BA00339G/00/EN/21.24-00
71659386
2024-05-15

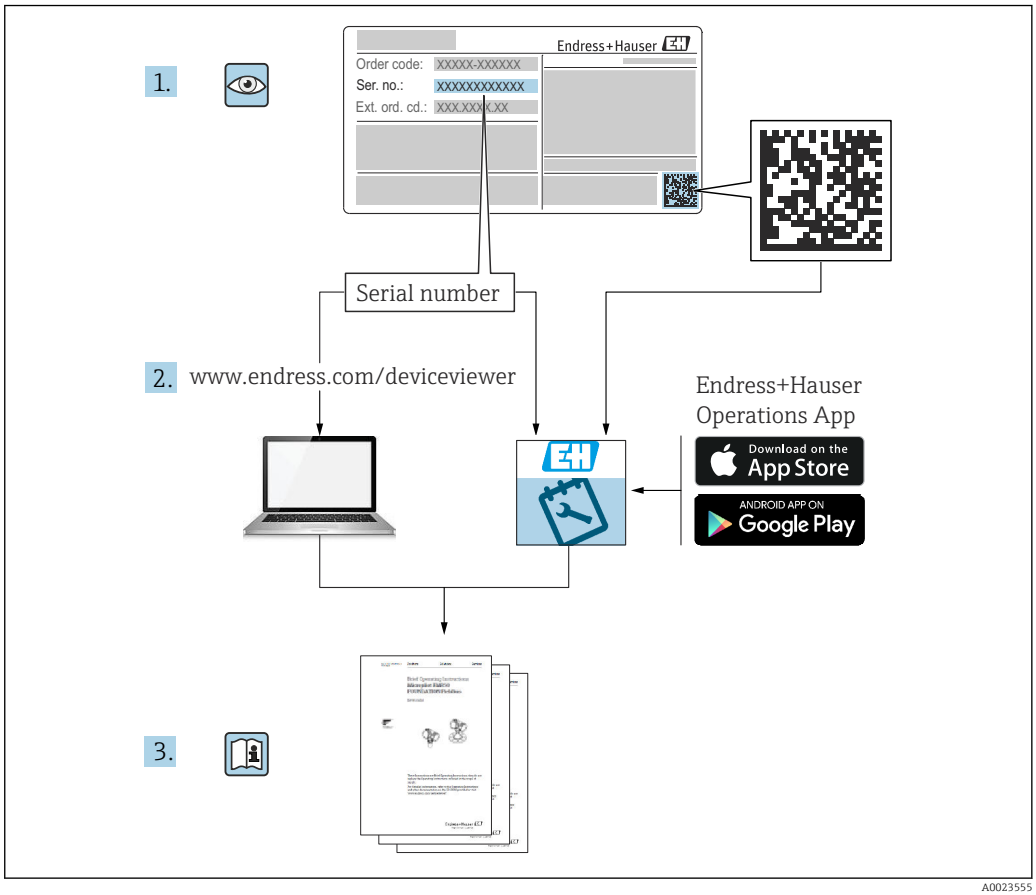
Valid as of version
02.03.01

Operating Instructions
Tankvision NXA820, NXA821, NXA822

Inventory Control
Description of Instrument Functions

Endress+Hauser
People for Process Automation

- Make sure the document is stored in a safe place such that it is always available when working on or with the device.
- To avoid danger to individuals or the facility, read the "Basic safety instructions" section carefully, as well as all other safety instructions in the document that are specific to working procedures.
- The manufacturer reserves the right to modify technical data without prior notice. Your Endress+Hauser sales organization will supply you with current information and updates to this manual.


1.
Endress+Hauser
Order code: XXXXX-XXXXXX
Ser. no.: XXXXXXXXXXXX
Ext. ord. cd.: XXX.XXXX.XX
Serial number
2. www.endress.com/deviceviewer
Endress+Hauser
Operations App
Download on the
App Store
ANDROID APP ON
Google Play
3.

A0023555

Change history

BA0339G/16.17
- Valid for software version: 02.00.00
- Changes to the previous version:
  Introduced Temperature and Density Profile

BA00339G/17.17
- Valid for software version: 02.01.00
- Changes to the previous version:
  - Introduced Floating Roof Weight Correction
  - Redundancy functionality with NXA820 Interface Only
  - CH alarm for Volume or Mass

BA00339G/18.18
- Valid for software version: 02.02.00
- Changes to the previous version:
  Introduced Switch by Gauge redundancy mode for NXA820 Interface Only

BA00339G/19.20
- Valid for software version: 02.03.00
- Changes to the previous version:
  Introduced tank comment fields and improved the change alarm functions

BA00339G/19.23-00
- Valid for software version: 02.03.01
- Changes to the previous version:
  Bug fix version

BA00339G/20.24-00
- Valid for software version: 02.03.01
- Changes to the previous version:
  Update Error messages

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1 About this document

1.1 Document function

This manual is giving detailed information on the system capabilities and architecture. It supports project and sales engineers in designing the system architecture during acquisition and execution phase. Furthermore the needed service information during system operation can be retrieved by servicing personnel.

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.

This manual is for day to day use of the Tankvision system. This manual will help in configuring and using the Tankvision system.

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 Symbols

1.2.1 Safety symbols

DANGER
This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.

WARNING
This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in serious or fatal injury.

CAUTION
This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in minor or medium injury.

NOTICE
This symbol alerts you to a potentially harmful situation. Failure to avoid this situation can result in damage to the product or something in its vicinity.

1.2.2 Symbols for certain types of information and graphics

Tip
Indicates additional information

Reference to documentation

Reference to graphic

▶
Notice or individual step to be observed

1., 2., 3.
Series of steps

↳
Result of a step

1, 2, 3, ...
Item numbers

A, B, C, ...
Views

⚠ → 📖 **Safety instructions**
Observe the safety instructions contained in the associated Operating Instructions

1.3 Documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- *Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from the nameplate
- *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate.

1.4 Registered trademarks

1.4.1 Microsoft, Windows

Microsoft and Windows are registered trademarks of the Microsoft Corporation

1.4.2 Modbus™

Modbus is a registered trademark of Schneider Electric USA, Inc.

1.4.3 ENRAF®

Registered trademark of Honeywell International Inc., Morris Plains, New Jersey, USA

1.4.4 HART®

Registered trademark of HART Communication Foundation, Austin, USA

1.4.5 Others

Honeywell, Rosemount, Emerson, Saab, L&J, GPE are registered trademarks and trademarks of these organizations and companies.

All other marks are property of their respective owners.

2 Basic safety requirements

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 starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
- Follow instructions and comply with basic conditions.

The operating personnel must fulfill the following requirements:
- Are instructed and authorized according to the requirements of the task by the facility's owner-operator.
- Follow the instructions in this manual.

2.2 Intended use

2.2.1 Applications

Tankvision is a dedicated tank inventory management system.

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

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

2.3 Workplace safety

For work on and with the device:
- Wear the required personal protective equipment according to federal/national regulations.

Before connecting or disconnecting the device:
- Switch off the supply voltage.

2.4 Operational safety

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

Modifications to the device

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

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

Repair

To ensure continued operational safety and reliability:

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

2.5 Product safety

This measuring device is designed in accordance with good engineering practice to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate.

It meets general safety standards and legal requirements. It also complies with the EU directives listed in the device-specific EU Declaration of Conformity. The manufacturer confirms this by affixing the CE mark to the device.

2.6 IT security

Our warranty is valid only if the product is installed and used as described in the Operating Instructions. The product is equipped with security mechanisms to protect it against any inadvertent changes to the settings.

IT security measures, which provide additional protection for the product and associated data transfer, must be implemented by the operators themselves in line with their security standards.

3 Incoming acceptance and product identification

3.1 Incoming acceptance

On receipt of the delivery:

1. Check the packaging for damage.
   ↳ Report all damage immediately to the manufacturer.
   Do not install damaged components.
2. Check the scope of delivery using the delivery note.
3. Compare the data on the nameplate with the order specifications on the delivery note.
4. Check the technical documentation and all other necessary documents, e.g. certificates, to ensure they are complete.

If one of the conditions is not satisfied, contact the manufacturer.

3.2 Product identification

The following options are available for identification of the device:
- Nameplate specifications
- Enter the serial number from the nameplate in the *Device Viewer* (www.endress.com/deviceviewer): all the information about the device and an overview of the Technical Documentation supplied with the device are displayed.
- Enter the serial number on the nameplate into the *Endress+Hauser Operations App* or scan the 2-D matrix code (QR code) on the nameplate with the *Endress+Hauser Operations App*: all the information about the device and the technical documentation pertaining to the device is displayed.

3.2.1 Nameplate

Do you have the correct device?

The nameplate provides you with the following information on the device:
- Manufacturer identification, device designation
- Order code
- Extended order code
- Serial number
- Tag name (TAG) (optional)
- Technical values, e.g. supply voltage, current consumption, ambient temperature, communication-specific data (optional)
- Degree of protection
- Approvals with symbols
- Reference to Safety Instructions (XA) (optional)

▶ Compare the information on the nameplate with the order.

3.2.2 Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany

Place of manufacture: See nameplate.

4 Getting started

4.1 Introduction to the Tankvision system

Tankvision is a tank inventory control system. Based on extensive engineering services, intelligent field device configuration, standardized bus technology and trend-setting software solutions, a web based system has been devised for the optimization of storage and delivery processes with Inventory and Process Control. This system provides tank inventory data to end users. Tank inventory control systems are mainly used in oil, gas, and petrochemical industries.

Tankvision allows worldwide access to inventory data. This enhances storage area optimization and improves logistics between the vendor and the final customer. Tankvision archives the inventory data for historical reports. Tankvision also manages product transfers and generates product transfer reports.

4.1.1 System Features

Tankvision is a web-based system running over the Intranet. The system provides an easy to use, GUI based multi-lingual interface. All you need is a web-browser to configure and view the system.

Tankvision acquires measured data such as level, temperature, pressure and density from field gauges. It then calculates tank inventory data such as product volume, mass, etc.

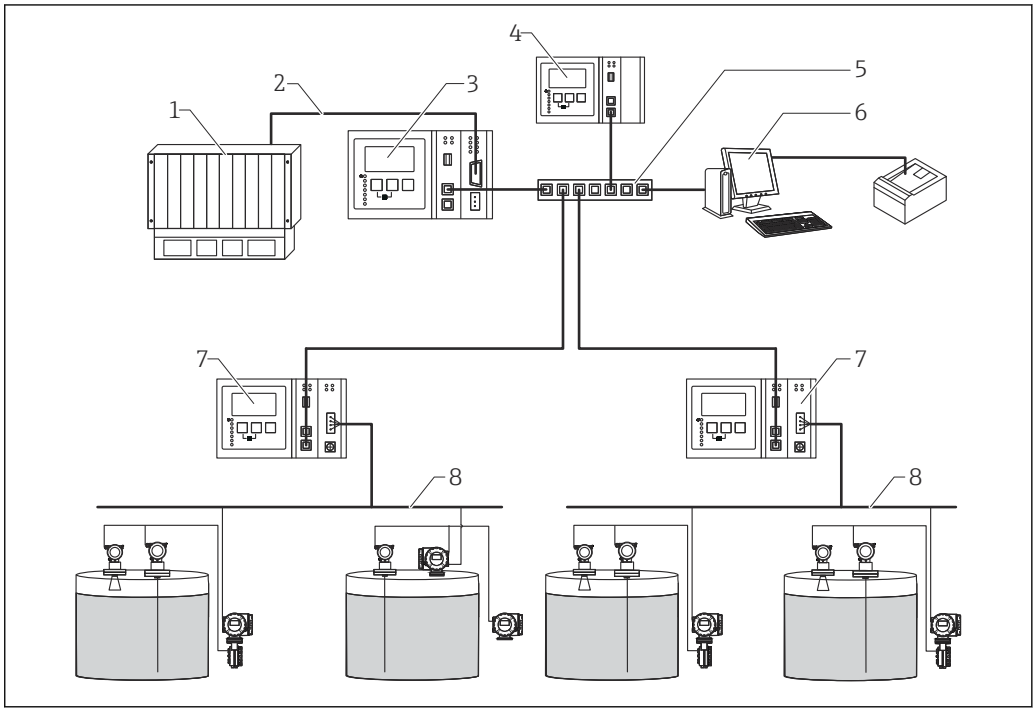
A list of Tankvision features is as follows:
- Provides measured data
- Performs inventory calculations
- Provides calculated inventory data
- Displays real-time trends and historical trends
- Displays and prints inventory reports
- Displays alarm and event notifications
- Displays Temperature and Density Profile data
- Provides redundancy with NXA820 Interface only

As a system, Tankvision provides:
- Web based interface
- Minimum configurations to get started
- No additional software to be installed
- Redundancy (planned)
- Pan caking of features to suite all kinds of installations
- Scalable
- Interface through standard network protocols
- Customizable web pages
- W&M compliance
- Inventory and Product Transfer Reports
- Multilingual user interface

4.1.2 System components

The Tankvision system is physically divided into separate units. Each unit is responsible for a specific operation. All Tankvision units are connected together through an Ethernet link.

The architecture for the Tankvision system is shown in the figure as follows:



1 *DCS /PLC (Distributed control system/Programmable logic controller)*
2 *Modbus*
3 *Host Link NXA822*
4 *Data Concentrator NXA821*
5 *Switch*
6 *Host Computer*
7 *Tank Scanner NXA820 (with inventory calculations)*
8 *Fieldbus protocol*

Tank Scanner NXA820:
- Captures measured data from the gauges installed on tanks.
- Provides measured data to other Tankvision units and visualization to end users.
- Provides the real-time trend of the measured data.
- Includes inventory calculations.
- Stores measured and calculated inventory data for a certain amount of time.
- Generates inventory reports and historical trends.

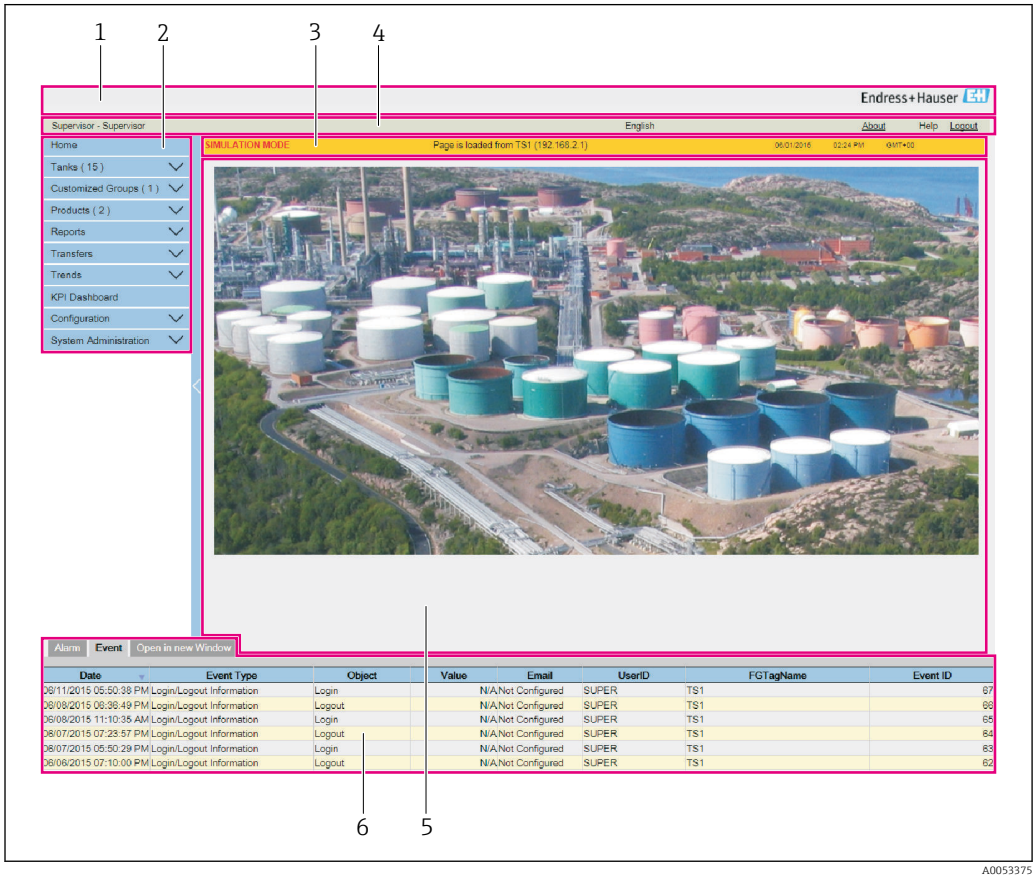
Data Concentrator NXA821:
- Provides a single entrance point to Tankvision systems with several NXA820 units.
- Enables grouping of tanks regardless to which NXA820 unit they are connected.

Host Link NXA822:
- Provides a Modbus link (serial Modbus or Modbus TCP/IP) to a DCS host or an Entis+ link to an Entis system.
- Enables Modbus compliant DCS software to monitor and control the tank farm operation.

4.2 The Tankvision 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.

4.2.1 The Home Page



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1 *System Header*
2 *Navigation Tree*
3 *Main Header*
4 *Metadata Header*
5 *Main View*
6 *Alarm and Event Panel*

System Header
Displays the Customer Logo or Graphic.

Navigation Tree
Contains header bars corresponding to different functional objects or groups in the system. Refer to "Navigation Tree - detailed description" (→ 15) for details.

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 non-real time data.
- Orange: the user has configuration rights and can view real time data.

