Aqconfig Documentation

Release 1.0

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Nov 06, 2020

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The program edits the configuration for an acquisition tool for Siemens Simatic S7 PLCs. It was written in Python with Tkinter as GUI library. To build the GUI a GUI Builder named PAGE was used.

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CHAPTER

ONE

ABOUT

With this program you can edit configuration files for the data aqcuisition program aqserver. Its GUI is written in Python and Tkinter. To build the GUI a GUI Builder named PAGE was used.

This was my first (finished) Python (3) application with a GUI. I always use my (private) projects to learn something new. Lots of web pages and lots of Stack overflow entries have been visited to find solutions to my problems. Thanks a lot to the community of coders and developpers.

CHAPTER

TWO

MAIN INTERFACE

2.1 Menu and toolbar

Menu and toolbar show the same functions. left part of the toolbar shows the File menu functions, right part shows the Help menu functions.

1. **File**
    1. New

        Clears all fields for a fresh config file
    2. Open . . .

        Opens an existing configuration file
    3. Save

        Save the open file
    4. Save as . . .

        Lets you save the open file under a new name
    5. Settings

        Opens a new dialog window, where you can adjust the program settings
    6. Save *.bat

Saves a batch file next to the config file, that you can use to start Aqserver directly with this config-file

7. Quit

Closes the configuration program

2. **Help**

8. Help contents

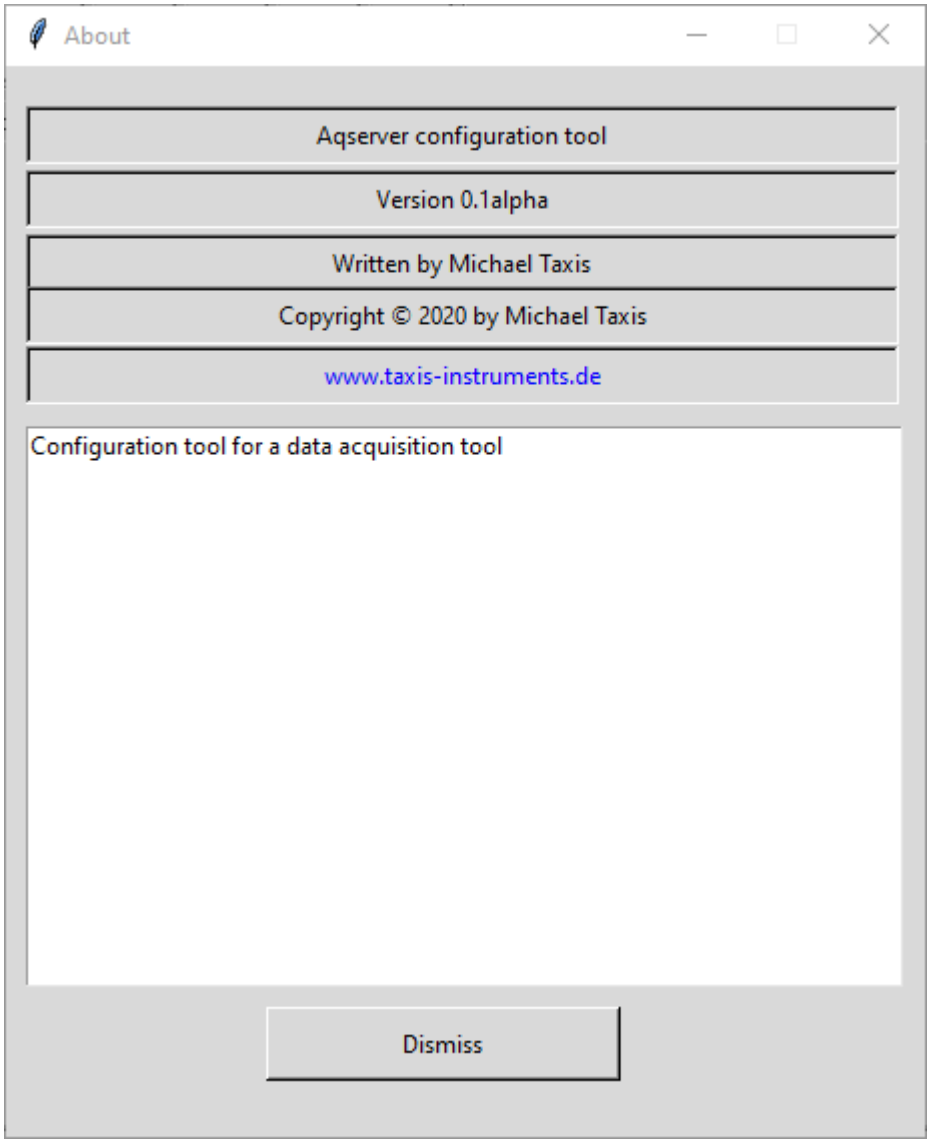
Opens the help file i a browser

9. Context help

switches the mouse pointer to a arrow with question mark. Click on a element in the interface and help for this element will be displayed in the browser

