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71241950

Valid as of software version:
01.05.00

Operating Instructions
Tankvision
Tank Scanner NXA820, Data Concentrator NXA821, Host Link NXA822

Operator Manual

Endress+Hauser
People for Process Automation

Table of Contents

1 Document information

1.1 Target audience for this manual

This manual should support the operating personal working on a regular basis with the Tank Gauging System understanding the possible tasks they have to perform and should serve as encyclopedia for those tasks.
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 Version history

Document version	Valid for SW version	Changes to the previous version
BA00424G/00/EN/01.12	01.02.02 - 00xxx / 01.04.00	Initial version
BA00424G/00/EN/13.13	01.05.00	New Tank images, new parameters in some applications

1.3 Document function

1.3.1 Used symbols

Safety symbols

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

Electrical symbols

Symbol	Meaning
A0011197	**Direct current** A terminal to which DC voltage is applied or through which direct current flows.
A0011198	**Alternating current** A terminal to which alternating voltage is applied or through which alternating current flows.
A0011200	**Ground connection** A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.

 A0011199	**Protective ground connection** A terminal which must be connected to ground prior to establishing any other connections.

Symbols for certain types of information

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

Symbols in graphics

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

1.4 Documentation

1.4.1 Operating instructions

Document number	Instrument	Type of Document
BA00339G/00	▪ Tank Scanner NXA820 ▪ Data Concentrator NXA821 ▪ Host Link NXA822	Description of Instrument Functions
BA00340G/00		Installation Instructions
BA00424G/00		System Description
BA00426G/00		Operator Manual
BA01137G/00	Tankvision NXA820 OPC Server	User Manual

2 Basic safety instructions

2.1 Requirements for the personnel

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

- Trained, qualified specialists: must have a relevant qualification for this specific function and task
- Are authorized by the plant owner/operator
- Are familiar with federal/national regulations
- Before beginning work, the specialist staff must have read and understood the instructions in the Operating Instructions and supplementary documentation as well as in the certificates (depending on the application)
- Following instructions and basic conditions

The operating personnel must fulfill the following requirements:

- Being 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 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.

2.3 Designated use

2.3.1 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.

2.4 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.

2.5 Operational safety

Risk of injury!

- Operate the device in proper technical condition and fail-safe condition only.
- The operator is responsible for interference-free operation of the device.

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

- If, despite this, modifications are required, consult with Endress+Hauser.

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 original spare parts and accessories from Endress+Hauser only.

2.6 Product safety

The device is designed to meet state-of-the-art safety requirements, has been tested and left thefactory in a condition in which it is safe to operate. The device complies with the applicable standards and regulations as listed in the EC declaration of conformity and thus complies with the statutory requirements of the EG directives. Endress+Hauser confirms the successful testing of the device by affixing to it the CE mark.

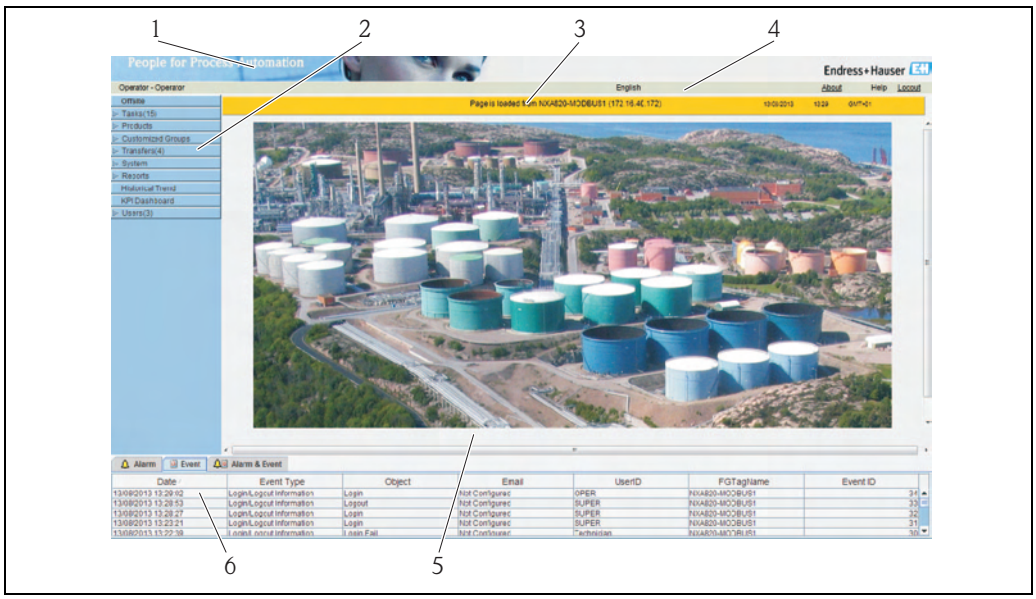
3 Recommendation PC configuration

With all on the market available web browser entering the Tankvision web server is possible. Nevertheless the pages are optimized for Microsoft Internet Explorer (supported version IE7, IE8 and IE9 – Compatibility Mode).
For a proper operation JAVA runtime need to be installed on the PC. As recommendation the version 6 update 31 should be used for best performance.
The user interface pages are optimized for a screen resolution of 1280x1024 (or higher).

4 User interface

Tankvision provides an intuitive user interface allowing the user to quickly navigate through the system. The following sections illustrate various parts of the Tankvision user interface and their usage.

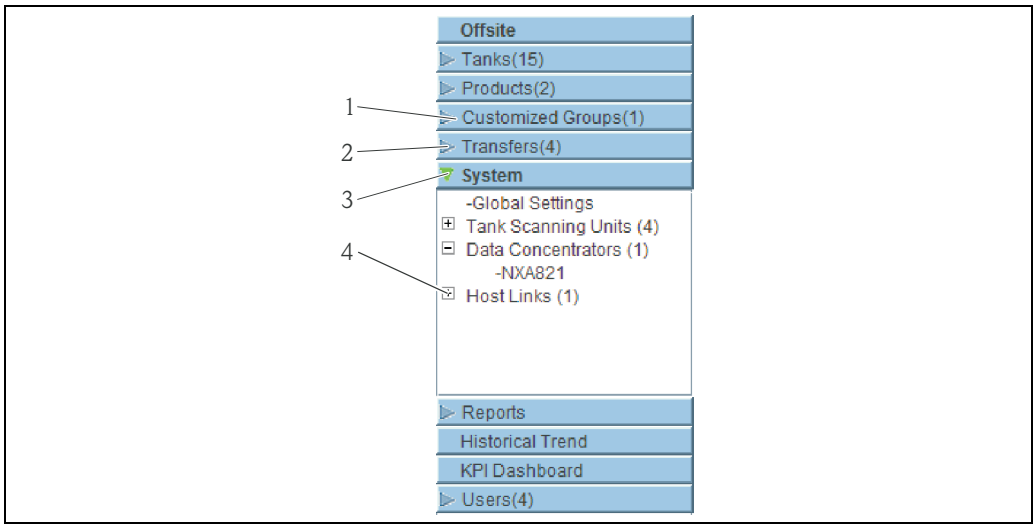
The Home Page



Pos.	Field	Description
1	System Header	Displays the Customer Logo or Graphic.
2	Navigation Tree	Contains header bars corresponding to different functional objects or groups in the system. Refer to "Navigation Tree - detailed description" (→ 9) for details.
3	Main Header	Displays the following information: ▪ The site name, tank name, Tankvision tag name or product name - depending on what is displayed in the Main View below the header ▪ The system date and time The main header is displayed with a background color depending on the access rights of the user logged into the system: ▪ Grey: the user does not have configuration rights and can only view data. ▪ Orange: the user has configuration rights and can view real time data.
4	Metadata Header	Displays the following information: ▪ The user name and the user type ▪ The language options link ▪ The help link ▪ The logout option
5	Main View	Displays the screens that the user has selected to configure the settings and view the operational information. Refer to "Main View Section- Colors in Edit Data" (→ 9) for details.
6	Alarm and Event Panel	The Alarm and Event Panel displays the real time information about alarms and events. Refer to "Alarm and Event Panel Section- Description" (→ 10) for details.

Navigation Tree - Detailed Description

The Navigation Tree is shown on the left side of the screen. Typically, the Navigation Tree allows the user to navigate down to the tanks. The image of the expanded Navigation Tree is as follows:



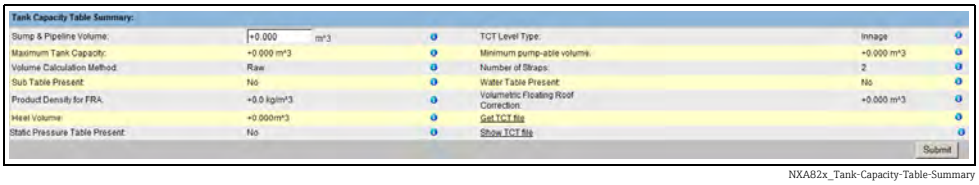
Navigation_Tree_Detailed_EN

Pos.	Field	Description
1	Header	The user can click on the text or the arrow of the Header to expand or collapse the branch. The Header name shows a number, which is dynamically appended. The number states the following: ▪ Tanks: The number of tanks in the NXA820 ▪ Products: The number of products defined in the system ▪ Customized Groups: The number of tank groups defined in the system ▪ Transfers: The number of product transfer stages (Waiting, In Progress, Finished, and Aborted) defined in the system ▪ Reports: The list of available system reports ▪ Users: The number of users defined in the system ▪ Historical Trend: Direct line to the historical Historical Data and Trend functionality The text will appear in bold and black when the header is in the expanded form.
2	Collapsed Arrow	This type of arrow is displayed when the Header is in the collapsed position. Click on the collapsed arrow to expand the Header.
3	Expanded Arrow	This type of arrow is displayed when the Header is in the expanded position. Click on the expanded arrow to collapse the Header.
4	Node	The user can click on the Node to view the operational information on the Main View section. If a Node is selected, it will appear in red color. The number of tanks in the group is appended to the Node name.

Main View Section - Colors in the Edit Data Area

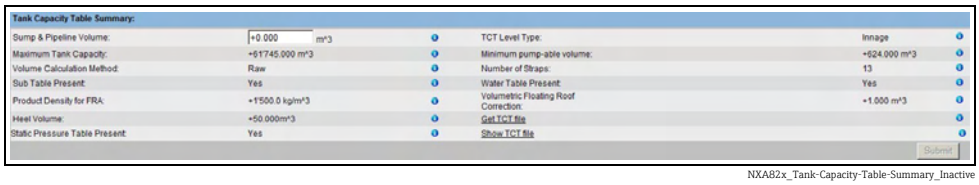
The system displays different colors in the Edit Data area, based on the access rights of the user:

1. If the user has access rights, then the edit data area has a light grey and light yellow background on alternate rows. The **Submit** button to save the settings is enabled.



NXA82x_Tank-Capacity-Table-Summary

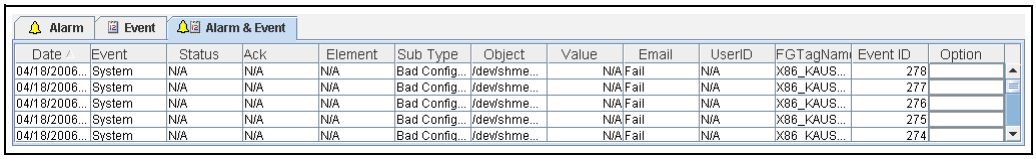
2. If the user does not have access rights, then the edit data area has a light grey and dark grey background on alternate rows. The **Submit** button to save the settings is disabled.



NXA82x_Tank-Capacity-Table-Summary_Inactive

Alarm and Event Panel - Description

The Alarm and Event Panel displays the alarm and event information, which is dynamically generated by the system. 200 events are shown.

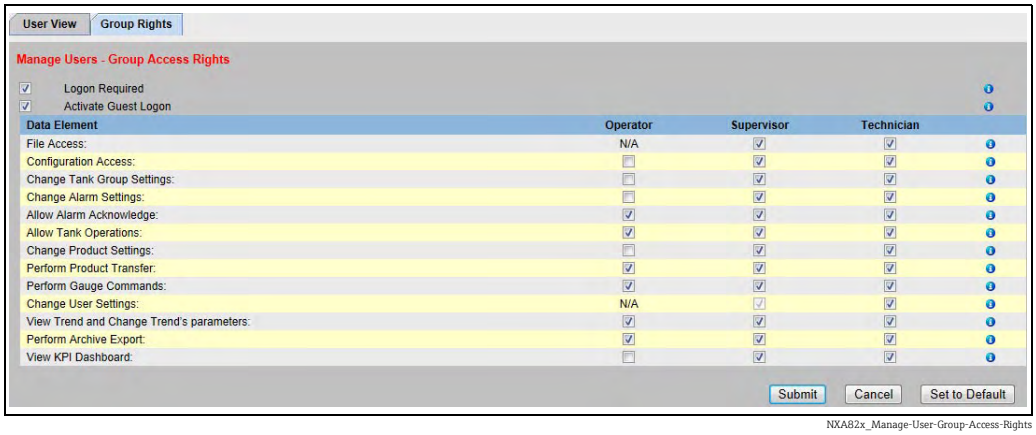


Tab	Description
Alarm	Displays details of the alarms generated by the system.
Events	Displays details of the events generated by the system.
Alarm & Events	Displays details of the alarms and events generated by the system.

5 User access rights

The Tankvision system has an inbuilt authentication mechanism to prevent unauthorized access. The system identifies the user by a unique logon name and password. The system records all the activities performed by each user and allows only a specific number of users from each user type to be logged in at the same time. This can be configured in system settings by an authorized entity. Each Tankvision unit has an option to confine user access rights data for local use within the unit or enable user access rights data for the central Tankvision unit thereby allowing the user to access all the units that are configured to the central Tankvision unit.

All in this manual descriped functionality is based on the default settings for the role of the "Operator". The operator is not allowed to perform any changes in the user access rights.
In case the "Operator" is allowed to perform other operations than the ones specified with the default settings refer to the "Description of Instrument Functions" - BA00339F/00/EN.



NXA82x_Manage-User-Group-Access-Rights

Field	Description
Logon Required	Select the check box to prompt the user to log on to access the Tankvision system. Clear the check box to allow the user to access any feature of the Tankvision system without logging in to the system. This Field indicates whether the user needs to logon to the system to access the Tankvision functionality.
Guest Logon Required	Select the check box to prompt the guest user to log on to access the Tankvision system. Clear the check box to allow the guest user to access the features that are available to guests only. This Field indicates whether a third party or guest user needs to log on to access the Tankvision functionality.

Column	Description
Data Element	This column displays a list of Data Elements, which are accessible only to specific user groups. To obtain access to these elements, the user with valid access rights (for example, supervisor/ technician) needs to allot access rights to the user group.
Operator	An operator performs day-to-day operations at the tank farm and can view refreshed data and alarm notifications. Select the appropriate check box to allow the operator group to access the relevant Data Element.
Supervisor	A supervisor configures and maintains the Tankvision system. He can view refreshed data and alarm notifications. Select the appropriate check box to allow the supervisor group to access the relevant Data Element.
Technician	A technician is a service person from Endress+Hauser who performs the initial setup and configuration of the Tankvision system. Select the appropriate check box to allow the technician group to access a particular Data Element.

Data Elements	Description
File Access	Access to allow file upload or download e.g. Firmware or web page templates
Configuration Access	Access to change configuration
Change Tank Group Settings	Allows to add, modify and delete tank group settings for static and dynamic tank groups
Change Alarm Settings	Allows to create, modify and delete alarm configurations
Allow Alarm Acknowledge	Allows to acknowledge active alarms
Allow Tank Operations	Allows to change tank status, product contents and enter manual data operations
Change Product Settings	Allows to create, modify and delete products
Perform Product Transfer	Allows to arm, start and stop product movements
Perform Gauge Commands	Allows to issue, kill and schedule gauge commands
Change User Settings	Allows to add, modify and delete users, and modify user access rights
View Real Time and Historical trend and Change Trend's parameters	Allows to configure real time and historical trend, and start or stop the real time and historical trends
Perform Archive Export	Allows the export of the archive.
View KPI Dashboard	Allows to view the KPI Dashboard.

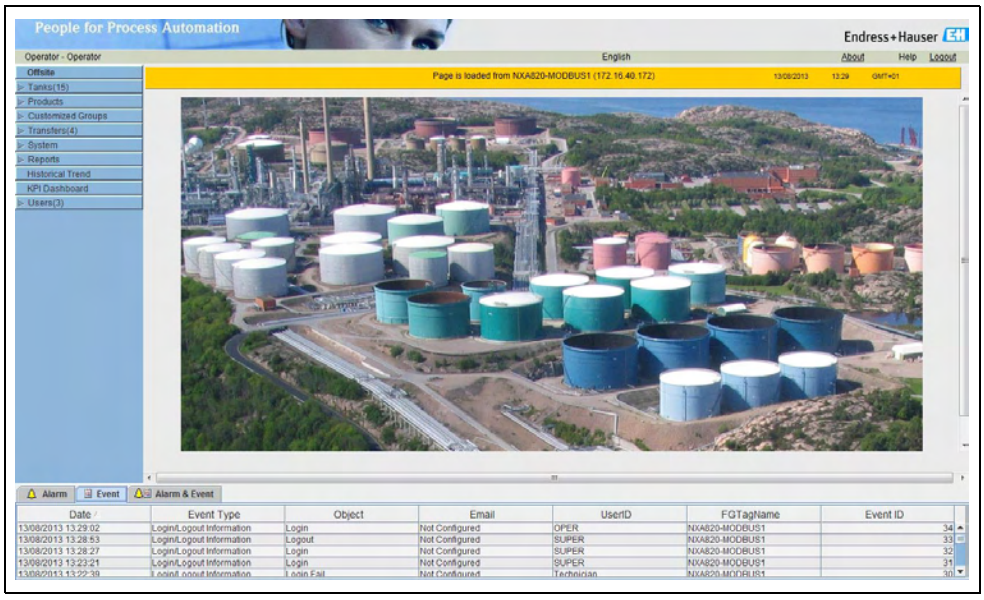
6 Operations

6.1 How to log on?

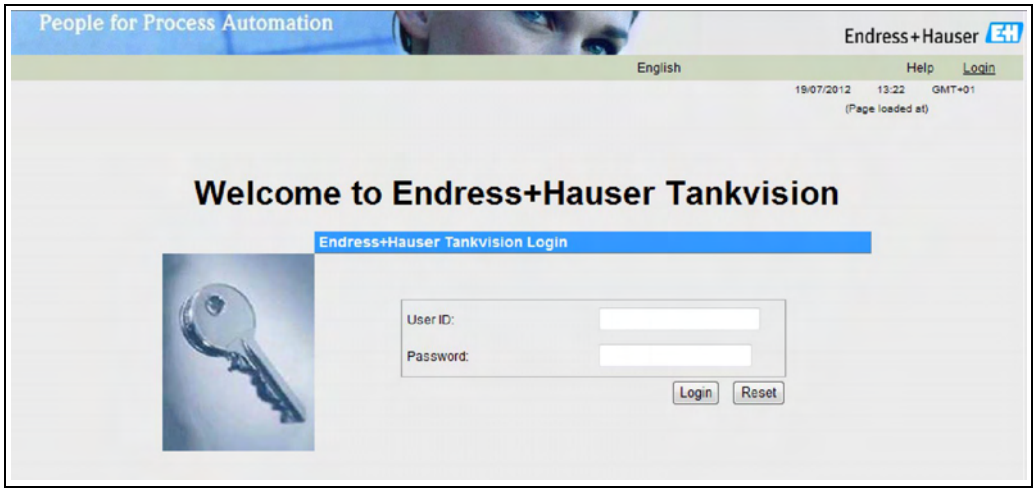
The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The user interface is reached via standard web browsers whereas the recommended web browser is Microsoft Internet Explorer.

1. Open a browser window (depending on the PC configuration this point might be skipped as opening a browser window is configured to be in the auto start and can't be closed without the necessary PC access rights.
2. Type in the IP address
   IP addresses are specific for every single Tankvision units in the system (example IP address 192.168.2.1). Depending on the browser configuration this point might be skipped as it is recommended to select the Tankvision IP address as home page which is auomatically opened the browser starts up.
3. The user interface opens and is ready for operation. Per default Tankvision is delivered without a logon required. In this case the default user access rights are set to Operator. The following screens opens:



If **Logon required** is selected in the user access rights (done during commissioning by the supervisor) the following screen opens before the above:



Field	Description
User ID	Enter the appropriate user login name . The user login name is alphanumeric and case sensitive.
Password	Enter the appropriate password. The user password is alphanumeric and case sensitive. It consists of 3 to 8 characters.

