

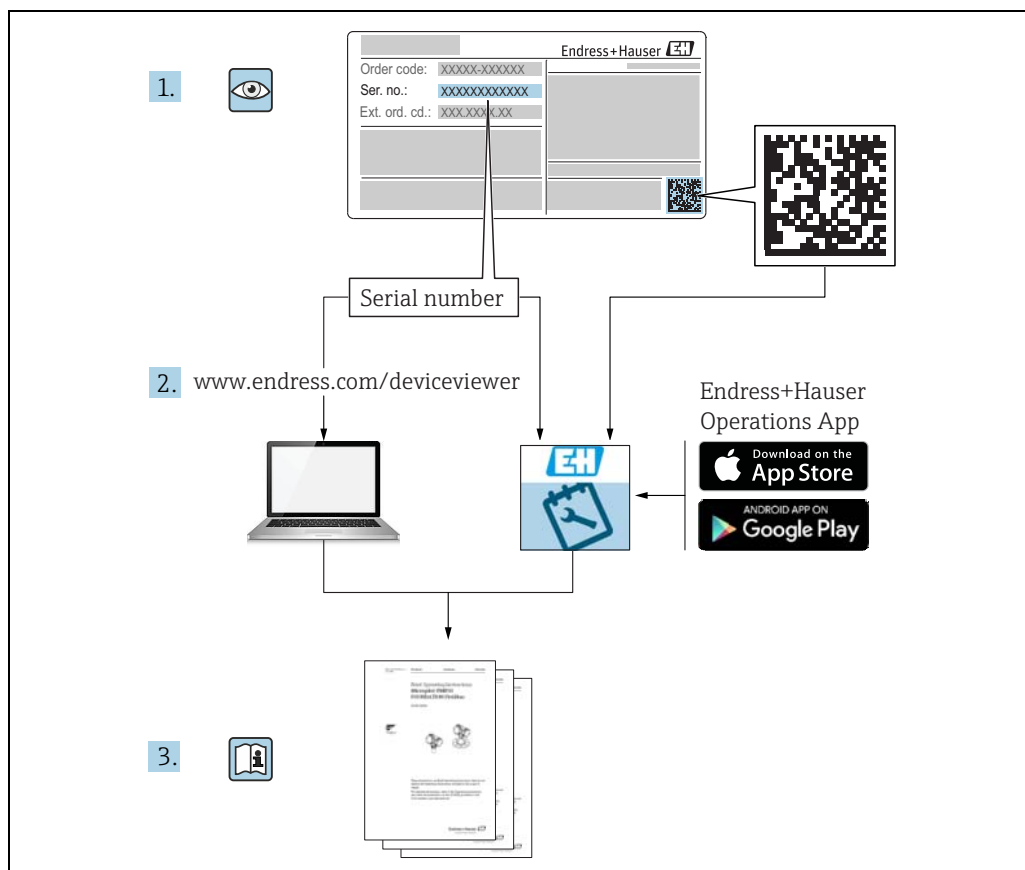
# Operating Instructions

## Tankvision

### NXA820 OPC Server

#### User Manual





A0023555

Make sure the document is stored in a safe place such that it is always available when working on or with the device.

To avoid danger to individuals or the facility, read the "Basic safety instructions" section carefully, as well as all other safety instructions in the document that are specific to working procedures.

The manufacturer reserves the right to modify technical data without prior notice. Your Endress+Hauser distributor will supply you with current information and updates to these Instructions.

## Change history

Document version	Valid for SW version	Changes to the previous version
BA01137G/02.17	02.00.00	Added temperature and density profile parameters
BA01137G/03.17	02.01.00	Introduced Floating Roof Weight Correction, Redundancy functionality with NXA820 Interface Only, CH alarm for Volume or Mass
BA01137G/04.18	02.02.00	Introduced Switch by Gauge redundancy mode for NXA820 Interface Only
BA01137G/05.20	02.03.00	Introduced <b>Tank Comment</b> opc element
BA01137G/06.23-00	02.03.01	Introduced OPC custom unit conversion

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# 1 About this document

## 1.1 Document function

This documents describes installation and user guide for configuration and usage of Tankvision OPC DA 3.0 Server.

This guide is for users of the Tankvision system and OPC Servers and OPC Clients. The intended audience includes Project Engineers and System Administrators.





Beside basic PC operating knowledge no special training is needed to perform the Tank Gauging System operations. Nevertheless it is recommended receiving a training on the system by Endress+Hauser.

## 1.2 List of abbreviations





Abbreviation	Meaning
OPC	OLE for Process Control Open Interoperability standards developed by OPC Foundation
OPC DA 3.0	OPC Data Access specification version 3.0 specification
COM	Component Object Model
DCOM	Distributed Component Object Model

## 1.3 Symbols




### 1.3.1 Safety symbols

Symbol	Meaning
 <small>A0011189-EN</small>	<b>DANGER!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
 <small>A0011190-EN</small>	<b>WARNING!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
 <small>A0011191-EN</small>	<b>CAUTION!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
 <small>A0011192-EN</small>	<b>NOTICE!</b> This symbol contains information on procedures and other facts which do not result in personal injury.



### 1.3.2 Electrical symbols

Symbol	Meaning
 A0011197	<b>Direct current</b> A terminal to which DC voltage is applied or through which direct current flows.
 A0011198	<b>Alternating current</b> A terminal to which alternating voltage is applied or through which alternating current flows.
 A0011200	<b>Ground connection</b> A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.
 A0011199	<b>Protective ground connection</b> A terminal which must be connected to ground prior to establishing any other connections.

### 1.3.3 Symbols for certain types of information

Symbol	Meaning
 A0011193	<b>Tip</b> Indicates additional information.
 A0011195	<b>Reference to page</b> Refers to the corresponding page number.
1. , 2. , 3. ...	Series of steps
 A0018373	Result of a sequence of actions

### 1.3.4 Symbols in graphics

Symbol	Meaning
1, 2, 3 ...	Item numbers
1. , 2. , 3. ...	Series of steps
A, B, C ...	Views
 A0011187	<b>Hazardous area</b> Indicates a hazardous area.
 A0011188	<b>Indicates a non-hazardous location</b> Safe area (non-hazardous area)

## 1.4 Documentation

The following documentation types are available in the Downloads area of the Endress+Hauser website: [www.endress.com/downloads](http://www.endress.com/downloads)



For an overview of the scope of the associated Technical Documentation, refer to the following:

- *W@M Device Viewer*: [www.endress.com/deviceviewer](http://www.endress.com/deviceviewer) - Enter the serial number from the nameplate
- *Endress+Hauser Operations App*: Enter the serial number from the nameplate or scan the matrix code on the nameplate

## 2 Basic safety instructions

### 2.1 Requirements for the personnel

The personnel for installation, commissioning, diagnostics and maintenance must fulfil the following requirements:

- Trained, qualified specialists: must have a relevant qualification for this specific function and task
- Are authorized by the plant owner or operator
- Are familiar with federal or national regulations
- Before starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application)
- Follow instructions and comply with basic conditions

The operating personnel must fulfil the following requirements:

- Are instructed and authorized according to the requirements of the task by the facility's owner-operator
- Following the instructions in these Operating Instructions

### 2.2 Intended use

#### 2.2.1 Application

Tankvision is a dedicated tank inventory management system.

Components:

- Tankvision Tank Scanner NXA820  
scans parameters from tank gauges and performs tank calculations
- Tankvision Data Concentrator NXA821  
summarizes data from various Tank Scanners NXA820
- Tankvision Host Link NXA822  
provides data to host systems (such as PLC or DCS) via Modbus

The above mentioned components are operated via a standard web browser. It does not require any proprietary software. Tankvision is based on a distributed architecture on a Local Area Network (LAN). Due to its modular structure it can be adjusted to any application. It is ideally suited for small tank farms with only a couple of tanks, but also for large refineries with hundreds of tanks.