10. About

Shows an About box for the program



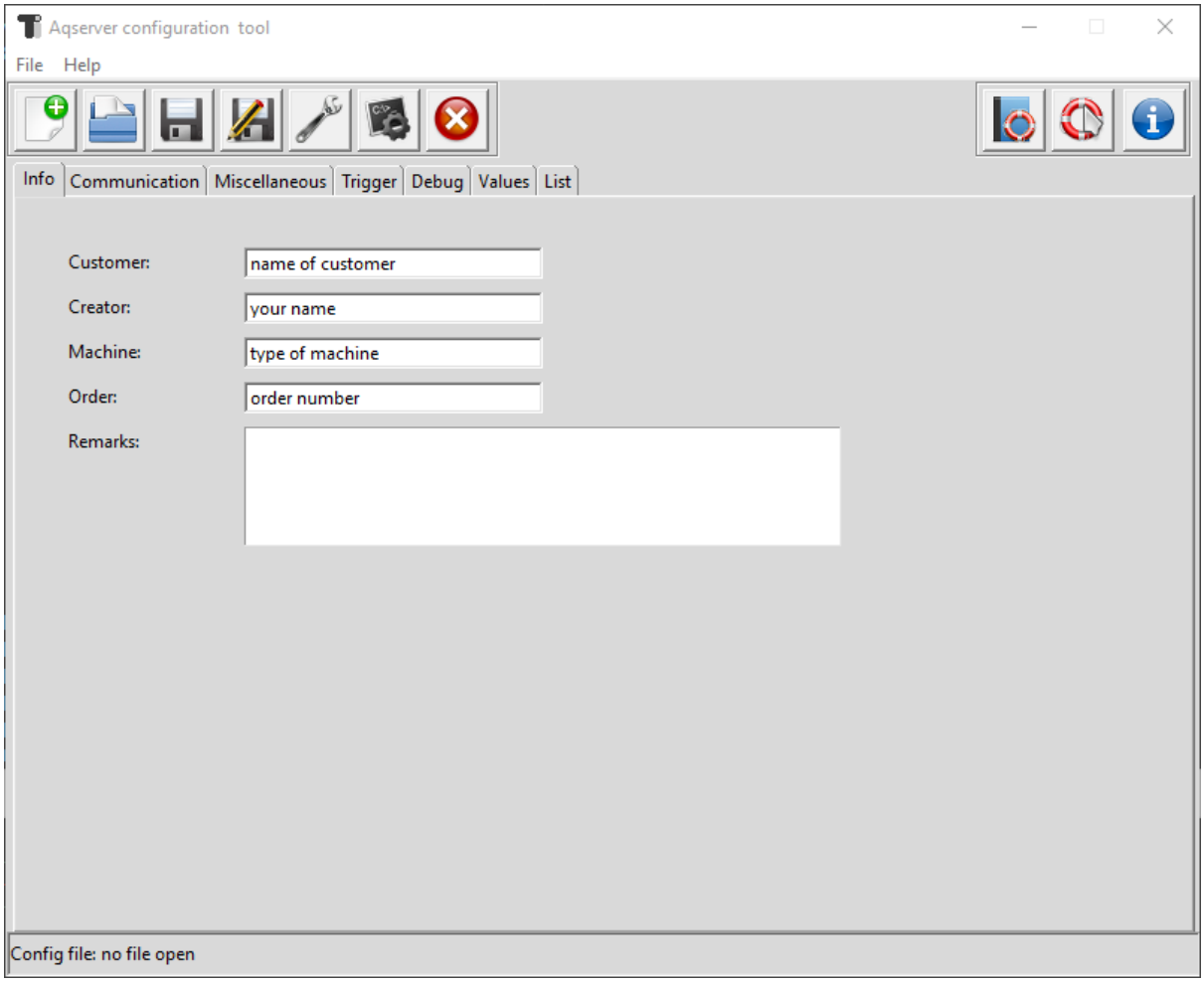
2.2 Statusbar

The statusbar shows the name of the open config file and whether it has been modified

CHAPTER

THREE

INFORMATION TAB



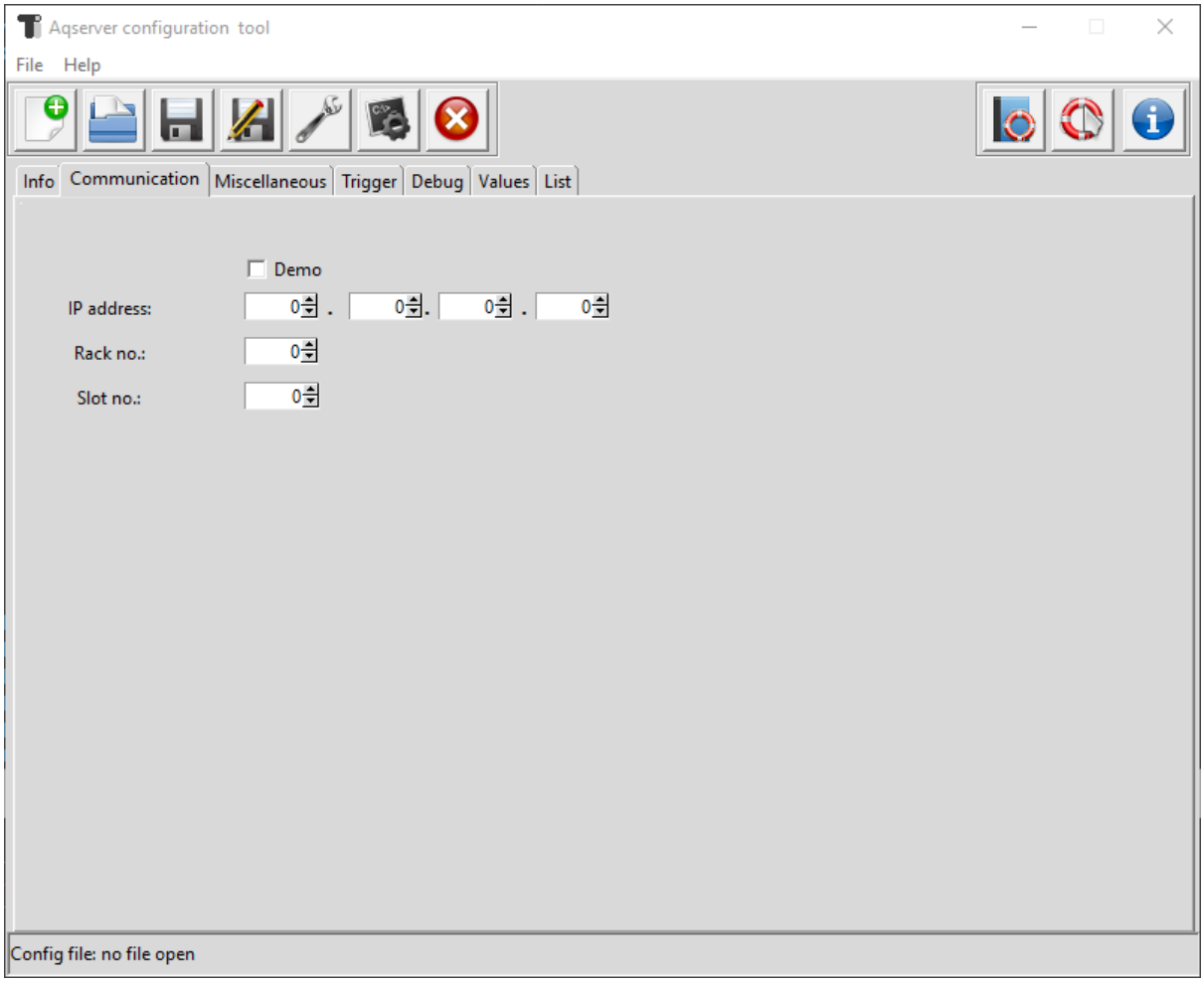
In this tab we can enter some general information about the data recording, to identify the situation later on

1. **Customer:** here we enter the customers name or some other information
2. **Creator:** enter your name
3. **Machine:** information about the machine (e.g. type, year, machine number)
4. **Order:** enter your order number
5. **Remarks:** enter a description for the recording, e.g. what was the problem, how did you solve it, result