User ID and the according Password are created during commissioning. Factory default:
- User ID: Oper
- Password: Oper

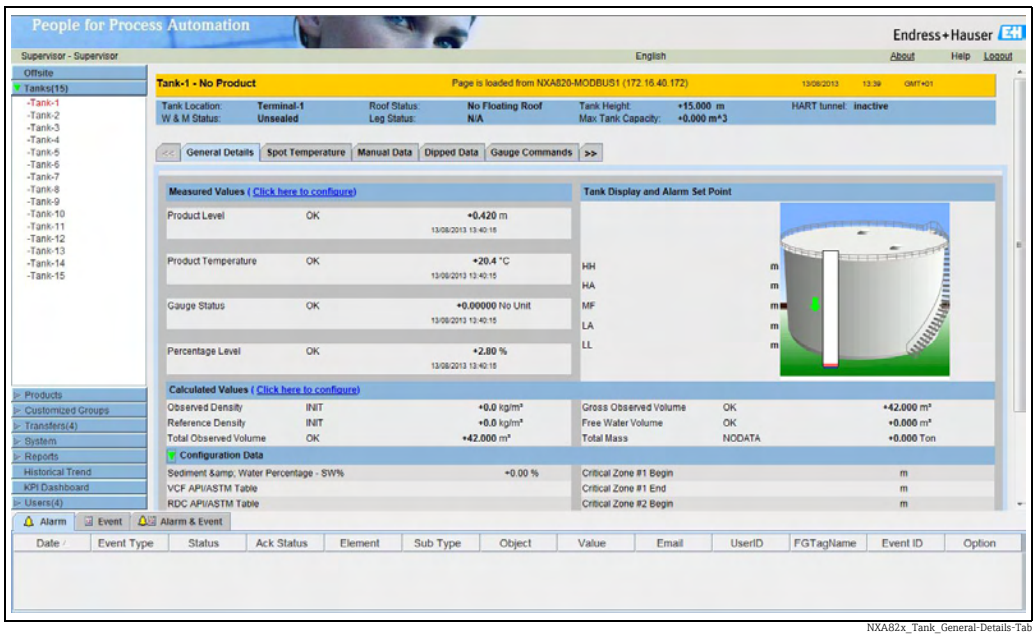
6.2 How to view tank details

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The **General Details** tab displays the most important tank data dynamically.

To view the General Details tab

1. On the **Tank Details** screen, click the **General Details** tab. Tankvision displays the screen as follows:



NXA82x_Tank_General-Details-Tab

Use the scrollbar on the right to see more parameters.

Column	Description
Measured Values	This area displays the measured values of the product or tank parameters in terms of temperature, pressure, density and water level along with their respective units of measurement. The date and time at which the value of each parameter has changed is also displayed along with the measured valued. Status: ▪ OK: Ok Status ▪ INIT: Field Scan started, value not yet received and processed ▪ MANUAL: Value set to manual ▪ NODATA: Calculation not configured, Field Scan is off ▪ INVALIDDATA: Calculation is out of boundaries ▪ LASTVALIDVALUE: Value is set on HOLD, need additional servo configuration ▪ FAIL: Communication error on field protocol of device configuration For version 01.02.02 the General Purpose Register 01 is showing the Device Error Code and the General Purpose Register 02 is showing the Gauge Status Code. From verision 01.04.00 the parameters are named **Gauge Error** and **Gauge Status**. These are the codes the gauge is delivering without interpretation by the system. See below for a list of Proservo and NMS error and status codes. The tank detail page way look different, if customized for a specific project.
Tank Display and Alarm Set Point	This area displays the picture of the tank and the corresponding Alarm Set Points for that particular tank.
Calculated Values	This area displays the calculated values of the product parameters in terms of volume, tank capacity, reference density, floating roof adjustment, product and vapor mass along with their respective units of measurement.
Product transfer Details	This area displays the status and details of the product transfer.
Configuration Data	This area displays the configuration data used for calculation.

6.2.1 Error and Status codes Modbus communication

Gauge Error NMS5

Error Code	Description	Definition	Remarks
0	No error	No error present	
101	OVER TENSION	Measured displacer weight exceeds the Over Tension set value at GVH 162	
102	UNDER TENSION	Measured displacer weight reduced below the Under Tension set value at GVH 163	
106	Z PHASE NO INPUT (2nd)	Unable to recognize Z phase pulse (1 complete rotation of encoder) to CPU after retry	
107	ADC/SENSOR ERROR	Signal from AD converter out of the range	
111	LOCAL ERROR NMT	Recognize device error at the Prothermo NMT 53x (Average Temperature)	*2
112	Z PHASE NO INPUT (1st)	Unable to recognize Z phase pulse (1 complete rotation of encoder) to CPU	
113	LOCAL ERROR NRF	Recognized device error at the Promonitor NRF560	*3
114	SIFA ERROR	Local HART master IC failure on the Proservo	
115	WIRE CALIB. ERROR	Excess auto wire calibration range (e.g. build up on the wire)	
120	DISPLACER CALIB. ERROR	Excess auto weight calibration range (e.g. deposit and build up on the displacer)	
121	LCD CHECK	Recognized error between display panel 3 keys control input to CPU	
122	A PHASE NO INPUT	Unable to recognize a phase pulse (20 pulse / 1 rotation of encoder) to CPU	
124	POWER FAILURE	Supply voltage drop below allowable value	
201	MEMORY ERROR	Memory defect in W&M parameters	
232	LOCAL ERROR DEVICE1	Recognized device error at connected HART device 1	*3
233	LOCAL ERROR DEVICE 2	Recognized device error at connected HART device 2	*3
240	DEVICE ERROR NRF	Local HART communication error to the Promonitor NRF560	*3
250	DEVICE ERROR NMT	Local HART communication error to the Prothermo NMT53x	*2
130	DEVICE ERROR: DEVICE1	Local HART communication error to the HART device 1	*3
131	DEVICE ERROR: DEVICE2	Local HART communication error to the HART device 2	*3
132	ROM ERROR	Failure in the EEPROM data	
133	ECONOUCE CONTACT ON	Status input activated via connected switch (e.g. Leak detector, level alarm switch)	

Remarks

*2 Error code available only when the Prothermo NMT53x or 3 wire RTD SPOT temperature bulb is connected.
*3 Error code available only when the Promonitor NRF560 or HART device 1/2 is connected.

Gauge Status NMS5

Error Code	Description	Remarks
0	No definition	
1	Displacer at reference position	
2	Displacer hoisting up	
3	None	
4	Displacer stop	
5	Level measurement, balanced	
6	Up. I/F level, balanced	*1
7	Mid. I/F level, balanced	*1
8	Bottom meas. balanced	*1
9	Upper Dens, finished	*1
10	Middle Dens, finished	*1
11	Bottom Dens, finished	*1
12	Release over tension	
13	Calibration activated	
14	Seek level	
15	Follow level	
16	Seek Upper Density	*1
17	Seek Middle Density	*1
18	Seek Density Bottom	*1
19	Seek Upper I/F level	*1
20	Follow up. I/F level	*1
21	Seek Mid. I/F level	*1
22	Follow Mid. I/F level	*1
23	Seek Bottom Level	
24	Not initialised	
25	Stopped at High Stop.	
26	Stopped at Low Stop	
27	Repeatability testing	
28	Seeking water level	*1
29	Water level, balanced	*1
30	Follow water level	*1
31	Over/Under Tension	

Remarks

*1 Status available when the Proservo NMS53x is implemented with Interface and Density measurement functionality.

For NRF590 neither status codes nor error codes are available the Gauge Error/Gauge Status are set to 0 with the status INIT to show that the data are invalid.

6.2.2 Error and Status codes V1

Error codes NMS5

Error Code	Description
0	No Error
1	Over Tension
2	Under Tension
3	Encoder Error
4	Hall Sensor Error

Status codes NMS5

Status Code	Operation Status
01	Up
02	Stop
03	Bottom
04	Upper Density
05	Level
08	Upper Interface Level
09	Release Over Tension
10	Middle Density
11	Density Bottom
12	Middle Interface Level
13	Calibration Active
27	Repeatibility Testing
28	Water Dipping

6.2.3 Status Codes WM550

With WM550 the status are transferred bit coded. In Tankvision this bit sequence is shown as decimal number which needs to be transferred into bits to be interpreted.[1)]

Gauge Error Bits	
0	Servo Check
1	Seeking Level
2	Doing Profile
3	Doing Dip
4	Finding BSW
5	Following BSW
6	Finding Datum
7	Following Level
8	Density Sensor
9	Temp. Sensor
10	BSW Sensor
11	Datum Sensor
12	Conf. Warning
13	Liquid State
14	Liquid State Unknown
15	ISH Fitted

Gauge Status Bits	
0	Gauge Servoing
1	Gauge Stowed
2	Stow received on port 1
3	Stow received on port 2
4	NOVRAM corrupted
5	Multielement therm. Fitted
6	Ref. Volatage is DN
7	Calibration bit 0
8	Calibration bit 1
9	Calibration bit 2
10	-
11	-
12	-
13	-
14	-
15	-

Gauge Error from NRF590 and NMS5

Tank Side Monitor NRF590 (Task 2, 3, 4, 5, 9, 11, 27, 28, 30, 31, 36, 37, 38)

Decimal	Bit Coded	Description
0	0000’0000’0000’0000	Level
1	0000’0000’0000’0001	Stop

Proservo NMS5 (Task 2, 3, 4, 5, 9, 11, 27, 28, 30, 31)

Decimal	Bit Coded	Description
0	0000’0000’0000’0000	Level
1	0000’0000’0000’0001	Stop

1) To translate the decimal number in the gauge staus/gauge error field into binary number you can use the following formular in Excel (change A1 to the field the decimal number is written):
=RIGHT(SUMPRODUCT(INT(MOD(A1/2^(ROW(16:30)-1),2))*10^(ROW(1:15)-1))&TEXT(SUMPRODUCT(INT(MOD(A1/2^(ROW(1:15)-1),2))*10^(ROW(1:15)-1)),REPT("0",15)),INT(LN(A1)/LN(2))+1)

Proservo NMS5 (Task 36, 37, 38)

Decimal	Bit Coded	Description
16386	0100’0000’0000’0010	Level unbalanced or seeking level
16388	0100’0000’0000’0100	Upper density or density seeking
16400	0100’0000’0001’0000	Upper interface level (unbalanced) or upper interface seeking
16416	0100’0000’0010’0000	Upper interface level (balanced) or upper interface following
16448	0100’0000’0100’0000	Bottom level, Bottom Density seeking or Bottom seeking
16512	0100’0000’1000’0000	Level or Level following
49154	1100’0000’0000’0010	Level unbalanced or seeking level, compatibility mode
49156	1100’0000’0000’0100	Upper density or density seeking, compatibility mode
49168	1100’0000’0001’0000	Upper interface level (unbalanced) or upper interface seeking, compatibility mode
49184	1100’0000’0010’0000	Upper interface level (balanced) or upper interface following, compatibility mode
49216	1100’0000’0100’0000	Bottom level, Bottom Density seeking or Bottom seeking, compatibility mode
49280	1100’0000’1000’0000	Level or Level following, compatibilty mode

Gauge Error from NRF590 and NMS5

Status report (Task 1) NRF590

Decimal	Bit Coded	Description
0	0000'0000'0000'0000	No multi element temperature fitted
32	0000'0000'0010'0000	Multe element temperature fitted

Status report (Task 1) NMS5

Decimal	Bit Coded	Description
1	0000'0000'0000'0001	Gauge Servoing
5	0000'0000'0000'0101	Stow received on port 1
7	0000'0000'0000'0111	Stow received on port 1, Gauge Stowed
9	0000'0000'0000'1001	Stow received on port 2
11	0000'0000'0000'1011	Stow received on port 2, Gauge Stowed
21	0000'0000'0001'0101	NMS Error Code present (see below), Stow received on port 1
23	0000'0000'0001'0111	NMS Error Code present (see below), Stow received on port 1, Gauge Stowed
25	0000'0000'0001'1001	NMS Error Code present (see below), Stow received on port 2
27	0000'0000'0001'1011	NMS Error Code present (see below), Stow received on port 2, Gauge Stowed
33	0000'0000'0010'0001	NMT connected, Gauge Servoing
37	0000'0000'0010'0101	NMT connected, Stow received on port 1
39	0000'0000'0010'0111	NMT connected, Stow received on port 1, Gauge Stowed
41	0000'0000'0010'1001	NMT connected, Stow received on port 2
43	0000'0000'0010'1011	NMT connected, Stow received on port 2, Gauge Stowed
53	0000'0000'0011'0101	NMS Error Code present (see below), NMT connected, Stow received on port 1
55	0000'0000'0011'0111	NMS Error Code present (see below), NMT connected, Stow received on port 1, Gauge Stowed
57	0000'0000'0011'1001	NMS Error Code present (see below), NMT connected, Stow received on port 2
59	0000'0000'0011'1011	NMS Error Code present (see below), NMT connected, Stow received on port 2, Gauge Stowed

NMS Error Codes

Error Code	Description
101	Over Tension
102	Under Tension
106	Z Phase no Input (2)
107	ADC Sensor Error
112	Z Phase no Input
115	Wire calibration error
120	Displacer calibration error
122	A Phase no input

6.3 How to view Spot Temperatures

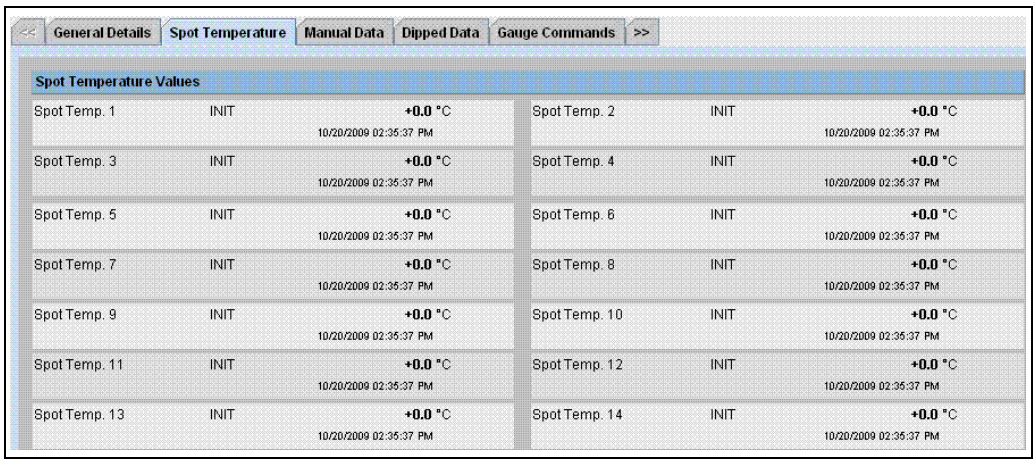
The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The **Spot Temperature** tab displays measured values from the spot elements of an average temperature probe, if configured.

Depending on the system architecture this parameters might be used for displaying other values than temperatures.

To view the Spot Temperature tab

1. On the **Tank Details** screen, click the **Spot Temperature** tab. Tankvision displays the screen as follows:



Column	Description
Spot Temperature Values	Displays measured values from the spot elements of an average temp. probe (e.g. NMT539). The date and time at which value of each parameter has changed is also displayed along with the measured value.

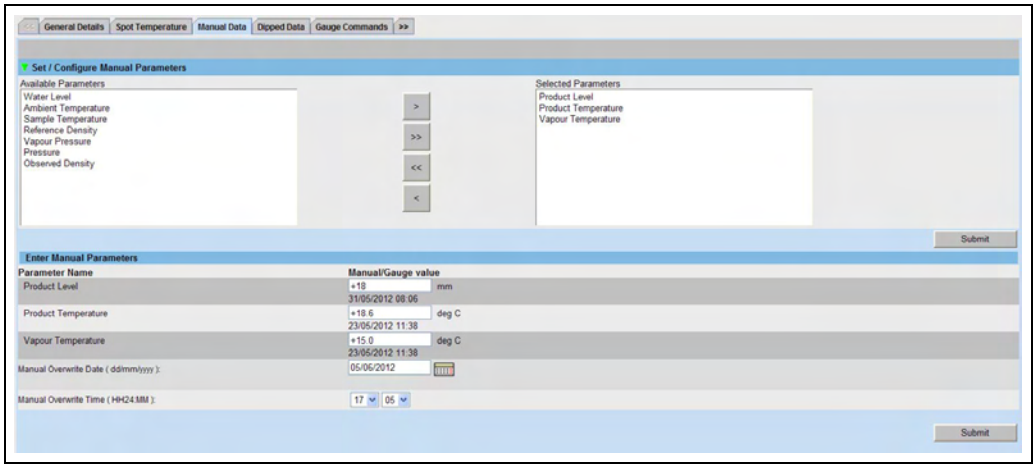
6.4 How to view and enter Manual Data

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11). The **Manual Data** tab gives you the option of entering values for the product level, temperature, density and pressure manually.

Functionality is depending on the user right settings.

Selection of Parameters for manual data entry

1. Click the **Manual Data** tab. With opening the **Set/Configure Manual Parameters** the following screen for selecting parameters for manual data entry is shown.



2. The user can select one or several parameter from the available parameter list and move them to the selected parameter list by using **>** button and clicking **Submit**. Using **>>** moves all available parameters in the selected Parameters (deselecting works in accordance by using the **<** or **<<** buttons). From the following list the parameters can be chosen (see below):

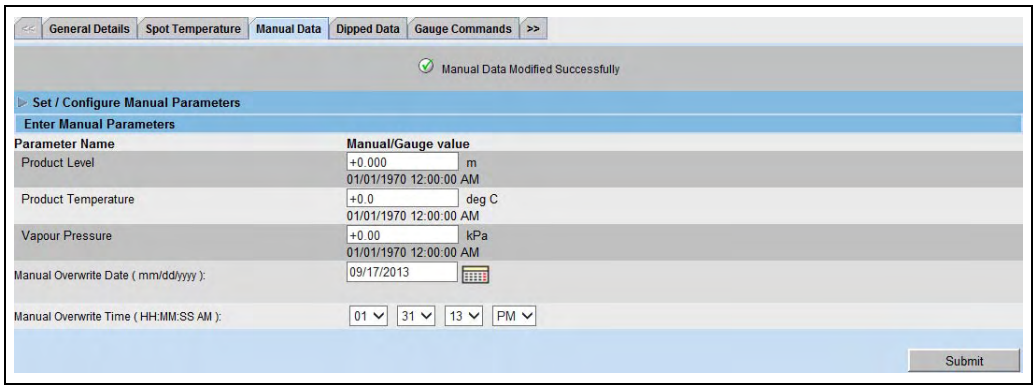
Field	Description
Product level	Enter the appropriate value for the product level in the according text box. The data type for this field is numeric.
Water level	Enter the appropriate value for the water level in the according text box. The data type for this field is numeric.
Product Temperature	Enter the appropriate value for the product temperature in the according text box. This field displays the temperature of the product in the tank. The data type for this field is numeric.
Vapor Temperature	Enter the appropriate value for the vapor temperature in the according text box. This field displays the temperature of the vapor in the tank. The data type for this field is numeric.
Ambient Temperature	Enter the appropriate value for the ambient temperature in the according text box. This field displays the ambient temperature outside the tank. The data type for this field is numeric.
Observed Density	Enter the appropriate value for the observed density in the according text box. This field displays the observed density of the product in the tank. The data type for this field is numeric.
Sample Temperature	Enter the temperature at which the density of the sample was measured in the according text box. This field displays the temperature of the density sample. The data type for this field is numeric.
Reference Density	Enter the appropriate value for the reference density in the according text box. This field displays the reference density of the product in the tank. The data type for this field is numeric.

Field	Description
Vapor Pressure	Enter the appropriate value for the vapor pressure in the according text box. This field displays the vapor pressure of the product in the tank. The data type for this field is numeric. In the radio buttons below mark the pressure measurement method: **absolute** or **relative**.
Pressure	Enter the appropriate value for the pressure in the according text box. This field displays the pressure of the product in the tank. The data type for this field is numeric. In the radio buttons below mark the pressure measurement method: **absolute** or **relative**.

3. Tankvision will show a confirmation message and the parameters are now available to enter manual values.

To enter manual data

1. Click the **Manual Data** tab. Tankvision displays the screen as follows:



NXA82x_Manual-Data_Enter-Manual-Parameters

Column	Description
Parameter Name	This column displays a list of the tank parameters that can be configured manually.
Manual Gauge Value	This column displays the text boxes that allow the user to enter the data for the relevant parameter.

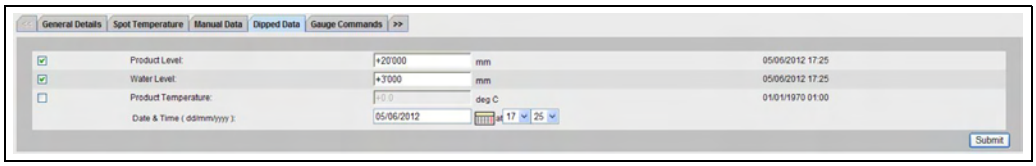
2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button.
4. After saving the settings, Tankvision displays a confirmation message.

An event is generated after manually entering a value for a tank parameter. The event details can be viewed in the **Event** or **Alarm & Event** overview.

6.5 How to enter dipped data

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The **Dipped Data** tap gives you the option of entering dipped values for the product level, water level, product temperature, observed density with acc. sample temperature and the reference density.



