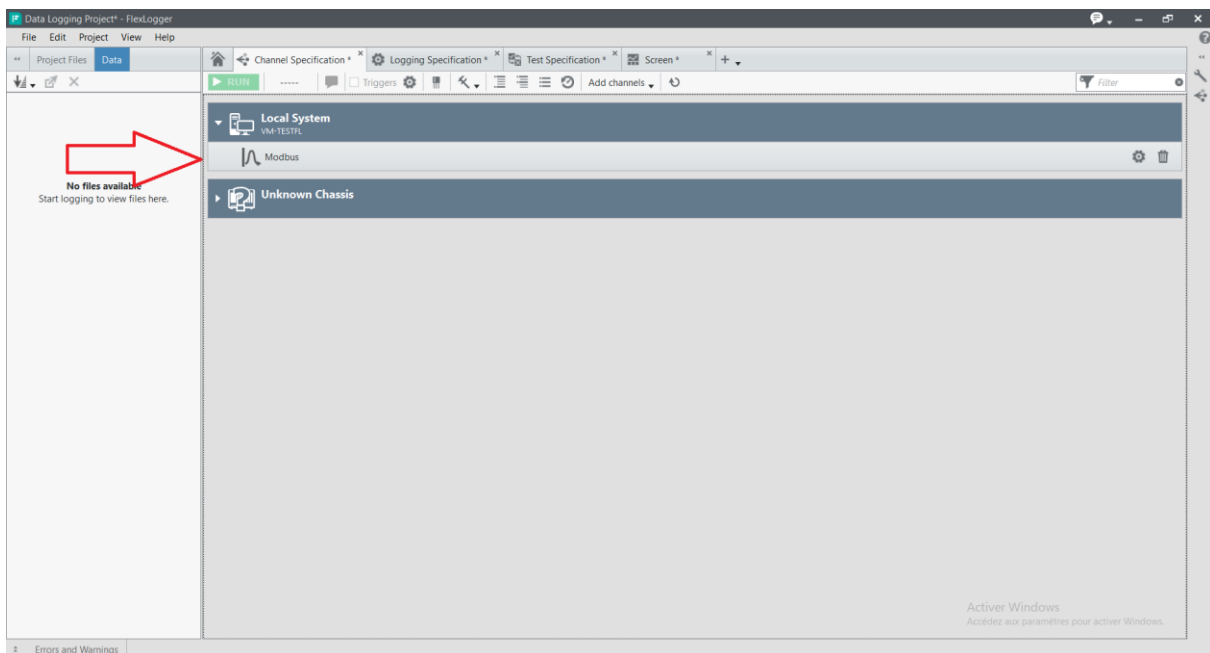
- 1) In your project start be locating the "Add channel" button:



- 2) Select the Modbus option in Add Channels>Plugin>Modbus



- 3) This will create the following device channel:

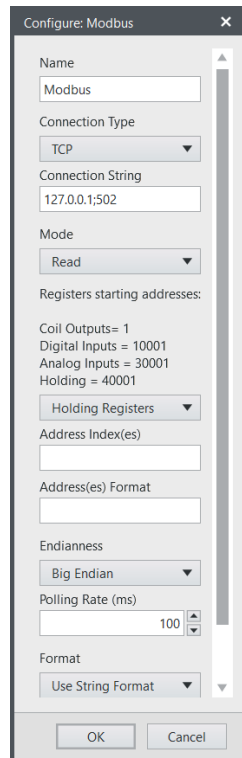


4.2.2 Setting up a Channel Cluster

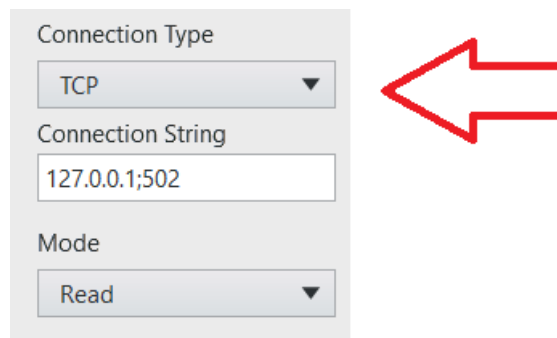
- 1) On the desired Channel cluster select the gear button located on the far right:



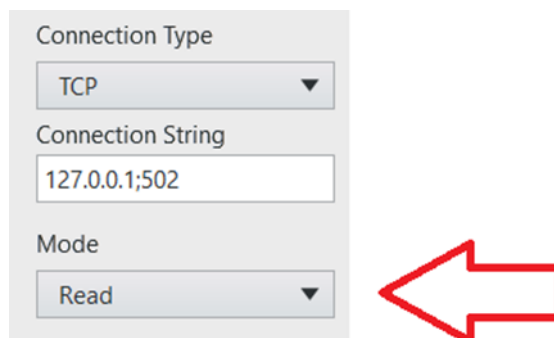
2) The following menu should then appear:



3) In the dropdown list "Connection Type" select the required protocol:

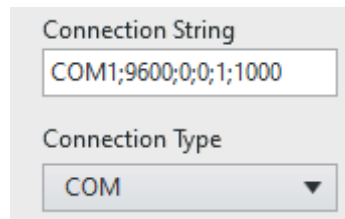


4) In the case of a TCP connexion, in the string indicator Connexion String enter the IP address of your controller and the port separated by a semicolon

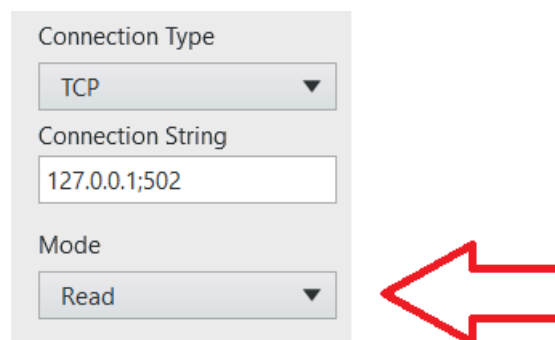


In the case of a serial connection, the Connection String must be entered as followed and separated by semicolon:

- Ressource Name
- Baud Rate
- Parity
 - None = 0
 - Odd = 1
 - Even = 2
 - Mark = 3
 - Space = 4
- Flow Control
 - None = 0
 - XON/XOFF = 1
 - RTS/CTS = 2
 - XON/XOFF & RTS/CTS = 3
 - DTR/DSR = 4
 - XON/XOFF & DTR/DSR = 5
- Mode
 - RTU = 0
 - ASCII = 1
- Timeout (ms)



5) Select in the "Mode" dropdown the access mode of the channel

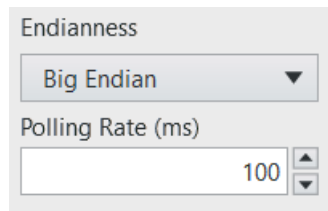


Note: Each Channel cluster can only have one Access mode. If a register needs to be access in both modes, create one Channel Cluster for each mode

6) Select the "Endianness" dropdown list. Then choose which order should the bytes be interpreted by the application

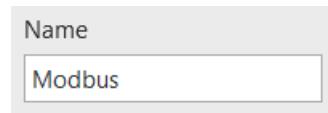
- For MSB mode select "Big Endian" (default)

- For LSB mode choose "Little Endian"

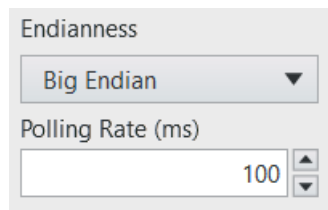


7) Optional Settings:

- **Name**
The Name field allow the user to change the name of the Channel cluster. By default, the channel cluster name is Modbus.