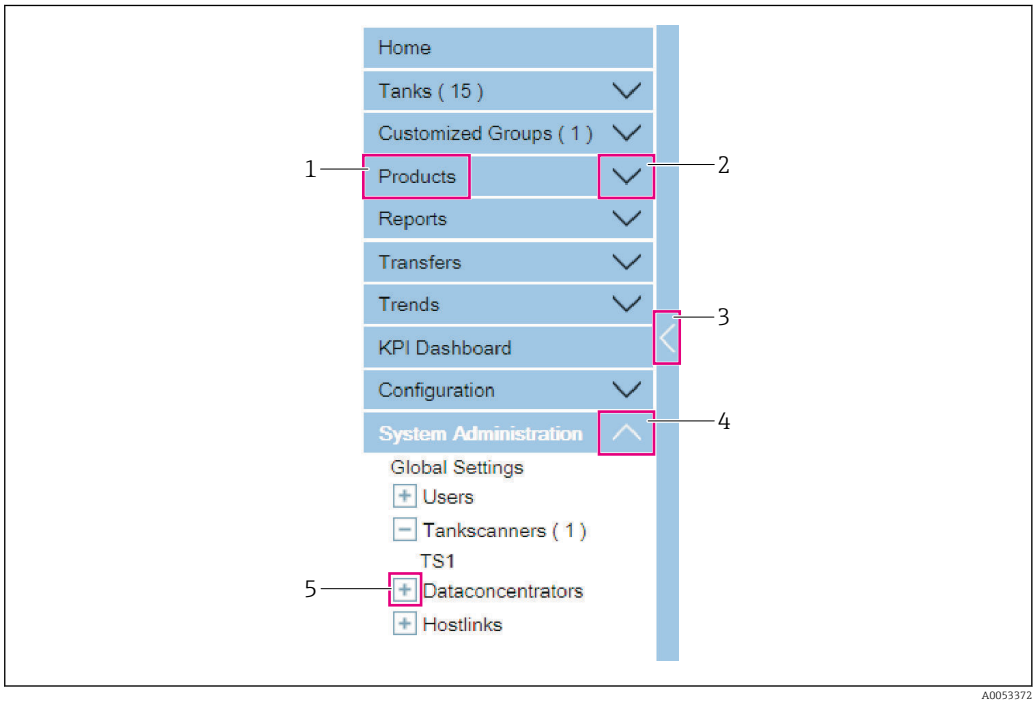
Metadata Header
Displays the following information:
- The user name and the user type
- The language options link
- The help link
- The logout option

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" (→ 16) for details.

Alarm and Event Panel
The Alarm and Event Panel displays the real time information about alarms and events.
Refer to "Alarm and Event Panel - Description" (→ 16) for details.

4.2.2 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:



1 *Header*
2 *Collapsed Arrow*
3 *Collapse/Expand Navigation Tree*
4 *Expanded Arrow*
5 *Node*

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
- Users: The number of users defined in the system

The text will appear in bold and white when the header is in the expanded form.

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.

Collapse/Expand Navigation Tree
The user can click on this arrow to collapse or expand the Navigation Tree.

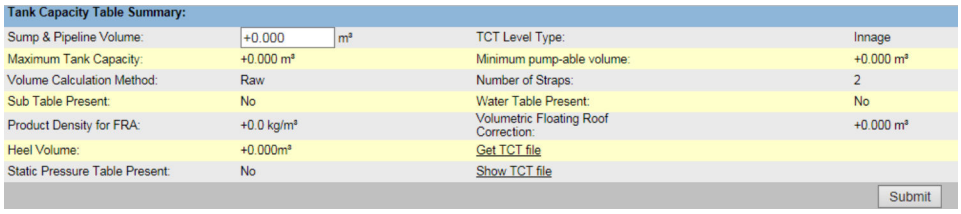
Expanded Arrow
This type of arrow is displayed when the Header is in the expanded position. Click on the expanded arrow to collapse the Header.

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.

4.2.3 Main View Section - Colors in the Edit Data Area

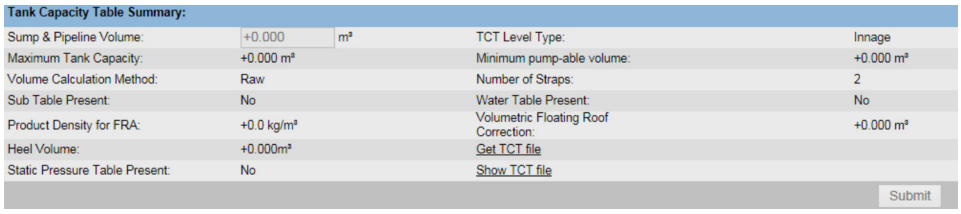
The system displays different colors in the Edit Data area, based on the access rights of the user:

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.



Tank Capacity Table Summary:			
Sump & Pipeline Volume:	+0.000 m³	TCT Level Type:	Innage
Maximum Tank Capacity:	+0.000 m³	Minimum pump-able volume:	+0.000 m³
Volume Calculation Method:	Raw	Number of Straps:	2
Sub Table Present:	No	Water Table Present:	No
Product Density for FRA:	+0.0 kg/m³	Volumetric Floating Roof Correction:	+0.000 m³
Heel Volume:	+0.000m³	Get TCT file	
Static Pressure Table Present:	No	Show TCT file	
			Submit

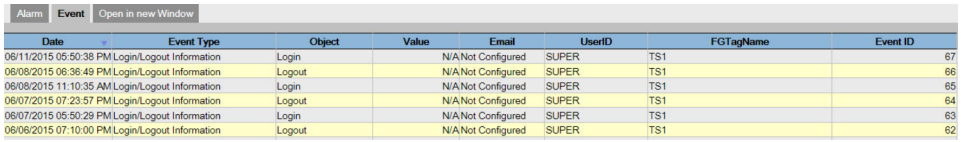
If the user does not have access rights, then the edit data area has a light grey and dark grey background on alternate rows. The **Submit** button to save the settings is disabled.



Tank Capacity Table Summary:			
Sump & Pipeline Volume:	+0.000 m³	TCT Level Type:	Innage
Maximum Tank Capacity:	+0.000 m³	Minimum pump-able volume:	+0.000 m³
Volume Calculation Method:	Raw	Number of Straps:	2
Sub Table Present:	No	Water Table Present:	No
Product Density for FRA:	+0.0 kg/m³	Volumetric Floating Roof Correction:	+0.000 m³
Heel Volume:	+0.000m³	Get TCT file	
Static Pressure Table Present:	No	Show TCT file	
			Submit

4.2.4 Alarm and Event Panel - Description

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



Alarm | Event | Open in new Window

Date	Event Type	Object	Value	Email	UserID	FGTagName	Event ID
06/11/2015 05:50:38 PM	Login/Logout Information	Login	N/A	Not Configured	SUPER	TS1	67
06/08/2015 06:36:49 PM	Login/Logout Information	Logout	N/A	Not Configured	SUPER	TS1	66
06/08/2015 11:10:35 AM	Login/Logout Information	Login	N/A	Not Configured	SUPER	TS1	65
06/07/2015 07:23:57 PM	Login/Logout Information	Logout	N/A	Not Configured	SUPER	TS1	64
06/07/2015 05:50:29 PM	Login/Logout Information	Login	N/A	Not Configured	SUPER	TS1	63
06/06/2015 07:10:00 PM	Login/Logout Information	Logout	N/A	Not Configured	SUPER	TS1	62

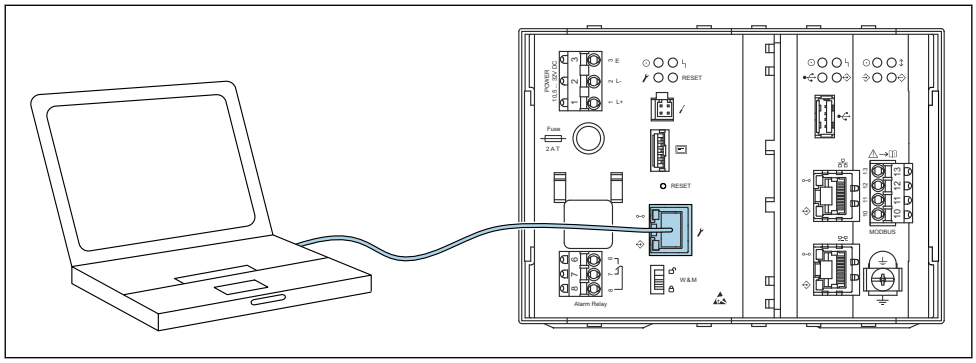
Alarm tab
Displays details of the alarms generated by the system.

Events tab
Displays details of the events generated by the system.

Open in new Window tab
Opens the Alarm and Event Panel in a new window.

4.3 Logging into the Tankvision system

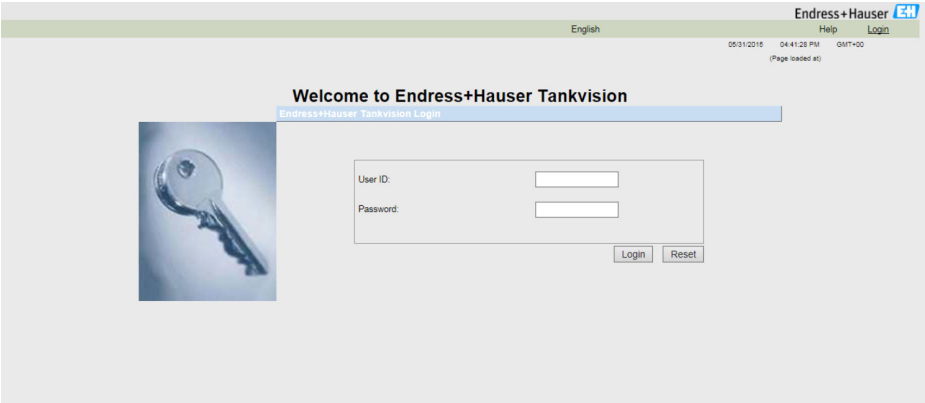
To integrate a Tankvision unit (i.e. a Tank Scanner NXA820, Data Concentrator NXA821 or Host Link NXA822) into the network, proceed as follows:

1. 

   Connect a laptop to the service port of the Tankvision unit. Make sure that the laptop is configured to get a dynamic IP address from a DHCP server.

2. Open the internet browser and enter the following URL: http://192.168.1.1. The Tankvision login screen appears. You are logged in as Operator (Operators do not have the right to change settings).

3. Login as Supervisor (Supervisors are permitted to change settings). Click on **Login** in the Meta header.
   ↳ The following screen opens:



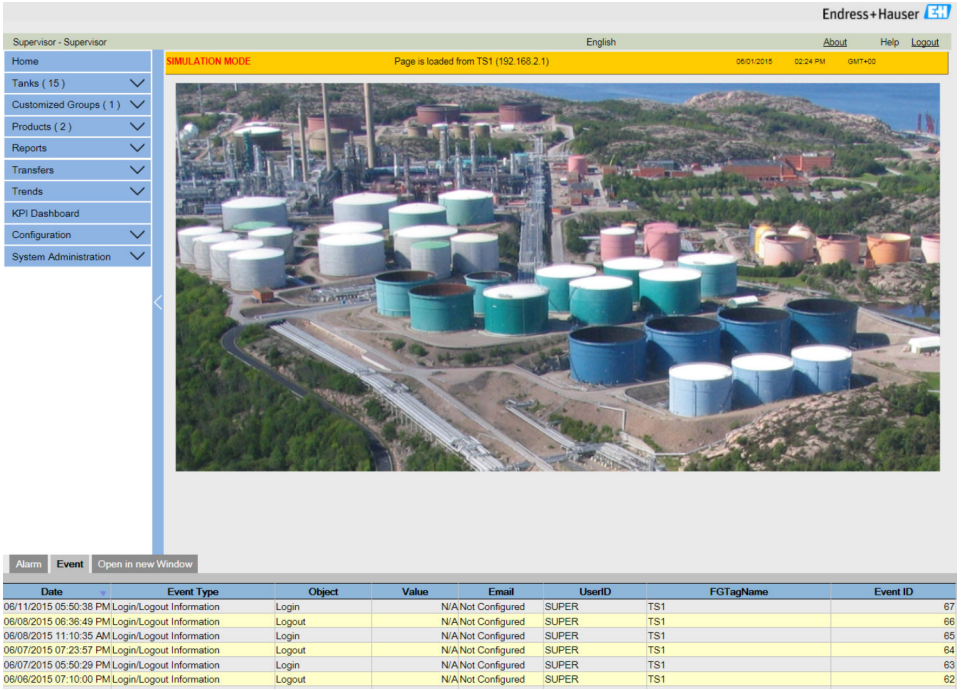
User ID
Enter the appropriate user login name [1]. The user login name is alphanumeric and case sensitive.

Password
Enter the appropriate password [1].
The user password is alphanumeric and case sensitive. It consists of 3 to 8 characters.

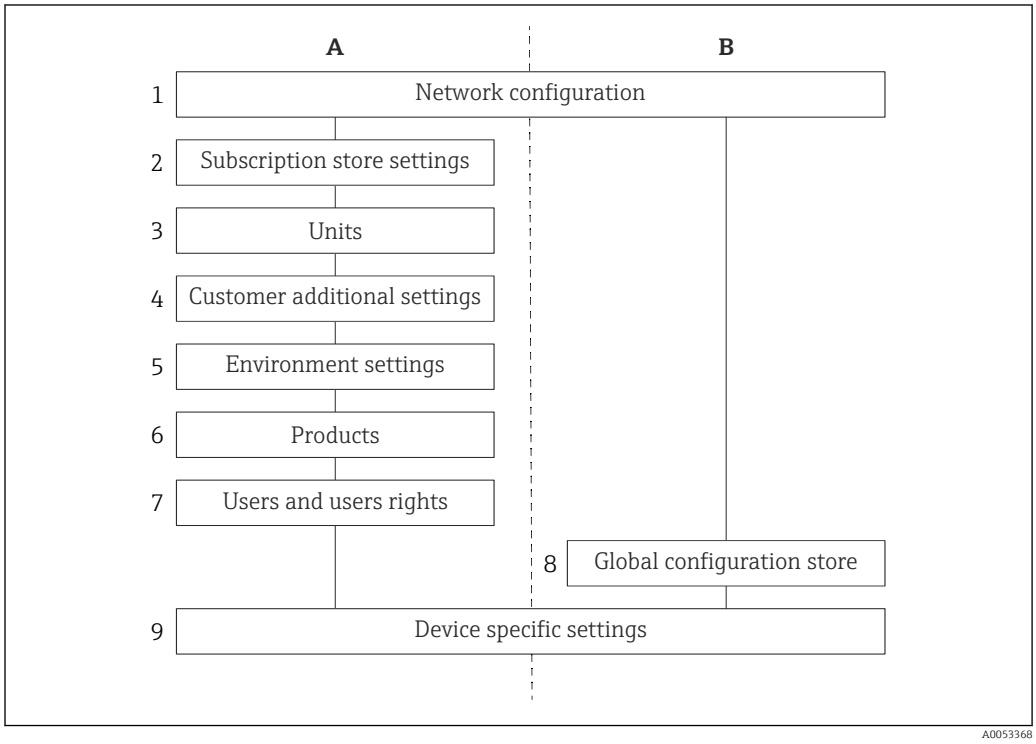
Enter ...
- ... "Super" into **User ID**.
- ... "Super" into **Password**.
- Click the **Login** button.

Tankvision displays the Home Page as follows:

1) The user ID (= User Login Name) and password are defined by the system administrator when adding a user to the system.



4.4 Common settings - Tankvision system

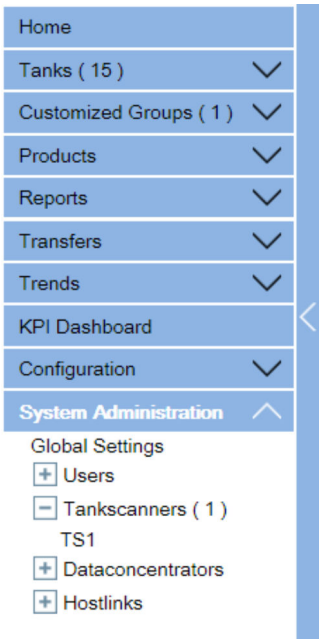


A *Stand alone / Subscription store*
B *All other units*
1 *Network configuration*
2 *Subscription store settings*
3 *Units*
4 *Customer additional settings*
5 *Environment settings*
6 *Products*
7 *Users and users rights*
8 *Global configuration store*
9 *Device specific settings*

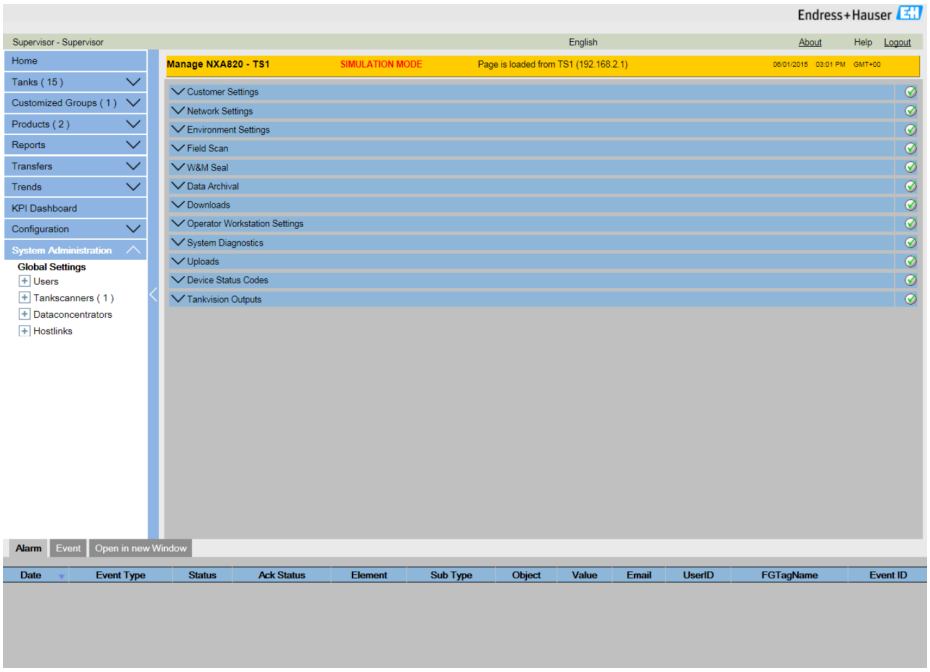
4.4.1 Network settings

You are logged in as "Supervisor".