### 2.3 Workplace safety

For work on and with the device:

- Wear the required personal protective equipment according to federal/national regulations.
- Switch off the supply voltage before connecting the device.

### 2.4 Operational safety

Risk of injury!

- Operate the device only if it is in proper technical condition, free from errors and faults.
- The operator is responsible for interference-free operation of the device.

#### Modifications to the device

Unauthorized modifications to the device are not permitted and can lead to unforeseeable dangers!

- If modifications are nevertheless required, consult with the manufacturer.

### Repair

To ensure continued operational safety and reliability:

- Carry out repairs on the device only if they are expressly permitted.
- Observe federal/national regulations pertaining to repair of an electrical device.
- Use only original spare parts and accessories.

## 2.5 Product safety

This measuring device is designed in accordance with good engineering practice to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. It meets general safety standards and legal requirements. It also complies with the EC directives listed in the device-specific EC Declaration of Conformity. Endress+Hauser confirms this by affixing the CE mark to the device.

Furthermore, the device meets the legal requirements of the applicable UK regulations (Statutory Instruments). These are listed in the UKCA Declaration of Conformity along with the designated standards.

By selecting the order option for UKCA marking, Endress+Hauser confirms a successful evaluation and testing of the device by affixing the UKCA mark.

Contact address Endress+Hauser UK:

- Endress+Hauser Ltd.  
Floats Road  
Manchester M23 9NF  
United Kingdom  
[www.uk.endress.com](http://www.uk.endress.com)

## 2.6 IT security

We only provide a warranty if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

Endress+Hauser can be contacted to provide support in performing this task.

## 3 Installation

### 3.1 Required files

**TankvisionOPCServer\_Installer.msi:** This file contains complete installable for Tankvision OPC Server application.

### 3.2 Supported Windows version

- Windows 7 (32 bit / 64 bit)
- Windows 10 (32 bit / 64 bit)

**i** On 64-bit machines OPC Server will be installed and run in 32-bit compatibility mode. I.e. OPC Server will be installed in **C:\Program Files(x86)** or equivalent location.

### 3.3 Installation

- i** You need to have administrator access right to install the software.
- i** Install Microsoft .NET Framework 4 or higher before installation.

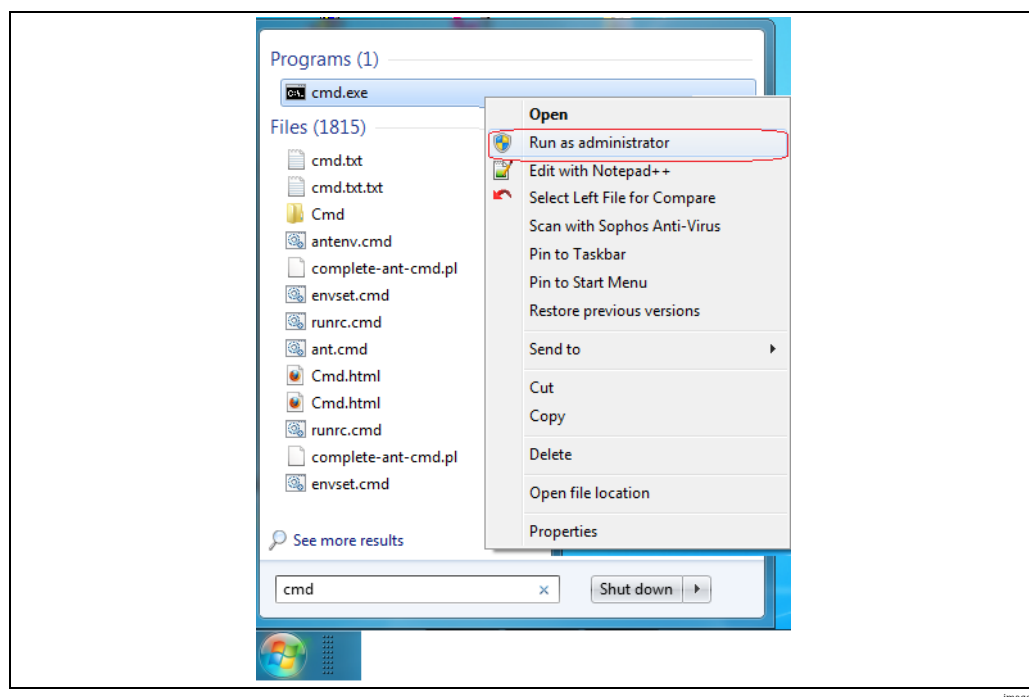
#### 3.3.1 Install Microsoft .NET Framework 4

- Web Installer  
<http://www.microsoft.com/en-us/download/details.aspx?id=17851>
- Standalone Installer  
<http://www.microsoft.com/en-in/download/details.aspx?id=17718>

#### 3.3.2 Install Tankvision OPC Server

**Windows 10 / Windows 7**

Open Command prompt in Administrator mode as shown in below figure:





Go to directory where **TankvisionOPCServer\_Installer.msi** is located and type **TankvisionOPCServer\_Installer.msi**.

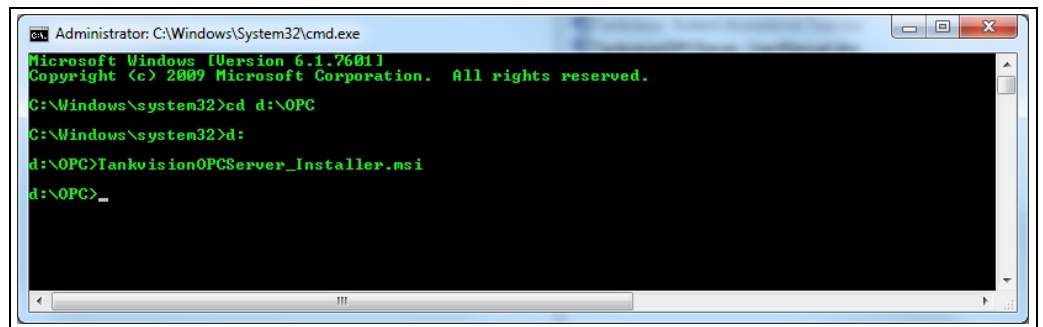


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## Installation

Follow the below instructions to install.

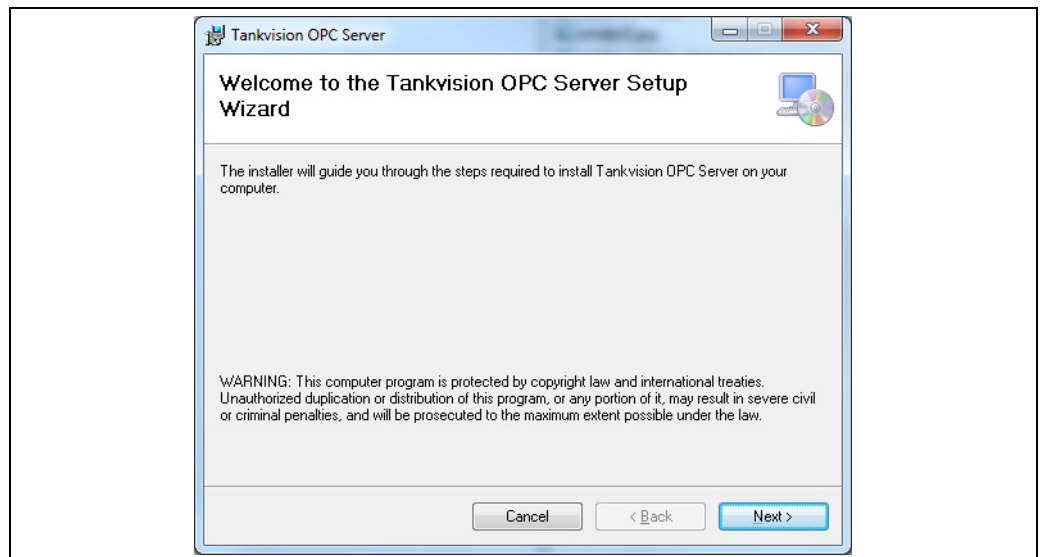


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Press **Next** to continue.