- **The Polling Rate**
The Polling Rate settings let you control the period between each Write or Read operation. By default, the period is set to 100 ms. This value can be changed in the indicated field



8) To save the change press the ok button

4.2.3 Creating I/O Channels

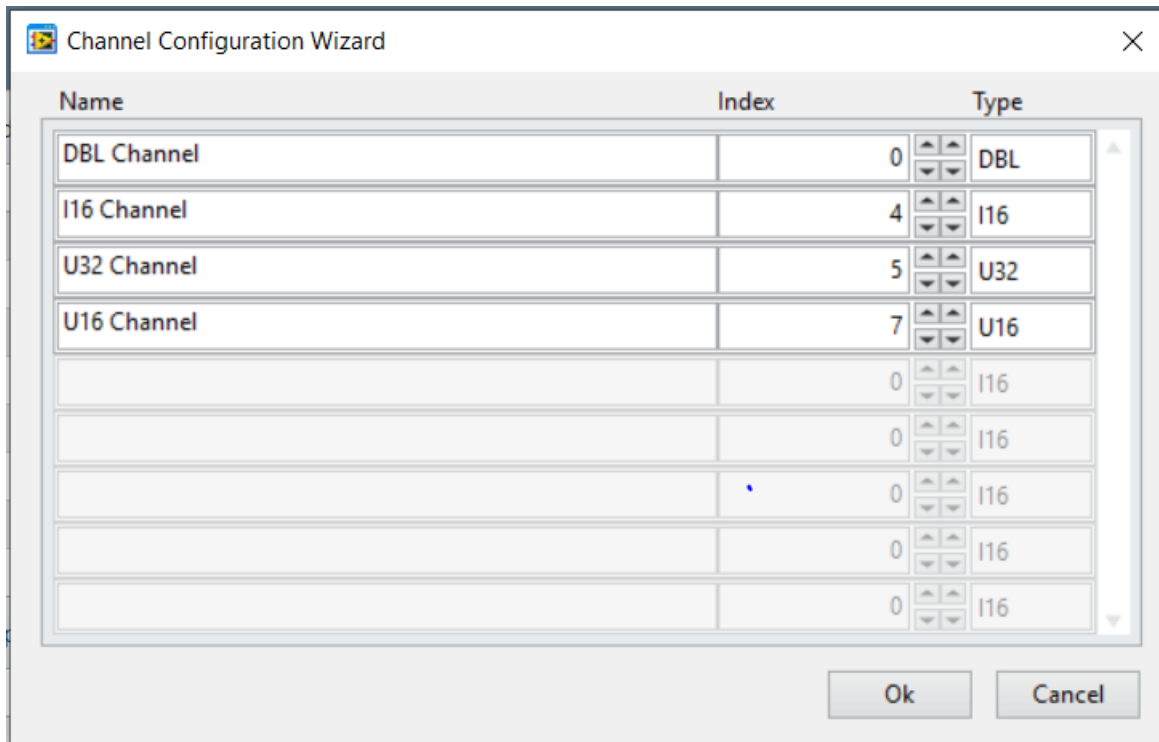
Note: The different registers that can be used with the plugin are the following:

Table 1:

Register	Coil	Digital	Analog	Holding
Access Mode	Write Only	Read Only	Read Only	Read and Write
Depth of each index	1 bit	1 bit	16 bits	16 bits
Starting Address	1	10001	30001	40001

4.2.3.1 Analog and Holding Registers channels setup

When the analog or the holding register has been selected in the Channel Cluster option, the types: SGL, U32 and I32 will have a depth of 32 bits and the type DBL will have a depth of 64 bits. Since, each index have an interval of 16 bits, the 32-bits type will use the indicated index and the following one and the 64-bits type will use the indicated index and the 3 following one. **See the example:**



The different channels will access the register like this:

Table 2:

Index: (Depth: 16 bits each)	0	1	2	3	4	5	6	7
Channel access scope:	DBL channel				I16 channel	U32 Channel		U16 channel

Follow the step 1 to 12 of 4.2.3.3 to setup a channel

4.2.3.2 Coil and Digital Registers channels setup

When the Digital or Coil register has been selected in the Channel cluster option, each new channel will have a depth of 1 bit no matter what data type will be select in the wizard. So, the example will use the register like this:

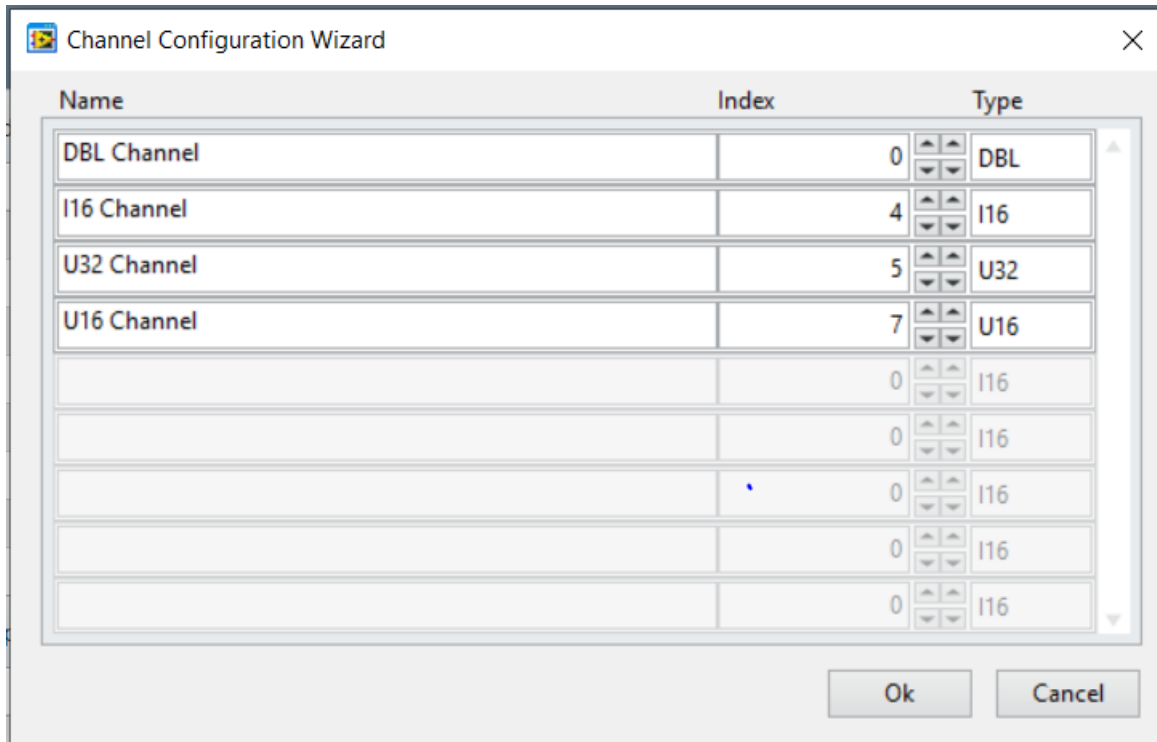


Table 3:

Index: (Depth: 1 bit each)	0	1	2	3	4	5	6	7
Channel access scope:	DBL channel	Not Used	Not Used	Not Used	I16 channel	U32 Channel	Not Used	U16 Channel

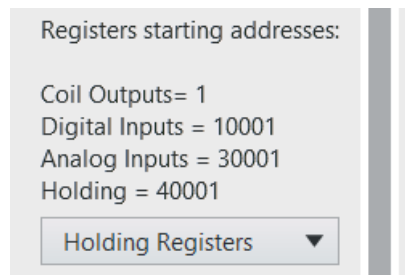
Follow the step 1 to 12 of [4.2.3.3](#) to setup a channel

4.2.3.3 Setup of the I/O channels with the Wizard (Recommended)

- 1) On the device channel select the gear button located on the far right:



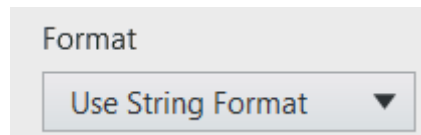
2) In the menu find the following Dropdown List:



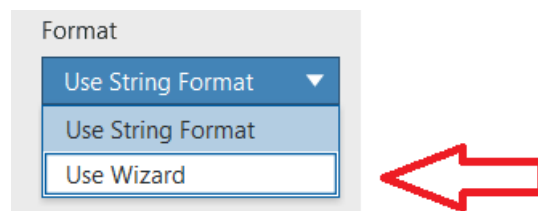
3) Select the register that need to be addressed in the list

Note: to access two registers add another Modbus device channel (See 4.1.1 for instruction)

4) In the menu find the dropdown list "Format"