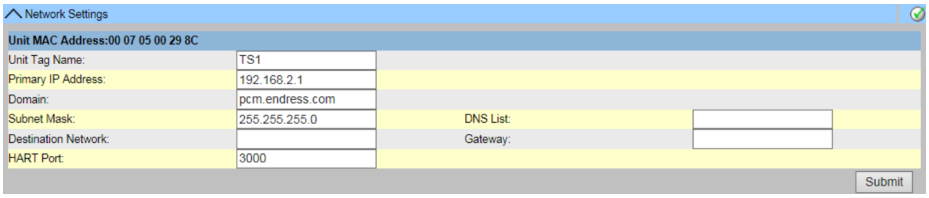
1. In the navigation tree, click the **System Administration** header.
   ↳ It expands as follows:



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



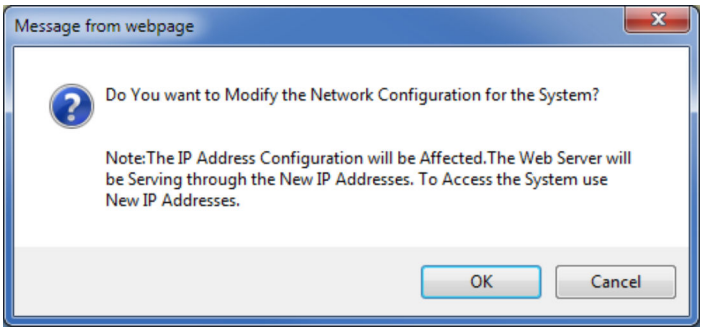
3. Click ⌄ on **Network Settings** to unfold it. Click ⌄ again on the subentry **Network Settings**.
   ↳ Tankvision displays the screen as follows:



4. Enter the appropriate information in the relevant fields.

Observe the following when entering information into the fields:
- The following parameters are mandatory: **Unit Tag Name**, **Primary IP Address**, **Domain**, **Subnet Mask** and **HART Port**.
- The required values of the parameters depend on your local network configuration. For more information please contact your local network administrator.
- For detailed information on the individual fields, refer to "Network Settings".

5. Click the **Submit** button to proceed.
   ↳ The system displays a confirmation box as follows:



6. Click the **OK** button to proceed, or click the **Cancel** button to exit.
7. After saving the settings, Tankvision displays a confirmation message.
8. Disconnect the laptop and connect the Tankvision unit to the network using the System LAN port.
   ↳ The Tankvision unit can now be operated from a computer within the LAN.

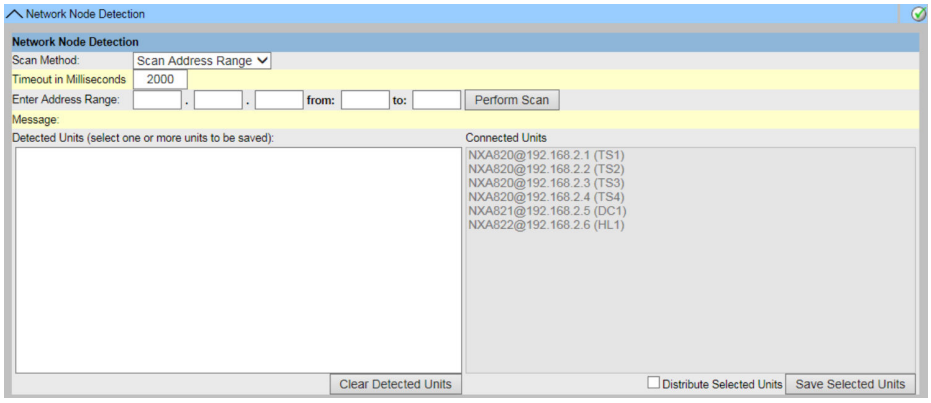
4.4.2 Network Node Detection

The Network Node Detection helps to detect and connect to all devices in the same network. This is a precondition for a global/local scenario (e.g. to use a Data Concentrator NXA821 as a Global Store or for the usage of Subscription Stores).

To do so, proceed as follows:

1. Login to the Tankvision unit as "Supervisor" and navigate to the **Global Settings** screen as described in "Network settings".
2. Click ⌄ on **Network Settings**.

3. Click on **Network Node Detection**.
   ↳ Tankvision displays the screen as follows:



Scan Method
Select the appropriate Scan Method from this field. Choose between scanning for a single IP address (**Scan Address**) and scanning a range of IP addresses (**Scan Address Range**).

Timeout in Milliseconds
Enter the appropriate scan timeout (in milliseconds) in the text box.

Enter Address
Enter the known IP address of a device in the network into the text boxes.
This field is only available when **Scan Address** was selected for **Scan Method**.

Enter Address Range
Enter a range of IP addresses, that are in the same network as the current device, into the text boxes.
This filed is only available when **Scan Address Range** was selected for **Scan Method**.

Message
Displays a message after the scan, e.g. how many devices were detected.

Detected Units
Lists all the devices that were detected during a scan.

Connected Units
Lists all devices that are already connected to the current device.

Distribute Selected Units
Select the check box to distribute the selected **Detected Units** to all connected units when clicking **Save Selected Units**.
Clear the check box to save the selected **Detected Units** only to the current device when clicking **Save Selected Units**.

4. Enter the appropriate information in the relevant fields.
5. Click **Perform Scan** to start the Network Node Detection.
   ↳ During the scan a progress bar is displayed. The rest of the screen is locked while the progress bar is displayed.
6. Click on the detected units (multiple selection by holding the **Ctrl** key while clicking) to select the detected units that are to be saved. Click **Save Selected Units** to save the selected units (and the current device). Click **Clear Detected Units** to clear the **Detected Units**.

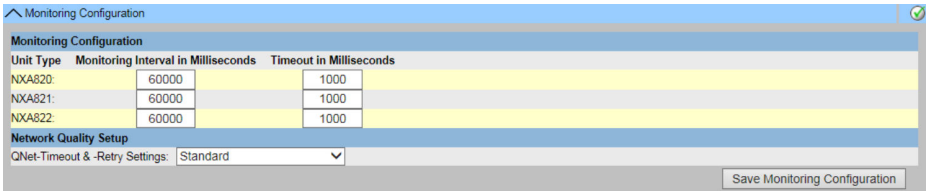
If a device in the network is removed or replaced, repeat the Network Node Detection to update the connected devices.

4.4.3 Monitoring Configuration

Configure the interval and timeout for monitoring the other devices in the network as well as the network quality.

To do so, proceed as follows:

1. Login to the Tankvision unit as "Supervisor" and navigate to the **Global Settings** screen as described in "Network settings".
2. Click on **Network Settings**.
3. Click on **Monitoring Configuration**.
   ↳ Tankvision displays the screen as follows:



Unit Type
Displays the device type (Tank Scanner NXA820, Data Concentrator NXA821, Host Link NXA822).

Monitoring interval in Milliseconds
Enter the appropriate interval, in which the current device checks if the other devices in the network are available, in the text box.

Timeout in Milliseconds
Enter the appropriate timeout for the availability check of the other devices in the network in the text box.

QNet-Timeout & -Retry Settings
Select the appropriate network quality. The names of the settings are self-explanatory.

4. Enter the appropriate information in the relevant fields.
5. Click the **Save Monitoring Configuration** button.

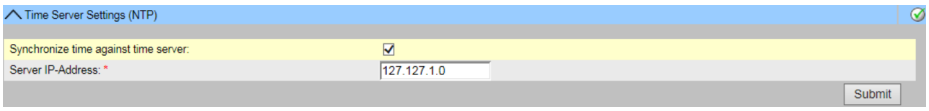
4.4.4 Time Server Settings

The availability of the Time Server Settings depends on the **Configuration Store Type** selected in **Define Configuration Store Details** (→ 23).

Synchronize the time of the device with a time server in the network.

To do so, proceed as follows:

1. Login to the Tankvision unit as "Supervisor" and navigate to the **Global Settings** screen as described in "Network settings".
2. Click on **Network Settings**.
3. Click on **Time Server Settings (NTP)**.
   ↳ Tankvision displays the screen as follows:



Synchronize time against time server
Select the check box to synchronize the system time of the current device with a time server in the network.
Clear the check box to use the system time of the current device.
Only available if **Subscription Store** is selected as the **Configuration Store Type** in **Define Configuration Store Details** (→ 23).
Not available if **Use Local Configuration Store** is selected as the **Configuration Store Type**, because this setting always uses the system time of the current device.
If **Use Global Configuration Store** is selected as the **Configuration Store Type**, the IP address of the configured Subscription Store is automatically used as time server.

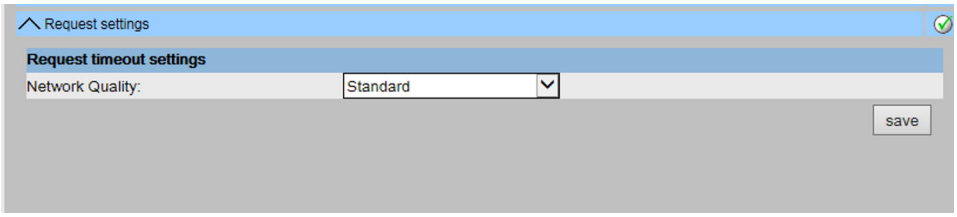
Server IP-Address
Enter the appropriate IP address of a time server. The IP address has to be available in the network of the current device.
Entering the IP address "127.127.1.0" (default) synchronizes with the internal real-time clock of the current device.
If an invalid IP address is entered and **Submit** button is clicked, the field returns to the last valid IP address.
This field is only available if the **Synchronize time against time server** check box is available and selected.
NOTE! Do not use other Tankvision devices as time servers.

4. Enter the appropriate information in the relevant fields.
5. Click the **Submit** button.

The time of synchronization depends, amongst other things, on the network quality.

4.4.5 Request Settings

Configure the request timeout settings based on the network quality for communication between the Tankvision unit and the computer where the web page is displayed.



1 *Request Settings*

Network Quality
Select the appropriate network quality. The names of the settings are self-explanatory.

Request timeout [ms]
Enter the appropriate timeout to check web request receives the response from unit in the text box.
This field is only visible for Custom Network Quality.

Max retries
Number of retries sent from web browser to determine if the Tankvision unit is alive or not. This field is only visible for Custom Network Quality.

4.4.6 Subscription Store definition

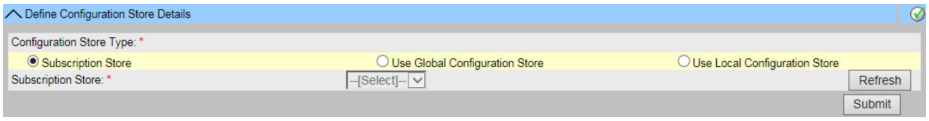
In a typical Tankvision system, most configuration settings are common for all Tankvision units within the network. Therefore, the time required for the configuration of the system can be minimized by defining one of the units to be a Subscription Store. The configuration

settings are only performed on this Subscription Store. These settings are then distributed to the other units within the network.

For each Tankvision unit (i.e. Tank Scanner NXA820, Data Concentrator NXA821 or Host Link NXA822) within the network it is necessary to define if it is a Subscription Store or if it receives its configuration from a Subscription Store.

To do so, proceed as follows:

1. Login to the Tankvision unit as "Supervisor" and navigate to the **Global Settings** screen, → 19.
2. Click on **Customer Settings**.
3. Click on **Define Configuration Store Details**.
   ↳ Tankvision displays the screen as follows:



4. For the Subscription Store:
   In **Configuration Store Type** select the option **Subscription Store** (Default).
5. For the other units:
   In **Configuration Store Type** select the option **Use Global Configuration Store**. In **Subscription Store** select the Subscription Store to which this unit is to be linked. In **Allow Local Configuration Change** define whether local configuration changes of this unit are allowed in case the Subscription Store is not available.
6. Click the **Submit** button to proceed, or click the **Refresh** button to reset the screen.
7. After saving the settings, Tankvision displays a confirmation message.

With the use of global configuration store the following information is transferred to the subscription units:
- Customer settings like site information (without customer specific logo), unit, e-mail server and day and time settings (configurations of languages and printer agent must be done for every single device)
- Environment settings
- Products
- Users including user access rights

Global settings is recommended if the synchronization of a new product or other information is required between the units. Once the synchronization is completed and there is no new or changed information available for synchronization, the Global settings can be switched off again. To do so, on the devices which are configured as subscription units, deselect the option **Use Global Configuration Store** and select the option **Subscription Store**. This reduces CPU load and improves system stability.

It is highly recommended to use an NXA820 as subscription store.

4.4.7 Further common steps (stand alone or subscription store)

Login to the Tank Scanner NXA820 as "Supervisor" and perform the following configurations:

Customer Settings and Environment Settings

1. In the navigation tree, click the **System Administration** header.
2. Click **Global Settings** (below the **System Administration** header).
3. In the main screen click the **Customer Settings** header and configure the parameters.

4. In the main screen, click the **Environment Settings** header and configure the parameters.

Product Configuration

1. In the navigation tree, click the **Configuration** header. Click **Products**.
2. Click ✓ on **Configure New Products** to add a new product and define the product properties (refer to "The "Configuration" - "Products" menu").
3. Click ✓ on **Product Overview** to modify and delete Products.

Users and user access rights

1. In the navigation tree, click the **System Administration** header. Click **Users**.
2. Click on **Group Access Rights** to define the rights of the different users.
3. Click on **Manage Users** to create, modify and delete users.

4.4.8 Tank Scanner NXA820 specific settings

Login to the Tank Scanner NXA820 as "Supervisor" and perform the following configurations:

Field Scan Configuration

1. In the navigation tree, click the **System Administration** header.
2. Click **Global Settings** (below the **System Administration** header).
3. In the main screen, click the **Field Scan** header.
4. Click the individual headers of the **Field Scan** menu and configure the parameters. For a description of the parameters refer to "Field Scan - Modbus EIA485", "Configure Field Scan - Sakura V1" and "Configure Field Scan - Whessoe WM550" .

ℹ The parameters can only be edited if the field scan is not currently active. If necessary, go to the **Start/Stop Field Scan** tab and stop the field scan.

Tank Configuration

1. In the navigation tree, click the **Configuration** header.
2. Click **Tanks** (below the **Configuration** header).
3. In the main screen, select the tank you are going to configure and click the **Modify** button.
4. Click the individual headers of the tanks menu on the **Tank Details** tab (**General Details**, **Capacity Details**, ...) and configure the parameters.

Product-tank assignment

1. In the navigation tree, click the **Tanks** header.
2. In the list below the **Tanks** header select a tank.
3. In the main screen click the **Assign Product** tab.
4. Select the product from the drop-down list.
5. Click **Submit** to save the settings.

ℹ For details about tank-product assignment refer to section "The Product Transfer" tab".

Additional Settings

- Depending on your requirements, you can perform numerous further settings.

Start Field Scan

1. In the navigation tree, click the **System Administration** header.
2. Click **Global Settings** (below the **System Administration** header).
3. In the main screen, click the **Field Scan** header.
4. Click the **Start/Stop Field Scan** tab and then click on **Start**. Field Scanning is now active.

4.4.9 Data Concentrator NXA821 specific settings

Associate Tank Scanner

Assign the Tank Scanner NXA820 to the Data Concentrator NXA821:

1. Login to the Data Concentrator NXA821 as "Supervisor".
2. In the navigation tree, click the **System Administration** header.
3. Click **Global Settings** (below the **System Administration** header).
4. In the main screen, click the header **Tank Scanner Unit And Tank Assignment**.
5. Select all Tank Scanner units you want to assign to the Data Concentrator from the **Available Units** list and move them to the **Selected Units** list using the arrow buttons. All units in the **Selected Units** list will be assigned to the Data Concentrator.
6. Click the **Submit** button to save the settings.

Additional Settings (like groups)

- Depending on your requirements, you can perform numerous further settings.

4.4.10 Host Link NXA822 specific settings

The Host Link NXA822 provides an interface for a host system to access inventory data from the NXA820 unit.

To configure the Host Link settings, proceed as follows:

1. Login to the Host Link NXA822 as "Supervisor".
2. In the navigation tree, click the **System Administration** header.
3. Click **Global Settings** (below the **System Administration** header).
4. In the main screen, click the **Field Scan** header.

The **Field Scan** header contains the following sub-headers which are used to configure the Host Link settings and to start the Host Link:
- **Host Link Configuration**
- **Modbus TCP Configuration** (if the Modbus TCP protocol has been selected)
- **Modbus Serial Configuration** (if the Modbus Serial protocol has been selected)
- **Entis+ Configuration** (if the Entis+ serial protocol has been selected)
- **Start/Stop Host Link**

4.4.11 Configuration of W&M systems

Description of the sealing process

Locking mechanisms in Tankvision:

Connected PCs are registered in the system by assigning the MAC address. Once the system has been locked, only these PCs are accepted and can display calibrated data.

When the W&M switch is flipped, a checksum is calculated and set.

This calculation is repeated every 8 hours. If this checksum deviates from that at the time of sealing, changes have been made to the system. It is no longer possible to modify W&M parameters, such as tank tables, units and print templates, once the W&M switch has been flipped.

Recommended procedure:

It is recommended to start calibrating the tank gauging system from the field devices via possible protocol converters and finish the process with the Tankvision inventory management system.

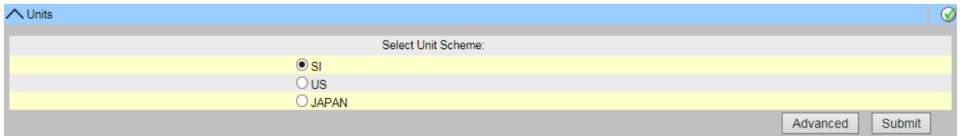
When calibrating the Tankvision Tank Scanner or Data Concentrator, it is recommended to start with the unit used as the Global Configuration Store since the engineering units are configured centrally here. These units would then not have to be checked separately in the boxes assigned (see "Units", → 📄 27).