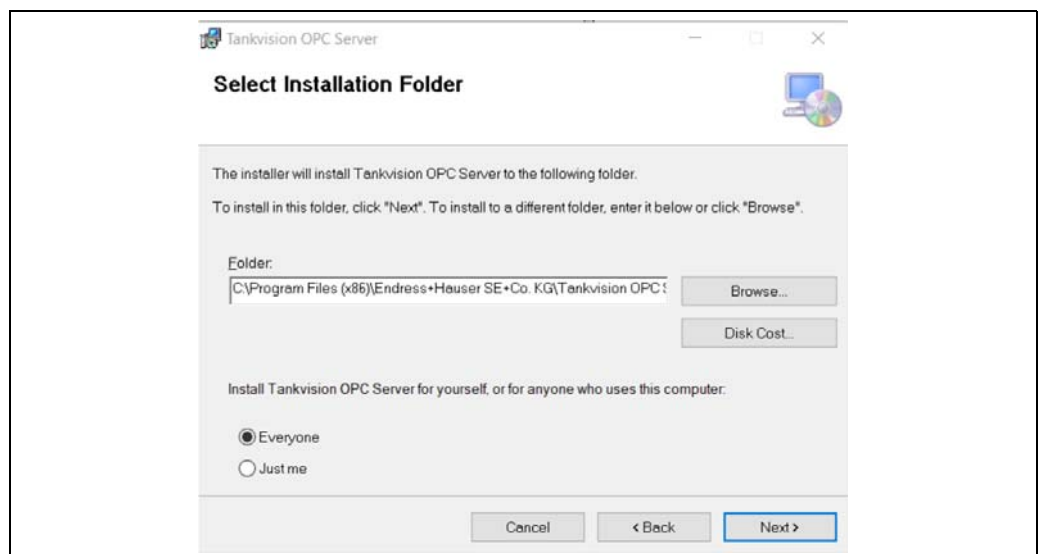
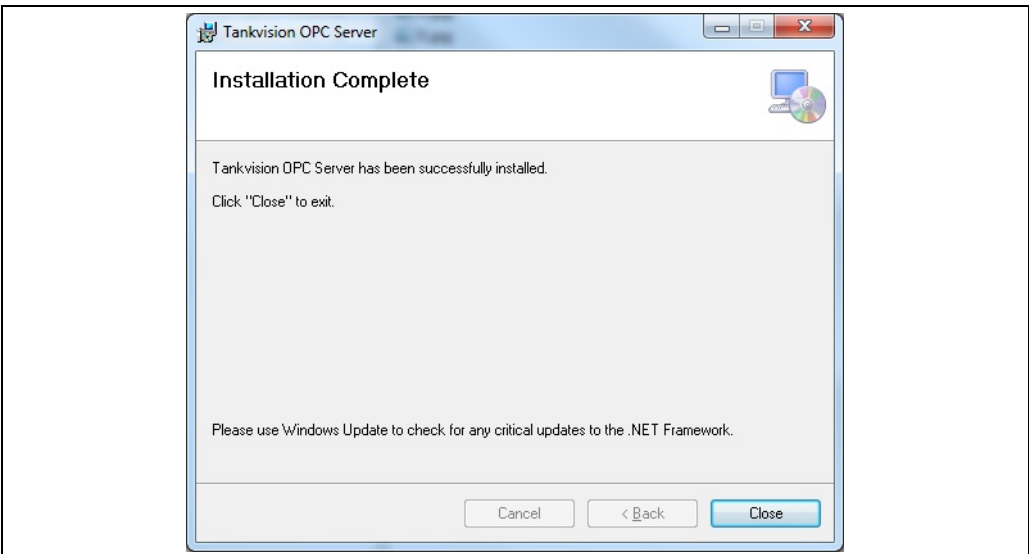
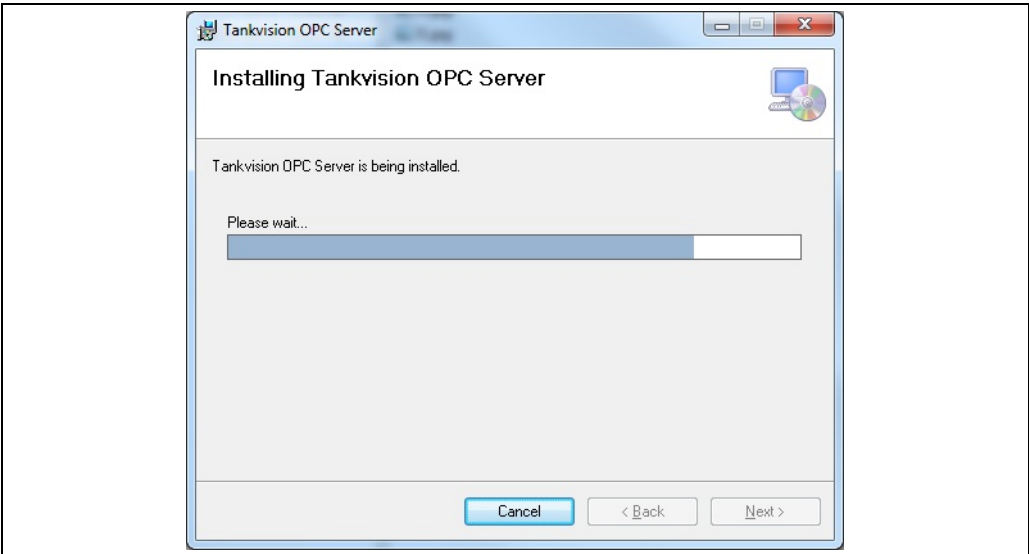
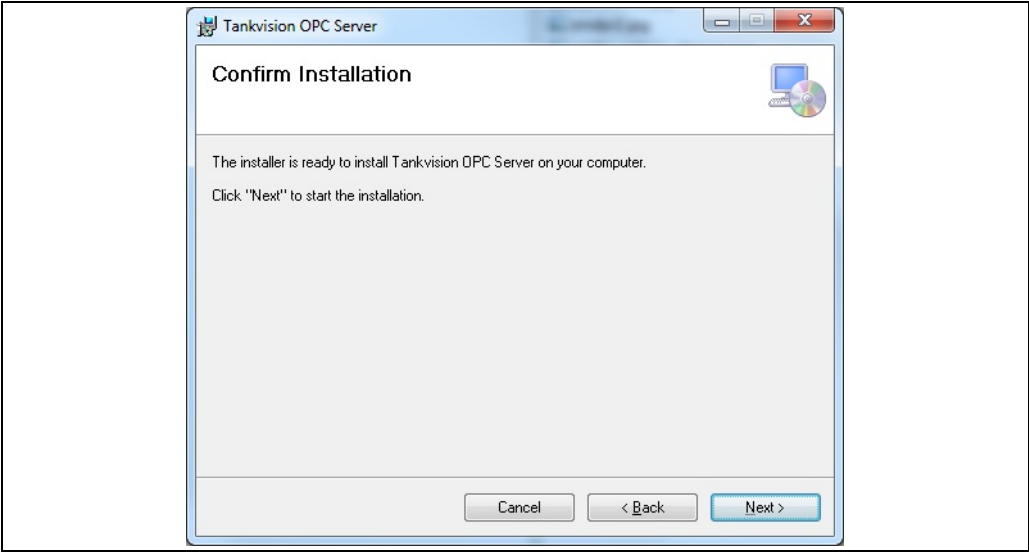


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## 4 Configurator

This section explains some of the basic settings required to configure OPC server.