Field	Description
Product level	Enter dipped values for the product level. Activate the field by enabling the check box in the beginning of the column.
Water level	Enter dipped values for the water level. Activate the field by enabling the check box in the beginning of the column.
Product temperature	Enter dipped values for the product temperature. Activate the field by enabling the check box in the beginning of the column.
Date and Time	Enter the appropriate Date and Time in the text box / drop down list. This time will be used as time stamp for the manually entered value. The data type for this field is time.

6.6 How to issue gauge commands

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

Every gauge supports a specific set of commands. The Tankvision system supports these gauges and stores their data and corresponding gauge commands in "gauge definition files". The functionality of gauge commands is dependent on the gauge type assigned to the tank, whereas completion of a gauge command is based on the gauge status or gauge commands status. The Tankvision system retrieves these commands from the "gauge definition files" during the configuration of gauge commands. Gauge commands can be scheduled and sent only by an authorized user. Most of these commands are unique for servo gauges. You can send a gauge command to a gauge installed on a tank manually or even schedule a gauge command to be sent automatically.

6.6.1 Schedule Gauge Command

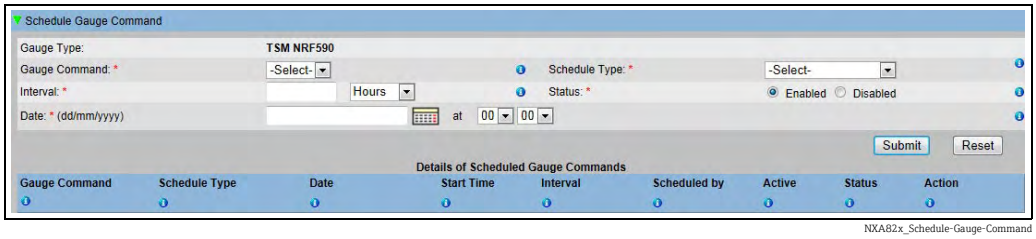
The Tankvision system allows the user to schedule gauge commands, such that they can be executed either immediately or at a certain time. An operator can schedule a gauge command only if that particular gauge command is enabled in the **Gauge Command** configuration screen.

To schedule a gauge command

1. Click the **Gauge Commands** tab. Tankvision displays the screen as follows:

NXA82x_Gauge-Command-Details_Tab

2. Click on **Schedule Gauge Command**. Tankvision displays the screen as follows:



NXA82x_Schedule-Gauge-Command

Field	Description
Gauge Type	This field displays the Gauge Type.
Gauge Command	Select the appropriate gauge command from the drop down list. The data type for this field is "character".
Schedule Type	Select the appropriate Schedule type from the drop down list. The gauge command can be scheduled to be sent once or scheduled for automatic repetition. **Sent Once**: Select **sent once** to enable the gauge command to be sent only once. **Automatic Repetition**: Select **automatic repetition** to enable the Interval field. This field allows you to schedule the system to send a particular gauge command periodically. The data type for this field is "character".
Interval	Enter the appropriate interval in the text box. This field is enabled if the Schedule Type for the gauge command is selected as **Automatic Repetition**. The data type for this field is "numeric". Also, in the adjacent text box: Select the appropriate unit for the interval from the drop down list. The system allows you to schedule the interval for the gauge commands in terms of hours or minutes. The data type for this field is character.
Date	Enter or select the appropriate date from the drop down calendar. The Tankvision system allows you to select the date on which the gauge command is to be sent. The data type for this field is alphanumeric. Also, enter or select the appropriate time in terms of hours and minutes from the respective drop down lists. The Tankvision system allows you to select the exact time at which the gauge command is to be sent. If the Schedule Type for a gauge command is "automatic repetition", then the time entered in the text boxes indicates the first time the gauge command is to be sent. The data type for this field is numeric.
Status	Select the appropriate option. This field indicates the status of the gauge command. This field allows you to enable or disable a gauge command.

3. Enter the appropriate information in the relevant fields.
4. Click the"**Submit** button to send a gauge command, or click the **Reset** button to exit.
5. After saving the settings, Tankvision displays a confirmation message.

The system generates an event, when the Gauge Command is sent. This information can be viewed in the **Event** or **Alarm & Event** tab.

Error Messages

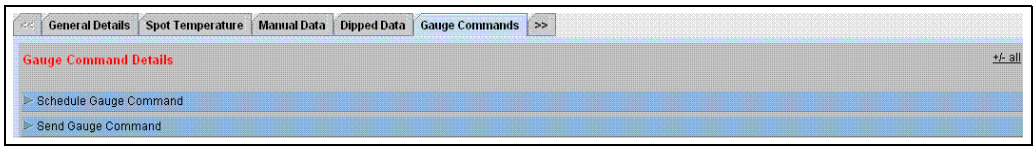
1. "Cannot send gauge command while tank status is Manual, In Maintenance, or Locked." This message appears when the user sends a gauge command while tank status is **Manual**, **In Maintenance** or **Locked**.

6.6.2 Send Gauge Command

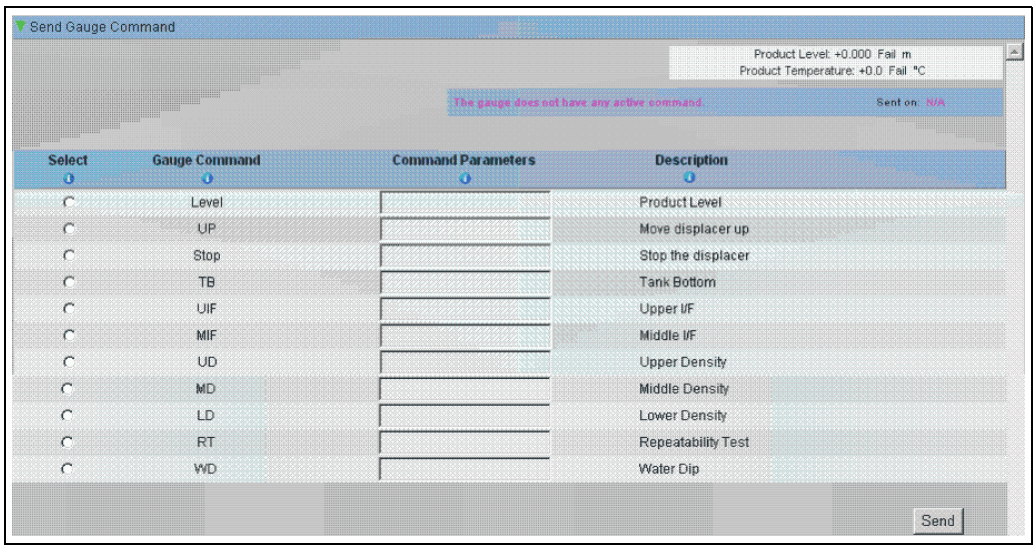
The Tankvision system allows you to send commands to a gauge installed on a tank. A gauge command can be sent only if that particular command is enabled for the tank in the **Gauge Command** configuration screen. Once a gauge command is sent, it remains active till the system receives an appropriate response from the gauge. The response for a gauge command depends on the gauge and communication protocol.

To send a gauge command

1. Click the **Gauge Commands** tab. Tankvision displays the screen as follows:



2. Click ▷ on **Send Gauge Command**. Tankvision displays the screen as follows:

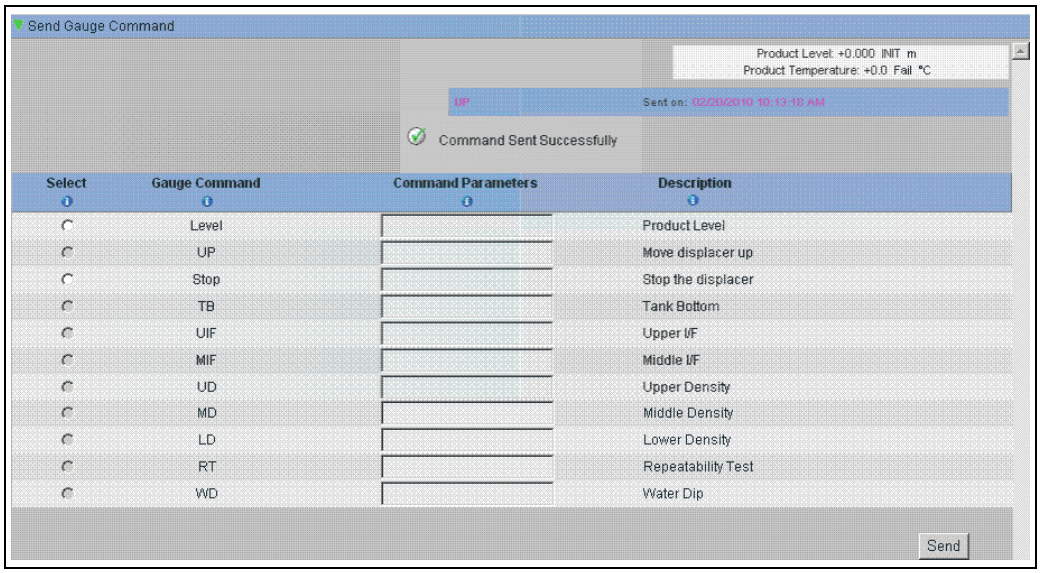


Field	Description
Product level	Displaying Product Level and Product Temperature incl. Status
Product temperature	
Status	Displaying Active Gauge Command and issuing Date and Time
Date and Time	

Column	Description
Select	Select the appropriate gauge command option corresponding to the gauge command name. The radio buttons are highlighted only if the corresponding gauge commands are configured in the **Gauge Command** screen.
Gauge Command	This column displays a list of gauge commands in abbreviated form.
Description	This column displays a short description corresponding to each gauge command.

3. Select the appropriate gauge command option.

4. Click the **Send** button to activate the gauge command.
5. After saving the settings, Tankvision displays a confirmation message as follows:



6. In the above figure, all options in the **Select** column are disabled, except the **Stop** option. If the gauge command has to be stopped, then select the stop option, and click the **Send** button.
   If another gauge command needs to be sent, it might be necessary to cancle the acitve command by sending the STOP command prior issuing the new command.

The system generates an event, when a Gauge Command is activated. This information can be viewed in the **Event** or **Alarm & Event** tab.

Error Messages

1. "Cannot send gauge command while tank status is Manual, In Maintenance, or Locked." This message appears when the user sends a gauge command while the tank status is **Manual**, **In Maintenance** or **Locked**.

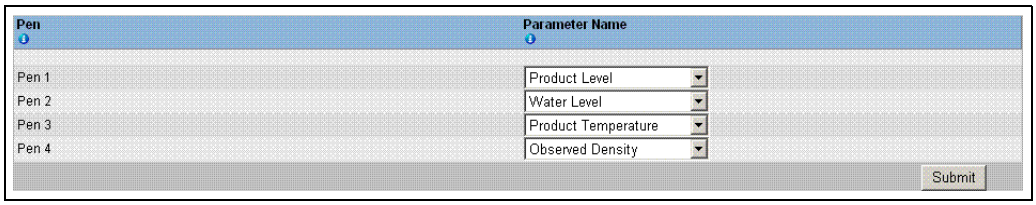
6.7 How to view a real time trend

The below described operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The Tankvision system collects data from the tanks and monitors these values using a trend. A trend is a line graph which gives a pictorial representation of the recent changes of the measured values over time. The Real Time Trend is hosted in the Tankvision unit. It depicts the real-time measured or calculated values of a selected tank as a function of time in the form of a line chart.
The system has default settings which can be customized as required for each tank element and will eventually be plotted on the trend. Up to 4 values can be plotted in one chart.

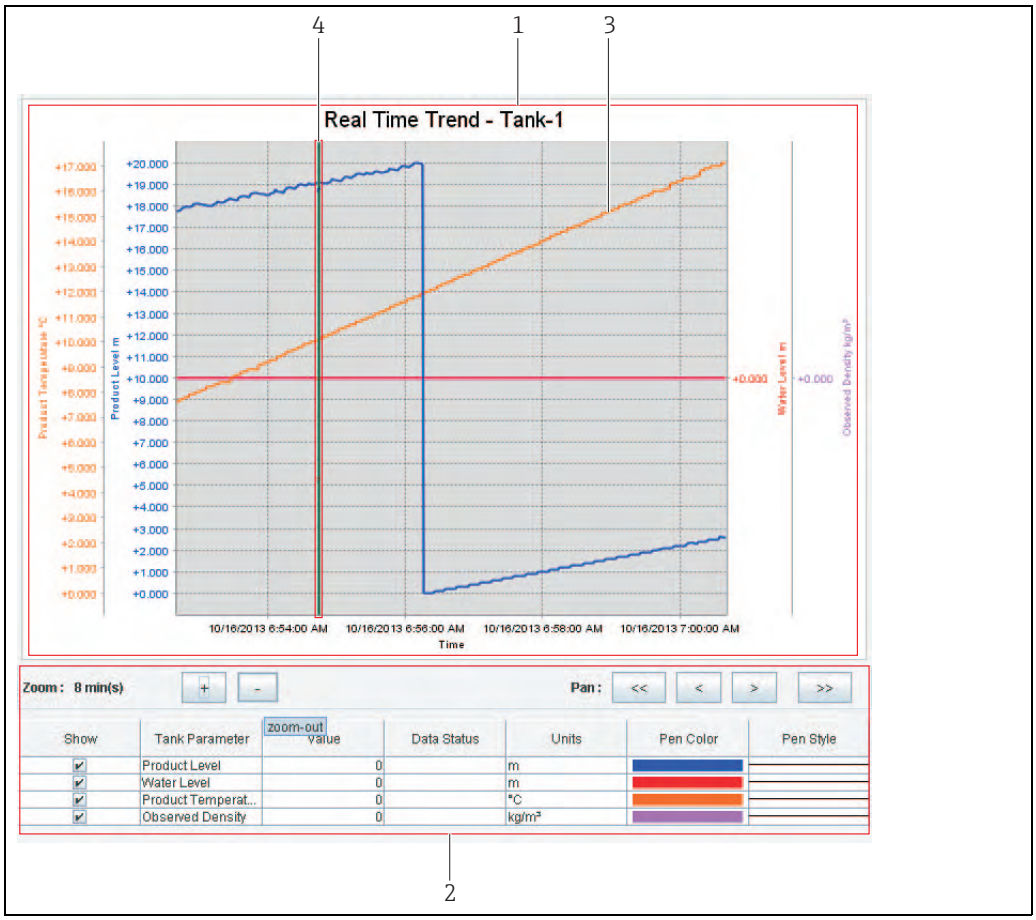
To view a real time trend

1. Click the **Real Time Trend** tab. Tankvision displays the screen as follows:



Column	Description
Pen	This column displays a list of pens (**Pen 1**, **Pen 2**, **Pen 3** and **Pen 4**) that are used to identify the parameters selected.
Parameter Name	Select the appropriate parameter from the drop down list.

2. Select the appropriate parameter name for each pen and click the **Submit** button. Tankvision displays the screen as follows:



NXA82x_Real-Time-Trend_View

Pos.	Field	Description
1	Trend Graphic Area	The Trend Graphic Area includes a rectangular chart with Tank Elements drawn using a specified pen configuration.
2	Trend Setting	The Trend Setting area allows the user to configure the trend view.
3	Line Graphs	The line graphs are displayed based on the selection of tank parameters in the Trend Setting area.
4	Plotter	The plotter can be moved through the graphic area. According to the position of the plotter values are displayed in the row **value** field.

Field	Description
Zoom	The Zoom icons allow you to make changes to the current time window. The zoom is specified in terms of the percentage of the time window. The current zoom level reflects the width (time interval) of the plotting area. + The **Zoom-In** is possible maximum up to 20 seconds. - The **Zoom-Out** is possible up to 24 hours.
Pan	The Pan icons allow you to make changes in the current time window displayed in trend. << The **Go First** button rewinds the trend to the oldest available values in the rolling data buffer of the trend. < The **Go Previous** button shows the previous time window. > The **Go Next** button shows the next time window. >> The **Go Last** button shows current or latest values in the trend.

Field	Description
Show	Select the appropriate check boxes to view the line graphs of the relevant tank parameter. Clear the appropriate check boxes to prevent the system from creating line graphs of the relevant tank parameter.
Tank Parameter	This column displays the list of parameters for which the user can view line graphs.
Value	The value column shows the tank parameter value at the current plotter position. The date and time are displayed on the header bar of the **Value** column. The value is shown for those tank parameters that are currently selected to be displayed on the trend or if the value at plotter position has not the status "fail". In this case the system displays the row in light blue color.
Data Status	This column displays the status of the data. Only those values are plotted, whose status is OK.
Units	This column displays the units of the tank parameter.
Pen Color	Click the color palette to select the unique color for the line graph. This column displays the pen colors used to draw the graphical line which depicts the value of the particular tank parameter on the trend.
Pen Style	Click the **Pen Style** to select the line style for depicting the relevant parameters. This column displays the style of the graphical line which depicts the values of the particular tank parameter on the trend.

To plot the trend, click on the Trend Graphic Area. The plotter moves in real-time. The Trend Setting area shows the values of all parameters plotted at the plotting cursor position.

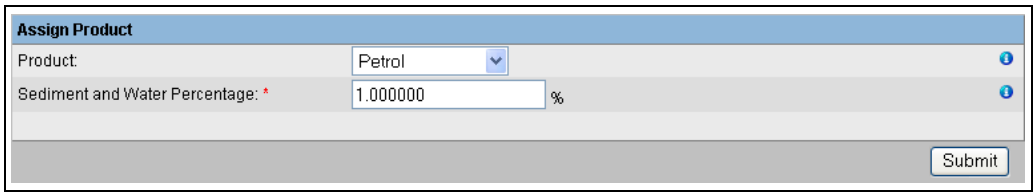
6.8 How to assign/change products at a tank

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

After configuring a product, it has to be assigned to a tank. The user can assign only one product to a tank. A product which is currently assigned to a tank can not be deleted from the system.

To assign a product to a tank

1. Click the **Assign Product** tab. Tankvision displays the screen as follows:



Field	Description
Product	Select the appropriate product from the drop down list. This field enables the system to assign a product to a specific tank.
Sediment and Water Percentage	Enter the appropriate sediment and water percentage for the selected product. The Tankvision system uses the sediment and water percentage in tank inventory calculations and corrects the product volume according to the sediment and water content. The data type for this field is numeric.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to assign the product to the tank.
4. After saving the settings, Tankvision displays a confirmation message.

Once the product is assigned to the tank, the tank is automatically added to the built-in product group, and the tank can be seen in the navigation tree of the screen under the **Products** Header.

An event is generated after a product is assigned to a tank. The event details can be viewed in the **Event** or **Alarm & Event** overview.

6.9 How to do Product transfer

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The product transfer is a day-to-day tank farm operation. During the tank farm operation, a product is pumped into or out of a tank. A tank may receive product from a pipeline, tanker, ship or another tank. When the product is to be filled into a tank, it is necessary to check the available tank capacity. Similarly, when the product is to be pumped out of a tank, it is necessary to check the product volume in the tank. Tankvision allows an operator to create a new product transfer.
Tankvision does not control the product transfer, but it monitors product transfers and generates product transfer data and reports. When a company sells the product stored in tanks to another company, it is important that the tank is W&M (weights and measurement) certified for correct measurements. The Tankvision system provides this facility by calibrating the system and then gets it W&M approved. All tanks which are W&M certified can be used for custody transfers.
In this case the product transfer report (→ 42) will mention the W&M approved status, which can be used to prove that the correct amount of product has been transferred.

6.9.1 Product Transfer Life Cycle

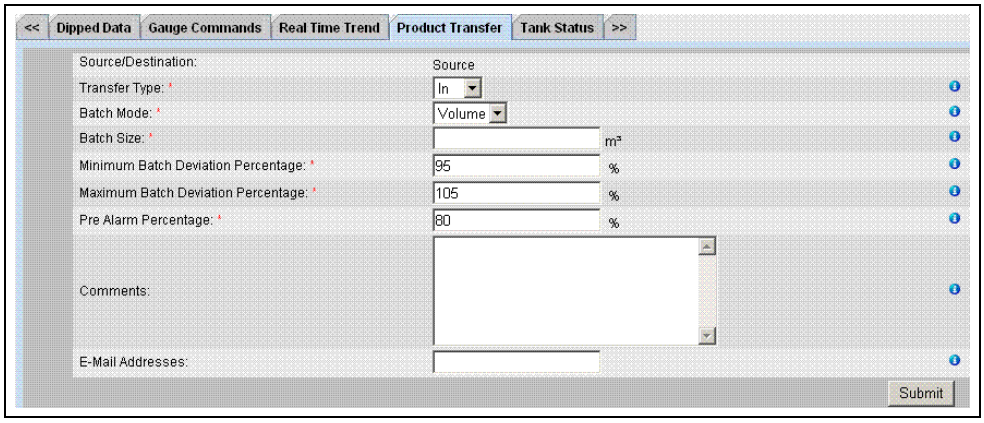
The Tankvision system allows the user to create, finish or abort a product transfer. Once a product transfer is created, the system monitors the product transfer to detect "start of transfer (active)", "product transfer paused" or "product transfer completed".