Initial calibration and system modifications

Initial calibration and changes to the Tankvision Tank Scanner NXA820

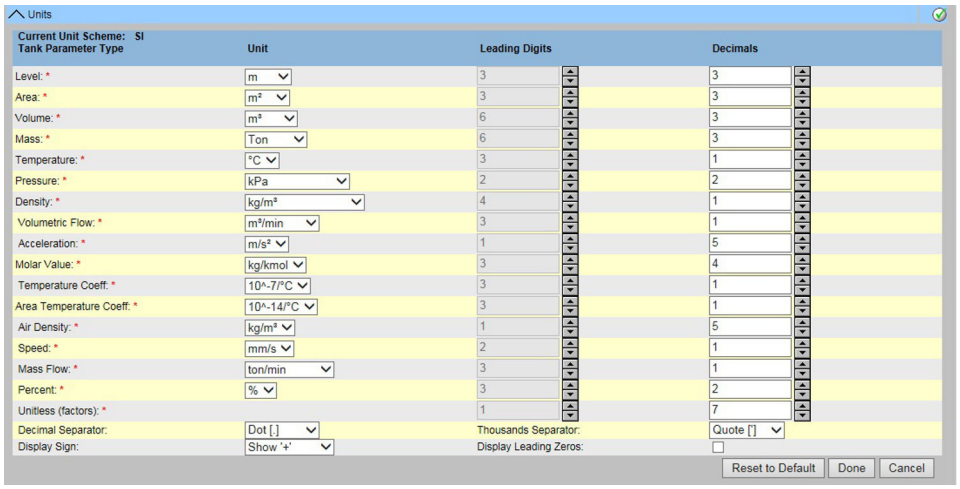
Units

The units do not have to be configured if **Use Global Configuration Store** (→ 📄 23) is selected. The units can be checked under **System Administration → Tankscanners → Tank Scanner Unit → Customer Settings → Units**.
This view allows the user to choose between the unit schemes.



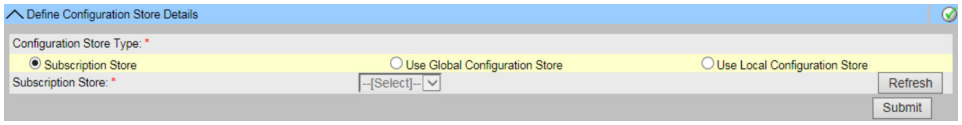
2 *Selecting the Unit*

The exact settings of the unit scheme selected can be checked under **Advanced**.



3 *Checking the Units*

Observe the following information!
- An apostrophe may not be chosen as the thousand separator for W&M applications.
- If the Tankvision device retrieves the basic settings from another Tankvision device (Global Configuration Store), the units of this Tankvision device do not have to be checked. The name of the box (Subscription Store) that provides the basic settings can be found under **System Administration → Global Settings → Customer Settings → Define Configuration Store Details** (see figure below).

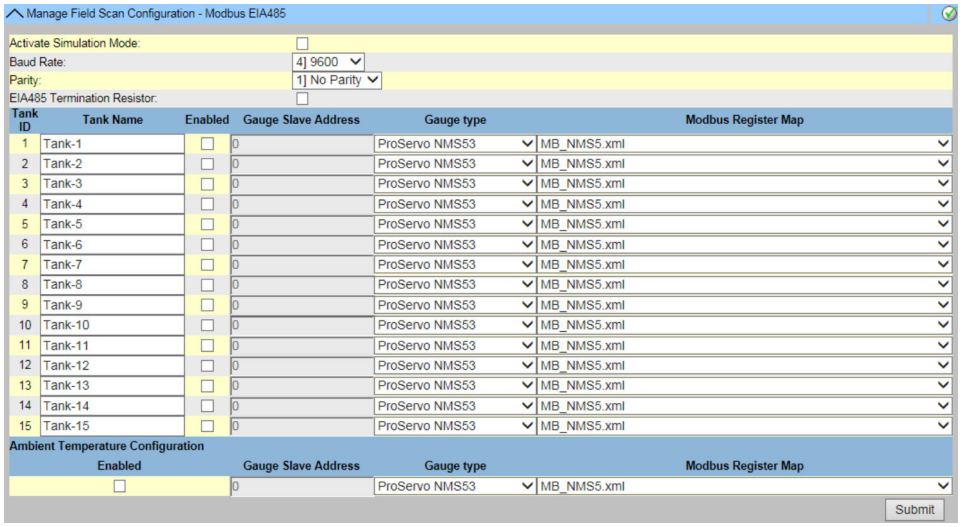


4 *Configuration Store Details*

Field device assignment

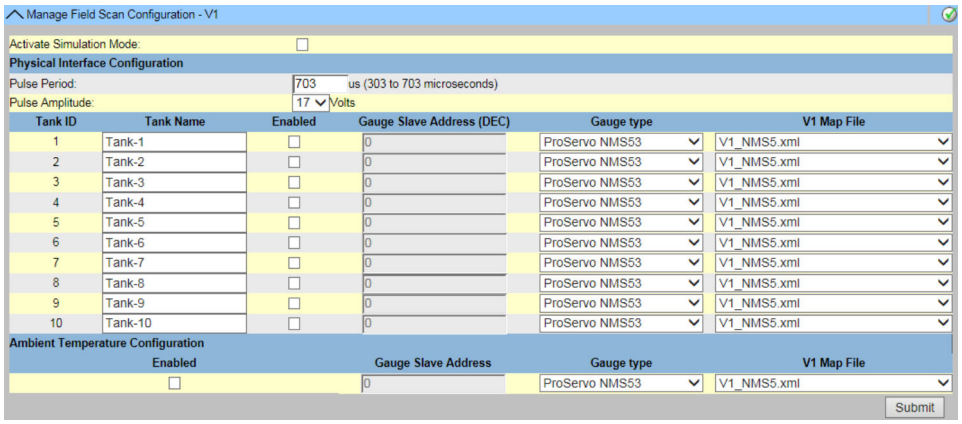
The field device assignment must be checked under **System Administration → Tankscanners → Tank Scanner Unit → Field Scan → Manage Field Scan Configuration-Modbus EIA485**.

The following parameters have to be checked for Modbus EIA485:
- Baud rate
- Parity
- Gauge slave address: assignment to the tank ID / tank name
- Gauge type: assignment to the tank ID / tank name
- Modbus register map: assignment to the field device type (gauge type)



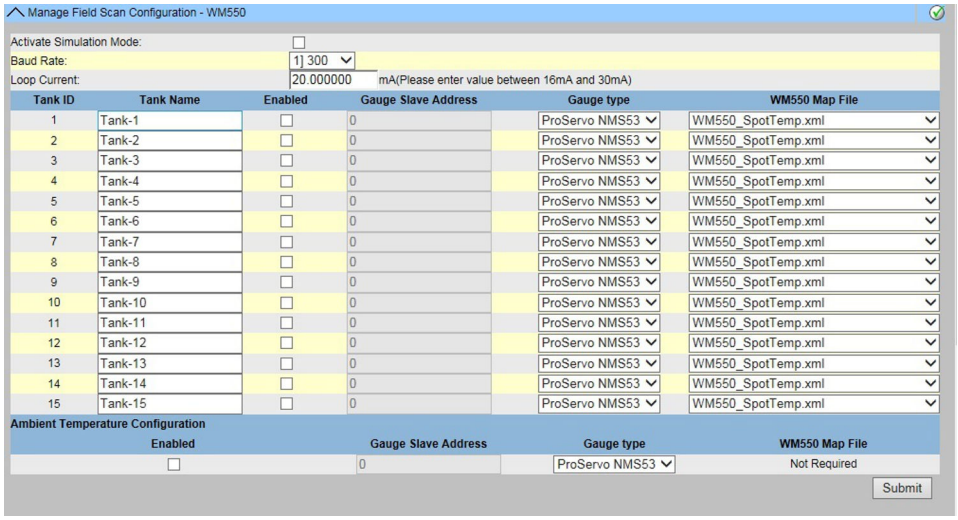
5 *Field Scan Configuration - Modbus*

The following parameters have to be checked for the V1 protocol:
- Gauge slave address (DEC): assignment to the tank ID / tank name
- Gauge type: assignment to the tank ID / tank name
- V1 map file assignment to the gauge type



6 *Field Scan Configuration - V1 Protocol*

The following parameters have to be checked for the WM550 protocol:
- Baud rate
- Loop current
- Gauge slave address: assignment to the tank ID / tank name
- Gauge type: assignment to the tank ID / tank name
- WM550 map file assignment to the field device type (gauge type)



7 *Field Scan Configuration - WM550 Protocol*

To activate the simulation mode

1. Upload the "simConfig.xml" file under **System Administration → Uploads → Generic Uploads**.
2. Modify the "simConfig.xml" file according to the desired simulation and rename it. Specify Tanks, Parameters, Units, Start, End and Step values.

Specify the mode of simulation for the parameters:
- 0: Parameter value equals Start value
- 1: Parameter value runs from Start value to End value in Step value per interval
- 2: Triangle wave simulation
- 3: Sine wave simulation

3. Download the modified and renamed file as a gauge map file (under **System Administration → Global Settings → Field Scan → Add Gauge Map File**).
4. Enable the checkbox **Activate Simulation Mode** on the **Field Scan Configuration** page.
5. Activate the Field Scan.
   ↳ **SIMULATION MODE** is displayed in red on the Main Header.

Tank table

The tank capacity details have to be loaded to check the tank table (**Configuration** → **Tanks** → Select the tank under **Select** - select and confirm with **Modify** (see Fig. "Tank Selection" below) → Select **Capacity Details** in the **Tank Details** tab (see Fig. "Tank Capacity Table Summary" below)).

Select	Tank Name	Location	Tank Shape	Product
◉	Tank-1	Terminal-1	Tank with Fixed Roof; without Stilling	Petrol
○	Tank-2	Terminal-1	Tank with Fixed Roof; without Stilling	Petrol
○	Tank-3	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-4	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-5	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-6	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-7	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-8	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-9	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-10	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-11	Terminal-1	Tank with Fixed Roof; without Stilling	Ethanol
○	Tank-12	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-13	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-14	Terminal-1	Tank with Fixed Roof; without Stilling	
○	Tank-15	Terminal-1	Tank with Fixed Roof; without Stilling	

Modify

8 Tank Selection

Capacity Details

Import Tank Capacity Table:

Select TCT file to Download: Browse...

Download TCT XML File

Tank Capacity Table Summary:

Sump & Pipeline Volume:	+0.000 × m³	TCT Level Type:	Innage
Maximum Tank Capacity:	+0.000 m³	Minimum pump-able volume:	+0.000 m³
Volume Calculation Method:	Raw	Number of Straps:	2
Sub Table Present:	No	Water Table Present:	No
Product Density for FRA:	+0.0 kg/m³	Volumetric Floating Roof Correction:	+0.000 m³
Heel Volume:	+0.000m³	Get TCT file	
Static Pressure Table Present:	No	Show TCT file	

Submit

9 Tank Capacity Table Summary

Steps for checking the tank table:

1. Check that the information in the **Tank Capacity Table Summary** is correct for the selected tank.
2. Check whether the TCT is suitable for the relevant tank. Clicking **Show TCT file** opens a browser window that shows the TCT in a tabular form (with the units in the configured format). Print by clicking **Print TCT**. To store the TCT file on a PC, click the **Get TCT file** link. The system will perform an export of the TCT in XML form as a compressed file (.gz). All units in the file are SI units (independent from the configured format).

```xml
<?xml version="1.0"?>
- <Tankvision CRC="12345">
  - <TCT VSP_TABLE="Y" WATER_TCT="Y" Sub_TCT="N" TCT_CalDate="3/28/2011" TCT_Date="3/28/2011">
      <Level_Type>Innage</Level_Type>
    - <Units>
        <Level>mm</Level>
        <Volume>m3</Volume>
        <P_Density_FRA_Unit>kg/m3</P_Density_FRA_Unit>
      </Units>
    - <FRA_TCT>
        <P_Density_FRA>1500</P_Density_FRA>
        <V_FRC>1</V_FRC>
      </FRA_TCT>
      <Heel_Volume>50</Heel_Volume>
      <Total_Tank_Volume>62369</Total_Tank_Volume>
      <Max_Tank_Capacity>61745</Max_Tank_Capacity>
      <Min_Pump_Volume>624</Min_Pump_Volume>
      <Volume_Method>RAW</Volume_Method>
    - <P_TCT CNT="13">
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      - <P_Strap>
          <P_Level>20000</P_Level>
          <P_Vol>100000</P_Vol>
        </P_Strap>
      </P_TCT>
    - <W_TCT CNT="10">
      + <W_Strap>
      + <W_Strap>
      + <W_Strap>
      + <W_Strap>
      + <W_Strap>
      + <W_Strap>
      + <W_Strap>
      + <W_Strap>
      + <W_Strap>
      - <W_Strap>
          <W_Level>1000</W_Level>
          <W_Vol>1999.98</W_Vol>
        </W_Strap>
      </W_TCT>
    - <VSP_TABLE CNT="23">
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
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      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      + <P_Strap>
      - <P_Strap>
          <P_Level>20000</P_Level>
          <VSP_Vol>5000</VSP_Vol>
        </P_Strap>
      </VSP_TABLE>
    </TCT>
  </Tankvision>
```
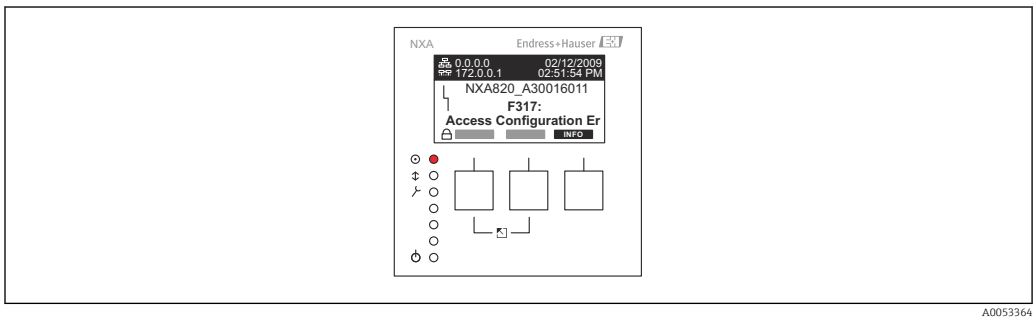


10 Table in XML Format

PC assignment

11 Tankvision Tank Scanner - PC Assignment

Every PC to be connected to the sealed system has to be registered. The PCs are registered under **System Administration → Global Settings → W&M Seal → Access Configuration**. The registered devices are listed with their MAC address in the column on the left. The MAC address of the PC currently used is displayed in the column on the right. Each PC has to be registered individually on every Tankvision box. If no PC is registered in the system, an error message is shown on the display of the Tankvision box once the W&M switch has been flipped.

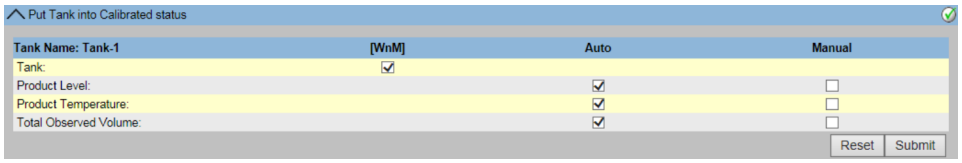


12 Error Message - No PC Registered in the System

During calibration acceptance, the list must be checked to ensure it only contains the MAC addresses of the Tankvision boxes and the PCs that should access the system. The PCs can be checked, for example, by loading the page above from every PC that should have access to the system and then comparing the MAC addresses (Registered Systems against Current MAC Address). The MAC addresses of the Tankvision box are provided on the nameplate.

Sealing tank data

The tank data are sealed individually for every tank. The W&M values are selected under: **Configuration** → **Tanks** → Select the Tank (**Select + Modify**) → **Put Tank into Calibrated Status** in the **Tank Details** tab. For more details refer to section "Put Tank into Calibrated Status".

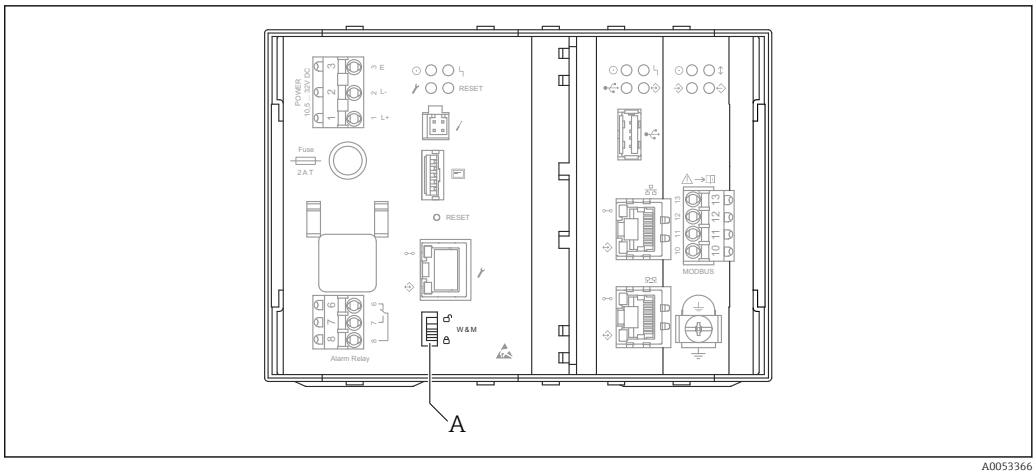


13 Sealing Tank Data

If the W&M switch is flipped, tanks can be removed from the calibrated status. This changes the calibration checksum. Removing a tank from the sealed system is equivalent to a system modification and must be accepted by an official from the Standards Authority.

Locking

The unit is locked by flipping the W&M switch on the Tankvision Tank Scanner NXA820.



A Tankvision W&M Switch

Flipping the switch means that the settings checked under "Sealing tank data" (→ 32) are fixed and can no longer be modified, and that the values specified under **Sealing Tank Data** are displayed as calibrated values by the computers specified under **PC Assignment**. A master checksum is calculated approx. 2 minutes after the W&M switch is flipped. This master checksum can be called up under **System Administration → Tank Scanner Unit → W&M Seal**. After approximately 2 more minutes, the system performs the first check calculation. The subsequent calculations are then performed every 8 hours.