**i** Administrator rights are required to change configuration files.

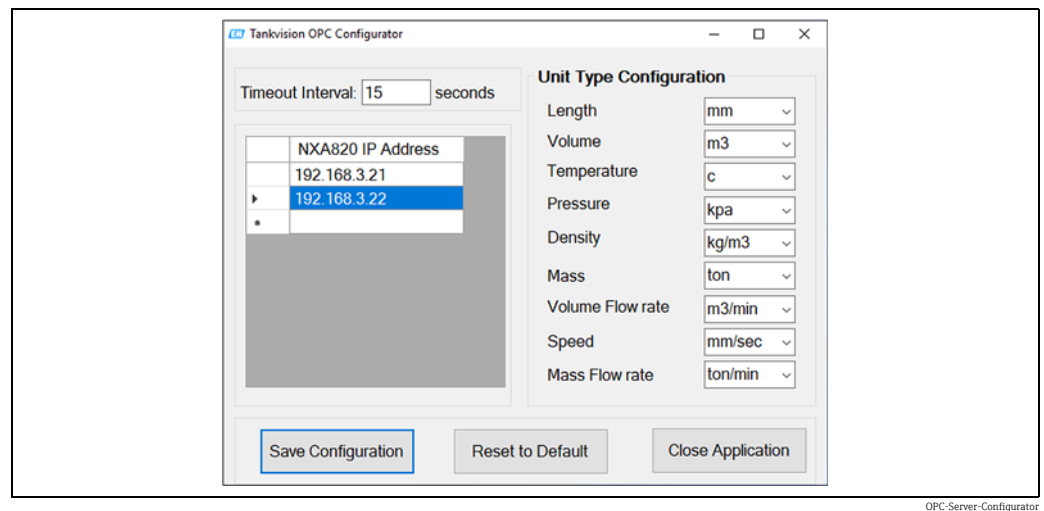
### 4.1 Basic OPC Server Configuration

The OPC Configuration can be changed by either using the **Tankvision OPC Configurator** tool or using the file **TankvisionOPC.config**.

**i** The current version supports up to 15 NXA820 devices connected to one OPC server.

#### 4.1.1 Tankvision OPC Configurator

Tankvision OPC configuration can be changed easily with the OPC Configurator tool which can be accessed via **Start menu > All Programs > Tankvision OPC Server > Tankvision OPC Configurator**.



OPC-Server-Configurator

Update the NXA820 IP addresses as required and save the configuration. To apply the latest changes, re-connect the OPC Server.

#### 4.1.2 Tankvision OPC Configurator

##### Windows 10 / Windows 7

Configuration files are stored at %ALLUSERSPROFILE%\Endress+Hauser SE+Co.KG\Tankvision OPC Server\Version\_Number\PluginData location

**i** To change any configuration file the user has to make the respective file writable.

Making a file writeable:

1. Select a configuration file and click the right mouse key to open the menu. Select **Properties**.
2. Select the **Security** tab and click the **Edit** button.

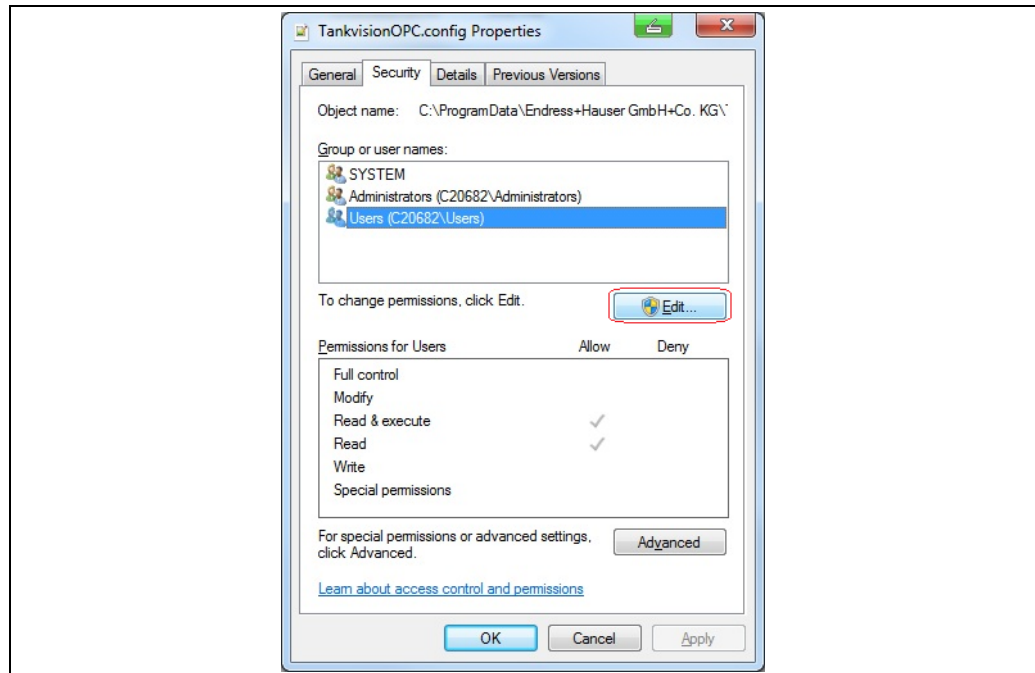


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3. On the **Security** tab, select **Users** from the list **Group or User Names**.

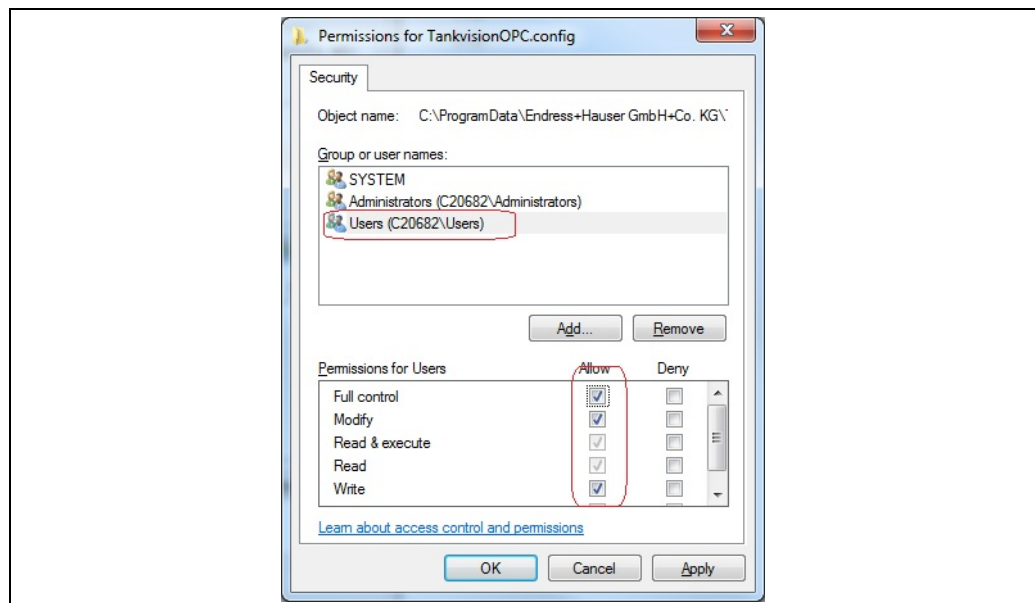


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4. Activate the **Full control** check box in the **Allow** column inside the field **Permissions for Users** and click **OK**.