CHAPTER

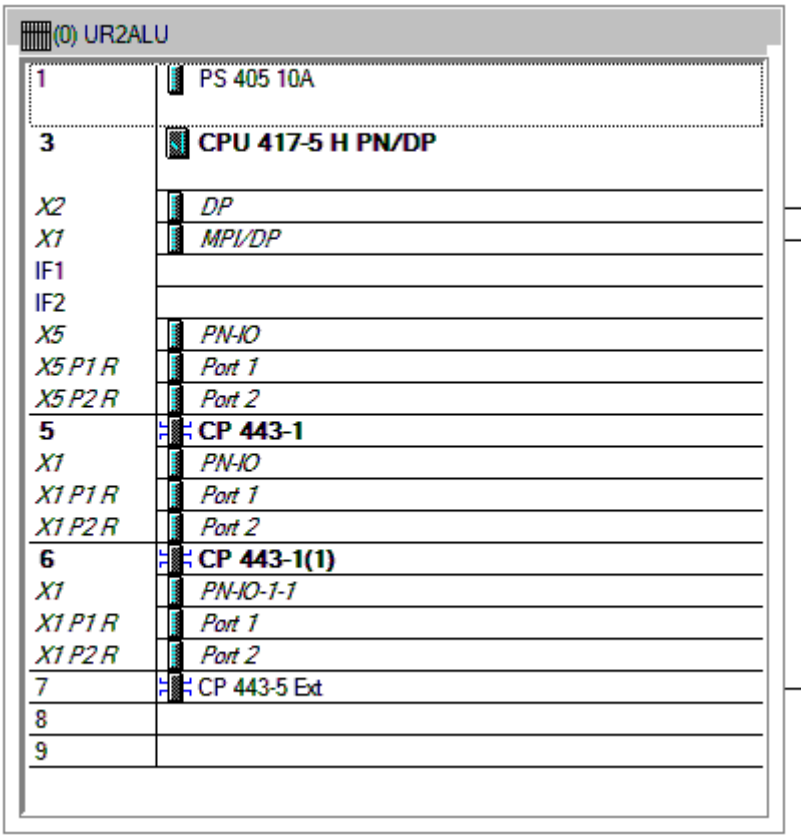
FOUR

COMMUNICATION TAB



Here we enter the communication details, how to reach the PLC

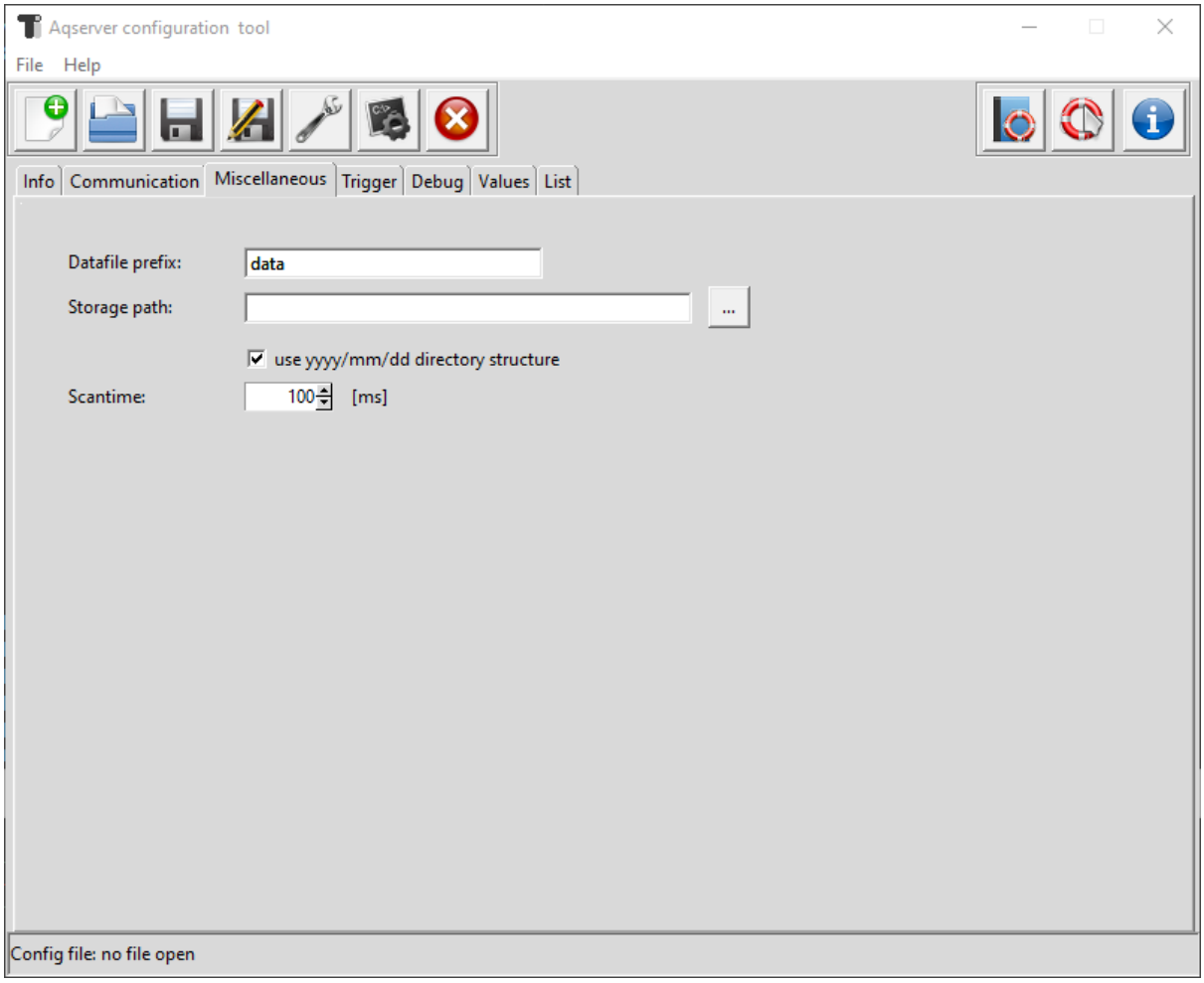
1. **Demo:** if checked, we run the program in demo mode, no real communication, random values will be created
2. **IP address:** enter the IP address of the PLC
3. **Rack no.:** enter the rack number of the PLC
4. **Slot no.:** enter the slot number for the CPU in the rack, can be found in HW Config of Step7


(0) UR2ALU
1
PS 405 10A
3
CPU 417-5 H PN/DP
X2
DP
X1
MPI/DP
IF1
IF2
X5
PN-IO
X5 P1 R
Port 1
X5 P2 R
Port 2
5
CP 443-1
X1
PN-IO
X1 P1 R
Port 1
X1 P2 R
Port 2
6
CP 443-1(1)
X1
PN-IO-1-1
X1 P1 R
Port 1
X1 P2 R
Port 2
7
CP 443-5 Ext
8
9

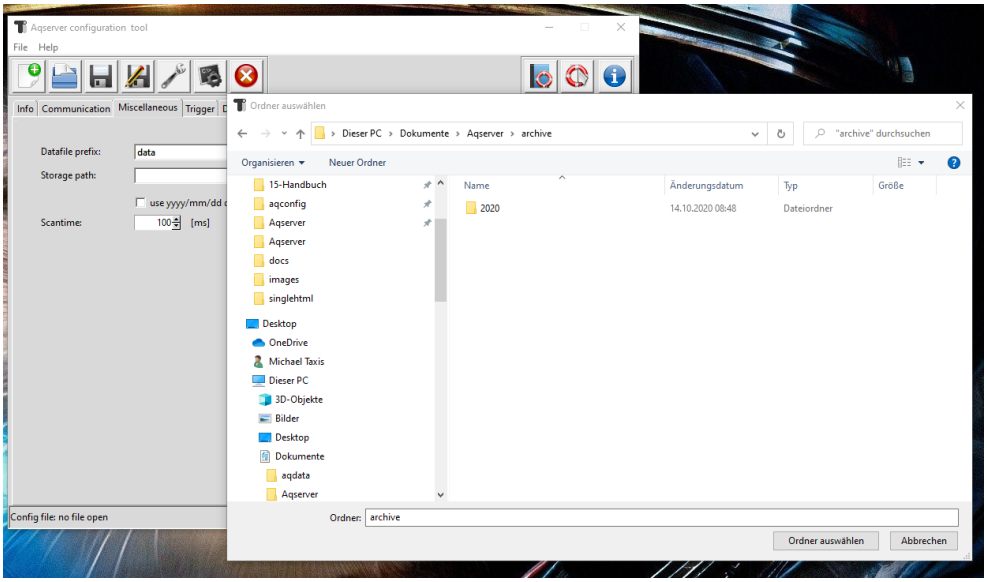
CHAPTER

FIVE

MISCELLANEOUS TAB



1. **datafile prefix** here you enter the name of the datafile, archives will additionally have a timestamp in the name.
2. **storage path** here you can enter the path where you want the archives to be stored. With the button a dialog willl open where you can pick a directory



With this dialog you can select the storage path

3. **use...** With this checkbox you can select whether the archives should be stored under a directory structure by day
4. **scantime** enter the scan interval in milliseconds