The following information is displayed:
- Date and time the page was loaded
- W&M switch status
- W&M CRC at sealing time
- Last calculated W&M CRC
- Last calculated CRC's time stamp

W&M Information

This page is static and is loaded at:	07/26/2015	01:22 PM	GMT+00
W&M Switch status:	Sealed		
W&M CRC At Sealing Time:	fa612003		
Time Of Sealing:	07/26/2015 01:22:32 PM		
Last Calculated W&M CRC:	fa612003		
Last Calculated CRC's Time Stamp:	07/26/2015 01:22:35 PM		

14 Tankvision W&M Seal

A modified checksum indicates that changes have been made to the system. The checksum must be documented (e.g. by printing out the screenshot, see Figure "Tankvision W&M Seal") and recorded in the acceptance report (e.g. by attaching the printout).

The checksum can be recalculated by switching the Field Scan off and then on again.

Checking the W&M display

The following steps must be taken to check the weights and measures display:
- The settings listed under "Sealing tank data" (→ 32) can no longer be modified.
- A **WM** in front of the values for the **Product Level**, **Product Temperature** and **Total Observed Volume** indicates that the values are calibrated.
- The level and temperature information has to match that of the field devices.

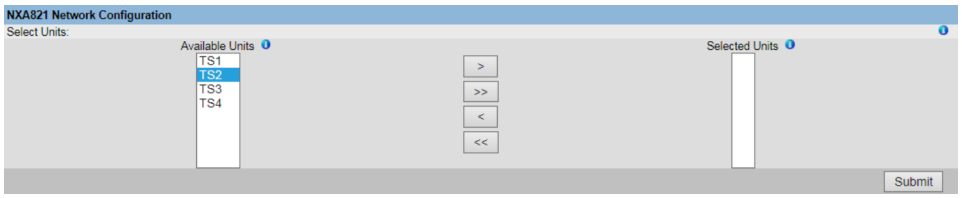
Checking the printouts

All printouts from connected printers that cannot be officially verified must bear the annotation "Measured values not calibrated" and no measured values may appear as calibrated.

Initial calibration and changes to the Tankvision Data Concentrator NXA821

Tank Scanner assignment

The assignment between the Tank Scanner units and the Data Concentrator must be checked under **System Administration → Dataconcentrators → Data Concentrator Unit → Tank Scanner Unit and Tank Assignment**.



15 *Tankvision Data Concentrator - Tank Scanner Assignment*

PC assignment

The locking procedure is the same as for the tank scanner (→ 32).

Stamp points for Tankvision Tank Scanner NXA820 and Data Concentrator NXA821

The stamp points are listed under Point 6 in type approval 4.454/08.10.

5 The Tankvision Operating Screens

Operating Screen		NXA820	NXA821	NXA822
Tank Details Screen		x	x	
	The "Tank Details" tab	x	x	
	The "Manual Data" tab	x	x	
	The "Assign Product" tab	x	x	
	The "Tank Calculator" tab	x	x	
	The "Tank Status" tab	x	x	
	The "Temperature Profile" tab	x	x	
	The "Density Profile" tab	x	x	
	The "Dipped Data" tab	x	x	
	The "Gauge Commands" tab	x	x	
	The "Product Transfer" tab	x	x	
Menu Reports		x	x	x
	Select NXA820 Configuration Details	x	x	x
	Select Product Transfer Details	x		
	Event Report	x	x	x
	Alarm Report	x	x	
	Select Tanks For Tank Report	x	x	
	Select Tanks For Tank Detail Report	x	x	
	Select Tank Groups For Report	x	x	
	Select Tank Groups For Details Report	x	x	
	Select Tank Inventory Report	x	x	
	Select Group Inventory Report	x	x	
	Product Transfer Report	x	x	
Menu Transfers		x	x	
Menu Trends		x	x	x
	Real Time trend	x	x	
	Historical Trend	x	x	
Menu KPI Dashboard		x		
Configuration - Tanks - Tank Details Tab		x	x	
	General Details	x	x	
	Capacity Details	x	x	
	Shell Details	x	x	
	Floating Roof	x	x	
	Flow Calculation	x	x	
	Water Content	x	x	
	Hybrid Tank Measurement System	x	x	
	Inventory Calculation	x	x	
	Put Tank into Calibrated Status	x	x	
	Hart Command	x	x	

Operating Screen		NXA820	NXA821	NXA822
Configuration - Tanks - Alarm Settings Tab		x	x	
	Measured Data Alarm Configuration	x	x	
	Calculated Data Alarm Configuration	x	x	
Configuration - Tanks - Gauge Commands Tab		x	x	
Menu Configuration - Customized Groups		x	x	
Menu Configuration - Products		x	x	
	Adding, Modifying and Deleting Products	x	x	
	General	x	x	
	Volume Correction Factor (VCF)	x	x	
	Reference Density Calculation (RDC)	x	x	
	OIML R22 Configuration (only for alcohols)	x	x	
	Sediment & Water	x	x	
	Mass & Weight	x	x	
	Vapor Calculation	x	x	
	Advanced (Weight & Measure)	x	x	
	View Product Tank Groups	x	x	
Menu Configuration - Tank Status		x	x	
Menu System Administration - Global Settings		x	x	x
	Customer Settings	x	x	x
	Network Setting	x	x	x
	Environment Settings	x	x	x
	Field Scan - Modbus EIA485	x		
	Configure Field Scan - Sakura V1	x		
	Configure Field Scan - Whessoe WM550	x		
	W&M Seal	x	x	x
	Data Archival	x	x	
	Tank Scanner Unit and Tank Assignment		x	
	Host Link			x
	Downloads	x	x	x
	Operator Workstation Settings	x	x	x
	System Diagnostics	x	x	x
	Uploads	x	x	x
	Device Status Codes	x	x	x
	Tankvision Outputs	x	x	x
Menu System Administration - Users		x	x	x

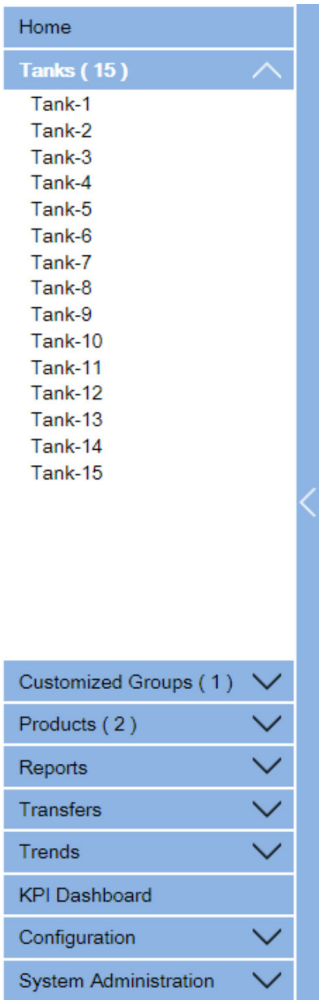
6 The Tank Details screen

The Tank Details screen is used to display real time tank data dynamically and to perform typical tank farm operations (e.g. tank-product assignment, product transfers, ...).

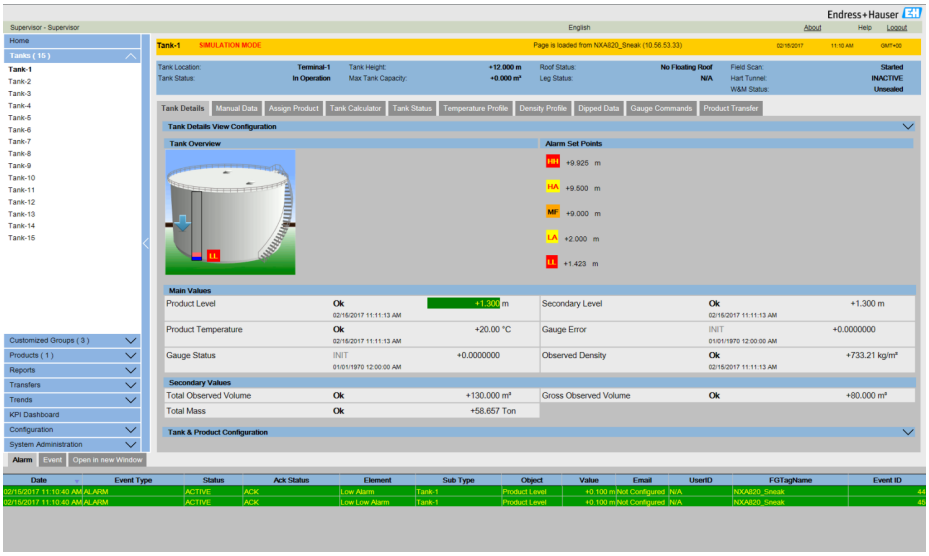
The Tank Details screen contains various tabs which are used for the different tasks.

To view the Tank Details screen

1. On the Navigation Tree, click the **Tanks** header.
   ↳ The **Tanks** header expands as follows:



2. Click the <Tank Name> of the tank you are going to work on.
   ↳ Tankvision displays the screen as follows:

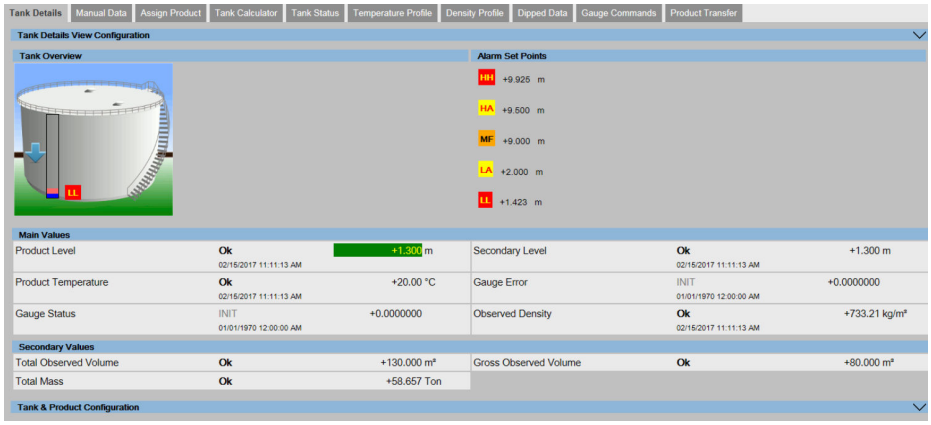


6.1 The "Tank Details" tab

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

To view the "Tank Details" tab

- On the Tank Details screen, click the **Tank Details** tab.
  ↳ Tankvision displays the screen as follows:



Tank Overview
This area displays the picture of the tank.

Alarm Set Points
This area displays the corresponding Alarm Set Points for that particular tank.

Main Values
This area displays the measured or calculated values with timestamp of the product or tank parameters in terms of temperature, pressure, density and water level along with their respective units of measurement, depending on the configuration made in **Tank**

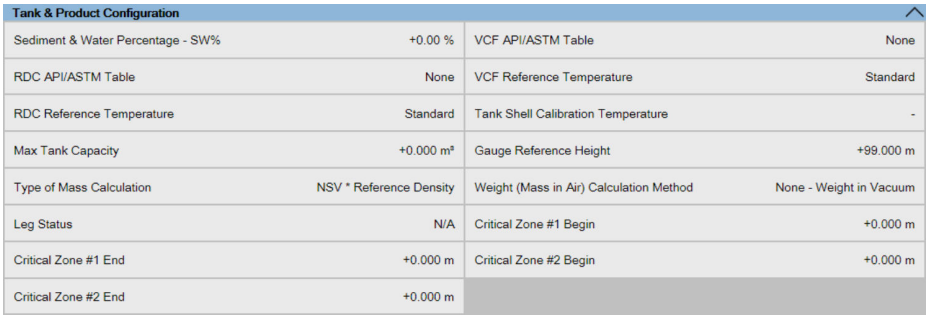
Details View Configuration. The date and time at which the value of each parameter has changed is also displayed along with the measured value status:

- 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

Secondary Values
This area displays the measured or calculated values without timestamp 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 and status. Which values are displayed, depends on the configuration made in **Tank Details View Configuration**.

Tank & Product Configuration
This area displays the tank and product configuration data used for calculation.

- Click on **Tank & Product Configuration**.
  - Tankvision displays the screen as follows:

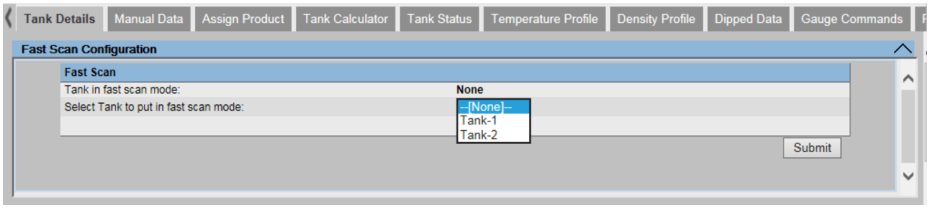


Tank & Product Configuration			
Sediment & Water Percentage - SW%	+0.00 %	VCF API/ASTM Table	None
RDC API/ASTM Table	None	VCF Reference Temperature	Standard
RDC Reference Temperature	Standard	Tank Shell Calibration Temperature	-
Max Tank Capacity	+0.000 m³	Gauge Reference Height	+99.000 m
Type of Mass Calculation	NSV * Reference Density	Weight (Mass in Air) Calculation Method	None - Weight in Vacuum
Leg Status	N/A	Critical Zone #1 Begin	+0.000 m
Critical Zone #1 End	+0.000 m	Critical Zone #2 Begin	+0.000 m
Critical Zone #2 End	+0.000 m		

6.1.1 Configuring the "Tank Details" tab

Which parameters are displayed in the **Tank Details** tab, size, number and order of the colums can be configured in the **Tank Details View Configuration** section.

1. Click on **Field Scan Configuration**.
   - Tankvision displays the screen as follows:

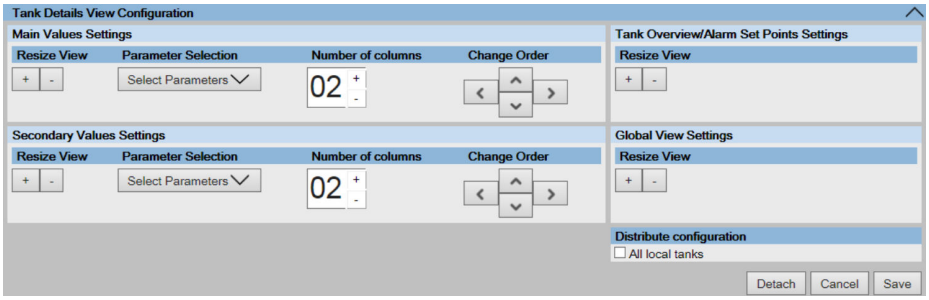


The **Fast Scan Configuration** option is only available for WM550 and V1 variant of Tank Scanner.

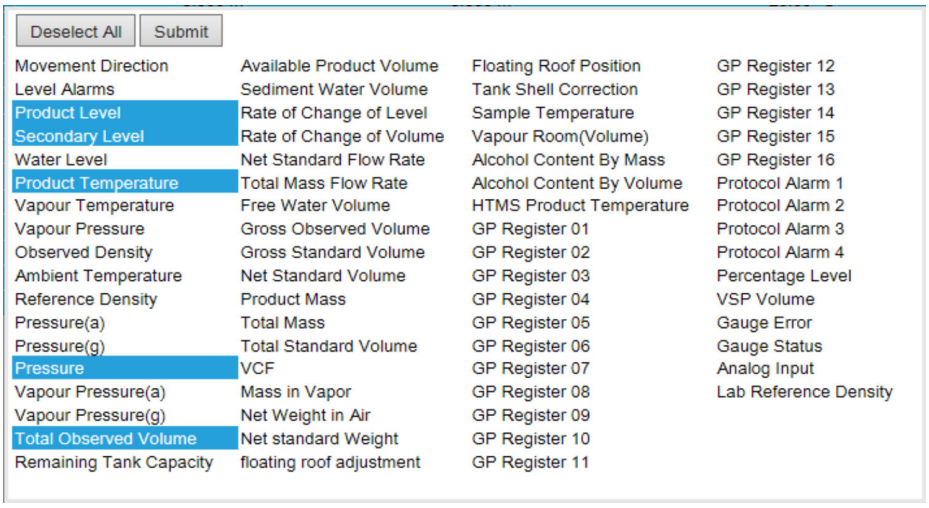
WM550 and V1 field protocols do not support high scan rates like Modbus protocol. For critical operation on a Tank, the time between two updates of level might be too long to guarantee safe option.

To overcome this problem users can select a specific tank with a higher frequency of update rate, while other tanks are scanned with normal frequency.

2. Click ⌄ on **Tank Details View Configuration**.
   ↳ Tankvision displays the screen as follows:



3. To select the parameters for either Main Values or Secondary Values, click the **Select Parameters** picklist in either **Main Values Settings** or **Secondary Values Settings**.
   ↳ Tankvision displays a pop-up as follows:



4. Click on the parameters to select/deselect them. Several parameters can be selected by holding the **Ctrl** key with clicking on the parameters. Click the **Submit** button to return to the **Tank Details View Configuration**.

5. Click the **Save** button to save the configuration. The configuration is changed for the selected tank only or for all local tanks on the same unit, depending on whether **All local tanks** was ticked in **Distribute configuration**. Click **Cancel** to exit.

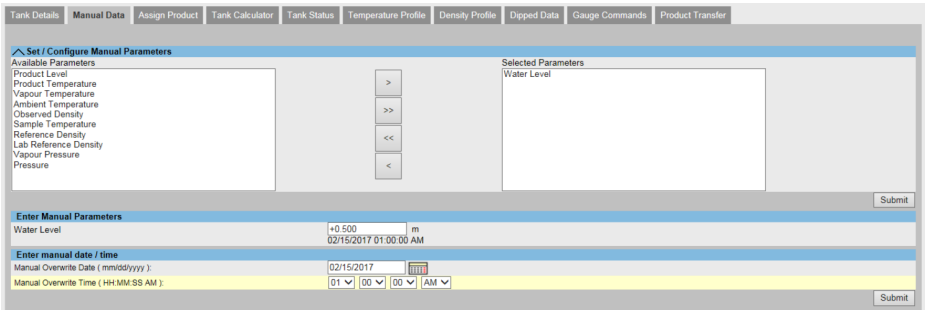
The **Detach** button detaches the **Tank Details View Configuration** from the **Tank Details** tab, so it can be moved around freely in the window.