The life cycle of a product transfer

The product transfer traverses through its life cycle as follows:
- Create a product transfer for a tank
- Detection of the start of the product transfer
- Detection of a paused transfer
- Detection of a completed transfer
- Transfer finished or aborted
- Product transfer report

To transfer a product for a tank

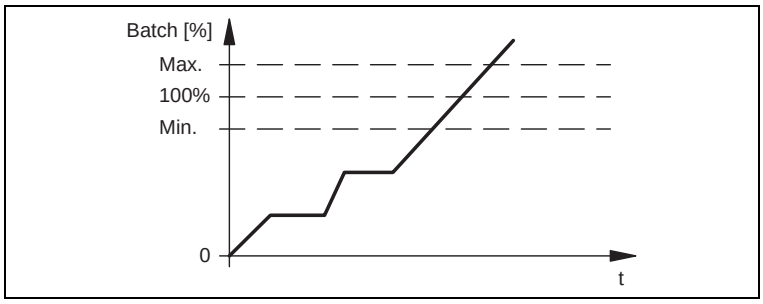
1. Click the **Product Transfer** tab. Tankvision displays the screen as follows:



Field	Description
Source/Destination	The system displays the status of inflow or outflow of the product. If the transfer type is **In**, then this field displays **Source**. If the transfer type is **Out**, then this field displays **Destination**.

<table>
<tr><th>Field</th><th>Description</th></tr>
<tr><td>Transfer Type</td><td>Select the appropriate product transfer type from the drop down list. This field enables the system to allow transfer of the product into or out of the tank depending on the selected option, viz., In or Out.
In: A product is being filled into a tank.
Out: A product is being pumped out from a tank.
This field is disabled after creating a new product transfer.</td></tr>
<tr><td>Batch Mode</td><td>Select the appropriate batch mode from the drop down list. This field allows you to select the mode of product transfer. The batch mode is Volume or Mass.
Volume: The quantity of product to be transferred is specified as Total Observed Volume (TOV) of product.
Mass: The quantity of product to be transferred is specified as product Mass.
This field is disabled after creating a new product transfer.</td></tr>
<tr><td>Batch Size</td><td>Enter the appropriate batch size in the text box. This field displays the quantity of the product that is being transferred. The unit depends on whether the mode of product transfer is in volume or mass. The data type for this field is numeric.</td></tr>
<tr><td>Batch Deviation Percentage</td><td>Minimum
Enter the minimum batch percentage.This field is used to determine, whether the product transfer is complete or not. The product transfer is considered as completed, if:
▪ The quantity of product that has been transferred so far (calculated as per batch mode) is equal to or more than the minimum batch deviation percentage of the batch size, and ...

Maximum
Enter the maximum batch percentage. This field is used to determine, whether the product transfer is complete or not. The product transfer is considered as completed, if:
▪ If the batch exceeds the max. batch percentage an event is generated.
▪ The quantity of product that has been transferred so far (calculated as per batch mode) is equal to or more than the minimum batch deviation percentage of the batch size and is less than the maximum batch deviation percentage of the batch size; and ...

▪ ... the rate of change of volume is less than the minimum rate of change of the volume
The data type for this field is numeric.
 
</td></tr>
<tr><td>Pre Alarm Percentage</td><td>Enter the pre-alarm percentage. If the quantity of product transfered (calculated as per the batch mode) increases above the pre alarm percentage of the batch size for In transfer or decreases below the pre-alarm percentage for Out transfer, then the system raises a pre-alarm.
The data type for this field is numeric.</td></tr>
<tr><td>Comments</td><td>Enter the appropriate comments in the comments field. This field allows the user to enter comments related to the product transfer. This information is captured in the product transfer report. The data type for this field is characters.</td></tr>
<tr><td>E-Mail Addresses</td><td>Enter the appropriate e-mail addresses. Whenever the product transfer is completed, the system sends a product transfer report by e-mail to the e-mail addresses entered in this field.</td></tr>
<tr><td>Transfer Status</td><td>This field displays the status of the product transfer. The product transfer status can be: "Armed", "Active", "Paused", "Completed", "Finished" or "Aborted".
▪ "Armed" (Ready to start)
▪ "Active" (In progress)
▪ "Paused" (On hold)
▪ "Completed" (if min. batch dev. percentage is reached 0 and flow goes to 0)
▪ "Finished" (tank transfer finished)
▪ "Aborted" (stop immediately before finishing)</td></tr>
</table>

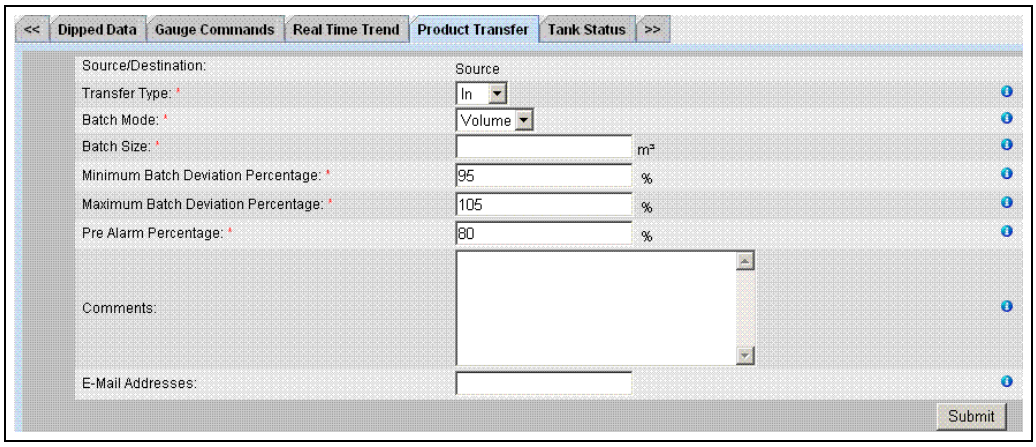
2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to create a new product transfer.
4. After saving the settings, Tankvision displays a confirmation message.

An event is generated after creating a product transfer. The event details can be viewed in the **Event** or **Alarm & Event** overview.

6.9.2 Status of a Product Transfer

Create a New Product Transfer

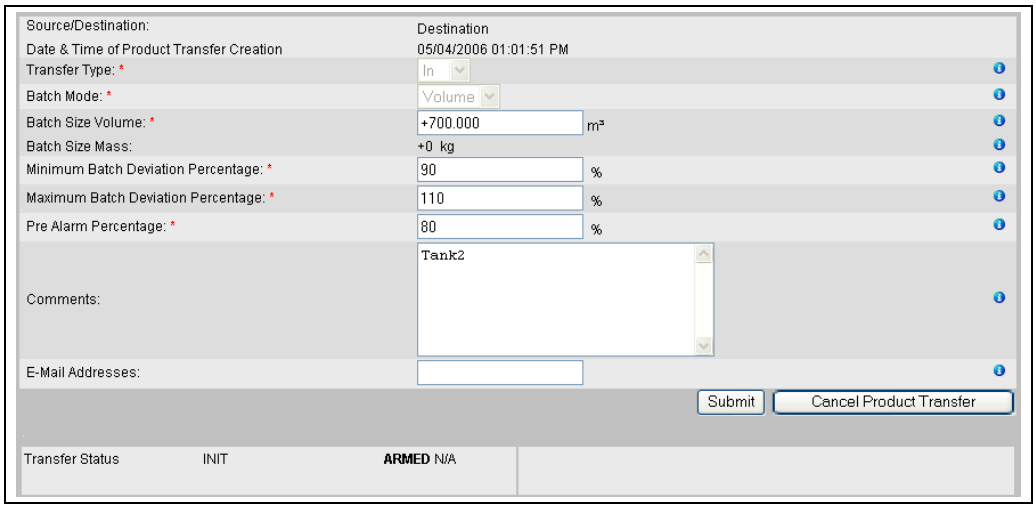
Creating a new product transfer is the first step to be followed after the pre-condition for product transfer is set in the system. While creating a new product transfer, the transfer status of the tank should be "None". The product transfer status "None" means that the tank does not have any product transfer associated with it in the Armed or Active status, and thus a new product transfer can be created. An image of Tankvision displaying the status as "None" is as follows:



Validate product transfer details

Once the user has created a new product transfer for a tank, this tank is said to be "Armed" for product transfer. The system starts monitoring a tank (with status) "Armed" to automatically detect the start of the product transfer. Auto detection of start of Product transfer defined in. Once a tank is armed for a product transfer, no other product transfer can be created for the tank, unless the existing transfer is cancelled.

An image of Tankvision displaying the status as "Armed" is as follows:



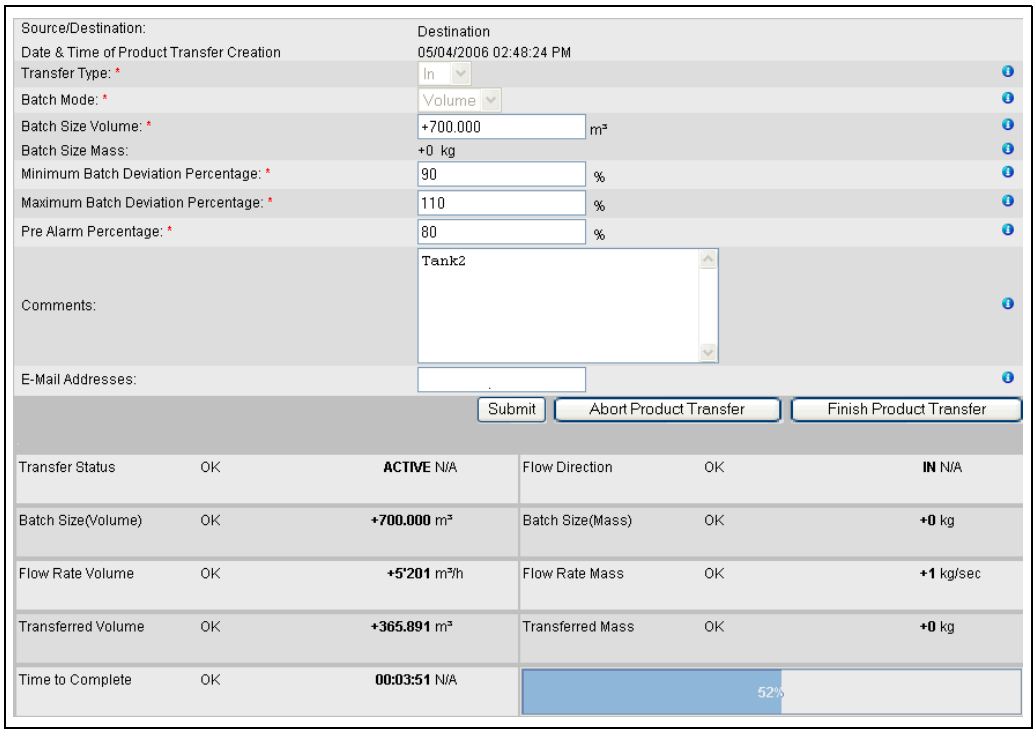
The system generates an event when the status is changed from "None" to "Armed". This information can be viewed in the **Event** or **Alarm & Event** tab.

Detection of the start of a product transfer

Once the product transfer has been armed, the system detects the start of the product transfer based on a change in the level and the rate of change of the level. The system treats the product transfer as started and the product transfer status is changed to "Active" if:

- The change in product level is greater than the minimum level change, and
- The rate of change of level is greater than the minimum rate of change of level configured under the flow calculation details

Once a tank is in the "Active" status for a product transfer, no other product transfer can be created for the tank, unless the active transfer is Finished or Aborted.
An image of Tankvision displaying the status as "Active" is as follows:

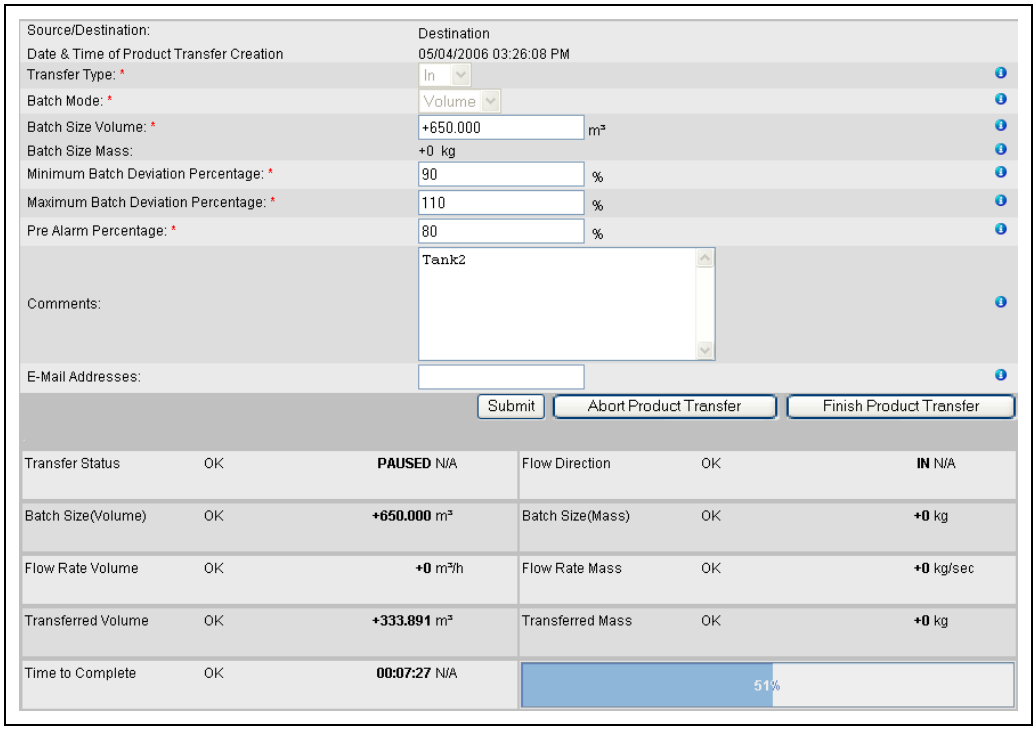


Product transfer paused

The system treats an Active product transfer as Paused and the product transfer status is changed to "Paused" if:

- the flow rate drops below the minimum volume change rate,
- the rate of change of level drops below the minimum rate of change of level configured under the tank flow calculation details, and
- the quantity of product that has been transferred is less than the minimum batch deviation percentage of the batch size

An image of Tankvision displaying the status as "Paused" is as follows:

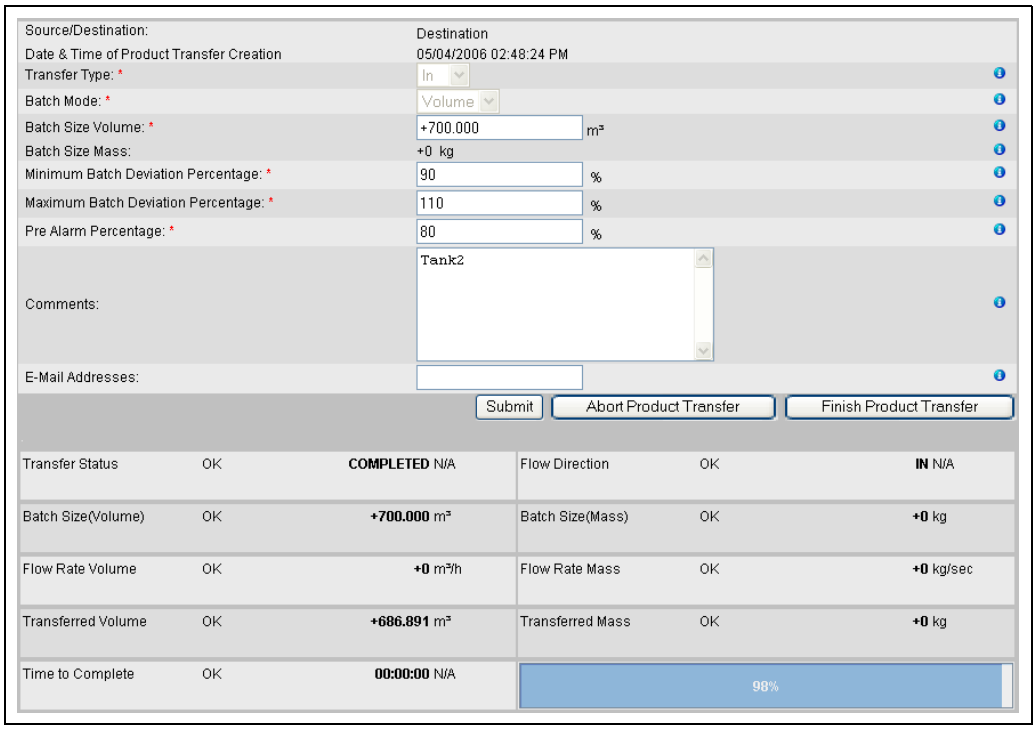


Product transfer completed

The product transfer is considered as completed, if:

- The quantity of product that has been transferred so far (calculated as per batch mode) is equal to or more than minimum batch deviation percentage of batch size, and is less than the maximum batch deviation percentage of the batch size; and
- the rate of change of volume is less than the minimum rate of change of volume

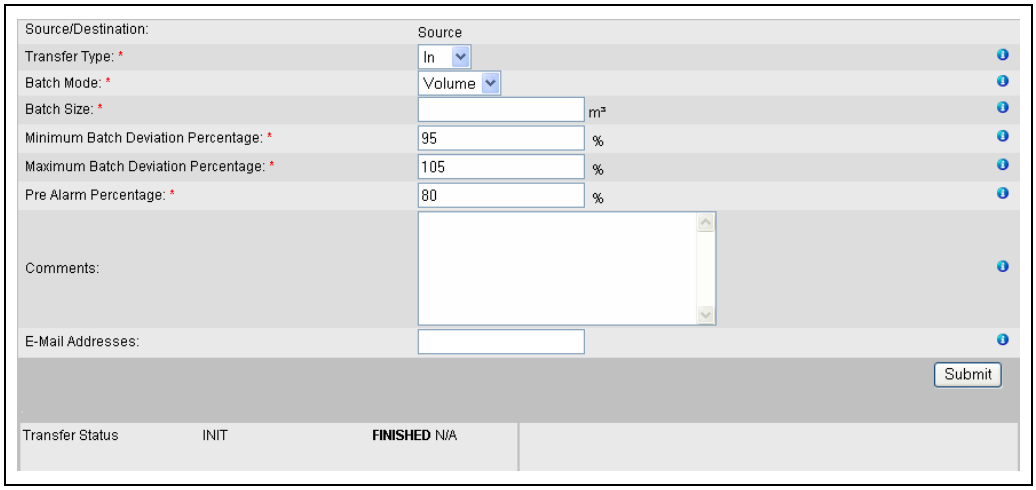
An image of Tankvision displaying the status as "Completed" is as follows:



The system generates an event for a completed product transfer. The event details can be viewed in the **Event** or **Alarm & Event** tab.

Product transfer finished

The user may choose to finish the product transfer before the product transfer is completed. The product transfer can be finished, when the tank is in an "Active" transfer stage.
An image of Tankvision displaying the status as "Finished" is as follows:

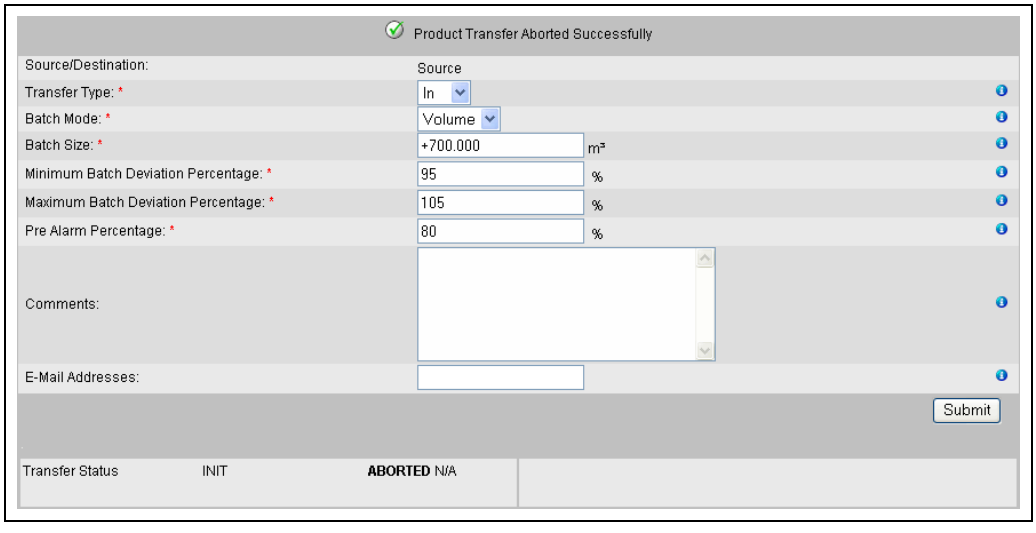


The system displays a pop up message to confirm about finishing the product transfer.

- When the user manually finishes the product transfer, the system generates and displays the **Product Transfer Report**.
- The system generates an event for product transfer finished by user. The information can be viewed in the **Events** or **Alarm & Event** tab.
- The user cannot manually finish the product transfer, if the product transfer status is "Completed".