CHAPTER

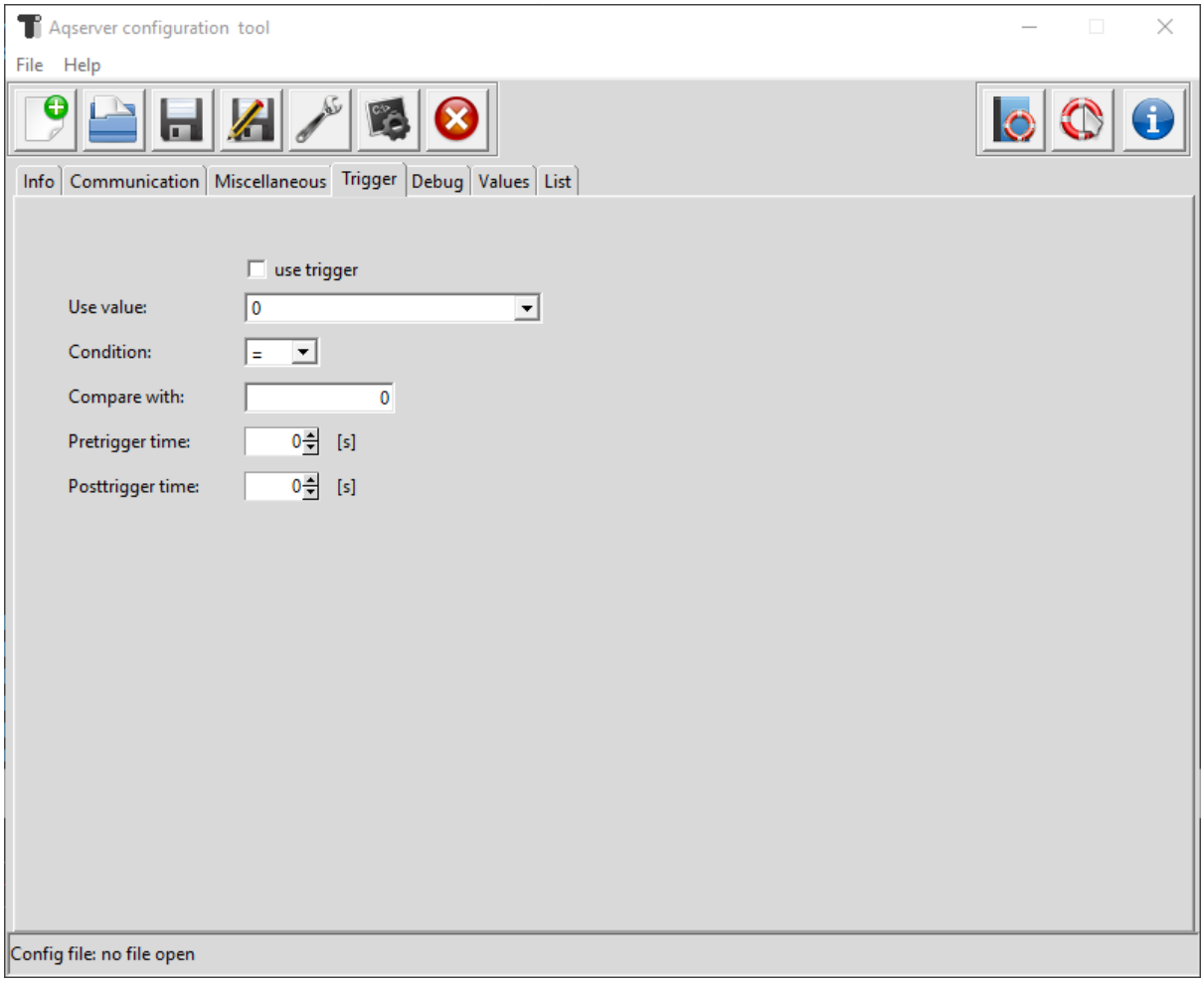
SIX

TRIGGER TAB

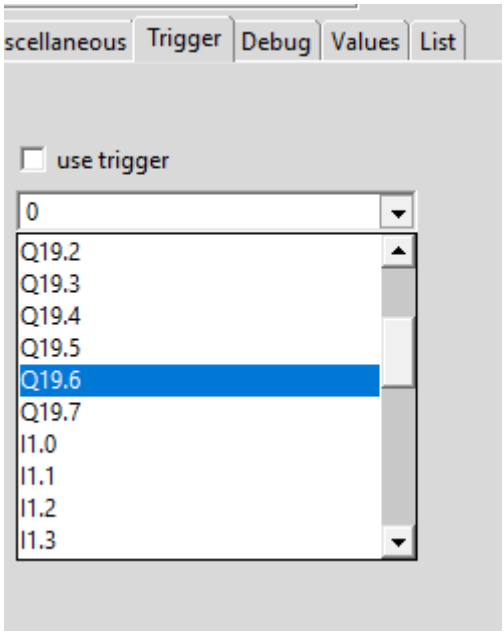
6.1 Trigger (Wikipedia):

In physics, a trigger is a system that controls the data collection of an experiment. Often it is not possible or not important to continuously record all measured values in experiments. In this case only a part of the measured values is read out and based on this, it is decided when the remaining data should be read out.

In our case we use the trigger to start a new datafile.



1. **trigger checkbox:** switch trigger function on or off
2. **trigger signal:** choose the trigger from available signals with the combobox



combobox with trigger signals

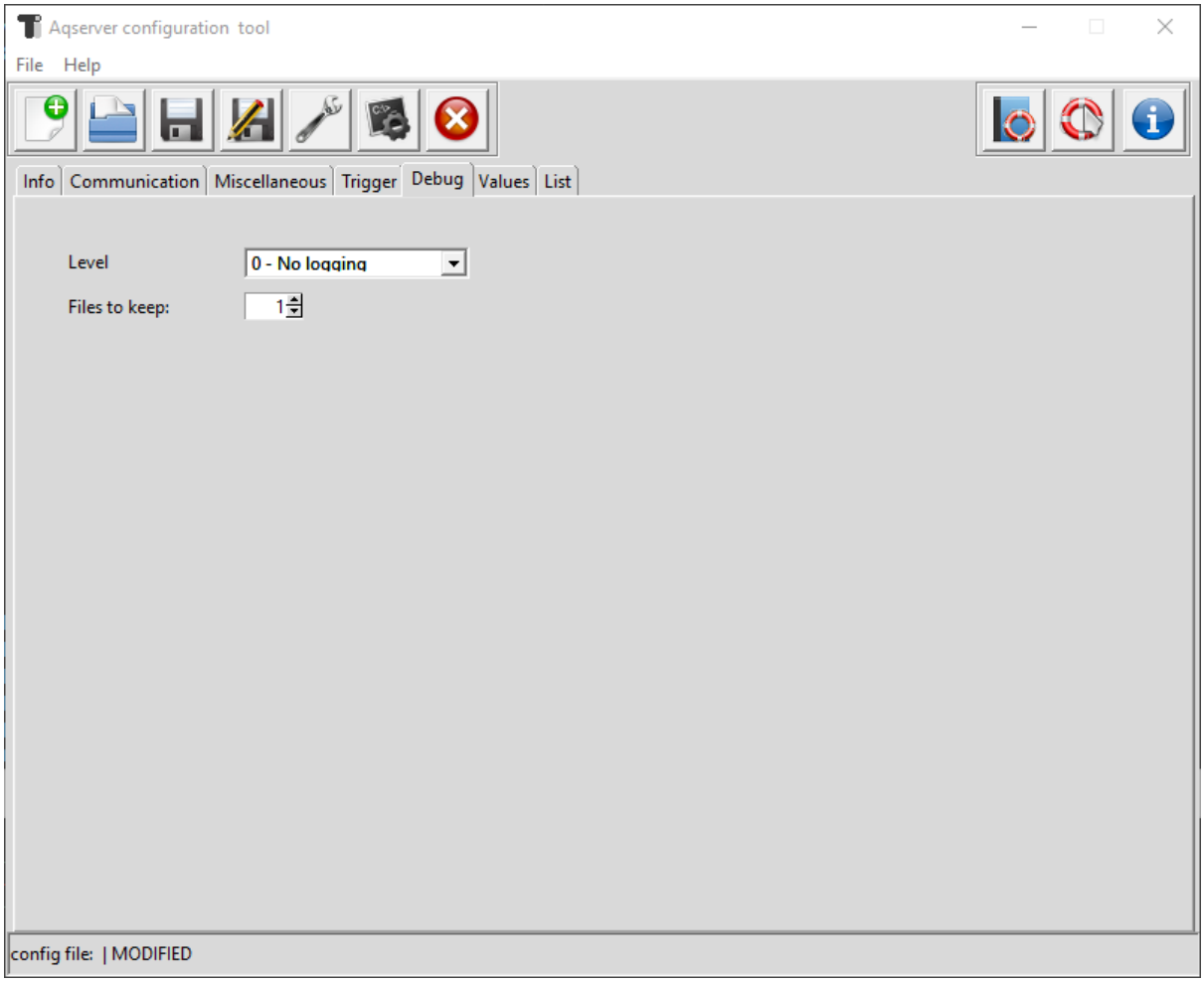
3. **trigger condition:** choose the comparison operator for the trigger
4. **trigger value:** value the trigger signal is compared with
5. **pre-trigger:** time before the trigger, where signals will go into new file
6. **post-trigger:** time after trigger, where signals will go into old file