6.2 The "Manual Data" tab

The **Manual Data** tab gives you the option of entering values for the product level, temperature, density and pressure manually.

To enter manual data

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



Available Parameters
This column displays the tank parameters which are available to be set into manual mode.

Selected Parameters
This column displays the tank parameters which are currently in manual mode.

Manual Overwrite Date
Enter the appropriate date in the text box. This date will be used as time stamp for the manually entered value. The data type for this field is date.

Manual Overwrite Time
Enter the appropriate time in the text box. This time will be used as time stamp for the manually entered value. The data type for this field is time.

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

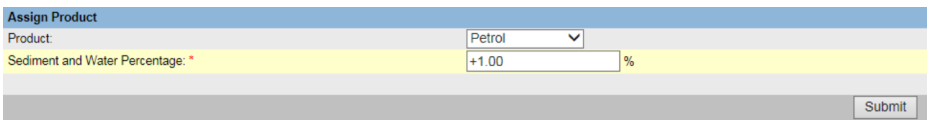
An event is generated after manually entering a value for a tank parameter. The event details can be viewed in the **Event** overview.

6.3 The "Assign Product" tab

After configuring a product, it has to be assigned to a tank. The user can assign only one product to a tank. Before another product can be assigned to the tank, the product currently assigned to the tank must be unassigned. 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:



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.

Observe the following information!
- 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** overview.

6.4 The "Tank Calculator" tab

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?

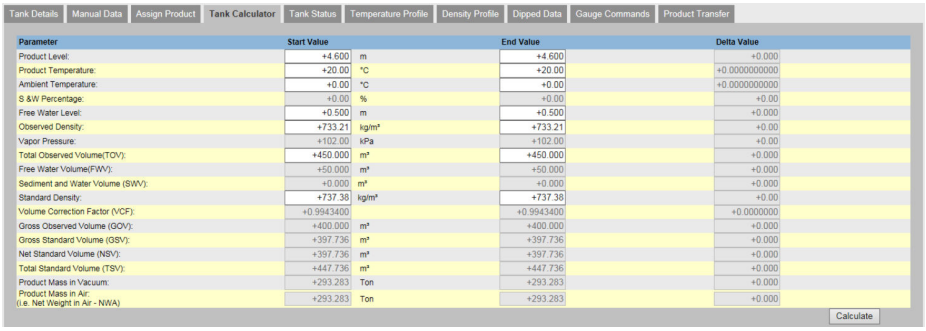
Based on the above mentioned scenarios, the tank calculator would also indicate whether the resulting tank parameter could cause an alarm.

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:



Parameter	Start Value		End Value	Delta Value
Product Level:	+4.600	m	+4.600	+0.000
Product Temperature:	+20.00	°C	+20.00	+0.0000000000
Ambient Temperature:	+0.00	°C	+0.00	+0.0000000000
S &W Percentage:	+0.00	%	+0.00	+0.00
Free Water Level:	+0.500	m	+0.500	+0.000
Observed Density:	+733.21	kg/m³	+733.21	+0.00
Vapor Pressure:	+102.00	kPa	+102.00	+0.00
Total Observed Volume(TOV):	+450.000	m³	+450.000	+0.000
Free Water Volume(FWV):	+50.000	m³	+50.000	+0.000
Sediment and Water Volume (SWV):	+0.000	m³	+0.000	+0.000
Standard Density:	+737.38	kg/m³	+737.38	+0.00
Volume Correction Factor (VCF):	+0.9943400		+0.9943400	+0.0000000
Gross Observed Volume (GOV):	+400.000	m³	+400.000	+0.000
Gross Standard Volume (GSV):	+397.736	m³	+397.736	+0.000
Net Standard Volume (NSV):	+397.736	m³	+397.736	+0.000
Total Standard Volume (TSV):	+447.736	m³	+447.736	+0.000
Product Mass in Vacuum:	+293.283	Ton	+293.283	+0.000
Product Mass in Air: (i.e. Net Weight in Air - NWA)	+293.283	Ton	+293.283	+0.000

Use the scroll bar on the right to see more parameters.

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.

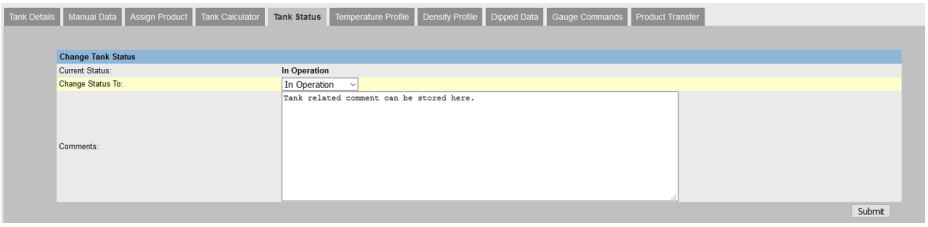
6.5 The "Tank Status" tab

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

To change the tank status for all tanks at once, go to the **Configuration → Tank Status** page.

To change the tank status

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



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" (→ 📄 44) 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.

Comments
Enter the tank related comment information here.

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** overview.

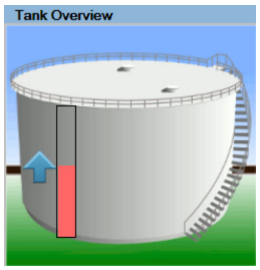
6.5.1 Tank Status Change Matrix

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

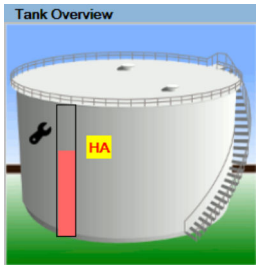
Activity vs Tank Status	In Operation	Manual	Maintenance	Locked
Inventory Calculation	Yes	Yes	No	Yes
Product Transfer	Yes	Yes	No	No
Gauge Commands	Yes	No	No	No
Raise Change in Volume Alarm	No	No	No	Yes
Field Scan	Yes	No	No	Yes
Raise Alarms	Yes	No	No	Yes

6.5.2 Tank Status Indicator

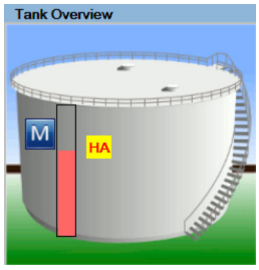
Tankvision indicates the tank status on the **Tank Overview** section on the **Tank Details** tab. When the tank status is modified to "In Operation", the system indicates the tank status on the **Tank Overview** section as follows:



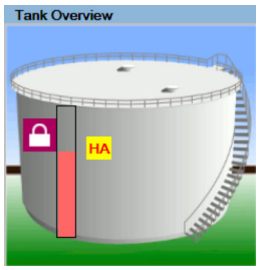
When the tank status is modified to "In Maintenance", the system indicates the tank status on the **Tank Overview** section as follows:



When the tank status is modified to "Manual", the system indicates the tank status on the **Tank Overview** section as follows:



When the tank status is modified to "Locked", the system indicates the tank status on the **Tank Overview** section as follows:

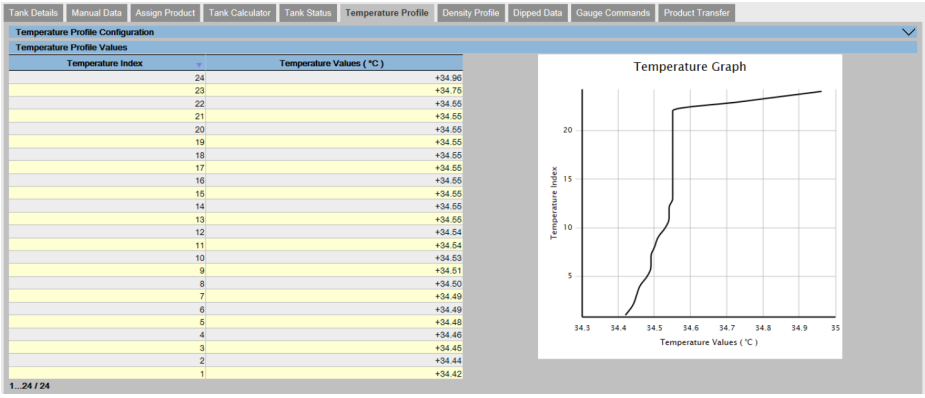


6.6 The "Temperature Profile" tab

The **Temperature Profile** tab displays measured values from the spot elements of an average temperature probe.

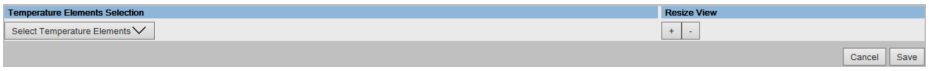
To view the "Temperature Profile" tab

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

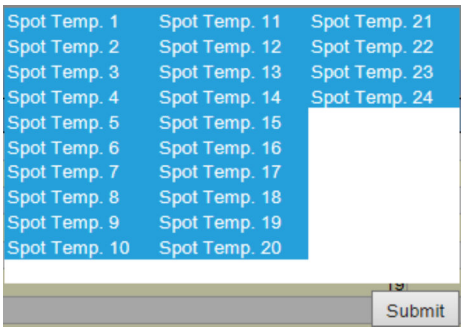


The table presents the temperature profile data according to the corresponding **Temperature Index** (element number, where the lowest element is the element number 1).
This information is also presented graphically next to this table in the **Temperature Graph**.
The amount of elements to be displayed (according to the average temperature probe which is in use) can be selected in the **Temperature Profile Configuration** section.
Which spot elements are displayed in the **Temperature Element Values** table and the size of the view can be configured in the **Temperature Elements Selection** section.

2. Click on **Temperature Elements Selection**.
   ↳ Tankvision displays the screen as follows:



3. To select the spot elements for the **Temperature Element Values** table, click the **Select Temperature Elements** picklist.
   ↳ Tankvision displays a pop-up as follows:



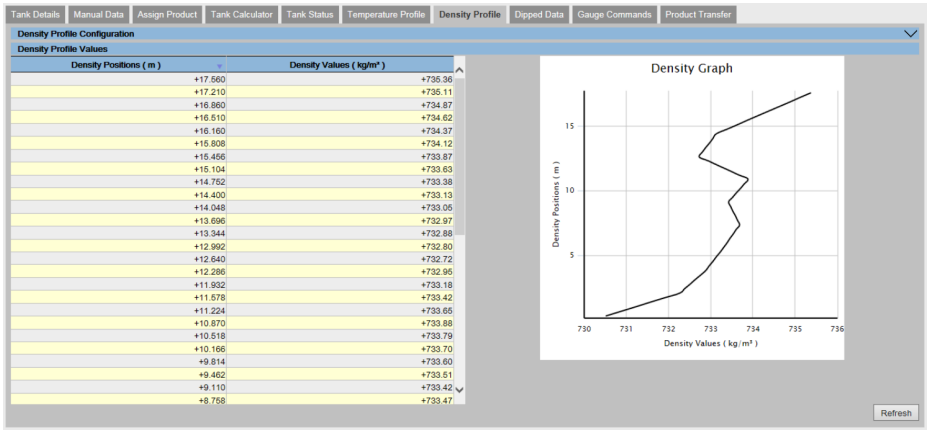
4. Click on the spot elements to select/deselect them. Several spot elements can be selected by holding the **Ctrl** key with clicking on the parameters.
5. Click the **Submit** button to return to the **Temperature Profile Selection**.
6. Click the **Save** button to save the configuration.
   ↳ The configuration is changed for the selected tank.
7. Click **Cancel** to exit.

6.7 The "Density Profile" tab

The **Density Profile** tab displays measured values from the spot elements of an average density probe.

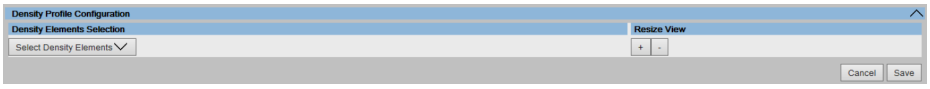
To view the "Density Profile" tab

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

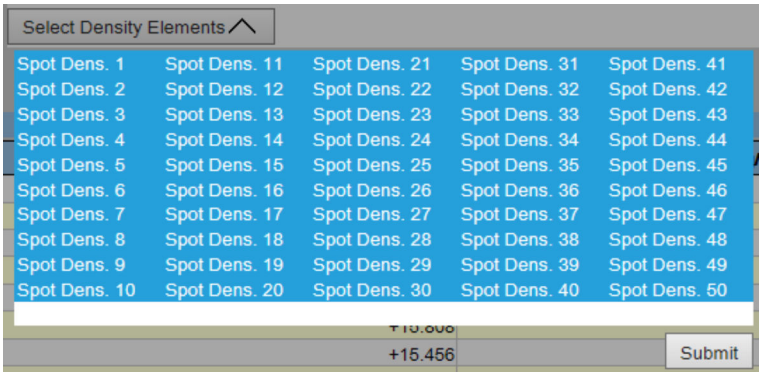


The table presents the density profile data according to the corresponding **Density Positions**. This information is also presented graphically next to this table in the **Density Graph**.
The amount of elements to be displayed (according to the average density probe which is in use) can be selected in the **Density Profile Configuration** section. Which spot elements are displayed in the **Density Element Values** table and the size of the view can be configured in the **Density Elements Selection** section.

2. Click ⌄ on **Density Elements Selection**.
   ↳ Tankvision displays the screen as follows:



3. To select the spot elements for the **Density Element Values** table, click the **Select Density Elements** picklist.
   ↳ Tankvision displays a pop-up as follows:



Click on the spot elements to select/deselect them. Several spot elements can be selected by holding the **Ctrl** key with clicking on the parameters.

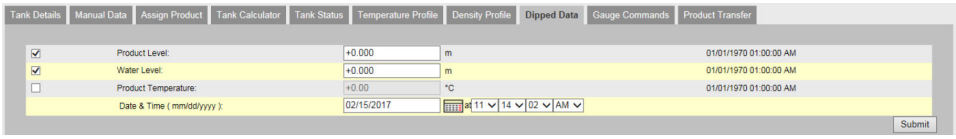
Click the **Submit** button to return to the **Density Profile Selection**.

Click the **Save** button to save the configuration. The configuration is changed for the selected tank. Click **Cancel** to exit.

ℹ The density profile graph is not continuously updated as profiles are not generated within a few minutes. Therefore the **Refresh** button has to be used if the data has to be actualized. This also applies after changing the configuration of the profile.

6.8 The "Dipped Data" tab

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



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 & 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.

6.9 The "Gauge Commands" tab

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 (refer to "The "Configuration" - "Tanks" menu - 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.

Tankvision Tank Scanner prevents the user to send the same gauge command multiple times to a servo gauge (i.e. the Tank Scanner only sends gauge command once to the servo gauge and ignores the gauge command until a new command is requested). This applies for gauge command requests via the Host Link, OPC DA or the web interface.

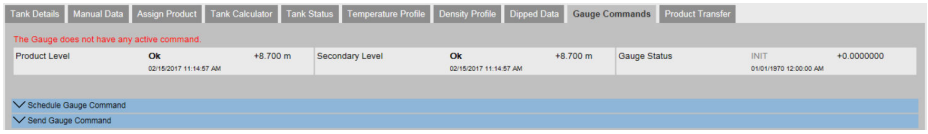
In case a gauge command has been given to the servo gauge via a separate way (e.g. directly from the display), then the Tank Scanner will not get this information. In this case simply by sending a different gauge command and switching back to the gauge command will solve the issue.

6.9.1 Schedule Gauge Command

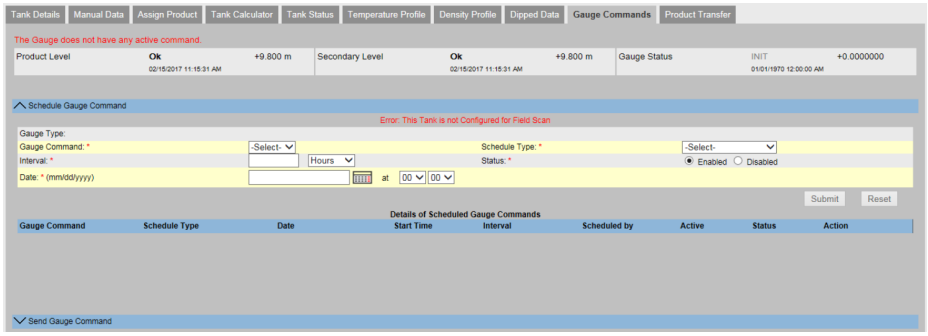
The Tankvision system allows the user to schedule gauge commands, such that they can be executed either immediately or at a certain time. An operator can schedule a gauge command only if that particular gauge command is enabled in the **Gauge Command** configuration screen.

To schedule a gauge command

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



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



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** tab.

Error Messages
"Error: Cannot Send Gauge Command While Tank Status is Manual or in Maintainance."
This message appears when the user sends a gauge command while tank status is **Manual**, **In Maintenance** or **Locked**.

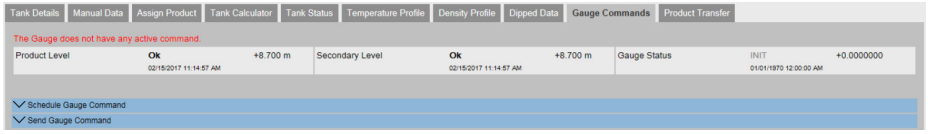
6.9.2 Send Gauge Command

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.