Product transfer aborted

The user may choose to abort the product transfer before the product transfer is completed. The product transfer can be "Aborted", when the tank is in an "Active" transfer stage. When the product transfer is aborted, the system does not record the data of starting and ending of product transfer. In such case, the system maintains different sets of data. The data of a previously completed or finished product transfer are preserved, and the data of the aborted product transfer are discarded.



The system displays a pop up message to confirm about the aborting of the product transfer.

The system generates an event for an aborted product transfer. The event details can be viewed in the **Event** or **Alarm & Event** tab.

Error Messages

1. "Tank cannot be armed for product transfer if "No product" has been assigned to tank"
   This message appears when the user attempts to create a product transfer when "No Product" is assigned to the tank.
2. "The Tank status is "Locked", cannot create a new product transfer for a tank that is locked"
   This message appears when the user attempts to create a product transfer when the tank status is "Locked".
3. "The Tank status is "In Maintenance", cannot create a new product transfer for a tank that is in maintenance"
   This message appears when the user attempts to create a product transfer when the tank status is "In Maintenance".
4. "Batch size cannot be zero, if you do not wish to specify batch size leave the field empty"
   This message appears when the Batch size entered by the user is equal to zero.
5. "Batch size should be greater than zero"
   This message appears when the value of the Batch size entered by the user is less than zero.
6. "Batch size should be smaller than remaining tank capacity"
   This message appears when the transfer type is "In" and the batch size entered by the user is more than the remaining tank capacity.
7. "Batch size should be smaller than available product quantity"
   This message appears when the transfer type is "Out" and the batch size entered by the user is more than the available product quantity.
8. "Minimum batch deviation should be less than maximum batch deviation"
   This message appears when the Minimum batch deviation entered by the user is greater than or equal to maximum batch deviation.
9. "Pre-alarm percentage should be greater than zero"
   This message appears when the Pre-alarm percentage entered by the user is less than or equal to zero.
10. "Pre alarm percentage should be less than minimum batch deviation"
    This message appears when the pre-alarm percentage entered by the user is more than the minimum batch deviation.

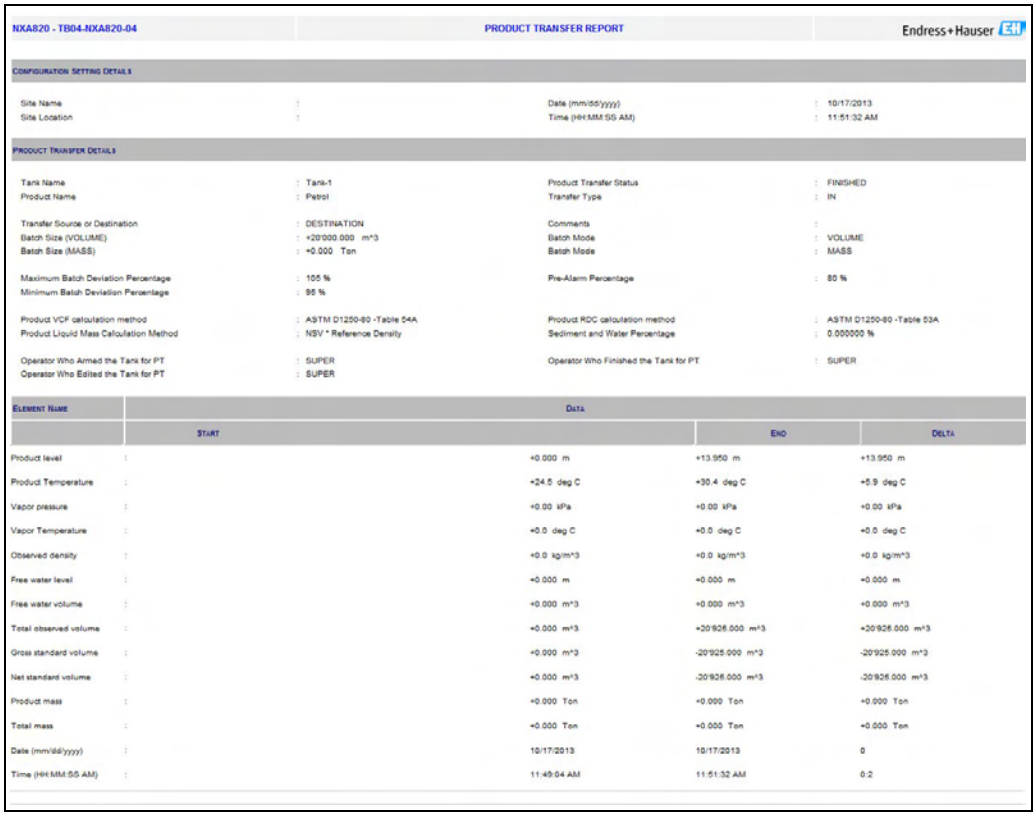
6.10 How to view a Transfer report

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The Tankvision system allows the user to arm a tank for product transfer, and is set up to detect the start and end of the product transfer details for a tank. The system records the product transfer data and generates a report for the product transfer with "Completed" and "Finished" statuses, using an appropriate template. You can view or even edit the product transfer report for the last product transfer that has been completed by the system.

To generate a product transfer report

1. Click the **Product Transfer Report** tab. Tankvision displays the screen as follows:


NXA820 - TB04-NXA820-04

PRODUCT TRANSFER REPORT

Endress+Hauser

CONFIGURATION SETTING DETAILS

Site Name	:	Date (mm/dd/yyyy)	: 10/17/2013
Site Location	:	Time (HH:MM:SS AM)	: 11:51:32 AM

PRODUCT TRANSFER DETAILS

Tank Name	: Tank-1	Product Transfer Status	: FINISHED
Product Name	: Petrol	Transfer Type	: IN
Transfer Source or Destination	: DESTINATION	Comments	:
Batch Size (VOLUME)	: +20'000.000 m^3	Batch Mode	: VOLUME
Batch Size (MASS)	: +0.000 Ton	Batch Mode	: MASS
Maximum Batch Deviation Percentage	: 105 %	Pre-Alarm Percentage	: 80 %
Minimum Batch Deviation Percentage	: 95 %		
Product VCF calculation method	: ASTM D1250-80 -Table 54A	Product RDC calculation method	: ASTM D1250-80 -Table 53A
Product Liquid Mass Calculation Method	: NSV * Reference Density	Sediment and Water Percentage	: 0.000000 %
Operator Who Armed the Tank for PT	: SUPER	Operator Who Finished the Tank for PT	: SUPER
Operator Who Edited the Tank for PT	: SUPER		

ELEMENT NAME	DATA		
	START	END	DELTA
Product level	+0.000 m	+13.950 m	+13.950 m
Product Temperature	+24.5 deg C	+30.4 deg C	+5.9 deg C
Vapor pressure	+0.00 kPa	+0.00 kPa	+0.00 kPa
Vapor Temperature	+0.0 deg C	+0.0 deg C	+0.0 deg C
Observed density	+0.0 kg/m^3	+0.0 kg/m^3	+0.0 kg/m^3
Free water level	+0.000 m	+0.000 m	+0.000 m
Free water volume	+0.000 m^3	+0.000 m^3	+0.000 m^3
Total observed volume	+0.000 m^3	+20'926.000 m^3	+20'926.000 m^3
Gross standard volume	+0.000 m^3	-20'925.000 m^3	-20'925.000 m^3
Net standard volume	+0.000 m^3	-20'926.000 m^3	-20'926.000 m^3
Product mass	+0.000 Ton	+0.000 Ton	+0.000 Ton
Total mass	+0.000 Ton	+0.000 Ton	+0.000 Ton
Date (mm/dd/yyyy)	10/17/2013	10/17/2013	0
Time (HH:MM:SS AM)	11:49:04 AM	11:51:32 AM	0:2

NXA82x_Product-Transfer-Report

Field	Description
W&M Approved	This section displays the status of W&M approval.
Configuration Setting Details	This section displays the report of the configuration settings.
Product Transfer Details	This section displays the report of Product Transfer settings. Refer to "Product Transfer Life Cycle" (→ 33) for details.
Element Name	This section displays the result of the product transfer in terms of parameter changes. Refer to "Tank Calculator" (→ 46) for details.

2. Refer to the "View Product Transfer Report" section under the "Reports" chapter for more information on the product transfer report.

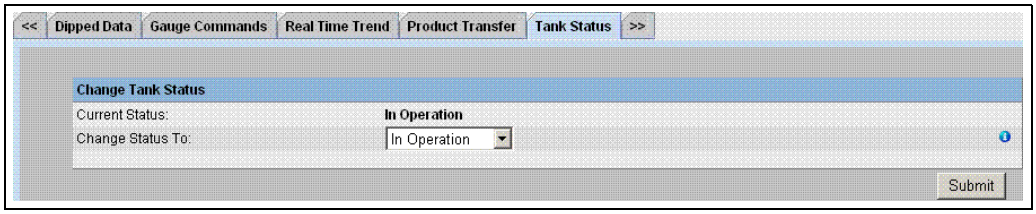
6.11 How to view and change Tank Status

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The tanks in the Tankvision system are associated with a status which can be changed by the operator.

To change the tank status

1. Click the **Tank Status** tab. Tankvision displays the screen as follows:



Field	Description
Current Status	The system displays the current status of the tank.
Change Status to	Select the appropriate status type from the drop down list. This field allows you to select the status in which the tank is required to function. The statuses are: ▪ **In Operation**: The tank is in normal operation. ▪ **In Maintenance**: The tank is under maintenance. A tank is always empty under maintenance, and tank operations such as gauge commands or product transfers cannot be performed. The field scan is not needed. ▪ **Manual**: The tank is in operated manually, which means the system will not measure the data automatically. All tank parameters are in manual mode and the field scan is in off mode. A product transfer can occur. ▪ **Locked**: The tank is generally filled but locked to disallow product transfer. All other activities can be performed. Refer to "Tank Status Change Matrix" (→ 43) for the activities that can be performed under various tank statuses, and to "Tank Status Indicator" (→ 44) to learn about the notification on the tank status graph.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to change the tank status.
4. After saving the settings, Tankvision displays a confirmation message.

An event is generated after changing the tank status. The event details can be viewed in the **Event** or **Alarm & Event** overview.

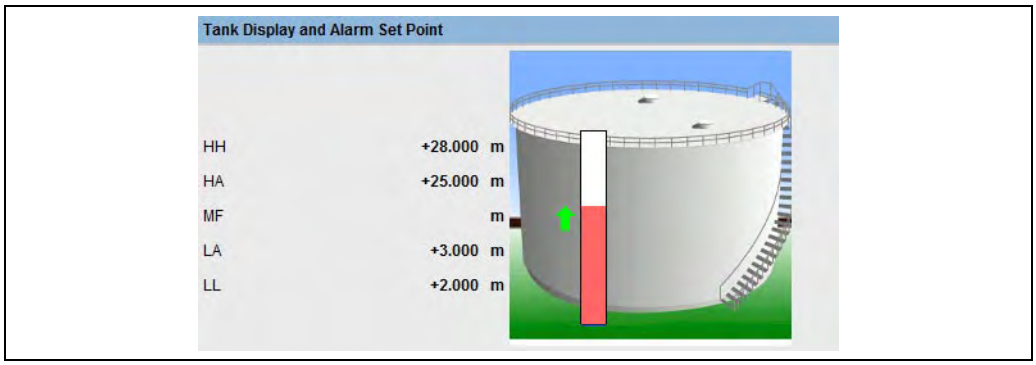
6.11.1 Tank Status Change Matrix

The activities that can be performed under various tank statuses are as follows:

Activity vs Tank Status	In Operation	Manual	Maintenance	Locked
Inventory Calculation	Yes	Yes	No	Yes
Product Transfer	Yes	Yes	No	No
Gauge Commands	Yes	No	No	No
Raise Change in Volume Alarm	No	No	No	Yes
Field Scan	Yes	No	No	Yes
Raise Alarms	Yes	No	No	Yes

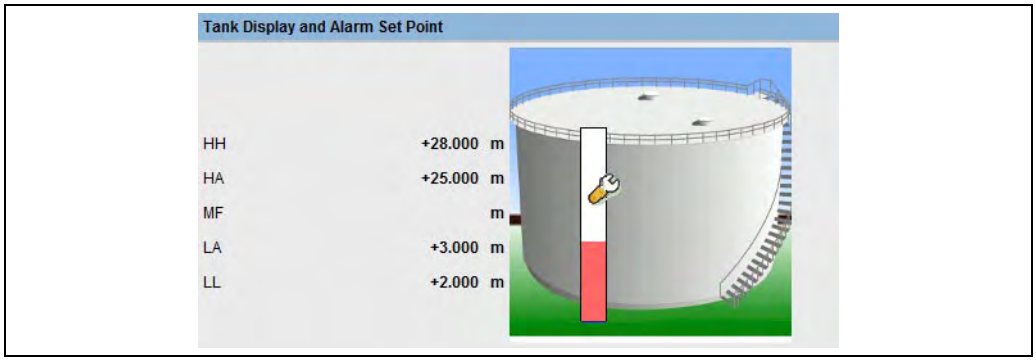
6.11.2 Tank Status Indicator

Tankvision indicates the tank status on the **Tank Display and Alarm Set Point** section in the **General Details** section. When the tank status is modified to "In Operation", the system indicates the tank status on the **Tank Display and Alarm Set Point** section as follows:



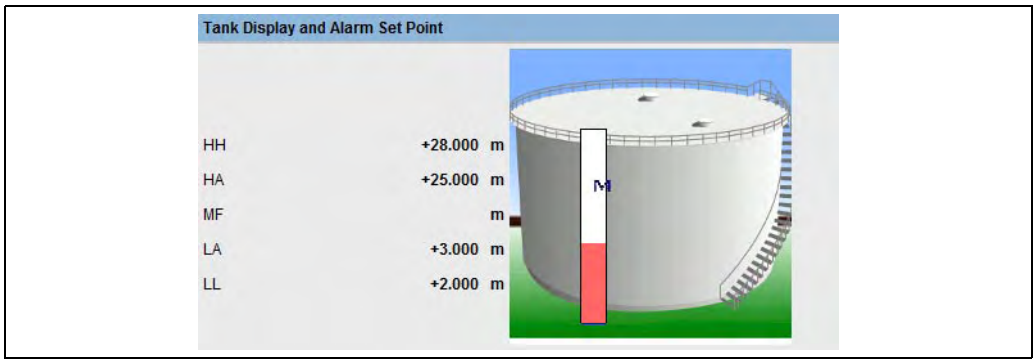
NXA82x_Tank-Status-Indicator_In-Operation

When the tank status is modified to "In Maintenance", the system indicates the tank status on the **Tank Display and Alarm Set Point** section as follows:



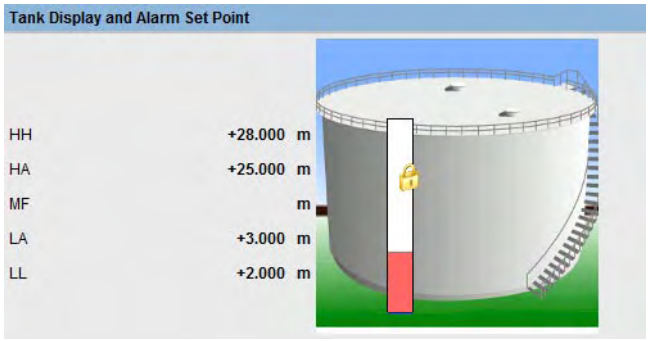
NXA82x_Tank-Status-Indicator_In-Maintenance

When the tank status is modified to "Manual", the system indicates the tank status on the **Tank Display and Alarm Set Point** section as follows:



NXA82x_Tank-Status-Indicator_Manual

When the tank status is modified to "Locked", the system indicates the tank status on the **Tank Display and Alarm Set Point** section as follows:



NXA82x_Tank-Status-Indicator_Locked

6.12 How to do tank calculations

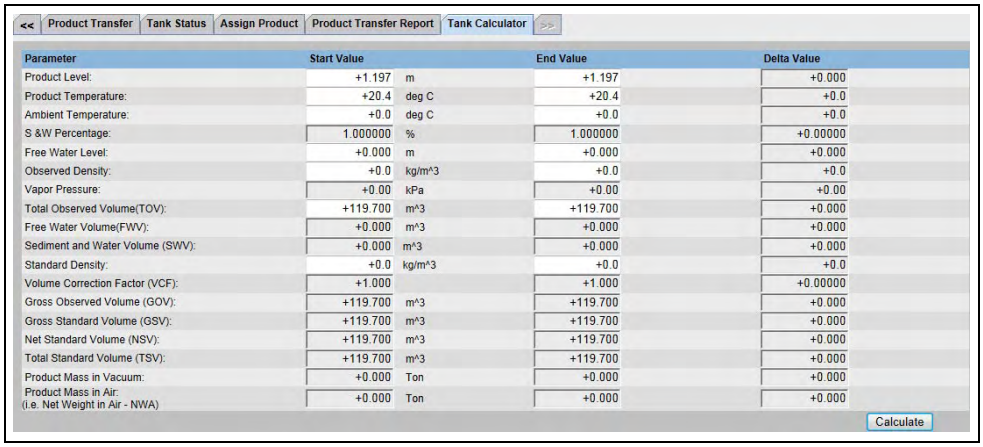
The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The Tankvision system performs inventory calculations based on the measured data scanned from a gauge or entered manually. The system uses the tank and product configuration mainly to perform these calculations. Tankvision provides a tank calculator to evaluate various "what if" scenarios. These scenarios could be:
- What would be the product volume for a certain product level?
- What would be the product level, if a certain quantity of product is pumped into the tank?
- What would be the product volume, if the product level is equal to the high level alarm?

Based on the above mentioned scenarios, the tank calculator would also indicate whether the resulting tank parameter could cause an alarm.
Thus, prior to an actual product transfer, the tank calculator can be used to verify whether it is possible to perform an "out" or "in" product transfer without resulting in an alarm. Any tank parameter that is changed in the tank calculator is used to carry out calculations and display results to evaluate the what-if scenarios. Changing tank parameters in the tank calculator does not change the actual tank data.

To use the tank calculator

1. Click the **Tank Calculator** tab. Tankvision displays the screen as follows:



Column	Description
Parameter	This column displays a list of product parameters for which the start and end value can be entered for the purpose of calculation.
Start Value	Enter the appropriate start values for the relevant parameters in the corresponding text boxes. The start value is the initial value of the parameter. For example, the initial level of the product will be the start value for **Product Level**. The data type for this field is numeric.
End Value	Enter the appropriate end values for the relevant parameters in the corresponding text boxes. The end value is the current or final value of parameter. For example, the current or final level of the product will be the end value for **Product Level**. The data type for this field is numeric.
Delta Value	The delta values are not editable. The delta value is the difference between the start value and the end value of a parameter. The data type for this field is numeric.

2. Enter the appropriate information in the relevant fields and click the **Calculate** button.

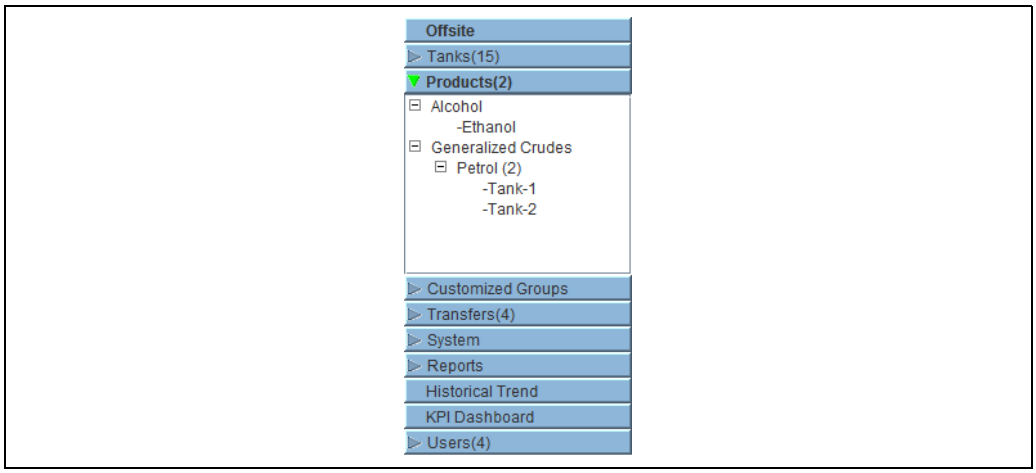
6.13 How to view products groups

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

The Tankvision system has a product-tank group feature, where the user can view different products stored in various tanks.