Note: Pre- and post-trigger are used to get an overlap between old and new datafile

CHAPTER

SEVEN

DEBUG TAB



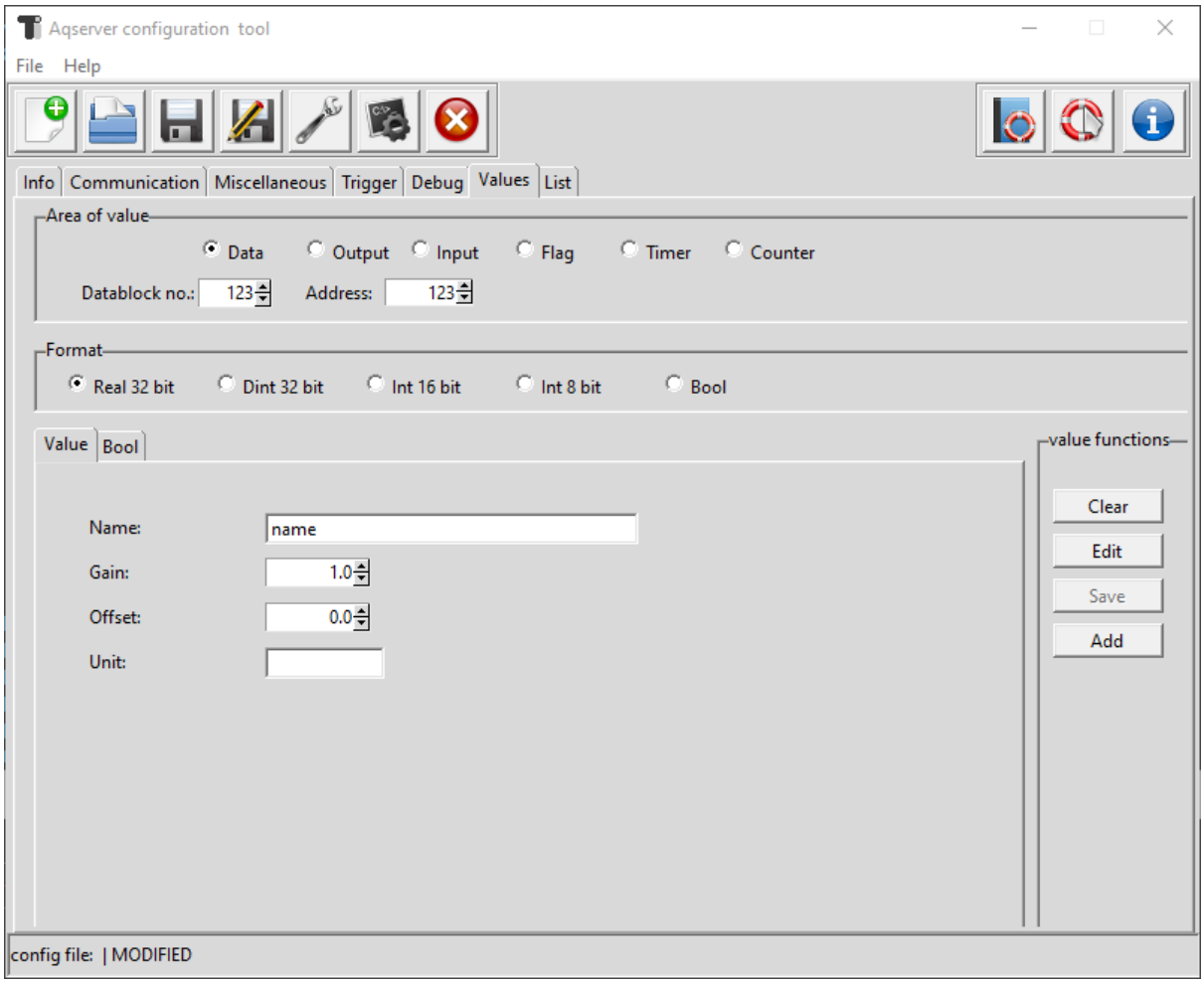
1. **Level** select the debugging level (for aqserver), where “1 - INFO” is the most verbose
2. **Files to keep** Give a number of logging files that will be kept.

CHAPTER

EIGHT

VALUES TAB

8.1 Values



1. **Area of values** select the area of the value from the following

    a. **Data** value is from the data area, you have to select also a datablock number and the address

    b. **Output** value is from the output area, you have to select also the address. Note that datablock number is greyed out.

    c. **Input** value is from the input area, you have to select also the address. Note that datablock number is greyed out.

    d. **Flag** value is from the flag area, you have to select also the address. Note that datablock number is greyed out.

e. **Timer** value is from the timer area, you have to select also the address. Note that datablock number is greyed out. Also the only allowed format is Int 16 bit

f. **Counter** value is from the counter area, you have to select also the address. Note that datablock number is greyed out. Also the only allowed format is Int 16 bit

2. **Data block number** enter / select the number of the datablock
3. **Address** enter the address of the value
4. **Format** select the format of the value with the radio buttons

a. **Real 32 bit** value is a real (float) number , with a length of 32 bit (REAL) Note that bottom notebook switches automatically to the value tab.