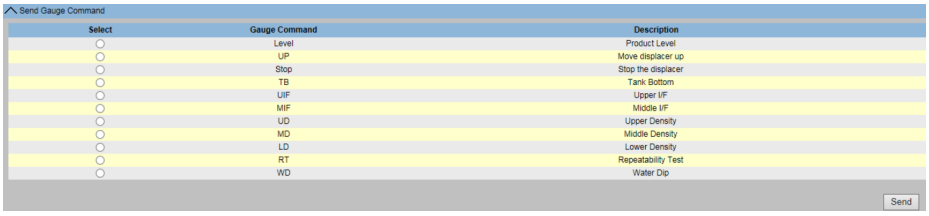
Tankvision system allows the user to send gauge command via following interfaces:
- Via Tankvision Tank Scanner web interface
- Via connected Host application with NXA822
- Via OPC Server

Sending gauge commands

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



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



Product level and **Product temperature**
Displaying Product Level and Product Temperature incl. Status

Status and **Date and Time**
Displaying Active Gauge Command and issuing Date and Time

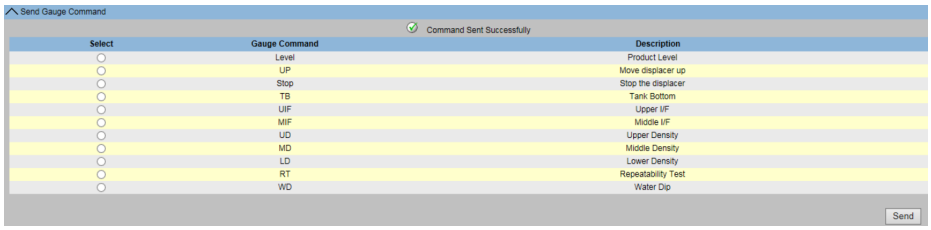
Select
Select the appropriate gauge command option corresponding to the gauge command name.
The radio buttons are highlighted only if the corresponding gauge commands are configured in the **Gauge Command** screen.

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 cancel the active 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** tab.

Error Messages
"Error: Cannot Send Gauge Command While Tank Status is Manual or in Maintainance."
This message appears when the user sends a gauge command while tank status is **Manual**, **In Maintenance** or **Locked**.

6.10 The "Product Transfer" tab

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 (refer to "Product Transfer Report") will mention the W&M approved status, which can be used to prove that the correct amount of product has been transferred.

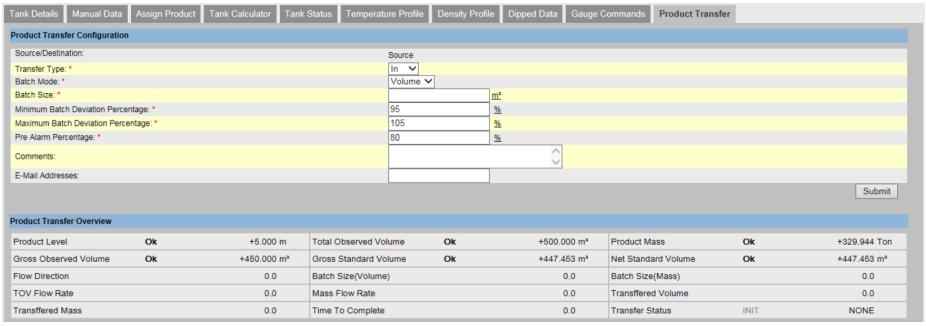
6.10.1 Product Transfer Life Cycle

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:



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**.

Transfer Type
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.

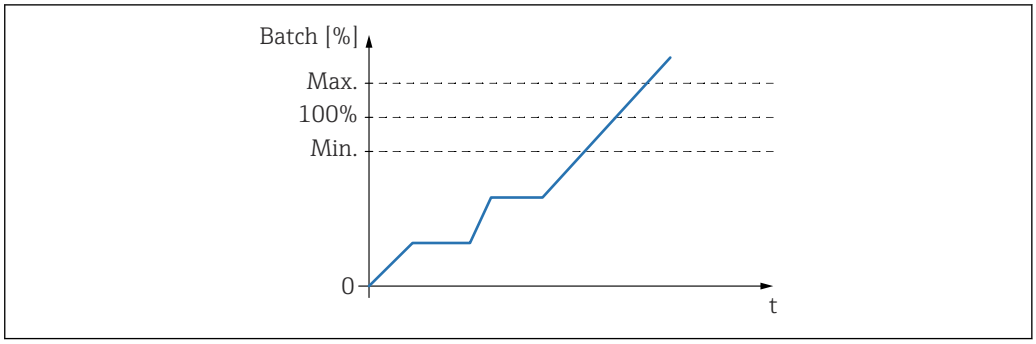
Batch Mode
Select the appropriate batch mode from the drop down list. This field allows you to select the mode of product transfer. The batch mode is **Volume** or **Mass**.
Volume: The quantity of product to be transferred is specified as Total Observed Volume (TOV) of product.
Mass: The quantity of product to be transferred is specified as product Mass.
This field is disabled after creating a new product transfer.

Batch Size
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.

Batch Deviation Percentage
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 the rate of change of volume is less than the minimum rate of change of the volume (refer to "Flow Calculation")

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 (refer to "Flow Calculation")

The data type for this field is numeric.



Pre Alarm Percentage
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.

Comments
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.

E-Mail Addresses
Enter the appropriate Email addresses. Whenever the product transfer is completed, the system sends a product transfer report by Email to the Email addresses entered in this field.

Transfer Status
This field displays the status of the product transfer. The product transfer status can be:
- **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)

2. Below the **Product Transfer Configuration**, the **Product Transfer Overview** is displayed. 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.

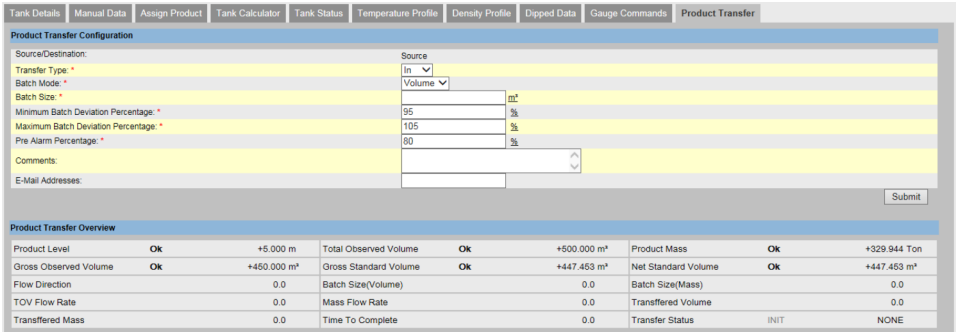
An event is generated after creating a product transfer. The event details can be viewed in the **Event** overview.

6.10.2 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.

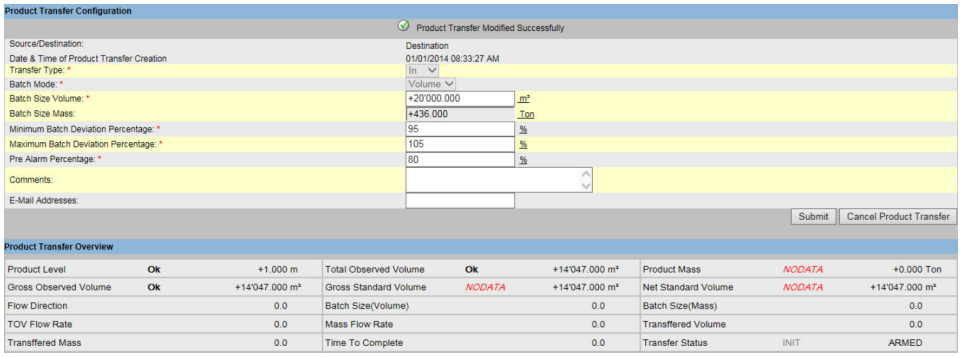
An image of Tankvision displaying the status as **NONE** is as follows:



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 Chapter "Flow Calculation"). 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 **Transfer 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** tab.

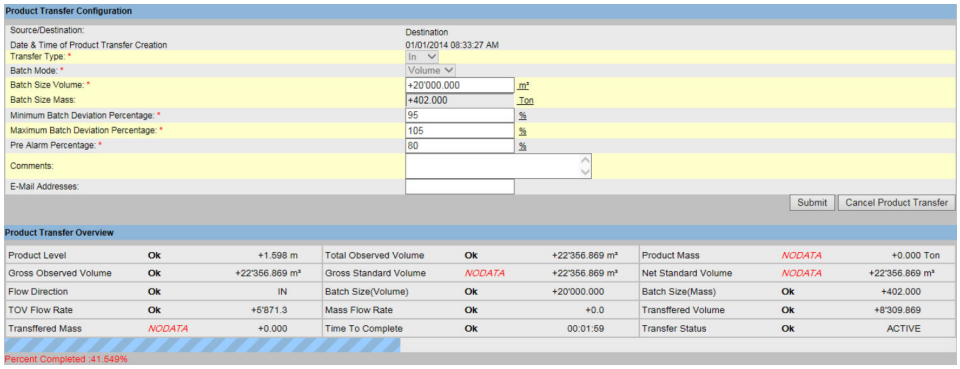
Detection of the start of a product transfer

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 Configuration

Source/Destination:	Destination
Date & Time of Product Transfer Creation	01/01/2014 08:33:27 AM
Transfer Type: *	In
Batch Mode: *	Volume
Batch Size Volume: *	+20'000.000 m³
Batch Size Mass:	+402.000 Ton
Minimum Batch Deviation Percentage: *	95 %
Maximum Batch Deviation Percentage: *	105 %
Pre Alarm Percentage: *	80 %
Comments:	
E-Mail Addresses:	

Submit | Cancel Product Transfer

Product Transfer Overview

Product Level	Ok	+1.598 m	Total Observed Volume	Ok	+22'356.869 m³	Product Mass	NODATA	+0.000 Ton
Gross Observed Volume	Ok	+22'356.869 m³	Gross Standard Volume	NODATA	+22'356.869 m³	Net Standard Volume	NODATA	+22'356.869 m³
Flow Direction	Ok	IN	Batch Size(Volume)	Ok	+20'000.000	Batch Size(Mass)	Ok	+402.000
TOV Flow Rate	Ok	+5'871.3	Mass Flow Rate	Ok	+0.0	Transffered Volume	Ok	+8'309.869
Transffered Mass	NODATA	+0.000	Time To Complete	Ok	00:01:59	Transfer Status	Ok	ACTIVE

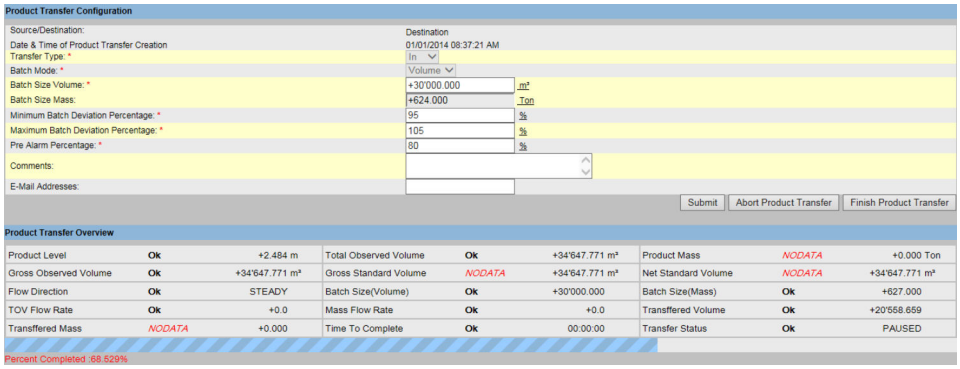
Percent Completed :41.549%

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 Configuration

Source/Destination:	Destination
Date & Time of Product Transfer Creation	01/01/2014 08:37:21 AM
Transfer Type: *	In
Batch Mode: *	Volume
Batch Size Volume: *	+30'000.000 m³
Batch Size Mass:	+624.000 Ton
Minimum Batch Deviation Percentage: *	95 %
Maximum Batch Deviation Percentage: *	105 %
Pre Alarm Percentage: *	80 %
Comments:	
E-Mail Addresses:	

Submit | Abort Product Transfer | Finish Product Transfer

Product Transfer Overview

Product Level	Ok	+2.484 m	Total Observed Volume	Ok	+34'647.771 m³	Product Mass	NODATA	+0.000 Ton
Gross Observed Volume	Ok	+34'647.771 m³	Gross Standard Volume	NODATA	+34'647.771 m³	Net Standard Volume	NODATA	+34'647.771 m³
Flow Direction	Ok	STEADY	Batch Size(Volume)	Ok	+30'000.000	Batch Size(Mass)	Ok	+627.000
TOV Flow Rate	Ok	+0.0	Mass Flow Rate	Ok	+0.0	Transffered Volume	Ok	+20'558.659
Transffered Mass	NODATA	+0.000	Time To Complete	Ok	00:00:00	Transfer Status	Ok	PAUSED

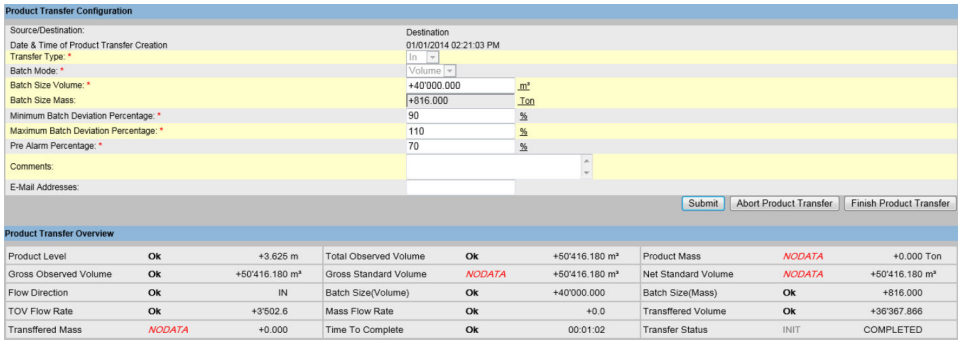
Percent Completed :68.529%

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:



Product Transfer Configuration

Source/Destination:	Destination	
Date & Time of Product Transfer Creation	01/01/2014 02:21:03 PM	
Transfer Type: *	In	
Batch Mode: *	Volume	
Batch Size Volume: *	+40'000.000	m³
Batch Size Mass:	+816.000	Ton
Minimum Batch Deviation Percentage: *	90	%
Maximum Batch Deviation Percentage: *	110	%
Pre Alarm Percentage: *	70	%
Comments:		
E-Mail Addresses:		

Submit | Abort Product Transfer | Finish Product Transfer

Product Transfer Overview

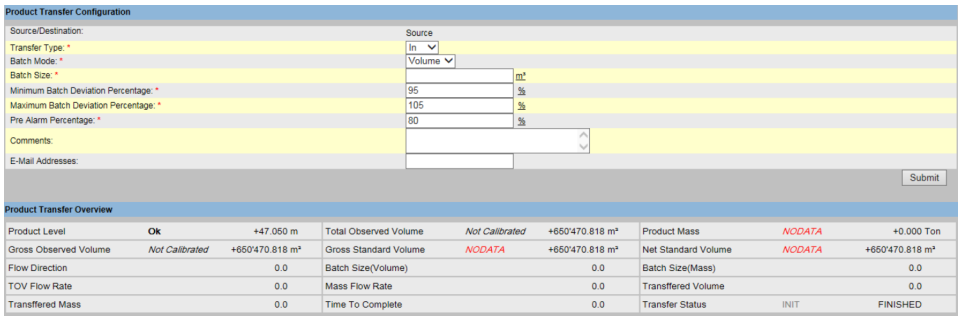
Product Level	Ok	+3.625 m	Total Observed Volume	Ok	+50'416.180 m³	Product Mass	NODATA	+0.000 Ton
Gross Observed Volume	Ok	+50'416.180 m³	Gross Standard Volume	NODATA	+50'416.180 m³	Net Standard Volume	NODATA	+50'416.180 m³
Flow Direction	Ok	IN	Batch Size(Volume)	Ok	+40'000.000	Batch Size(Mass)	Ok	+816.000
TOV Flow Rate	Ok	+3'502.6	Mass Flow Rate	Ok	+0.0	Transffered Volume	Ok	+36'367.866
Transffered Mass	NODATA	+0.000	Time To Complete	Ok	00:01:02	Transfer Status	INIT	COMPLETED

The system generates an event for a completed product transfer. The event details can be viewed in the **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:



Product Transfer Configuration

Source/Destination:	Source	
Transfer Type: *	In	
Batch Mode: *	Volume	
Batch Size: *		m³
Minimum Batch Deviation Percentage: *	95	%
Maximum Batch Deviation Percentage: *	105	%
Pre Alarm Percentage: *	80	%
Comments:		
E-Mail Addresses:		

Submit

Product Transfer Overview

Product Level	Ok	+47.050 m	Total Observed Volume	Not Calibrated	+650'470.818 m³	Product Mass	NODATA	+0.000 Ton
Gross Observed Volume	Not Calibrated	+650'470.818 m³	Gross Standard Volume	NODATA	+650'470.818 m³	Net Standard Volume	NODATA	+650'470.818 m³
Flow Direction		0.0	Batch Size(Volume)		0.0	Batch Size(Mass)		0.0
TOV Flow Rate		0.0	Mass Flow Rate		0.0	Transffered Volume		0.0
Transffered Mass		0.0	Time To Complete		0.0	Transfer Status	INIT	FINISHED

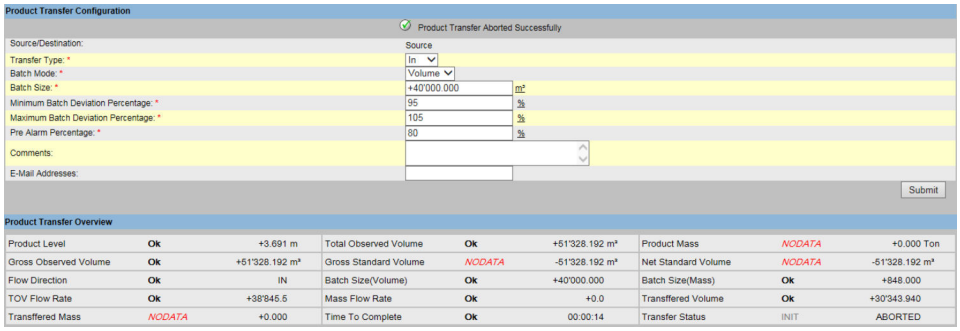
Observe the following information regarding the product transfer!

- 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** 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.