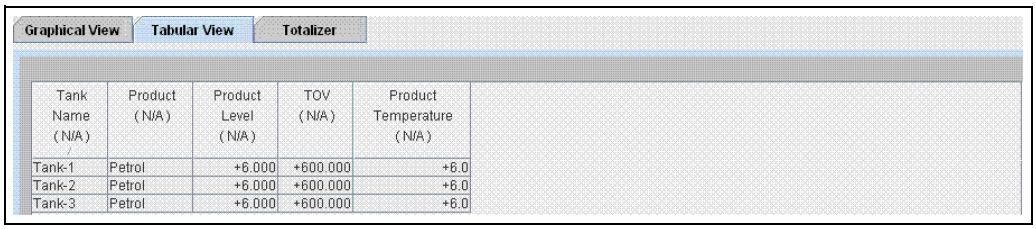
To view the product-tank group

1. On the Navigation Tree, click the **Products** header. (The number of products configured is displayed in brackets next to the header's name.) The **Products** header expands as follows:



NXA82x_Menu_Products

2. In the above figure, the <Product Name> created by the authorized personnel is displayed under the **Products** header. The number shown inside the bracket, is the total number of tanks that contain the product.
3. Click the <Product Name> to display the tanks filled with the relevant product. Tankvision displays the screen as follows:



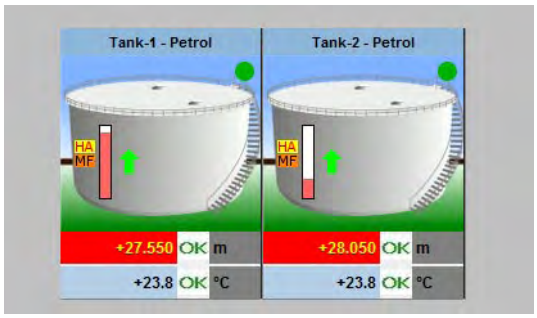
4. By default, the system displays the tabular view of the product group in the Products-<Product Name> screen.

Click the ⊞, the system will expand the node and display the names of the tanks that have this product. The user may click on the <Tank Name> to view the detailed information about the tank.

6.13.1 Graphical View of the Product-Tank Group Details

To view the product-tank group details in graphical format

1. On the Products - <Product Name> screen, click the **Graphical View** tab. Tankvision displays the screen as follows:



NXA82x_Product-Tank-Group-Details_Graphical-View

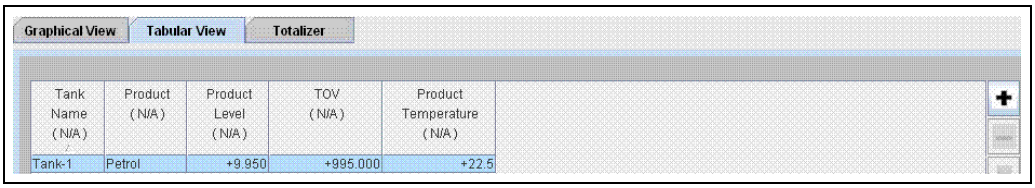
Field	Description
<Tank Name> und <Product Name>	The tank names and the product names are displayed for the selected tank group.
Level of Alarm	The current level of alarm is displayed as per the alarm set point.
Graphical Bar	The graphical bar displays the product level and water level.
Product Parameter	Each tank's measured data, viz., product level and product temperature are displayed with the appropriate units. The system also indicates the alarm acknowledgement status using different background colors. The background colors are as follows: ▪ Dark green - indicates an active and acknowledged alarm ▪ Light red - indicates an active and unacknowledged alarm ▪ Yellow - indicates an inactive and unacknowledged alarm ▪ White - indicates an inactive and acknowledge alarm
Tanks in a Tank group	The total number of tanks in a tank group is displayed as per the tank group parameter.

A guest user can view the **Non Real Time Product-Tank Group Details** screen. The system displays the measured graphical information of the tanks, when the <Product Name> is selected. The user has to manually refresh the screen to view the latest measured graphical information.

6.13.2 Tabular View of the Product-Tank Group Details

To view the product-tank group details in tabular format

1. On the Products - <Product Name> screen, click the **Tabular View** tab. Tankvision displays the screen as follows:



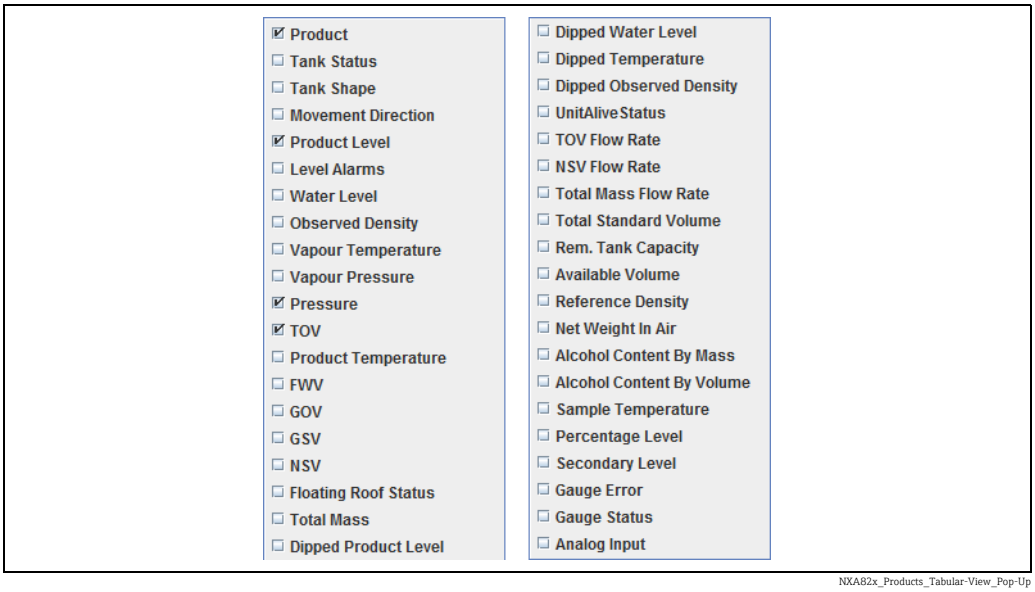
Description of the screen:

1. Displayed columns are selectable (see: to add columns to the tabular view):
   Tank name, Product, Tank Status, Tank Shape, Movement Direction, Product Level, Level Alarms, Water Level, Observed Density, Vapor Temperature, Vapor Pressure, TOV, Product Temperature, Free Water Volume (FWV), Gross Observed Volume (GOV), Gross Standard Volume (GSV), Net Standard Volume (NSV), Floating Roof Status, Total Mass, Dipped Product Level, Dipped Water Level, Dipped Temperature, Dipped Observed Density, Unit Alive Status, Total Observed Volume Flow Rate, Net Standard Volume Flow Rate, Total Mass Flow Rate, Total Standard Volume, Remaining Tank Capacity, Available Volume, Reference Density, Net Weight in Air, Alcohol Content By Mass, Alcohol Content By Volume, Sample Temperature, Percentage Level, Secondary Level, Gauge Error, Gauge Status, Analog Input, Level Change Rate
2. Description of the colours:
   – Brown: indicates that the level is moving up
   – Blue: indicates that the level is moving down

A guest user can view the **Non Real Time Product-Tank Group Details** screen. The system displays the measured tabular information of the tanks, when the <Product Name> is selected. The user has to manually refresh the screen to view the latest measured tabular information.

To add columns to the tabular view

1. Right-click in the grey area outside the table. The following pop-up window appears:



NXA82x_Products_Tabular-View_Pop-Up

2. Select/deselect the columns you want to see /don't want to see.
3. + possibility to enlarge, - possibility to minimize, by default on the smallest scale.
4. The tabular view will show the selected values until further changes.

6.14 How to view customized groups

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

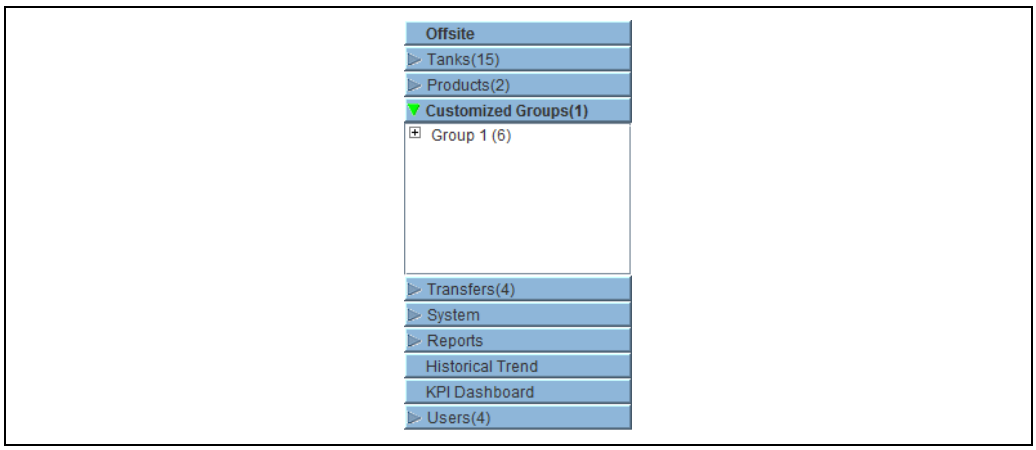
The user can select a tank group from the navigation menu, and can view the tank group details in graphical and tabular format. The graphical and tabular format give a quick feedback about the current tank status. The screen displays the tank data dynamically on a real time basis. The graphical and tabular page shows the tanks in the selected tank group. Each tank is shown with its tank parameters. There are two types of Tank Groups:

1. Static Tank Group: Tank group created by user
2. Dynamic Tank Group: Tank group created by defining filtration criteria. (e.g. All tanks in locked status)

Both types of tank groups are supported with real time graphical information.
The tank group details are viewed by two types of users, viz. operator and guest. The user logging into the system as an operator can view the real time tank group details. The user logging into the system as a guest can view the non-real time tank group details. A guest user has a minimal access to the Tankvision functionality. A guest user can view the tank details, gauge details, tank group and tank overview (all tanks on a specific Tankvision unit) in a non-real time mode. The guest user has to refresh the page to view the current tank data.

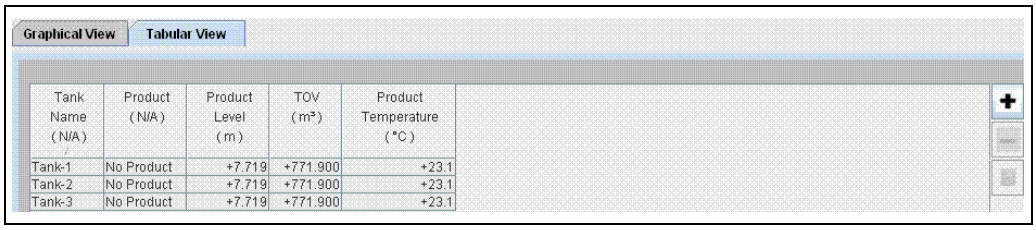
To view real time tank group details

1. On the Navigation Tree, click the **Customized Groups** header. (The number of tank groups configured is displayed in brackets next to the header's name) The **Customized Groups** header expands as follows:



NXA82x_Menu_Customized-Groups

2. In the above figure, the <Tank Group(s)> name created by the authorized personnel is displayed under the **Customized Groups**. The number of tanks associated in that group is displayed inside the bracket.
3. Click the <Tank Group> name to display the tank status in graphical and tabular format. Tankvision displays the screen as follows:

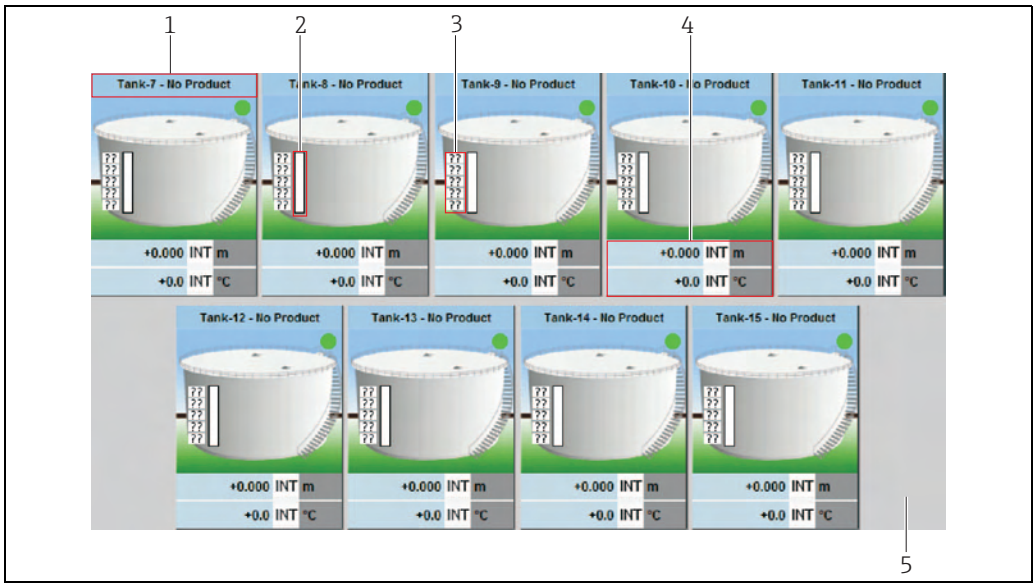


4. By default, the system displays the tabular view of the tank group.

6.14.1 Graphical View of the Tank Group Details

To view the tank group details in graphical format

1. On the Customized Groups - <Tank Group> name screen, click the **Graphical View** tab. Tankvision displays the screen as follows:



NXA82x_Tank-Group-Details_Graphical-View_Description

Graphical Information	Description
<Tank Name> and <Product Name>	The tank names and the product names are displayed for the selected tank group.
Level of Alarm	The current level of alarm is displayed as per the alarm set points.
Graphical Bar	The graphical bar displays the product level and water level.
Alarm Parameter	Each tank's measured data, viz., product level and product temperature are displayed with the appropriate units. The system also indicates the alarm acknowledgement status using different background colors. The background colors are as follows: ▪ Dark green- indicates an active and acknowledged alarm ▪ Light red- indicates an active and unacknowledged alarm ▪ Yellow- indicates an inactive and unacknowledged alarm ▪ White- indicates an inactive and acknowledged alarm Question marks will be displayed if no alarm settings are configured for a tank.
Tanks in a Tank group	The total number of tanks in a tank group is displayed as per the tank group parameter.

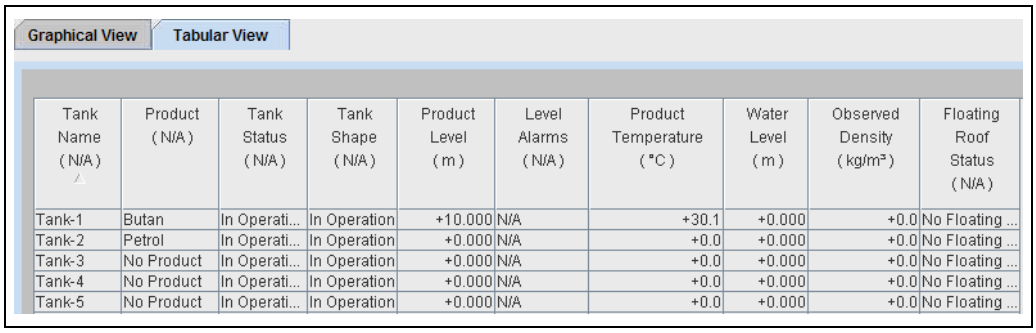
Depending on the tank group type the graphical information is as follows:

Tank Group Type	Graphical Information
Static Tank Group	The system displays the measured graphical information of the tanks at the time of selecting the relevant tank group.
Dynamic Tank Group	The user can view the measured graphical information of the tanks, which will be shown dynamically on the web page. The user can view the information on a real time basis. 1. In case, a product transfer is taking place under a dynamic tank group, the tank will be shown under (a) the **Tanks in Armed** tank group, if the user has created a new product transfer for a tank, or (b) the **Tanks in Transfer** tank group, if the status of product transfer is changed to "Active" from the "Armed" stage. 2. If the tank group is customized, then the tanks will be displayed in the tank group based on the filtration criteria that have been configured. For example, if **Alarm Type** is selected as **High Alarm** in the **Add New Dynamic Tank Group** screen, then the tank group will display only those tanks with **High Alarm** on the **Real Time Tank Group** screen.

6.14.2 Tabular View of the Tank Group Details

To view the tank group details in tabular format

1. On the Customized Groups - <Tank Group> name screen, click the **Tabular View** tab. Tankvision displays the screen as follows:



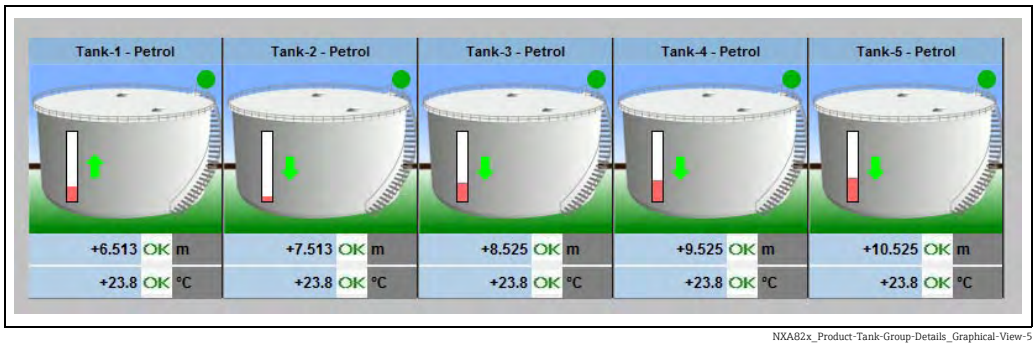
Tank Name (N/A)	Product (N/A)	Tank Status (N/A)	Tank Shape (N/A)	Product Level (m)	Level Alarms (N/A)	Product Temperature (°C)	Water Level (m)	Observed Density (kg/m³)	Floating Roof Status (N/A)
Tank-1	Butan	In Operati...	In Operation	+10.000	N/A	+30.1	+0.000	+0.0	No Floating ...
Tank-2	Petrol	In Operati...	In Operation	+0.000	N/A	+0.0	+0.000	+0.0	No Floating ...
Tank-3	No Product	In Operati...	In Operation	+0.000	N/A	+0.0	+0.000	+0.0	No Floating ...
Tank-4	No Product	In Operati...	In Operation	+0.000	N/A	+0.0	+0.000	+0.0	No Floating ...
Tank-5	No Product	In Operati...	In Operation	+0.000	N/A	+0.0	+0.000	+0.0	No Floating ...

6.15 How to view transfer groups

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

To view the product transfer group details in graphical format

1. On the Transfers - <Product Transfer Group Name> screen, click the **Graphical View** tab. Tankvision displays the screen as follows:



NXA82x_Product-Tank-Group-Details_Graphical-View-5

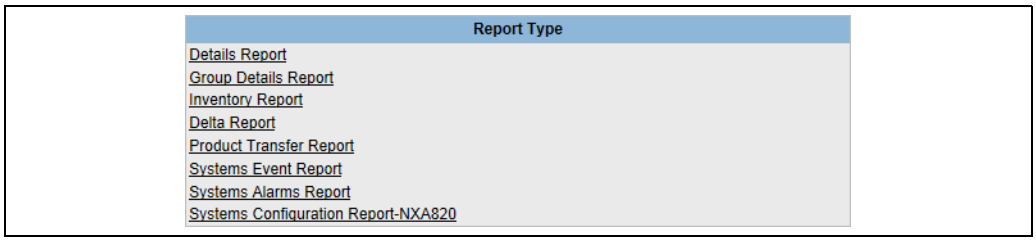
6.16 How to issue reports

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

In this chapter, you will learn how to generate reports.

To generate a report

1. On the Navigation Tree, click the **Reports** header. Tankvision displays the screen as follows:



NXA82x_Report-Type

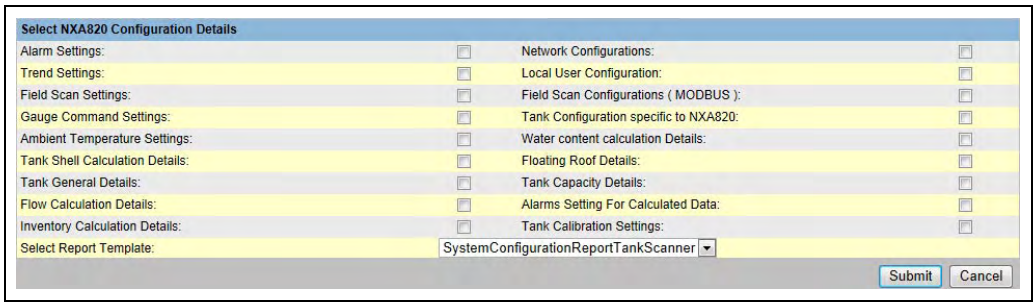
2. Select the type of report you are going to configure from the list.

Depending on the type of Tankvision unit and the system configuration, the following report types may be available:
- System Configuration Report - Tank Scanner[2)]
- System Configuration Report - Data Concentrator[2)]
- System Configuration Report - Host Link[2)]
- Product Transfer Report
- Systems Event Report
- Systems Alarm Report
- Tank Delta Report
- Tank Details Report
- Tank Group Details Report
- Inventory Report (V01.04.00)

3. On the following page, define which data are to be included into the report and which report template is to be used.
4. Click the **Submit** button.
5. After a couple of seconds Tankvision displays the report.

2) Depending on the Tankvision unit.