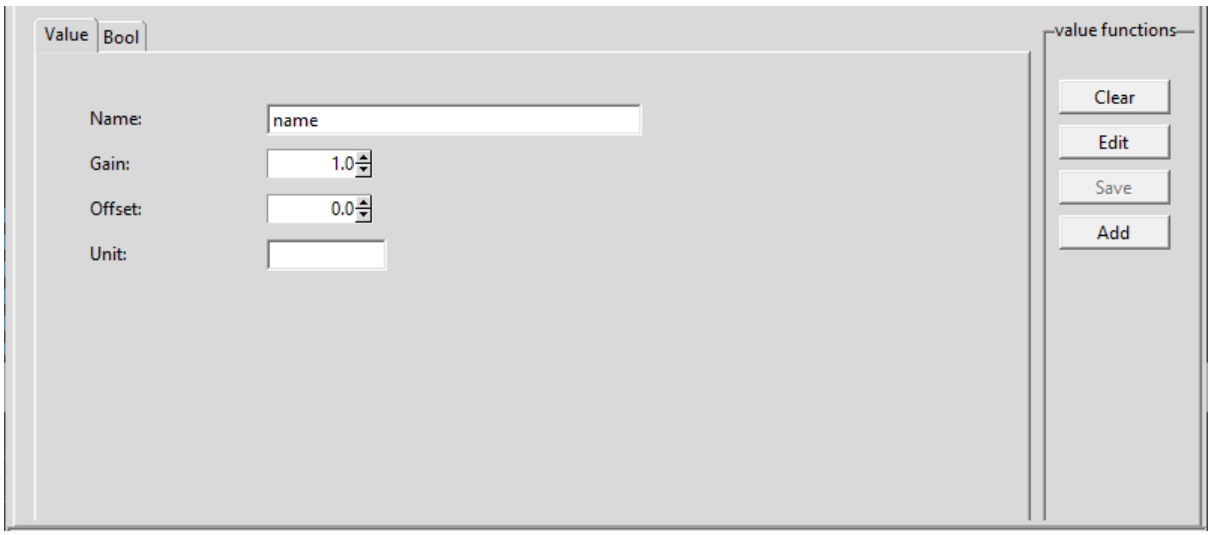
b. **Dint 32 bit** value is a integer number, with a length of 32 bit (DINT) Note that bottom notebook switches automatically to the value tab.

c. **Int 16 bit** value is a integer number, with a length of 16 bit (WORD) Note that bottom notebook switches automatically to the value tab.

d. **Int 8 bit** value is a integer number, with a length of 8 bit (BYTE) Note that bottom notebook switches automatically to the value tab.

e. **Bool** value is a boolean value (TRUE/FALSE). Note that bottom notebook switches automatically to the bool tab.

8.1.1 Value



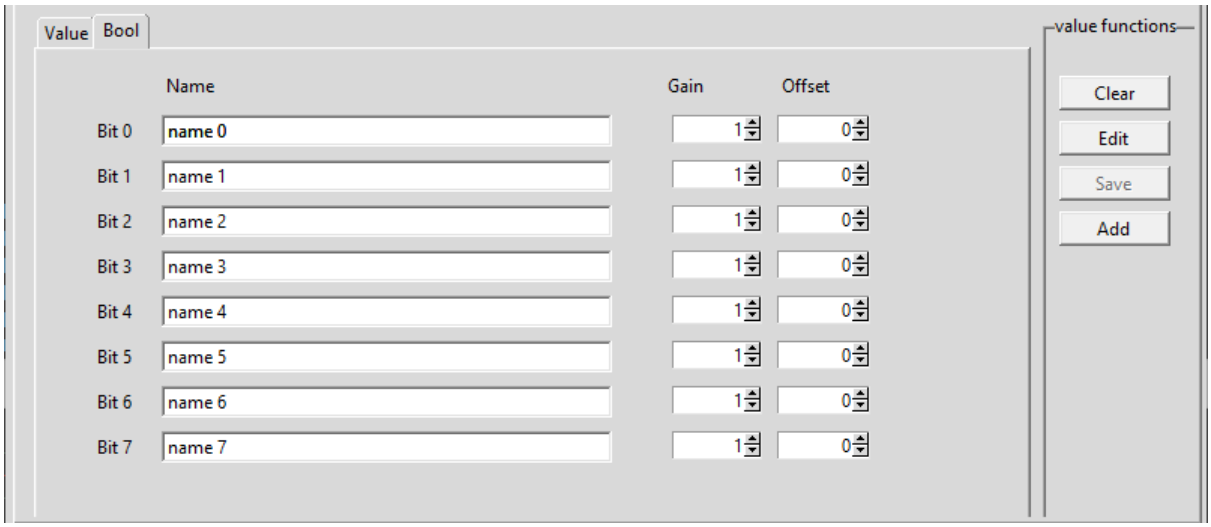
1. **Name** The name for the value

> **Note:** Names have to be unique. No duplicate entries are allowed in the list!

2. **Gain** The value coming from the PLC is multiplied with this value This can be used if several signals have to be compared but have different range (but maybe the same shape). Leave 1.0 for no effect (default setting).
3. **Offset** This value is added to the result of (value coming from the PLC multiplied by gain) Use this to shift the value up or down. Leave 0.0 for no effect (default setting)
4. **Unit** Enter a unit of the measured value, e.g. m^3, bar, psi...

8.1.2 Bool

Smallest value that can be read from the PLC is a Byte. So in order to get a boolean value we have to get a byte and then separate it to 8 booleans.



1. **name for every bit** The name for the bits (also unique)
2. **Gain for every bit** Gain does not make much sense, but we have it anyway. Leave 1 for no effect (default setting)
3. **Offset for every bit** This value is added to the result of (value coming from the PLC multiplied by gain). Can be useful if several boolean values are in one graph, to separate them. Leave 0 for no effect (default setting)

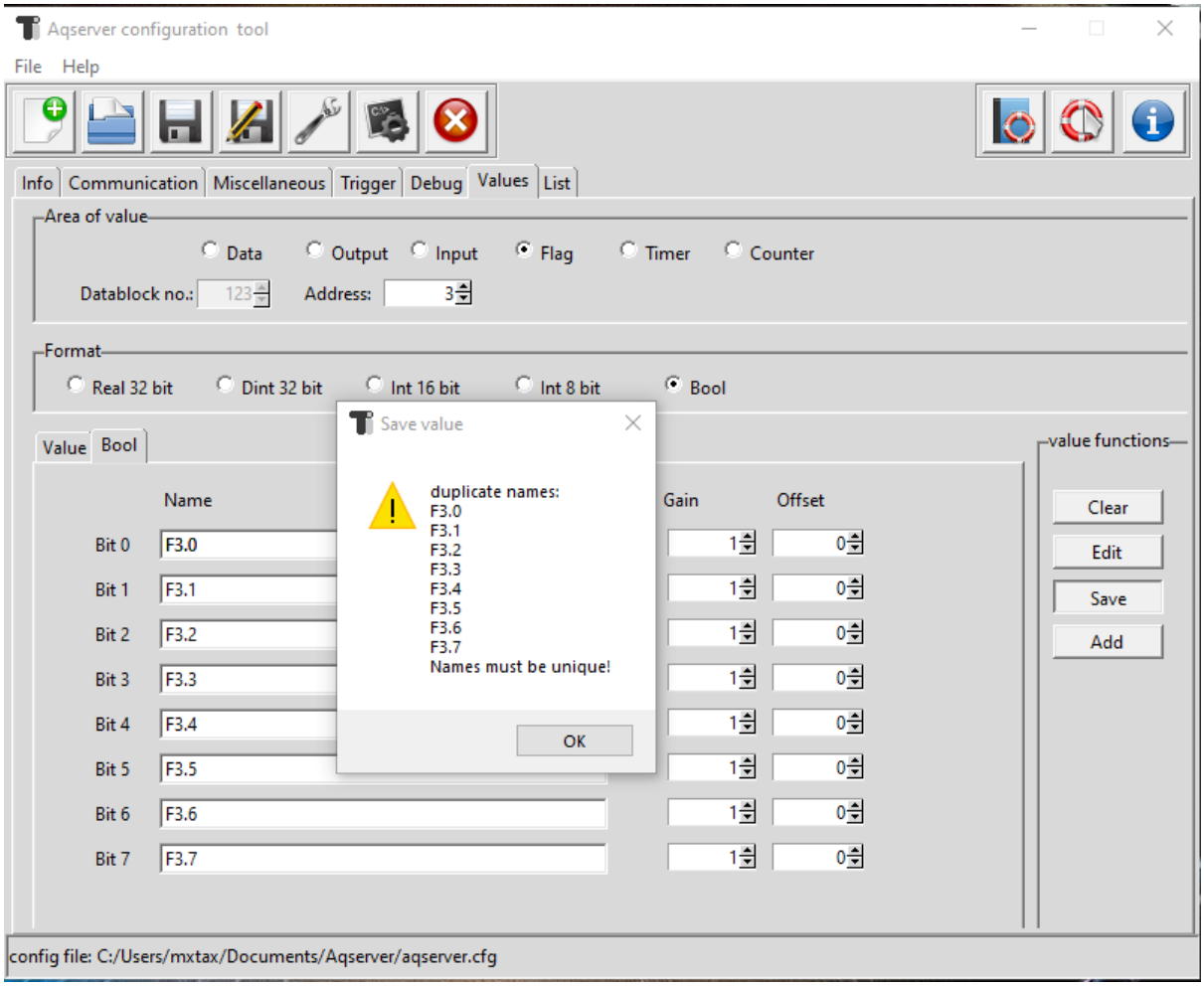
Note: There is no unit for a boolean value