Different NXA820 units can be configured by modifying the configuration file **TankvisionOPC.config**. New NXA820 can be added by using the <unit> element inside <units> element as shown in the example below:

```
<?xml version="1.0" encoding="utf-8"?>
<configuration xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <timeout>15000</timeout>
  <units>
    <unit>192.168.3.21</unit>
    <unit>192.168.3.22</unit>
  </units>
  <unitTypes>
    <length>mm</length>
    <volume>m3</volume>
    <temperature>c</temperature>
    <density>kg/m3</density>
    <mass>ton</mass>
    <pressure>kpa</pressure>
    <massflowrate>ton/min</massflowrate>
    <volflowrate>m3/min</volflowrate>
    <speed>mm/sec</speed>
  </unitTypes>
</configuration>
```

OPC\_config\_sample.XML

In the example above, 2 NX820 devices are added to the OPC server using the '<unit>' entry.


 The current version supports up to 15 NXA820 devices connected to one OPC server.

## 4.2 Start OPC Server

OPC server will be automatically started after installation. User can also manually start/restart OPC server by executing **RegServer.exe**.

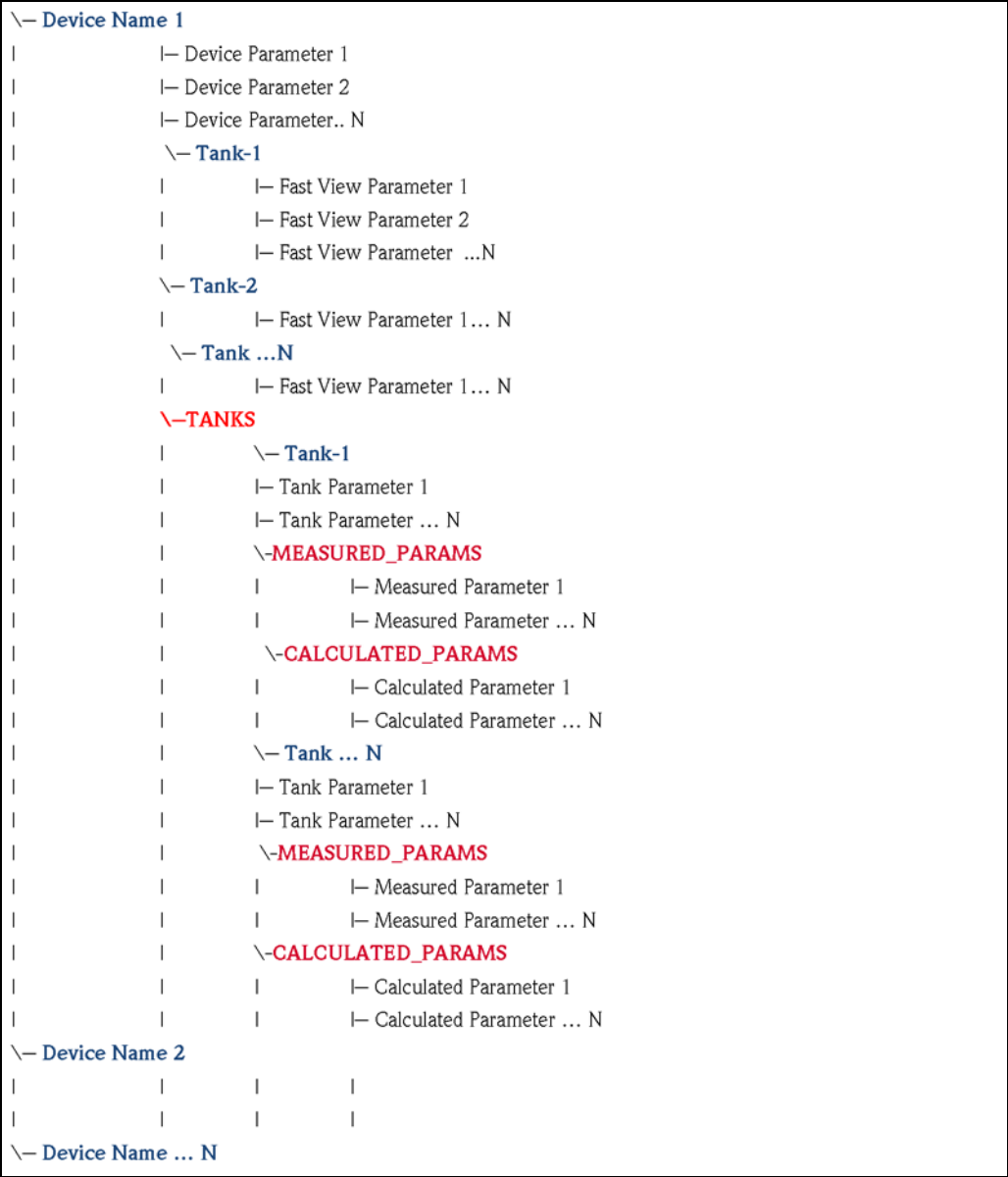
## 4.3 Stop OPC Server

OPC server can be stopped by executing **UnregServer.exe**.

 For Windows 10, to start/stop server open command prompt in Administrator mode, go to project install directory and type **RegServer.exe** or **UnRegServer.exe**.

# 5 OPC Data Structure

Below diagram shows Tankvision OPC elements view from OPC Client. Here, text mentioned in blue color are dynamic text and value will be received from Tankvision Tankscanner. Texts in red color are static text.



OPC-Data-Structure

## 6 Tankvision OPC Parameter

### Device Parameters (NXA820-01.Device Status Code)

No	Item Name	Comm ID	Type	Default Value	Unit
1	Device Status Code	5009	String	0	NA
2	Device Connection Active	5010	String	0	NA
3	Last Heart Beat Time	5011	Datetime	01.01.1970 00:00	NA
4	IP Address	5012	String	0.0.0.0	NA
5	Device Name *	5013	String	0	NA
6	Order Code *	5014	String	0	NA
7	Serial Number *	5015	String	0	NA
8	Firmware Version *	5016	String	0	NA
9	Redundancy Mode **	5017	unsigned long	0	NA
10	Redundancy Unit Type **	5018	unsigned long	0	NA
11	Redundancy State **	5019	unsigned long	0	NA
12	Redundancy Manual SwitchOver **	5020	unsigned long	0	NA

### Tank Parameter (NXA820-01.TANKS.Tank-1.Tank Name)

No	Item Name	Comm ID	Type	Default Value	Unit
1	Tank Name	5000	String	TankName	NA
2	Tank Shape	5520	unsigned long	0	NA
3	Tank Status	5516	unsigned long	0	NA
4	Tank Location	5515	String	0	NA
5	Transfer State	5519	unsigned long	0	NA
6	Product Code	5517	unsigned long	0	NA
7	Gauge Command \$	5514	unsigned long	0	NA
8	Gauge Communication Status	5004	unsigned long	0	NA
9	Product Name	5518	String	No Product	NA
10	Tank Comment	5522	String	-	NA

### Measured Parameter (NXA820-01.Tanks.Tank-1.MEASURED\_PARAMS.Free Water Level)

No	Item Name	Comm ID	Type	Default Value	Unit
1	Free Water Level	624	Double Float	0	m
2	Vapour Temperature	626	Double Float	0	C
3	Vapour Pressure	627	Double Float	0	KPa
4	Product Temperature	625	Double Float	0	C
5	Sample Temperature	1551	Double Float	0	C
6	Product Pressure	692	Double Float	0	KPa
7	Product Level	622	Double Float	0	m
8	Water Dip	1594	Double Float	0	m
9	Dip Temperature	1595	Double Float	0	C
10	Dip Product Level	1593	Double Float	0	m