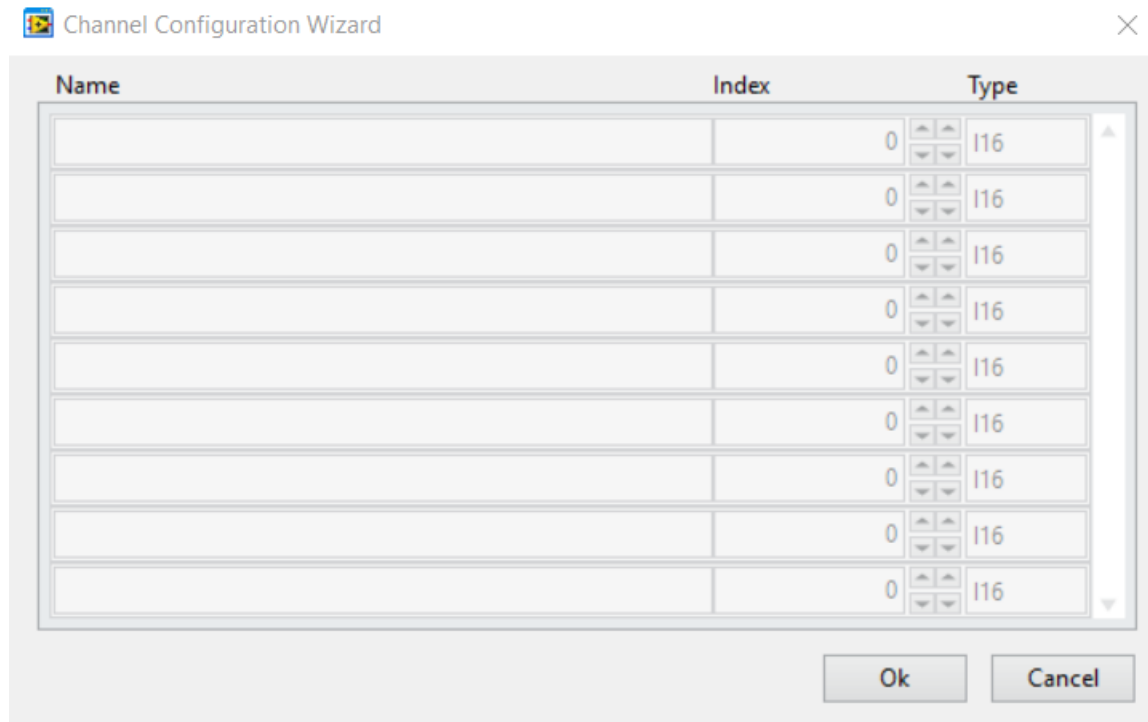


5) Navigate the Dropdown list and Select "Use Wizard"