6.16.1 Select NXA820 Configuration Details

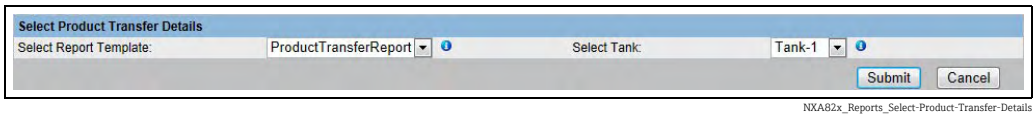


NXA82x_Reports_Select-NXA820-Configuration-Details

Field	Description
Alarm Settings	Generate a report of the alarm settings.
Trend Settings	Generate a report of the Trend settings.
Field Scan Settings	Generate a report of the Field Scan settings.
Gauge Command Settings	Generate a report of the Gauge Command settings.
Ambient Temperature Settings	Generate a report of the Ambient Temperature settings.
Tank Shell Calculation Details	Generate a report of the Tank Shell Calculation Details.
Tank General Details	Generate a report of the Tank General Details.
Flow Calculation Details	Generate a report of the Flow Calculation Details.
Inventory Calculation Details	Generate a report of the Inventory Calculation Details.
Select Report Template	Allows to select the report template to be used for the product transfer report.
Network Configuration	Generate a report of the Network Configuration.
Local User Configuratoin	Generate a report of the Local User Configuration.
Field Scan Configuration (V1)	Generate a report of the Field Scan Configuration (V1).
Tank Configuration specific to NXA820	Generate a report of the Tank Configuration specific to NXA820.
Water content calculation Details	Generate a report of the Water content calculation Details.
Floating Roof Details	Generate a report of the Floating Roof Details.
Tank Capacity Details	Generate a report of the Tank Capacity Details.
Alarms Setting For Calculated Data	Generate a report of the Alarms Settings For Calculated Data.
Tank Calibration Settings	Generate a report of the Tank Calibration Settings.

1. Click the **Submit** button.
2. After a couple of seconds Tankvision displays the report.

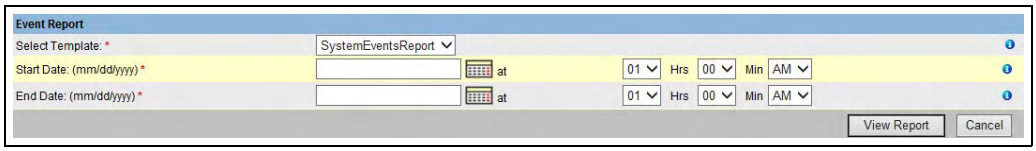
6.16.2 Select Product Transfer Details



NXA82x_Reports_Select-Product-Transfer-Details

Field	Description
Select Report Template	Selection list for installed Product Transfer report templates. If additional templates are installed user must select the wanted template. By default first template is selected.

6.16.3 Event Report

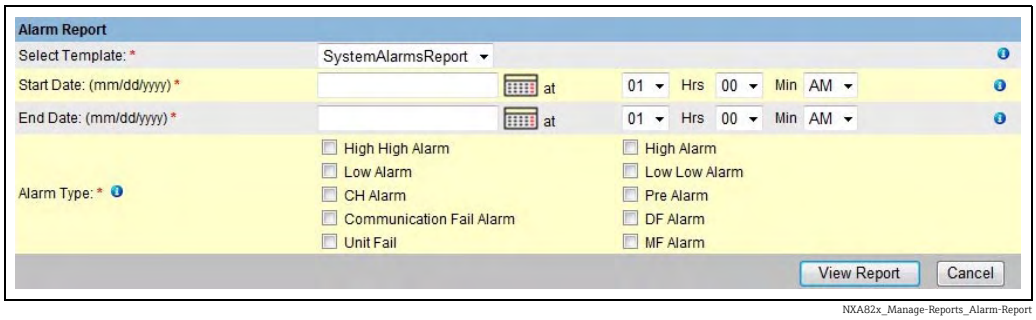


NXA82x_Manage-Reports_Event-Report

Field	Description
Select Template	Allows to select the report template to be used for event report.
Start Date	Define the start date (and time) for the event report.
End Date	Define the end date (and time) for the event report.

1. Click the **View Report** button.
2. After a couple of seconds Tankvision displays the report.

6.16.4 Alarm Report

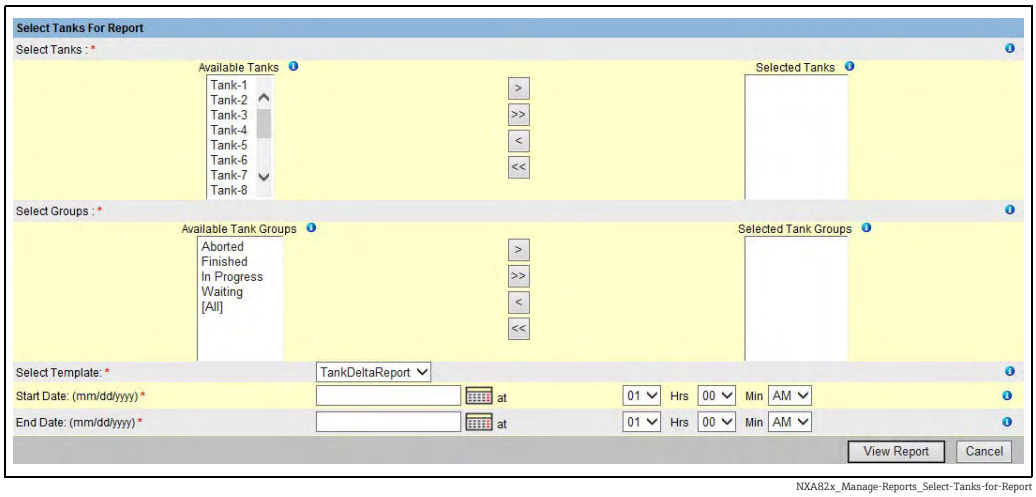


NXA82x_Manage-Reports_Alarm-Report

Field	Description
Select Template	Allows to select the template to be used to generate the alarm report.
Start Date	Define the start date (and time) for the alarm report.
End Date	Define the end date (and time) for the alarm report.
Alarm Type	Allows to select the type of alarm to be included into the alarm report.

1. Click the **View Report** button.
2. After a couple of seconds Tankvision displays the report.

6.16.5 Select Tanks For Tank Report



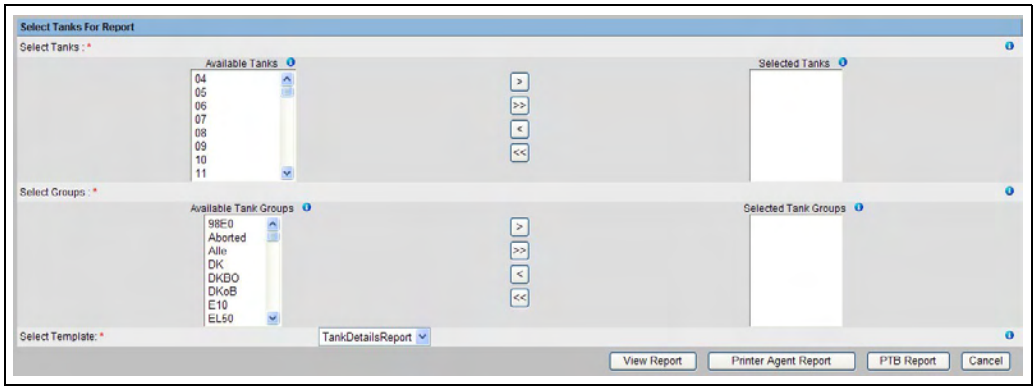
NXA82x_Manage-Reports_Select-Tanks-for-Report

Field	Description
Select Tanks	Allows to select the tanks to be included into the Tank report.
Select Groups	Allows to select the group of tanks to be included into the tank report.
Select Template	Allows to select the template to be used to generate the tank report.
Start Date	Define the start date (and time) for the tank report.
End Date	Define the end date (and time) for the tank report.

1. Click the **View Report** button.
2. After a couple of seconds Tankvision displays the report.

6.16.6 Select Tanks For Tank Detail Report

In case of using a Tankvision Data Concentrator with serial printer port option an additional print report button **PBT Report** is available.



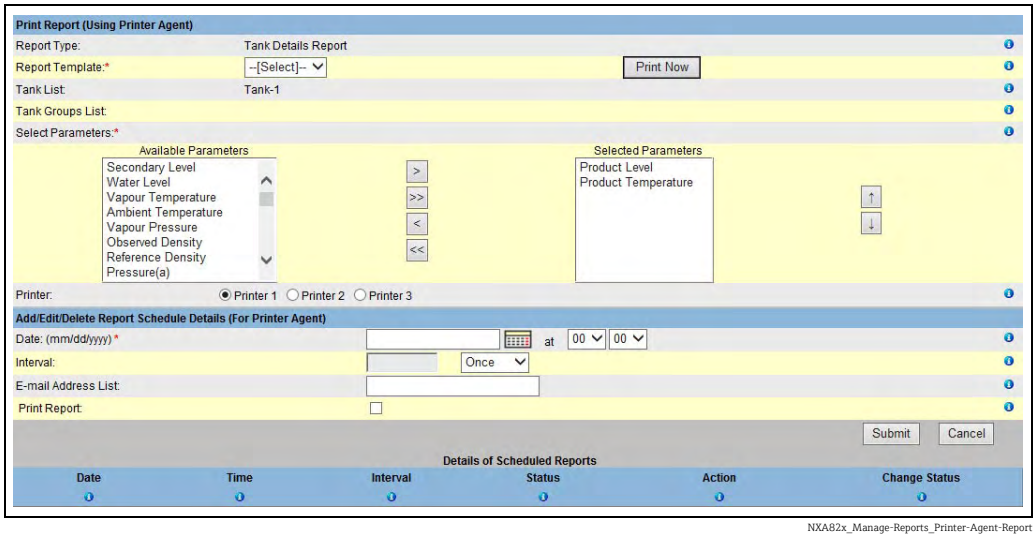
To use this functionality an appropriate template only containing plain text must be selected.

Field	Description
Select Tanks	Allows to select the tanks to be included into the Tank detail report.
Select Groups	Allows to select the group of tanks to be included into the tank detail report.
Select Template	Allows to select the template to be used to generate the tank detail report.

1. Click the **View Report** button.
2. After a couple of seconds Tankvision displays the report.

How to get a print out

Click on **Printer Agent Report** to initiate a print out.



NXA82x_Manage-Reports_Printer-Agent-Report

Select Template, the parameters of the selected Tanks/Tank Groups and the printer. With **Print now** the report is immediately send (via the Tankvision Printer Agent) to the selected

printer. In the section **Add/Edit/Delete Report Schedule Details (for printer agent)**[3] a scheduled print out can be set:
- As 1 time event by selecting a date and time
- As periodic event by selecting in addition to start day and time the interval

An email address can be entered the report should be send to and if a report should be printed can be selected. Click on **PTB Report** to initiate a print out via the connected serial plain text printer (Data Concentrator NXA821 only).

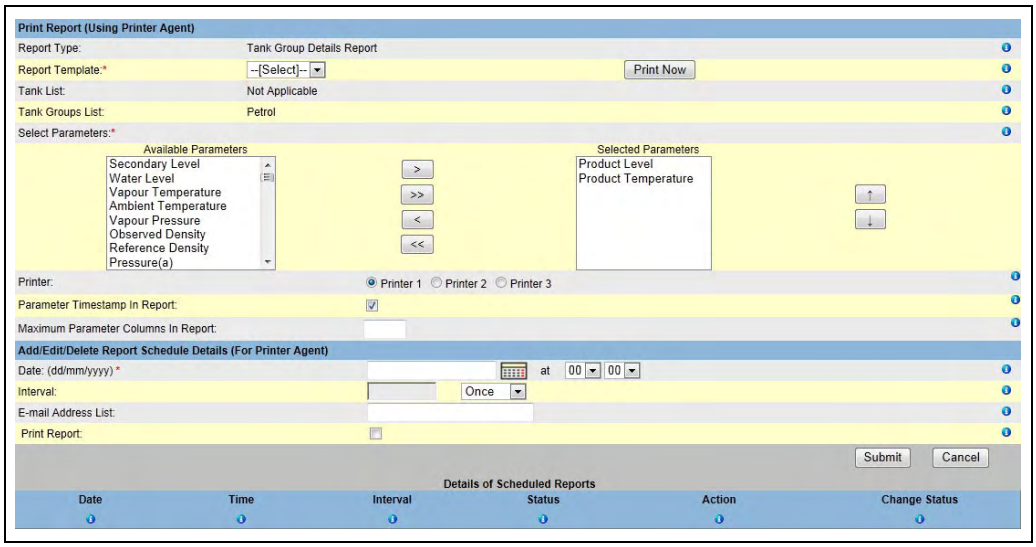
6.16.7 Select Tank Groups For Report

Field	Description
Select Groups	Allows to select the group of tanks to be included into the tank group report.
Select Template	Allows to select the template to be used to generate the tank group report.

1. Click the **View Report** button.
2. After a couple of seconds Tankvision displays the report.

How to get a print out

Click on **Printer Agent Report** to initiate a print out.



NXA82x_Reports_Tank-Group-Details-Report_Print

Select Template, the parameters of the selected Tanks/Tank Groups and the printer. With **Print now** the report is immediately send (via the Tankvision Printer Agent) to the selected printer.

3) Printer Agent, see BA00426G/00/EN Chapter "Tankvision Printer Agent".

In the section **Add/Edit/Delete Report Schedule Details (for printer agent)**[4] a scheduled print out can be set:
- As 1 time event by selecting a date and time
- As periodic event by selecting in addition to start day and time the interval

An email address can be entered the report should be send to and if a report should be printed can be selected. Click on **PTB Report** to initiate a print out via the connected serial plain text printer (Data Concentrator NXA821 only).

4) Printer Agent, see BA00426G/00/EN Chapter "Tankvision Printer Agent".

6.17 How to view and acknowledge alarm

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

6.17.1 Overview of the Alarm and Event Panel

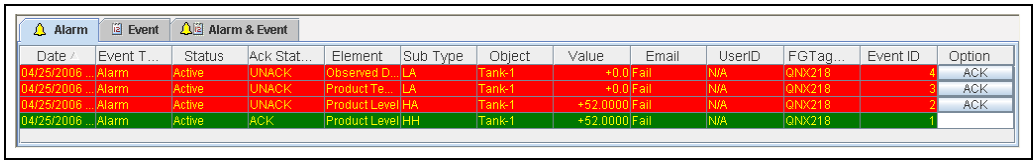
The **Alarm and Event Panel** of the Tankvision system displays an overview of the Alarms and Events generated by the system. The system will also pop up the message to the user in the local personal computer if an alarm pop up application is installed on that workstation.

Alarm Summary

Alarms:
Alarms are conditions pertaining to the functioning of the Tank or Tank elements. These conditions must be communicated to the user. The user may take the necessary actions based on the critical alarm displayed on the screen. These conditions are pre-defined by the user with valid access rights (for example, supervisor/ technician) while configuring a tank and the tank elements.
The Tankvision system is configured to raise various alarms based on measured data, calculated tank data, and alarm settings. The system continuously monitors the measured and calculated data and compares them with the preset alarm conditions such as Hold-off time and set point values. Whenever the value of a measured datum deviates from the set point value and remains deviated for a time span greater than or equal to the hold-off time, the system raises the appropriate alarm. The alarm will appear in the **Alarm** overview tab on the respective unit. The Operators receive the alarm notification on their computer screen in the form of a pop up window.

To view the Alarm Summary

1. Click the **Alarm** tab. Tankvision displays the alarm information as follows:



Field	Description
Date	This column displays the date and time at which the alarm was raised.
Event Type	This column indicates whether the alarm that is raised is a system alarm.
Status	This column indicates the status of the alarm in terms of **Active** or **Inactive**. Active Alarm: The alarm is active and not yet acknowledge by an operator. Inactive Alarm: The alarm is inactive and not acknowledged by an operator.
Ack Status	This column indicates whether an alarm is acknowledged or not by an operator **ACK**: The alarm is acknowledged. **UNACK**: The alarm is not acknowledged.
Element	This column indicates the name of the data element that has triggered the alarm. For example: level, temperature, pressure, etc. If the value of a data element deviates from the set point value the system raises an alarm.
Sub Type	This column indicates the severity of alarm that is raised. Alarm types range from those with highest priority to those with least priority. The examples for alarm sub- types are, "HH", "HL". "LA", etc.
Object	This column indicates the source of the alarm such as a tank, product, user or a Tankvision unit.
Value	This column indicates the currently measured value of the data element, due to which the alarm was raised, with its corresponding unit.

Field	Description
Email	This column indicates the e-mail delivery status: whether an e-mail was sent successfully to the configured mail server or not. **OK**: The e-mail was successfully sent. **FAILED**: The e-mail-sending failed.
UserID	This column indicates the name of the user which was logged in at the time when the alarm was generated.
FGTagName	This column indicates the tag name of the Tankvision unit which has raised the alarm. The FGTagName is the host name of the server.
Event ID	This column indicates the event ID of the alarm. Every Tankvision unit has a unique numerical ID.
Option	This column allows the user to acknowledge an alarm if required. The user can acknowledge the alarm once he makes sure that the specific condition is under control. This acknowledgement status is broadcast to all Tankvision units. **ACK**: The **ACK** button appears when an alarm needs to be acknowledged. A blank field appears when the alarm has already been acknowledged. Reference: Refer to "Types of Alarms" (→ 63) and "Alarm Color Schemes" (→ 64).

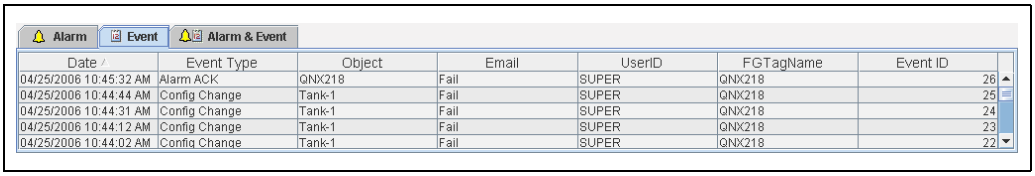
Whenever you acknowledge an alarm, the system raises and displays the appropriate event.

Event Summary

Events:
Apart from alarms, the Tankvision system also generates various "system events". System events are generated for changes in the state of system or for certain actions carried out by users. Unlike alarms, events need not to be acknowledged by users. Examples of system events are configuration changes, Start Field Scan, Stop Field Scan, Alarm ACK, etc.

To view the event summary

1. Click the **Event** tab. Tankvision displays the event information as follows:



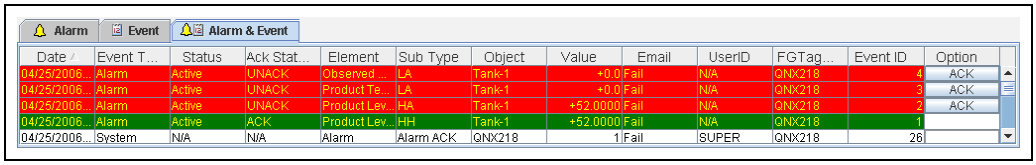
Field	Description
Date	This column displays the date and time at which the alarm was raised.
Event Type	This column indicates whether the alarm that is raised is a system malfunction alarm or a change in system configuration.
Object	This column indicates the source of the alarm such as a tank, product, user or a Tankvision unit.
Email	This column indicates the e-mail delivery status: whether an e-mail was sent successfully to the configured mail server or not. **OK**: The e-mail was successfully sent. **FAILED**: The e-mail-sending failed.
User ID	This column indicates the logon name of the user.
FGTagName	This column indicates the tag name of the Tankvision unit which has raised the event or alarm. The FGTagName is the host name of the server.
Event ID	This column indicates the Identification (ID) numbers of the Tankvision units in concern. Every Tankvision unit has a unique numerical ID.

Alarm and Event Summary

You can view the list of raised alarms as well as events in a single window. If an attribute is not related to that particular alarm or event, then the corresponding entry for the attribute is **N/A**.

To view the alarm and event summary

1. Click the **Alarm & Event** tab. Tankvision displays the alarm and event information as follows:



The attributes of the Alarm and Events Summary screen are described in "Alarm Summary" (see above).

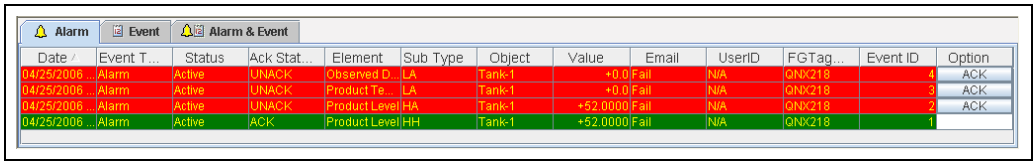
6.17.2 Types of Alarms

Alarm Sub-Types:
The Tankvision system raises different types of alarms depending on the value of a data element such as product level, temperature, pressure, etc. in comparison with the set point. Different alarm types are described in the table below.