No	Item Name	Comm ID	Type	Default Value	Unit
11	Dip Observed Density	1596	Double Float	0	kg/m <sup>3</sup>
12	Lab Reference Density	2887	Double Float	0	kg/m <sup>3</sup>
13	Reference Density	661	Double Float	0	kg/m <sup>3</sup>
14	Observed Density	628	Double Float	0	kg/m <sup>3</sup>
15	Ambient Temperature	660	Double Float	0	C
16	Alcohol Content in Volume	2102	Double Float	0	%
17	Alcohol Content in Mass	2101	Double Float	0	%
18	Secondary Level	623	Double Float	0	m
19	Gauge Status	2756	Double Float	0	NA
20	Gauge Error	2755	Double Float	0	NA
21	Analog Input *	2841	Double Float	0	%
22	Percentage Level	2654	Double Float	0	%
23	Temperature Element 1 to 16	1634 to 1649	Double Float	0	C
24	Temperature Element 17 to 24	1652 to 1659	Double Float	0	C
25	Temperature Element position 1 to 24	1660 to 1683	Double Float	0	m
26	Density Element 1 to 50	3001 to 3050	Double Float	0	kg/m <sup>3</sup>
27	Density Position 1 to 50	3051 to 3100	Double Float	0	m
28	FRT Level 1 **	3111	Double Float	0	m
29	FRT Level 2 **	3112	Double Float	0	m
30	FRT Level 3 **	3113	Double Float	0	m



### Calculated Parameter (NXA820-01.Tanks.Tank-1.CALCULATED\_PARAMS.Dead Stock)

No	Item Name	Comm ID	Type	Default Value	Unit
1	Usable Volume	719	Double Float	0	m <sup>3</sup>
2	Floating Roof Correction	762	Double Float	0	m <sup>3</sup>
3	Floating Roof Position	763	Double Float	0	NA
4	Free Water Volume	725	Double Float	0	m <sup>3</sup>
5	Gross Observed Volume	726	Double Float	0	m <sup>3</sup>
6	Gross Standard Volume	727	Double Float	0	m <sup>3</sup>
7	Liquid in Vapour Volume	1561	Double Float	0	m <sup>3</sup>
8	Vapour Mass	756	Double Float	0	kg
9	Net Standard Volume	728	Double Float	0	m <sup>3</sup>
10	Net Standard Weight	761	Double Float	0	kg
11	Net Standard Flowrate	723	Double Float	0	m <sup>3</sup> /min
12	Volume Flow Rate	722	Double Float	0	m <sup>3</sup> /min
13	Product Level Change Rate	721	Double Float	0	mm/sec
14	Product Mass	729	Double Float	0	kg
15	Dead Stock	718	Double Float	0	m <sup>3</sup>
16	Sediment and Water Volume	720	Double Float	0	m <sup>3</sup>
17	Tank Shell Correction Factor	774	Double Float	0	m <sup>3</sup>
18	Total Observed Volume	717	Double Float	0	m <sup>3</sup>
19	Total Mass	730	Double Float	0	kg
20	Mass Flow Rate	724	Double Float	0	kg/min
21	Total Standard Volume	752	Double Float	0	m <sup>3</sup>
22	Vapour Density	1591	Double Float	0	kg/m <sup>3</sup>
23	Vapour Room Volume	1592	Double Float	0	m <sup>3</sup>
24	Volume Correction Factor	754	Double Float	0	NA
25	Calculated Reference Density	661	Double Float	0	kg/m <sup>3</sup>
26	Calculated Observed Density	628	Double Float	0	kg/m <sup>3</sup>
27	HTMS Product Temperature	2201	Double Float	0	C
28	FRT Delta Level	3114	Double Float	0	m
29	FRT Delta Mass	3115	Double Float	0	m

### Fast View Parameter (NXA820-01.Tank-1.Dead Stock)

No	Item Name	Comm ID	Type	Default Value	Unit
1	Alcohol Content in Mass	2101	Double Float	0	%
2	Alcohol Content in Volume	2102	Double Float	0	%
3	Ambient Temperature	660	Double Float	0	C
4	Analog Input *	2841	Double Float	0	%
5	Dead Stock	718	Double Float	0	m <sup>3</sup>
6	Dip Observed Density	1596	Double Float	0	kg/m <sup>3</sup>
7	Dip Product Level	1593	Double Float	0	m

No	Item Name	Comm ID	Type	Default Value	Unit
8	Dip Temperature	1595	Double Float	0	C
9	Water Dip	1594	Double Float	0	M
10	Floating Roof Correction	762	Double Float	0	m <sup>3</sup>
11	Floating Roof Position	763	Double Float	0	NA
12	Free Water Level	624	Double Float	0	m
13	Free Water Volume	725	Double Float	0	m <sup>3</sup>
14	Gauge Command \$	5514	unsigned long	0	NA
15	Gauge Error	2755	Double Float	0	NA
16	Gauge Status	2756	Double Float	0	NA
17	Gross Observed Volume	726	Double Float	0	m <sup>3</sup>
18	Gross Standard Volume	727	Double Float	0	m <sup>3</sup>
19	Liquid in Vapour Volume	1561	Double Float	0	m <sup>3</sup>
20	Mass Flow Rate	724	Double Float	0	kg/min
21	Net Standard Flowrate	723	Double Float	0	m <sup>3</sup> /min
22	Net Standard Volume	728	Double Float	0	m <sup>3</sup>
23	Net Standard Weight	761	Double Float	0	kg
24	Observed Density	628	Double Float	0	kg/m <sup>3</sup>
25	Percentage Level	2654	Double Float	0	%
26	Product Code	5517	unsigned long	0	NA
27	Product Level	622	Double Float	0	M
28	Product Level Change Rate	721	Double Float	0	mm/sec
29	Product Mass	729	Double Float	0	kg
30	Product Name	5518	String	No Product	NA
31	Product Pressure	692	Double Float	0	KPa
32	Product Temperature	625	Double Float	0	C
33	Reference Density	661	Double Float	0	kg/m <sup>3</sup>
34	Sample Temperature	1551	Double Float	0	C
35	Secondary Level	623	Double Float	0	m
36	Sediment and Water Volume	720	Double Float	0	m <sup>3</sup>
37	Tank Location	5515	String	0	NA
38	Tank Name	5000	String	TankName	NA
39	Tank Shape	5520	unsigned long	0	NA
40	Tank Shell Correction Factor	774	Double Float	0	NA
41	Tank Status	5516	unsigned long	0	NA
42	Temperature Element 1 to 16	1634 to 1649	Double Float	0	C
43	Temperature Element 17 to 24	1652 to 1659	Double Float	0	C
44	Total Observed Volume	717	Double Float	0	NA
45	Total Standard Volume	752	Double Float	0	NA
46	Transfer State	5519	unsigned long	0	NA
47	Usable Volume	719	Double Float	0	NA
48	Vapour Density	1591	Double Float	0	kg/m <sup>3</sup>
49	Vapour Mass	756	Double Float	0	kg

No	Item Name	Comm ID	Type	Default Value	Unit
50	Vapour Pressure	627	Double Float	0	KPa
51	Vapour Temperature	626	Double Float	0	C
52	Volume Correction Factor	754	Double Float	0	NA
53	Volume Flow Rate	722	Double Float	0	m <sup>3</sup> /min
54	Lab Reference Density	2887	Double Float	0	kg/m <sup>3</sup>

**Note!**

- \$ Read/writable OPC Parameter.
- \* OPC Parameters available only in software version V01.05.00 and onwards.
- \*\* New parameters available only from Software Version 02.01.00 onwards