8.1.3 Buttons

1. **Clear** This button clears the entry fields and sets some defaults
2. **Edit** This button switches to the list tab, sop you select a value/row for edit
3. **Save** Changes to a selected value will be saved to the list. If no value was selected previously , then button is greyed out
4. **Add** Values entered to the fields will be added to the end of the list

Duplicate names

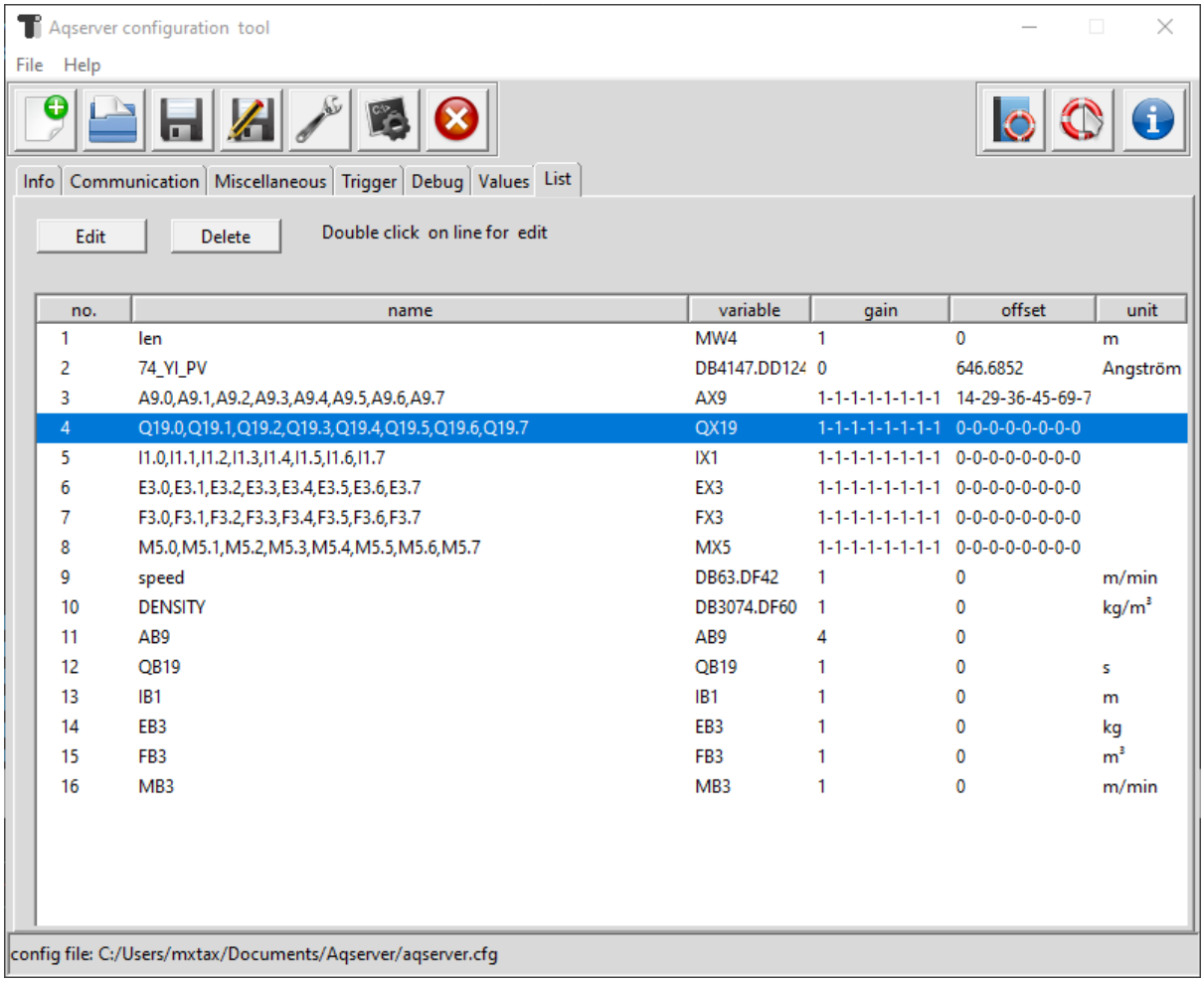
All value names must be unique. If a name entered to the Name field or to the Name0..7 field for the boolean is already in the list, a dialog will open and show the duplicates. Enter a different name for the shown ones and save/add again.


Aqserver configuration tool
File Help
Info Communication Miscellaneous Trigger Debug Values List
Area of value
Data Output Input Flag Timer Counter
Datablock no.: 123 Address: 3
Format
Real 32 bit Dint 32 bit Int 16 bit Int 8 bit Bool
Value Bool
Name Gain Offset
Bit 0 F3.0 1 0
Bit 1 F3.1 1 0
Bit 2 F3.2 1 0
Bit 3 F3.3 1 0
Bit 4 F3.4 1 0
Bit 5 F3.5 1 0
Bit 6 F3.6 1 0
Bit 7 F3.7 1 0
value functions
Clear
Edit
Save
Add
Save value
duplicate names:
F3.0
F3.1
F3.2
F3.3
F3.4
F3.5
F3.6
F3.7
Names must be unique!
OK
config file: C:/Users/mxtax/Documents/Aqserver/aqserver.cfg

CHAPTER

NINE

LIST TAB



no.	name	variable	gain	offset	unit
1	len	MW4	1	0	m
2	74_YI_PV	DB4147.DD124	0	646.6852	Angström
3	A9.0,A9.1,A9.2,A9.3,A9.4,A9.5,A9.6,A9.7	AX9	1-1-1-1-1-1-1-1	14-29-36-45-69-7	
4	Q19.0,Q19.1,Q19.2,Q19.3,Q19.4,Q19.5,Q19.6,Q19.7	QX19	1-1-1-1-1-1-1-1	0-0-0-0-0-0-0-0	
5	I1.0,I1.1,I1.2,I1.3,I1.4,I1.5,I1.6,I1.7	IX1	1-1-1-1-1-1-1-1	0-0-0-0-0-0-0-0	
6	E3.0,E3.1,E3.2,E3.3,E3.4,E3.5,E3.6,E3.7	EX3	1-1-1-1-1-1-1-1	0-0-0-0-0-0-0-0	
7	F3.0,F3.1,F3.2,F3.3,F3.4,F3.5,F3.6,F3.7	FX3	1-1-1-1-1-1-1-1	0-0-0-0-0-0-0-0	
8	M5.0,M5.1,M5.2,M5.3,M5.4,M5.5,M5.6,M5.7	MX5	1-1-1-1-1-1-1-1	0-0-0-0-0-0-0-0	
9	speed	DB63.DF42	1	0	m/min
10	DENSITY	DB3074.DF60	1	0	kg/m³
11	AB9	AB9	4	0	
12	QB19	QB19	1	0	s
13	IB1	IB1	1	0	m
14	EB3	EB3	1	0	kg
15	FB3	FB3	1	0	m³
16	MB3	MB3	1	0	m/min