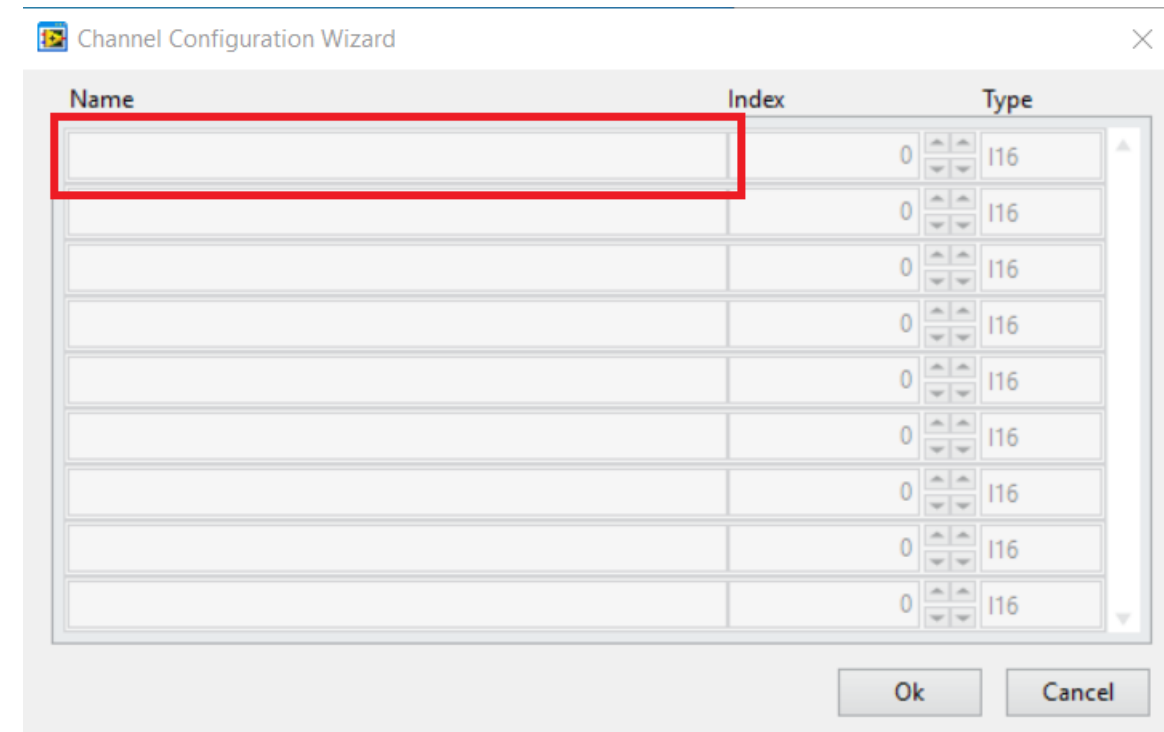


6) Hit the button "ok"

7) The Window "Channel Configuration Wizard" will appear:

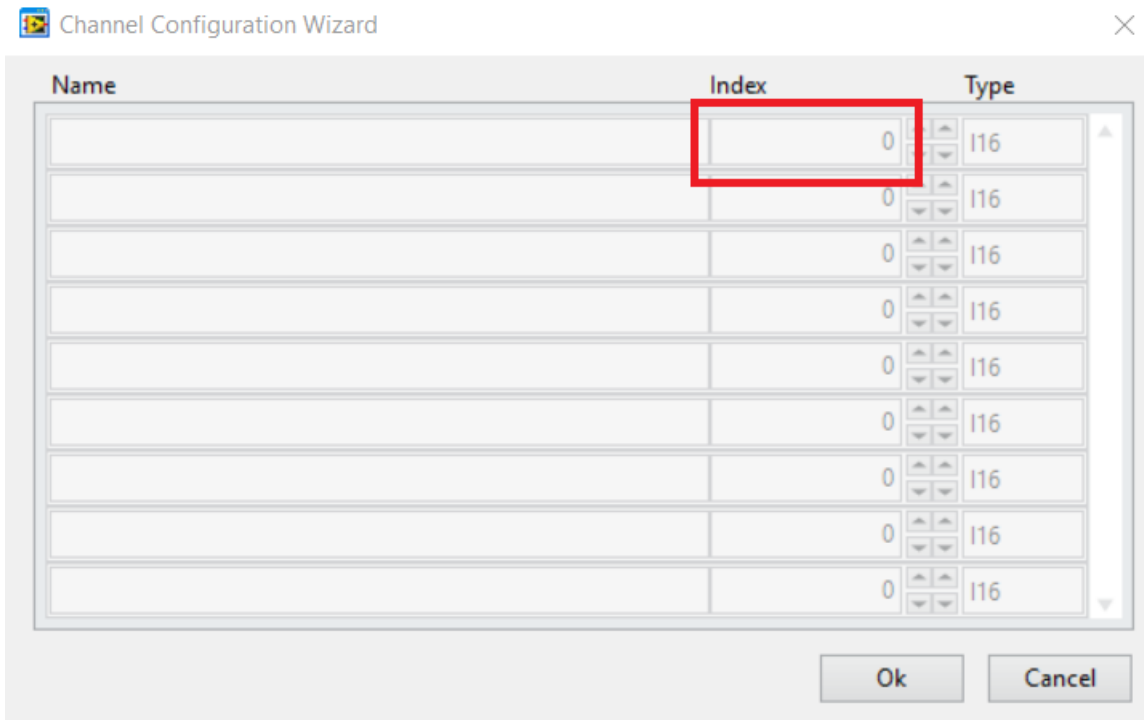


8) Give a name to the I/O channel in the highlighted field

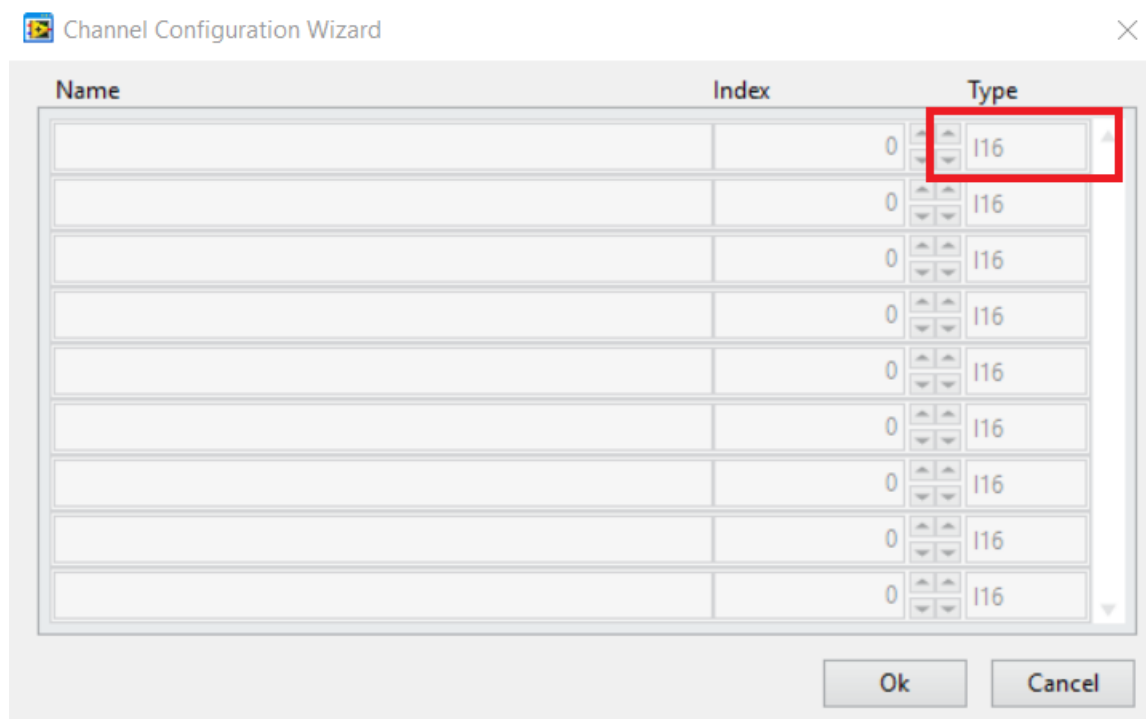


9) Select an index for the read or write operation in the highlighted field

Note: The index value is added to the first address of the selected register (see Table 1). For example, if the Holding register was selected and a value of 1 was entered, the operation will be made on the register address 40002 (40001 + 1) of the Modbus controller.