## 6.1 Tank Parameter Reference

### 6.1.1 Device Status Codes

Diagnostic Code	Short Text	Cause
F101	NXA 820 Conn. Lost	Unable to Communicate with NXA820
F301	Data Mem. Fault	Failed to Detect or Initialize Data Flash Memory
F302	LAN Fault	LAN Cable Disconnected or Failed
F303	SYNC Fault	SYNC Link Cable Disconnected or Failed
F304	FPGA Error	Unable to access FPGA
F305	NV Data Error	The data in the NV memory does not match the RAM copy
F306	Order Code Error	The factory set order code is invalid, NXA is unable to startup
F307	Expansion Board Fault	Expansion board type does not match expected protocol type or failed to program FPGA
F308	Watchdog Error	Software Watchdog Error
F309	FS Security Error	Security policy compromised due to file-system error
F310	High CPU Load	High CPU Utilization
F311	Low Disk Space	Low Disk Space
F312	Low RAM	Low RAM
F313	Bad Thread	Bad Thread Status
F314	Reset by WD	Hardware reset by WatchDog
F315	Checksum Error	Checksum Error
F316	Language Error	Language Installation Error
F317	Access Cnfg Err	Access Configuration Error: No machines registered for access
F318	FPGA Config Err	fpga.conf file is corrupted or not available
F319	RTC LowVolt Err	Real Time Clock Battery Low voltage Detected
F320	Time Read Err	Real Time Clock Read Error
F321	Time maybe bad!	Time maintained by the RTC might be wrong
F322	RTC Nvmgr Err	RTC could not access NV memory to store or retrieve time
C324	Archive Export Started	–
F325	NAND not accessible	NAND Flash damaged

Diagnostic Code	Short Text	Cause
F326	NAND Write exceeded	NAND Flash Write operation exceeded
F327	NAND Write stop exceeded	NAND Flash Write operation stop exceeded
F328	Database corrupted	Configuration database corrupted
F329	All Gauges failed	All connected gauges are failed. Valid only when redundancy is activated and redundancy is configured as Switch by Interface
F330	Connection lost with Primary unit	Secondary redundant unit lost the connection with Primary redundant unit
F331	Connection lost with Secondary unit	Primary redundant unit lost the connection with Secondary redundant unit
F332	Module restarted often	Module is restarted more 5 times
F333	One or more Gauges failed	One or more connected gauges have failed. Valid only when redundancy is activated and redundancy is configured as Switch by Gauge
C485	Simulation Mode On	Field scan simulation mode is activated
C486	Manual Switch Over ON	Redundancy Manual Switch Over is activated.
C487	Redundancy activated	Redundancy feature is activated.
C488	Unit is active	Redundant unit is active. i.e. field scan is active.
C489	Unit is passive	Redundant unit is passive. i.e. field scan is in standby mode
F501	Database Fault	Database Failure
F502	Not Configured	LAN Has Not Been Configured
C503	HART Tunneling	Gauge Configuration In Progress
F504	Subscrip. Store	Subscription Store Cannot Be Found
M505	Time Server	–
C506	Field Scan Off	The field scan has been stopped
C507	Interface Off	The hostlink interface has been stopped

### 6.1.2 Tanks Status

Status Code	Meaning
646	In Maintenance
647	Locked
648	Manual
649	In Operation

### 6.1.3 Product Transfer State

Status Code	Meaning	Description
0	None	Transfer not started
1	Armed	Transfer initialized
2	Active	Transfer is in progress
3	Completed	Transfer completed , here product transfer is within defined min, max batch size
4	Finished	Transfer finished by user by pressing <b>Finish</b> button
5	Aborted	Transfer aborted by user
6	Paused	Transfer is paused

### 6.1.4 Tank Parameter Status

Status Code	Meaning	Description
655	OK	Valid data is received from connected gauge
656	FAIL	Communication error on field protocol of device configuration
657	MANUAL	Value set to manual
675	INIT	Field Scan started, value not yet received and processed
676	NODATA	Calculation not configured, Field Scan is off
677	INVALIDDATA	Calculation is out of boundaries
680	LAST VALID VALUE	Value is set on HOLD, need additional servo configuration

### 6.1.5 Gauge Communication Status

Status Code	Meaning
1	Gauge Communication OK
2	Gauge Communication Fail

### 6.1.6 Tank Shape

Status Code	Meaning
1	Tank with Fixed Roof; without Stilling
2	Tank with Fixed Roof; with Stilling well
3	Tank with External Floating Roof; without Stilling
4	Tank with External Floating Roof; with Stilling
5	Tank with Internal Floating Roof; without Stilling
6	Tank with Internal Floating Roof; with Stilling
7	Open Tank
8	Spherical Tank
9	Bullet Tank

### 6.1.7 Redundancy Manual SwitchOver

Value	Meaning
0	Redundancy Manual Switch Over deactivated
1	Redundancy Manual Switch Over activated

### 6.1.8 Redundancy Mode

Value	Meaning
0	Redundancy Mode deactivated
1	Redundancy Mode: Switch by Interface
2	Redundancy Mode: Switch by Gauge

### 6.1.9 Redundancy State

Value	Meaning
0	Redundant unit is active
1	Redundant unit is passive

### 6.1.10 Redundancy Unit Type

Value	Meaning
0	Primary Redundant unit
1	Secondary Redundant unit

## 6.2 Tankvision Unit Type Configuration

Unit Type	Possible unit selection
Length	m
	cm
	mm
	ft
	in
	fi8
	fi16
	fi256
Temperature	C
	f
	K
Volume	m <sup>3</sup>
	l
	kl
	ft <sup>3</sup>
	usgal
	ukgal
	usbbl
	ukbbl
	bblusliq

Unit Type	Possible unit selection
Density	kg/m <sup>3</sup>
	g/cm <sup>3</sup>
	g/l
	g/ml
	kg/l
	lb/usgal
	lb/ukgal
	lb/ft <sup>3</sup>
	api(ipst68)
	api(ist90)
Mass	ton
	kg
	g
	lb
	uston
	ukton
	Oz
Pressure	kpa
	pa
	mpa
	bar
	mbar
	psi
	g/cm <sup>2</sup>
	kg/cm <sup>2</sup>
	torr
	atm
	inh2o4c
	mmh2o4c
	inh2o
	inhg
	fth2o
	mmh2o
	mmhg

Unit Type	Possible unit selection
Massflowrate Volfowrate	ton/min
	ton/hr
	ton/d
	kg/d
	kg/hr
	kg/min
	kg/s
	g/hr
	g/min
	g/s
	lb/s
	lb/d
	lb/hr
	lb/min
	uston/d
	uston/hr
	uston/min
	ukton/d
	ukton/hr
	m <sup>3</sup> /h
	m <sup>3</sup> /min
	m <sup>3</sup> /sec
	l/h
	l/min
	l/sec
	ft <sup>3</sup> /h
	ft <sup>3</sup> /min
	ft <sup>3</sup> /sec
	ukgal/h
	ukgal/min
	usgal/h
	usgal/min
	usgal/sec
	usbbl/h
	usbbl/min
	usbbl/s
	ukbbl/h
	ukbbl/min