Sub Type	Description	Is Set off
HH	High High Alarm	Whenever the value of a data element raises above the HH set point and remains there for an interval greater than or equal to the hold-off time for the alarm. Data Elements that set off alarms when they deviate from the predefined set point value, are as follows: Product Level, Temperature, Pressure, Density, Product Secondary level, Water level, Vapor pressure, Vapor temperature.
HA	High Alarm	Whenever the value of a data element raises above the HA set point and remains there for an interval greater than or equal to the hold-off time for the alarm. This alarm sub-type is similar to HH but with lower severity than HH. The set point for HA is lower than the set point for HH.
MF	Max Fill Alarm	The Max. Fill Alarm (MF) is indicating that the tank which is filling has reached or exceeded the Normal fill level. The normal fill level (normal capacity) may be defined as the level to which the tank will intentionally be filled on a routine basis, using the normal process control system. The normal fill level will be dependent on the preceding levels and should be sufficiently far below the LAH to avoid spurious activation, eg due to level surges during filling or thermal expansion of the contents. This level is also called Maximum working level. Enter the appropriate value for the Max. Fill Alarm set point. This set point is used to detect whether any of the following parameters have reached their respective MF alarm value, namely: Product Level. The MF Alarm set point should be less than the HA alarm for the corresponding parameter and less than the Gauge Reference Height. The data type for this field is numeric.
LA	Low Alarm	Whenever the value of a data element falls below the LA set point and remains there for an interval greater than or equal to the hold-off time for the alarm.
LL	Low Low Alarm	Whenever the value of a data element falls below the LL set point and remains there for an interval greater than or equal to the hold-off time for the alarm. This alarm sub-type is similar to LA but with higher severity than LA. The set point for LL is lower than the set point for LA.
CH	Change Alarm	Whenever the rate of change of the data element level increases above the CH set point and remains above there for an interval greater than or equal to the hold-off time for the alarm. This alarm is raised only when the tank is in the "Locked" status (→ 43).
DF	Difference Alarm	Whenever the absolute value of the difference between product level and product secondary level increases above the DF set point and remains there for an interval greater than or equal to the hold-off time for the alarm.
FL	Fail Alarm	Whenever the gauge status received from a gauge indicates that the gauge has failed.
CO	Gauge Communication Error Alarm	Whenever the communication with a gauge fails due to a timeout error.
TO	Time out / Age Alarm	Whenever the data received from a gauge is too old.

6.17.3 Alarm Color Schemes

The Tankvision system highlights the alarms using different text and background colors to indicate the priority of each alarm as shown in the figure below.



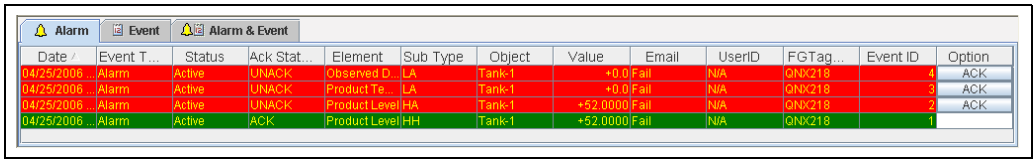
Background Color	Text Color	Indicates
Dark Green	Bright Yellow	An active and acknowledged alarm
Light Red	Bright Yellow	An active and unacknowledged alarm
Yellow	Red	An inactive and unacknowledged alarm
White	Black	An inactive and acknowledged alarmed

6.17.4 Acknowledging an Alarm

One of the important aspects of an alarm is alarm acknowledgement. As long as an alarm is not acknowledged, a new alarm of the same kind for the same tank is not generated, even if the related datum again crosses the configured set point. Therefore, a new alarm of the same type is generated only after the current alarm has become inactive and has been acknowledged by the user.
Alarm acknowledgment ensures that the alarm condition has been brought to the notice of operators. Alarms can be acknowledged from the Alarm summary displayed in the **Alarm and Event** Panel of the user interface or alarm pop up agent, or from a host system connected to the Tankvision system.

To acknowledge an alarm

1. Click the **ACK** button in the **Option** column.



When more than one user acknowledges the alarm at the same time, the system will record the first user as a user who acknowledged the alarm. For all other users, the system will display the error message "Alarm has already been acknowledged".

Error Messages

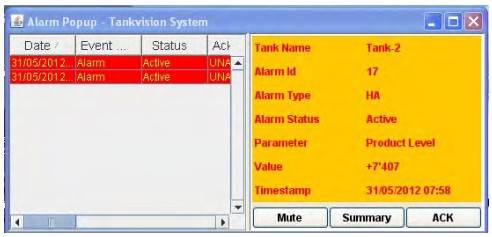
1. "You Do Not Have Access Rights to Acknowledge Alarms!"
   This message appears if you do not have authority to acknowledge an alarm. Only the user with valid access rights (for example, supervisor/ technician) can acknowledge an alarm.

6.17.5 Alarm Pop up Agent

- The Alarm Pop up Agent is a windows program installed on a PC, connecting to NXA820/ NXA821.
- The program is running in the background and scans for alarms generated in NXA820/ NXA821.
- If an alarm is present, a pop up window opens displaying the alarm.
- The alarm can be acknowledged within this window.
- The window can only be closed if no alarm is active.

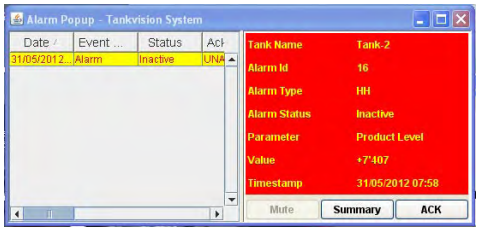
In case an alarm is present the Alarm pup up agent pops up and stays in front of all open windows (and can't be closed with an active alarm). Also a horn sound is present (for the Max. Fill alarm (MF) the sound is different to the other alarms as is has a lower severity).

By selecting one alarm in the left list more information is shown on the right side:



With clicking on the button **Mute** the sound can be switched off. By clicking on the button **Summary** a browser window/tab opens showing the present alarms and events (→ 60, "Overview of the Alarm and Event Panel").
By clicking on **ACK** the alarm gets acknowledged in the pop up agent and the system (also in Tankvision user interface the alarm is acknowledged). The alarm disappears from the pop up window and the acknowledgment gets recorded in the event log.

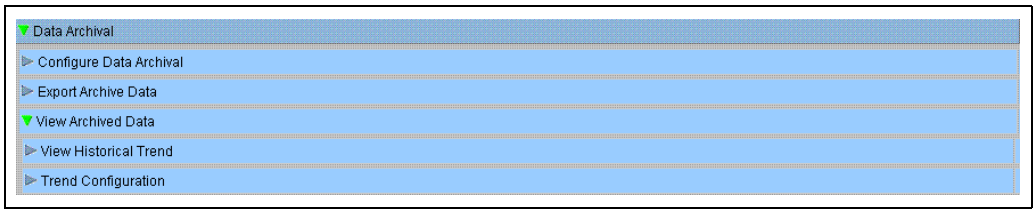
Also in the pop up agent the color scheme is followed:
Inactive alarms are indicated like in the picture below.



6.18 How to select and view historical trends

The below descriped operations can be performed with the default user access rights for an operator ("User access rights", → 11).

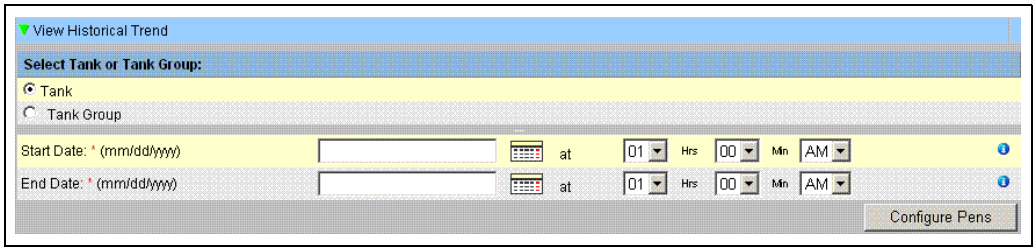
On the Navigation Tree, click the **System** header. Click **Global Settings** → **Data Archival**. Click ▶ on **View Archived Data**. Tankvision displays the screen as follows:



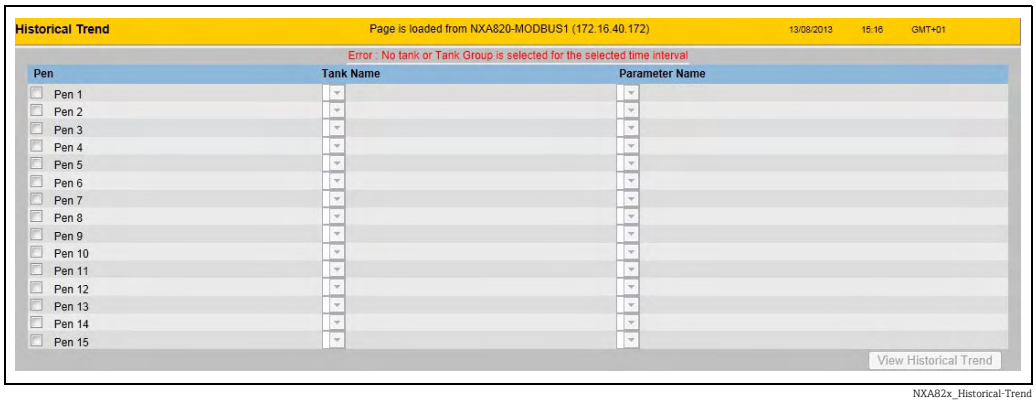
Field	Description
View Historical Trend	User operational page to define value(s) of tank(s) which shall be displayed in a graph.
Trend Configuration	Pen configuration page for the historical graph.

Historical trend can also be reached direct from navigation tree.

6.18.1 View Historical Trend

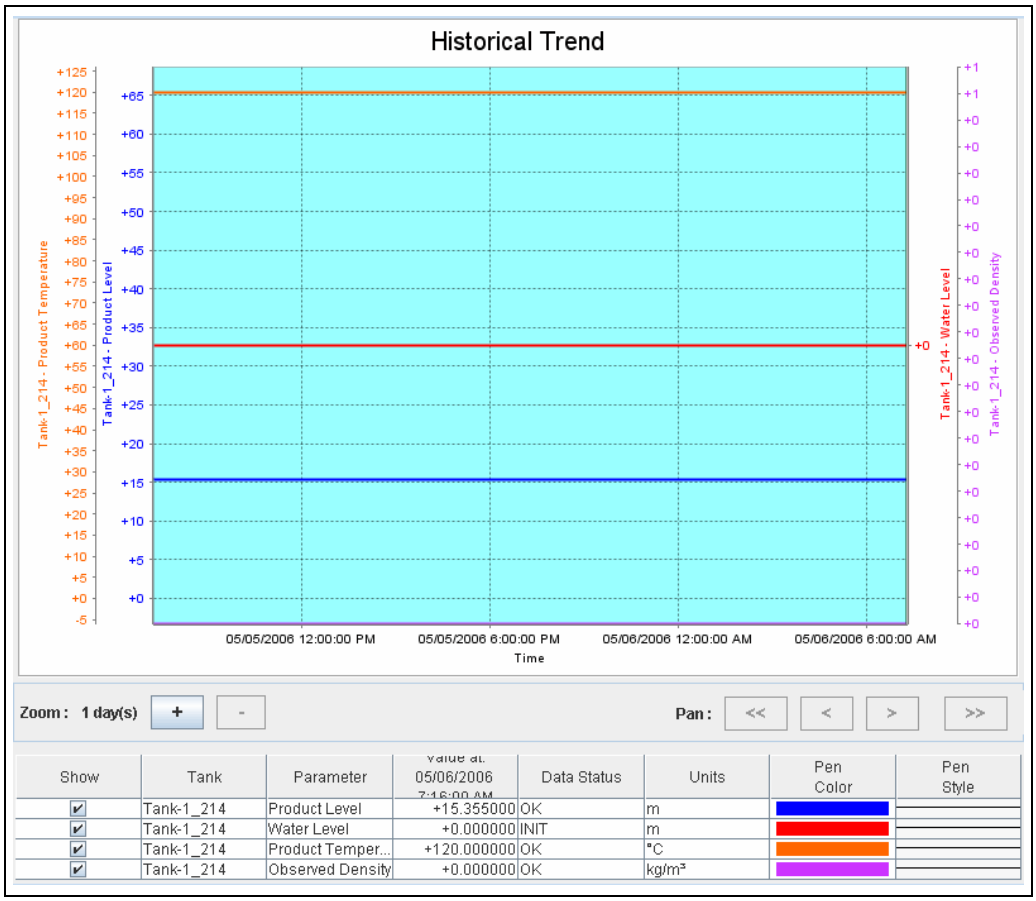


Select Tank for Tank Groups and Intervall which should be displayed and continue by clicking **Configure Pens**. Tankvision displays the screen as follows:



NXA82x_Historical-Trend

Click on **View Historical Trend**. Tankvision displays the Historical Trend as follows:

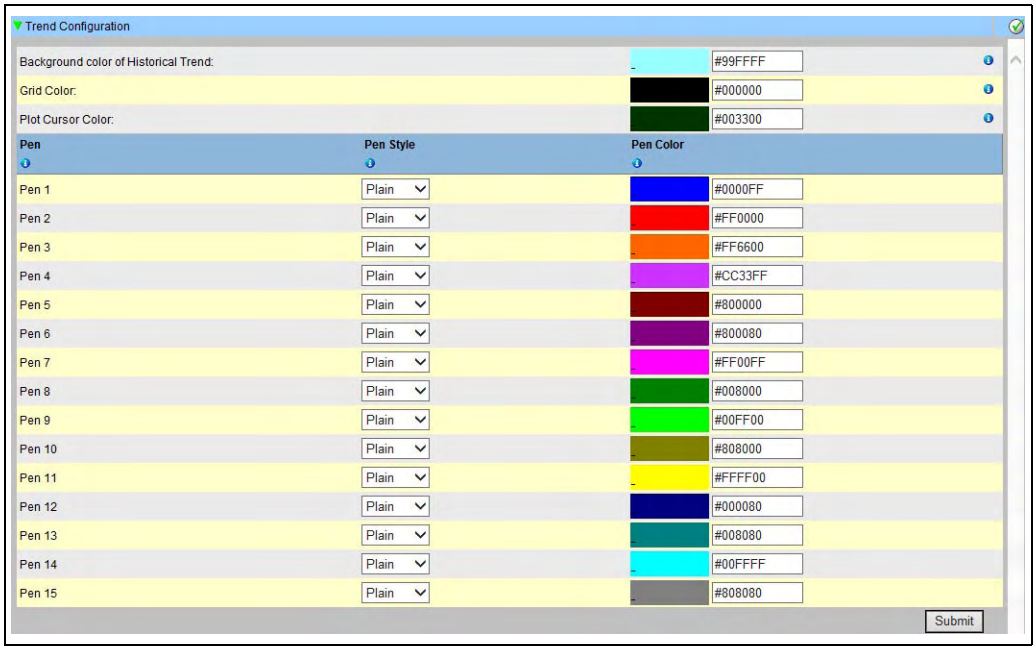


Show	Tank	Parameter	Value at: 05/06/2006 7:16:00 AM	Data Status	Units	Pen Color	Pen Style
☑	Tank-1_214	Product Level	+15.355000	OK	m		
☑	Tank-1_214	Water Level	+0.000000	INIT	m		
☑	Tank-1_214	Product Temper...	+120.000000	OK	°C		
☑	Tank-1_214	Observed Density	+0.000000	OK	kg/m³		

Refer to the "View Real Time Trend" section (→ 29) for the description of the above screen.

6.18.2 Trend Configuration

Configuration of the Trend screen.



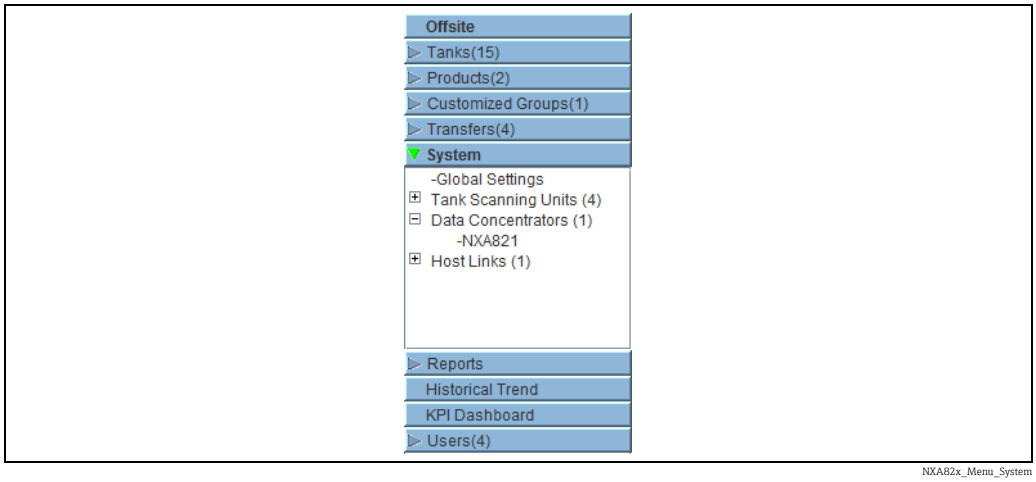
NXA82x_Trend-Configuration

Column	Description
Pen	This column displays a list of colors that can be selected for the drawing pen on the trend's screen.
Pen Style	Select the appropriate pen style from the drop down list. This column displays the types of pen styles that can be used on the trend's screen.
Pen Color	Click the color palette icon to select the appropriate pen color. This field displays the colors configured for the drawing pen.

6.19 How to check the sealing status

The default user rights of the operator do not allow changes in the settings. Viewing the settings is possible.

1. In the Navigation Tree, click the **System** header. It expands as follows:



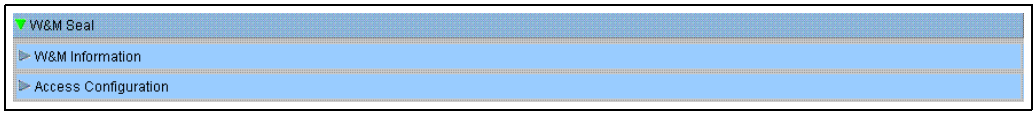
NXA82x_Menu_System

2. Click **Global Settings**. Tankvision displays the screen as follows:

NXA82x_Global-Settings-Screen

To view the W&M Approved Status

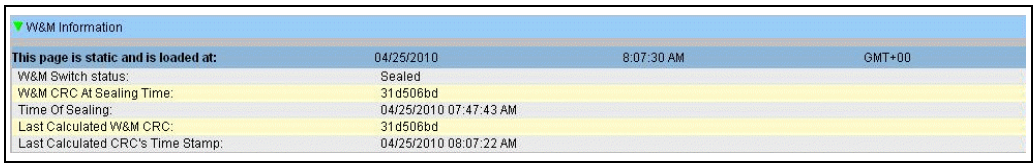
Click ▶ on **W&M Seal**. Tankvision displays the screen as follows:



Field	Description
W&M Information	Shows detailed information of sealing status for a device: ▪ W&M Switch status ▪ W&M CRC at sealing time ▪ Time of sealing ▪ Last calculated W&M CRC ▪ Last calculated CRC's time stamp
Access Configuration	Registration page to configure access rights for a PC that can access the device after sealing.

6.19.1 W&M Information

Click ▷ on **W&M Information**. Tankvision displays the screen as follows:



Field	Description
This page is static and is loaded at:	Displays the date and time when the screen was locked. This is a static page meaning no auto update is running.
W&M switch status	Displays the current W&M switch status. The status can be sealed (closed W&M switch) or unsealed (open W&M switch).
CRC at sealing time	A checksum is calculated with closing the W&M switch. This checksum is displayed in this field.
Time of sealing	Displays the date and time the sealing took place.
Last Calc. W&M CRC	Displays the latest calc. W&M checksum. The checksum is recalculated on a regular basis. In case of an mismatch of the recalculated checksum with the initial checksum, the system was manipulated.
Last calc. W&M CRC time stamp	Displays date and time of the last calculated W&M checksum.

The **W&M CRC at sealing time** and the **Last calc. W&M CRC** must be identical.
The **Last calc. W&M CRC time stamp** must not be older than 9h.

7 Maintenance

There are no special maintenance operations which could be performed by the Operator for the Tankvision Tank Scanner, Data Concentrator, Host Link or OPC Server.

8 Troubleshooting

Finding	Solution
The user interface is not loaded completely	1. Press F5 or the reload button in the browser navigation bar. 2. If the above didn't resolve the issue check if the compatibility mode (Internet Explorer 8 or 9) is switched on. If PC user rights do not allow performing the action above contact the supervisor. 3. If the above didn't resolve the issue delete the cache of the browser (recommendation: Reduce the cache size to 0). If PC user rights do not allow performing the action above contact the supervisor. 4. If the above didn't resolve the issue check the settings of the JAVA Runtime (the automatic updates must be switched of and the temporary internet files must be emptied and switched of too). If PC user rights do not allow performing the action above contact the supervisor.
The IP address is forgotten	The IP address is shown on the local display.
The user interface is out of size	Check the display settings. Recommended resolution is 1280x1024 (or higher)

9 Repair

For repairs on Tankvision Tank Scanner, Data Concentrator and Host Link contact Endress+Hauser.

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