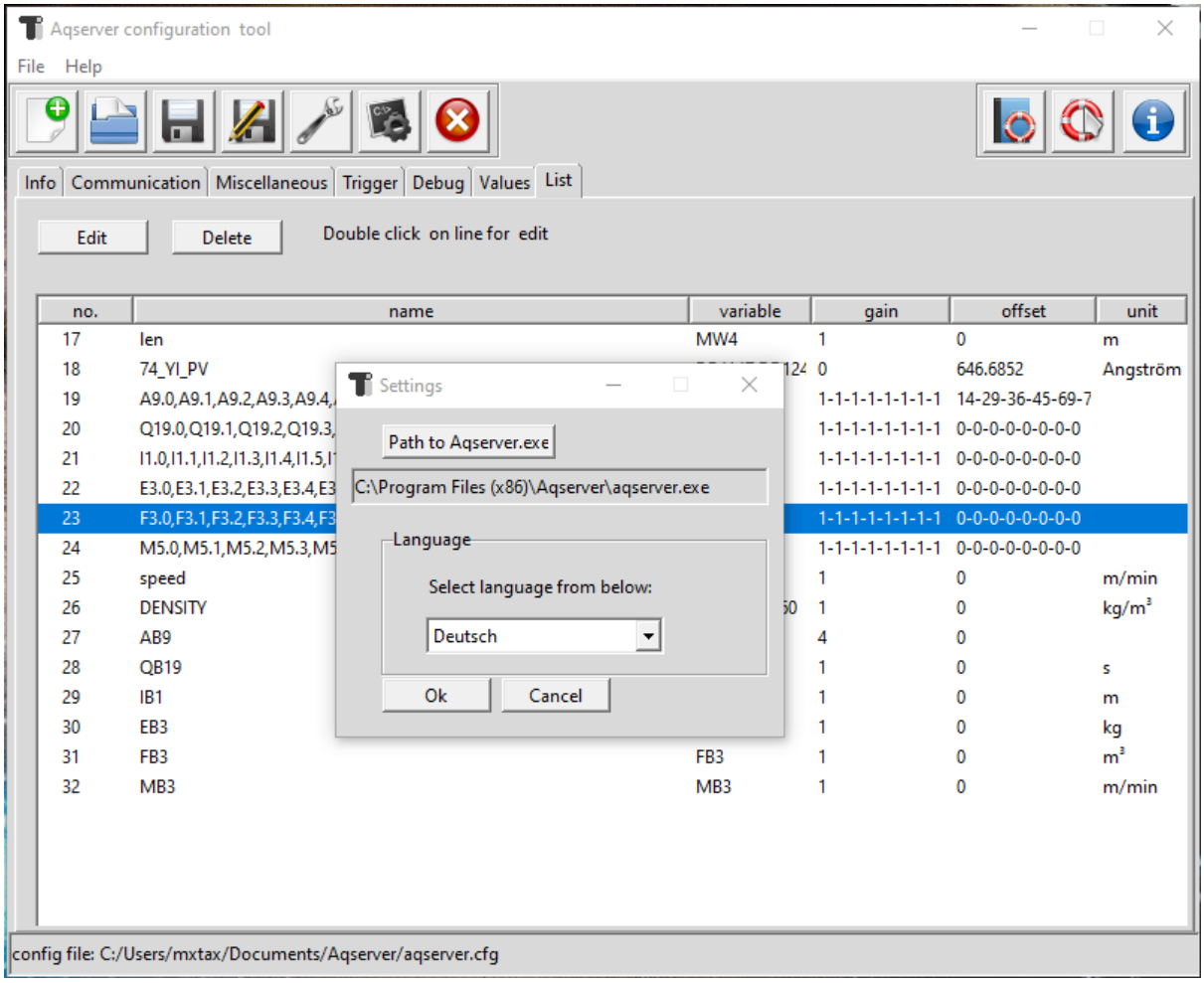
1. **Edit** Edit the selected value/row from the list. Will open this value in the values tab
2. **Delete** Deletes the selected value from the list. Has to be confirmed.

Note: Deleting a value from the list can destroy the display of a datafile in KST2, because it is based on the order of the values in the datafiel. When we change the order by deleting a value from the list, then display will not work anymore.

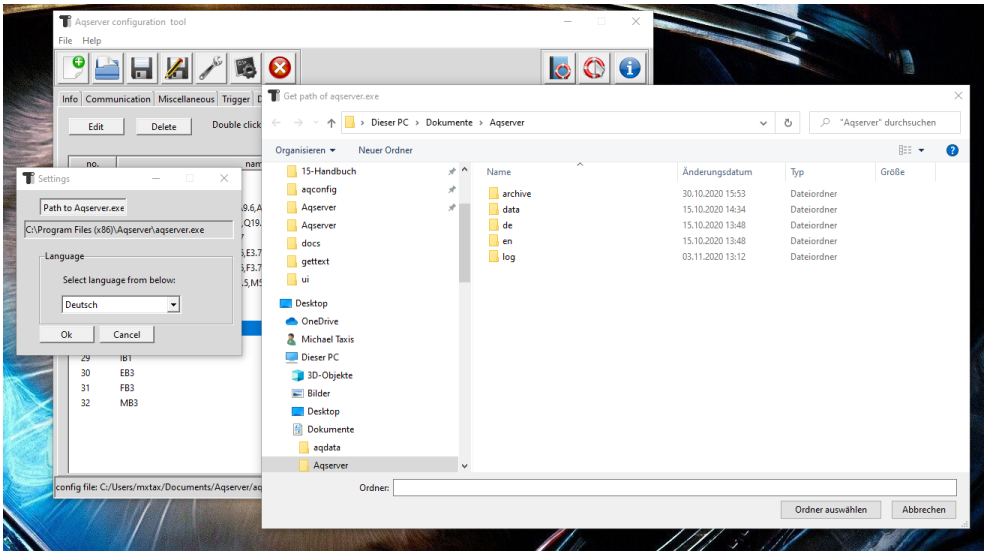
CHAPTER

TEN

SETTINGS



1. **Button Path to Aqserver.exe** Here we have to select the directory where the Aqserver.exe is located.



Default location is “C:Program Files (x86)Aqserver”

2. **Label Path to Aqserver.exe** The label shows the directory
3. **Language combobox** Select language for the program from the combobox
4. **Ok** Click to accept settings
5. **Cancel** Click to close the dialog and leave previous settings

CHAPTER

ELEVEN

CHANGELOG

- 05 October 2020
  - 0.1.0alpha

    first version

CHAPTER

TWELVE

LICENSING

Aqserver is distributed as python source code or Windows setup program under Lesser General Public License version 3.0 (LGPLv3)

Basically this means that you can distribute your commercial software linked with Aqconfig without the requirement to distribute the source code of your application and without the requirement that your application be itself distributed under LGPL.

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