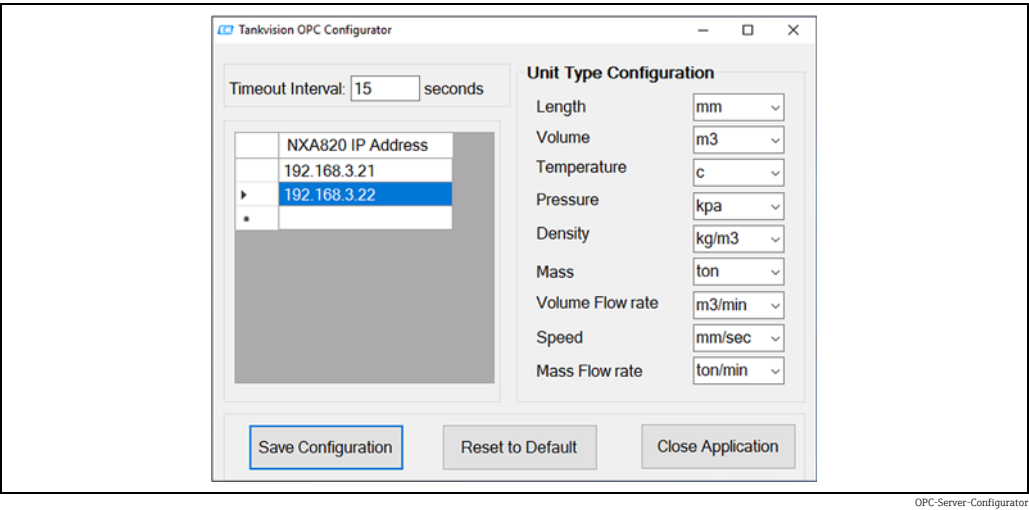


Unit Type	Possible unit selection
Speed	mm/sec
	m/sec
	m/min
	m/h
	in/sec
	in/min
	in/h
	ft/sec
	ft/min
	ft/h

## 7 Advanced OPC Server Configuration

### 7.1 Tankvision OPC configurator

By using the **Tankvision OPC Configurator** utility the user can easily change the OPC configuration parameters.



#### Save Configuration

Press **Save Configuration** to update the configuration. Reconnect the OPC Server to use the latest configuration.

#### Reset to Default

Press **Reset to Default** to revert configuration to initial state. Reconnect the OPC Server to use the latest configuration.

#### Close Application

Close **Tankvision OPC Configurator** GUI application.

### 7.2 Configuration files

#### 7.2.1 TankvisionOPC.config

Instead of using the **Tankvision OPC Configurator** users can also change the configuration manually by adding **TankvisionOPC.config** file.

```
<?xml version="1.0" encoding="utf-8"?>
<configuration xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <timeout>15000</timeout>
  <units>
    <unit>10.56.53.33</unit>
  </units>
  <unitTypes>
    <length>mm</length>
    <volume>m3</volume>
    <temperature>c</temperature>
    <density>kg/m3</density>
    <mass>ton</mass>
    <pressure>kpa</pressure>
    <massflowrate>ton/min</massflowrate>
    <volflowrate>m3/min</volflowrate>
    <speed>mm/sec</speed>
  </unitTypes>
</configuration>
```

OPC\_config\_sample\_units\_XML

### Communication Timeout

The communication time out is defined by the **<timeout>** key. The unit for Timeout value is milliseconds, it can be set between 1000 to 10 000 ms. For infinite timeout, set value to -1.

### NXA820 unit

Number of NXA820 units can be configured by adding **<unit>** keys.

### Custom Unit configuration

NXA820 parameter values can be visualized in custom units by different keys listed in **<unitTypes>**.

Refer to this section for a list of possible entries:

 Tankvision Unit Type Configuration →  22

## 7.2.2 TVOPCUnits.xml

Separate tanks can also be configured in Tankvision Device using **TVOPCUnits.xml** file. For each Tankvision device a block **<TVOPCUnitInfo>** needs to be defined. Each block can contain individual configuration.

Sample file:

```
<?xml version="1.0" encoding="utf-8"?>
<ArrayOfTVOPCUnitInfo xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <TVOPCUnitInfo>
    <IPAddress>172.16.40.154</IPAddress>
    <TankScanList>
      <int>1</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>0</int>
      <int>1</int>
      <int>1</int>
    </TankScanList>
  </TVOPCUnitInfo>
</ArrayOfTVOPCUnitInfo>
```


OPC\_TVOPCUnits-XML

### Sub Block <IPAddress>

This block defines the IP address of each NXA820 connected, which must be present in the **TankvisionOPC.config** file to set individual configurations for this device.

### Sub Block <TankScanList>

Consists of a "Boolean" list of max 15 items called **<int>**. Allowed values are '1' and '0'. 1st item is the corresponding entry for Tank 1 of this device. Entry 7 is linked to Tank 7.

 Here the internal Tank ID is used, not the configured Tank Name!

'1' set the OPC Server to scan the values from this Tank. '0' configures the OPC Server to skip this Tank from scanning.

7.2.3 TVOPCIN.xml

This file contains list of OPC elements as mentioned in parameter table.

**i** It is advisable not to change this file if user is not familiar or comfortable with changing xml file.

Example

If user needs to display different name for OPC Elements. For example if user wants to display **Product Level** as **P\_LEVEL** then user has to change only parameter string as shown below:

From

```
<OpcElement>
  <FASTVIEWPARAM>Product Level</FASTVIEWPARAM>
  <AccessRights>READABLE</AccessRights>
  <DataType xmlns="">float</DataType>
  <Value xsi:type="xsd:float">0</Value>
  <PARAMDATANODEID>622</PARAMDATANODEID>
  <PropertyId>NoProperty</PropertyId>
</OpcElement>
```

OPC\_TVOPCIN-XML\_From

To

```
<OpcElement>
  <FASTVIEWPARAM>P_LEVEL</FASTVIEWPARAM>
  <AccessRights>READABLE</AccessRights>
  <DataType xmlns="">float</DataType>
  <Value xsi:type="xsd:float">0</Value>
  <PARAMDATANODEID>622</PARAMDATANODEID>
  <PropertyId>NoProperty</PropertyId>
</OpcElement>
```

OPC\_TVOPCIN-XML\_To

7.2.4 TVOPCLOGGERCONF.xml

Tankvision OPC Server provides different level of log level to capture variety of messages. OPC Server supports mainly seven user log level:

Log Level	Messages captured
FATAL	All Exception and critical messages
ERROR	Error messages and exception messages
WARNING	Warning messages and captures more messages than FATAL or ERROR
INFO	Information messages and captures more messages as compared to above
DEBUG	All debug information
OFF	No user log
ALL	Captures all messages

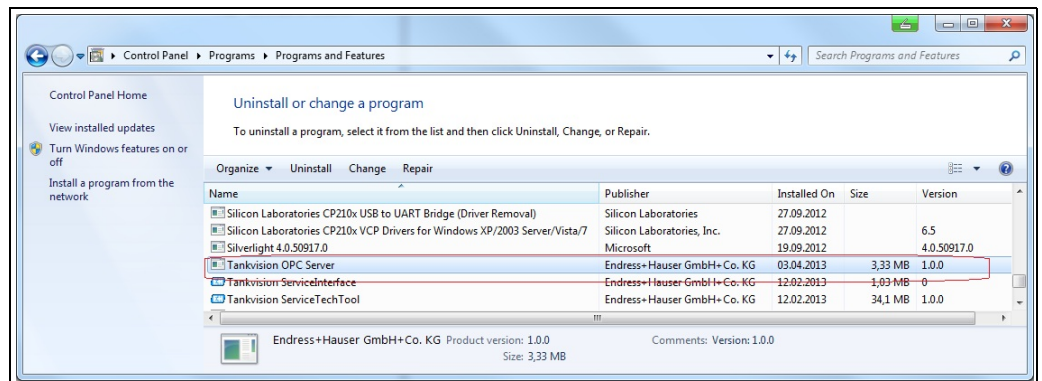
In normal operation it is not required to change user log level but if OPC server is not working properly then user can change log level to analyse the problem.

```
<logger name="OPC.DA.AppPlugin"> <level value="WARN"/> </logger>
<logger name="OPC.DA.TankvisionOPCPlugin"><level value="WARN"/></logger>
```

OPC\_TVOPCLoggerConf-XML

## 7.2.5 Un-Installation

Go to **Control Panel** → **Programs** → **Uninstall program** and select **Tankvision OPC Server**.



## 7.2.6 Tankvision OPC Version

Tankvision OPC Server version can be found from **Control Panel** → **Programs** → **Uninstall program** as shown in above figure. Here OPC Server version 1.0.0.



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