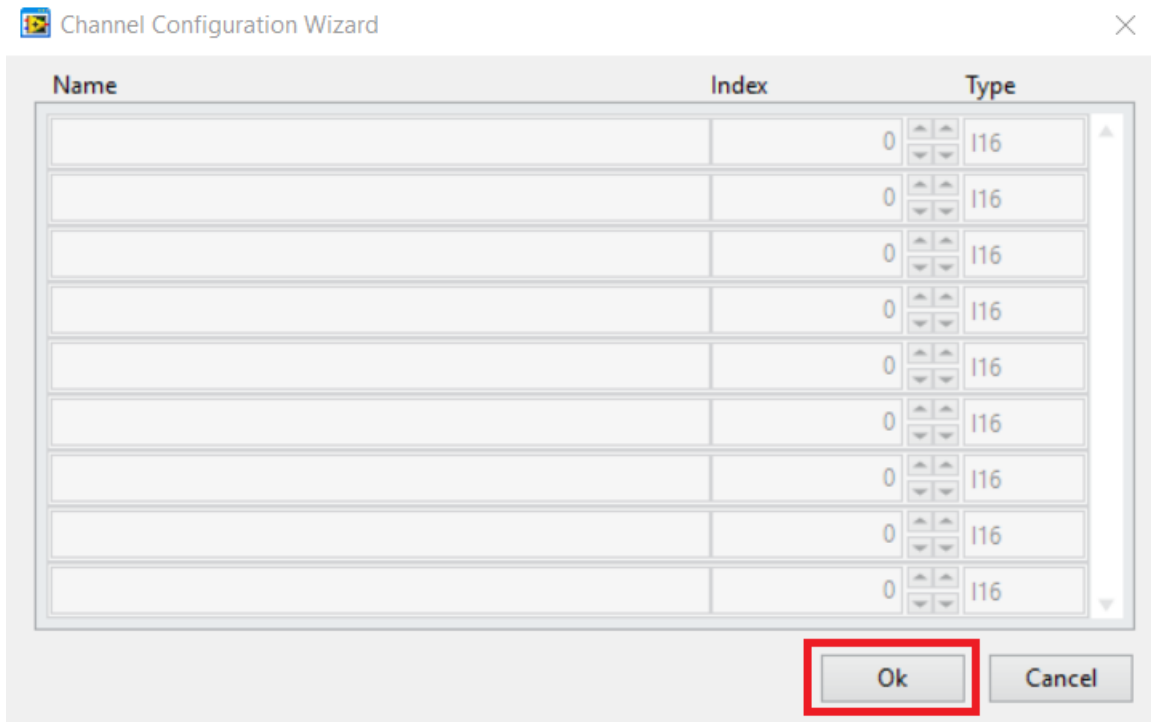


10) Select the data type of the variable in the highlighted dropdown list



11) Repeat Step 8 to 10 for additional channels

12) Press the Ok button

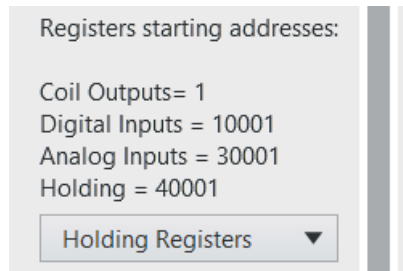


4.2.3.4 Setup of the I/O channels without the wizard (Not Recommended)

- 1) On the device channel select the gear button located on the far right:

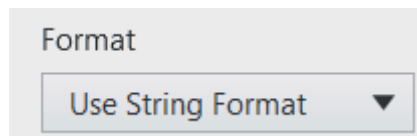


- 2) In the menu find the following Dropdown List:

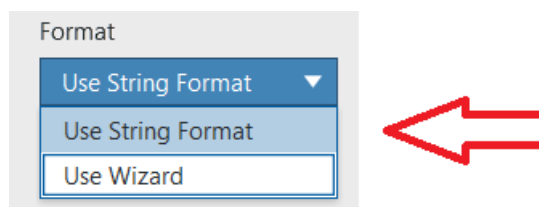


- 3) Select the register that need to be addressed in the list
Note: to access two registers add another Modbus device channel (See 4.1.1 for instruction)

- 4) In the menu find the dropdown list "Format"



- 5) Navigate the Dropdown list and Select "Use String"



6) Find the string indicator "Address Index(es)"

- A. Enter the desired address in the register for the first channel
- B. If another channel is needed put an ";" and add the other address
- C. Repeat step b for each needed channel

Example:

Address Index(es)

Note: The index value is added to the first address of the selected register (see Table 1). For example, if the Holding register was selected and a value of 1 was entered, the operation will be made on the register address 40002 (40001 + 1) of the Modbus controller.

7) Find the string indicator "Address(es) Format"

- A. Enter the desired data format for the first channel
- B. If another channel is needed put an ";" and add the other format
- C. Repeat step b for each needed channel

Example:

Address(es) Format

8) Find the string indicator "Channel Name(s)"

- A. Enter the desired Name for the first channel
- B. If another channel is needed put an ";" and add the other Name for the next channel
- C. Repeat step b for each needed channel

Example:

Channel Name(s)

9) Hit the button "ok"