Product Transfer Configuration

Product Transfer Aborted Successfully

Source/Destination:	Source	
Transfer Type: *	In	
Batch Mode: *	Volume	
Batch Size: *	+40'000.000	m³
Minimum Batch Deviation Percentage: *	95	%
Maximum Batch Deviation Percentage: *	105	%
Pre Alarm Percentage: *	80	%
Comments:		
E-Mail Addresses:		

Submit

Product Transfer Overview

Product Level	Ok	+3.691 m	Total Observed Volume	Ok	+51'328.192 m³	Product Mass	NODATA	+0.000 Ton
Gross Observed Volume	Ok	+51'328.192 m³	Gross Standard Volume	NODATA	-51'328.192 m³	Net Standard Volume	NODATA	-51'328.192 m³
Flow Direction	Ok	IN	Batch Size(Volume)	Ok	+40'000.000	Batch Size(Mass)	Ok	+848.000
TOV Flow Rate	Ok	+38'845.5	Mass Flow Rate	Ok	+0.0	Transffered Volume	Ok	+30'343.940
Transffered Mass	NODATA	+0.000	Time To Complete	Ok	00:00:14	Transfer Status	INIT	ABORTED

Observe the following information regarding the product transfer!

- 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** tab.

Error Messages

- "Error: Tank Cant be Armed with New Product Transfer If No Product has been Assigned to the Tank"
  This message appears when the user attempts to create a product transfer when "No Product" is assigned to the tank.
- "Error: Tank Status Locked; Cant Create New Product Transfer for Locked Tank"
  This message appears when the user attempts to create a product transfer when the tank status is **Locked**.
- "Error: Tank Status in Maintenance; Cant Create New Product Transfer for Tank in Maintenance"
  This message appears when the user attempts to create a product transfer when the tank status is **In Maintenance**.
- "Error: Invalid Batch Size, should be Non-Zero Positive Float within correct range"
  This message appears when the Batch size entered by the user is equal to zero.
- "Error: Invalid Batch Size, should be Non-Zero Positive Float within correct range"
  This message appears when the value of the Batch size entered by the user is less than zero.
- "Error: 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.
- "Error: 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.
- "Error: 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.
- "Error: Pre Alarm Percentage should be Less Than Minimum Deviation"
  This message appears when the pre-alarm percentage entered by the user is more than the minimum batch deviation.

7 The "Reports" menu

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

To generate a report

1. On the Navigation Tree, click the **Reports** header.
   ↳ It expands as follows:

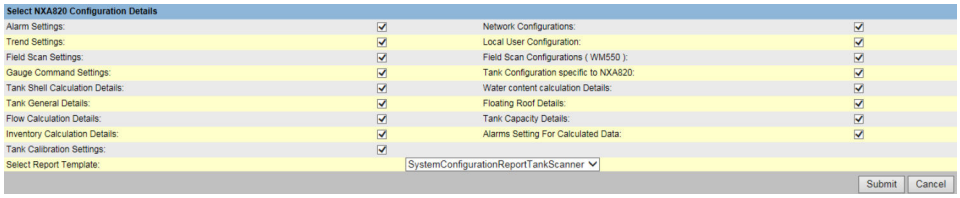
2. Select the type of report you are going to configure from the list.

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

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.

7.1 Select NXA820 Configuration Details



16 Select NXA820 Configuration Details

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.

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 Configuration
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.

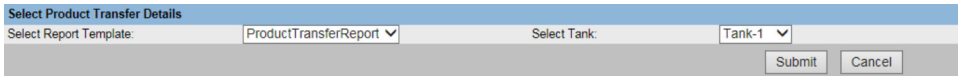
Floating Roof Details
Generate a report of the Floating Roof Details.

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.

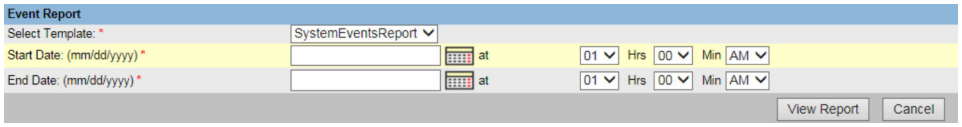
7.2 Select Product Transfer Details



17 *Select Product Transfer Details*

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.

7.3 Event Report



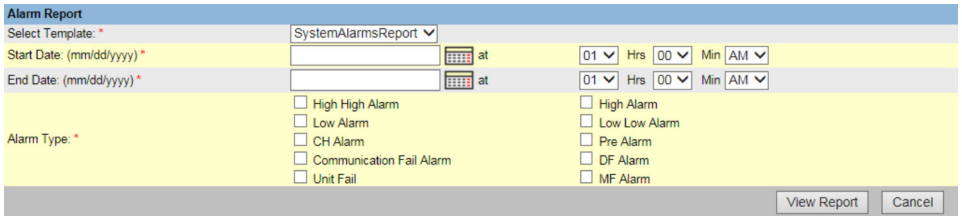
18 *Event Report*

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.

7.4 Alarm Report



19 *Alarm Report*

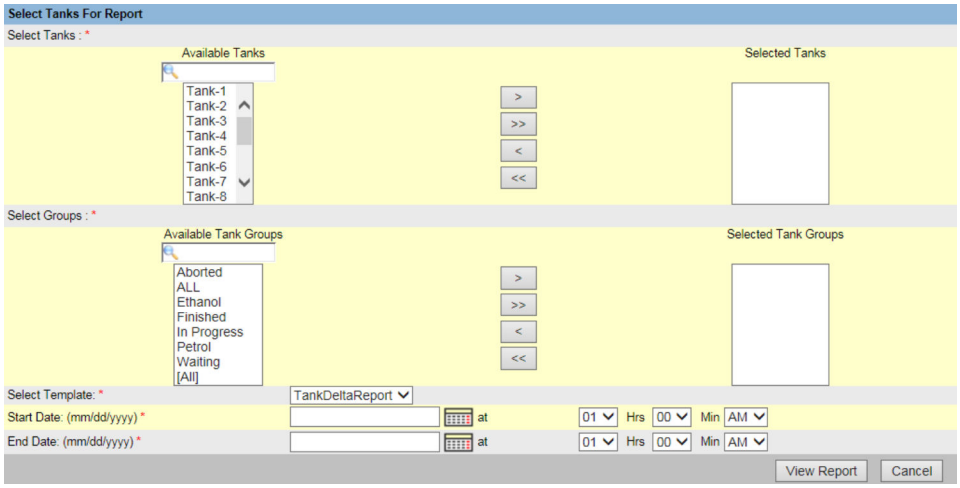
Select Template
Allows to select the template to be used to generate the alarm report.

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.

7.5 Select Tanks For Tank Report



20 Select Tanks For Tank Report

Select Tanks
Allows to select the tanks to be included into the Tank report.

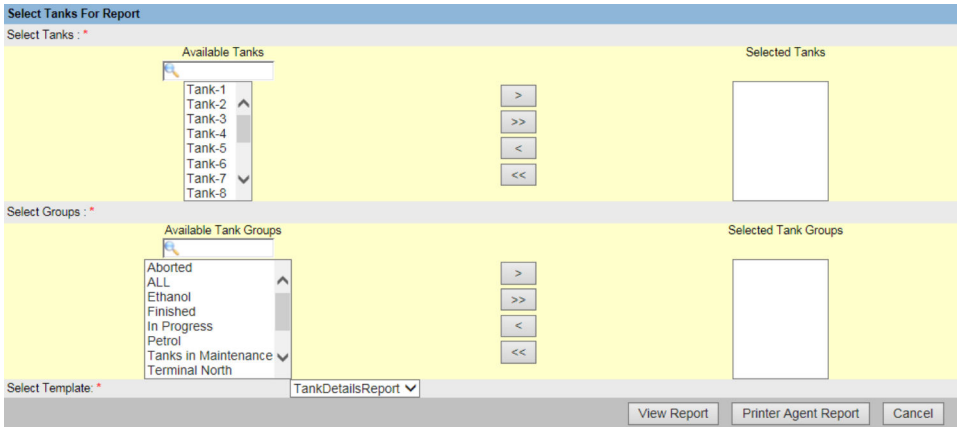
Select Groups
Allows to select the group of tanks to be included into the tank report.

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.

7.6 Select Tanks For Tank Detail Report



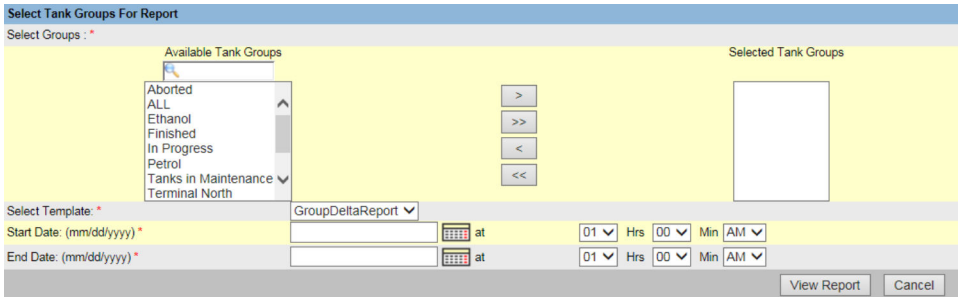
21 Select Tanks For Tank Detail Report

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.

7.7 Select Tank Groups For Report



22 Select Tank Groups For Report

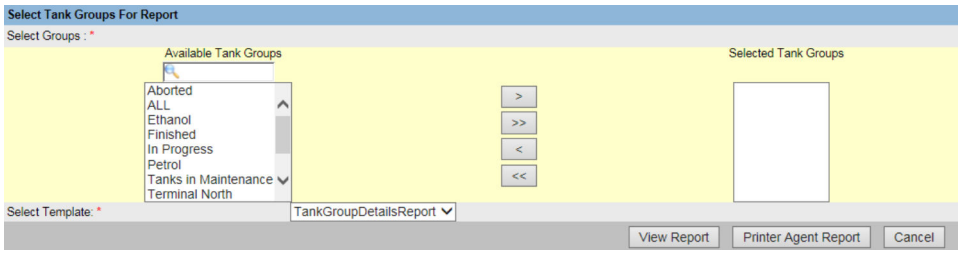
Select Groups
Allows to select the group of tanks to be included into the tank group report.

Select Template
Allows to select the template to be used to generate the tank group report.

Start Date
Define the start date (and time) for the tank group report.

End Date
Define the end date (and time) for the tank group report.

7.8 Select Tank Groups For Details Report

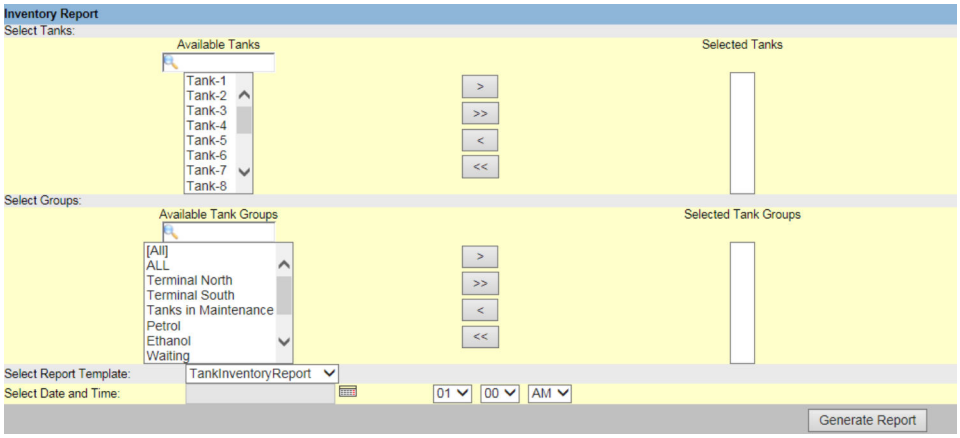


23 Select Tank Groups For Details Report

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.

7.9 Select Tank Inventory Report



24 *Select Tank Inventory Report*

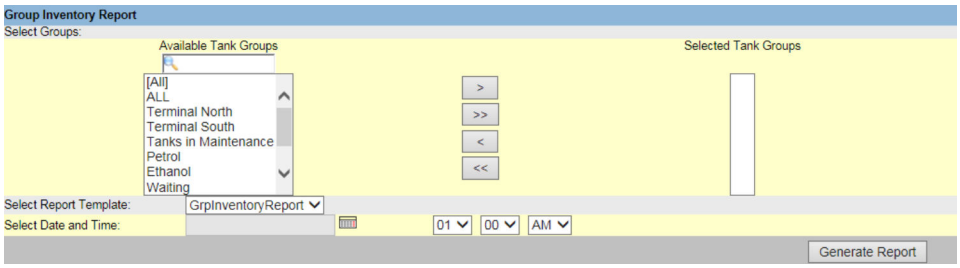
Select Tanks
Allows to select the tanks to be included into the tank inventory report.

Select Groups
Allows to select the group of tanks to be included into the tank inventory report.

Select Report Template
Allows to select the template to be used to generate the tank inventory report.

Select Date and Time
Allows to select the date and time from when the data on the report shall be generated.

7.10 Select Group Inventory Report



25 *Select Group Inventory Report*

Select Groups
Allows to select the group of tanks to be included into the group inventory report.

Select Report Template
Allows to select the template to be used to generate the group inventory report.

Select Date and Time
Allows to select the date and time from when the data on the report shall be generated.

7.11 Product Transfer Report

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 - NXAC1001101101 | PRODUCT TRANSFER REPORT | Endress+Hauser

CONFIGURATION SETTING DETAILS

Site Name	:	Date (mm/dd/yyyy)	: 01/02/2014
Site Location	:	Time (HH:MM:SS AM)	: 11:35:38 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)	: +40'000.000 m³	Batch Mode	: VOLUME
Batch Size (MASS)	: +872.000 Ton	Batch Mode	: MASS
Maximum Batch Deviation Percentage	: 110 %	Pre-Alarm Percentage	: 80 %
Minimum Batch Deviation Percentage	: 90 %		
Product VCF calculation method	: ASTM D1250-80 -Table 24B	Product RDC calculation method	: ASTM D1250-80 -Table 23B
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	:	+1.003 m	+4.281 m	+3.278 m
Product Temperature	:	+23.8 °C	+22.0 °C	-1.8 °C
Vapor pressure	:	+25.00 kPa	+24.75 kPa	-0.25 kPa
Vapor Temperature	:	+1.7 °C	+1.9 °C	+0.2 °C
Observed density	:	+21.8 kg/m³	+21.8 kg/m³	+0.0 kg/m³
Free water level	:	+5.025 m	+5.013 m	-0.012 m
Free water volume	:	+0.000 m³	+0.000 m³	+0.000 m³
Total observed volume	:	+14'089.113 m³	+59'481.000 m³	+45'391.887 m³
Gross standard volume	:	-14'089.113 m³	-59'481.000 m³	-45'391.887 m³
Net standard volume	:	-14'089.113 m³	-59'481.000 m³	-45'391.887 m³
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)	:	01/02/2014	01/02/2014	0
Time (HH:MM:SS AM)	:	11:34:42 AM	11:35:38 AM	0:0

W&M Approved
This section displays the status of W&M approval.

Configuration Setting Details
This section displays the report of the configuration settings.
Refer to "Site Information" for details.

Product Transfer Details
This section displays the report of Product Transfer settings.
Refer to "Product Transfer Life Cycle" for details.

Element Name
This section displays the result of the product transfer in terms of parameter changes.
Refer to "The "Tank Calculator" tab" for details.

2. For more information on the product transfer report, → 60.

8 The "Transfers" menu

The Tankvision system has a feature of dynamically displaying the product transfer. The product transfer details are grouped in the **Waiting**, **In Progress**, **Finished**, and **Aborted** product transfer stages.

Product transfer groups:

Waiting
In this group, the user can view all the tanks that have a product transfer in the Armed stage.

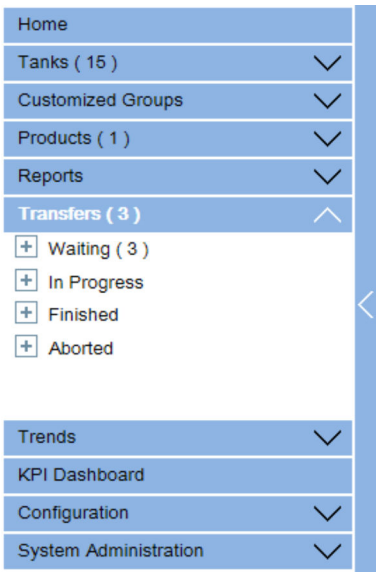
In Progress
In this group, the user can view all the tanks that have a product transfer in the Active and Paused stages.

Finished
In this group, the user can view all the tanks that have a product transfer in the Finished or Completed stages.

Aborted
In this group, the user can view all the tanks that have a product transfer in the Aborted stage.

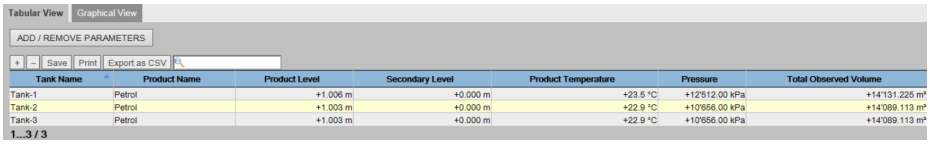
To view product transfer details

1. On the Navigation Tree, click the **Transfers** header. (The number of product transfer groups is displayed in bracket next to the header's name.)
   ↳ The **Transfers** header expands as follows:



2. In the above figure, the <Product Transfer Groups> name are displayed under the **Transfers** header.
   ↳ The <Product Transfer Group> name dynamically displays the number of tanks associated with the <Product Transfer Group> name, which is shown inside the bracket.

3. Click the <Product Transfer Group> name.
   ↳ Tankvision displays the **Transfers** - <Product Transfer Group Name> screen as follows:



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

Click the ⊞ next to the <Product Transfer Group> name. The system will expand the leaf node, and display the <Tank Names> that are in the respective product transfer group. The user may click on the <Tank Name> to view detailed information for the tank.

8.1 Graphical View of the Product Transfer Group Details

To view the product transfer group details in graphical format

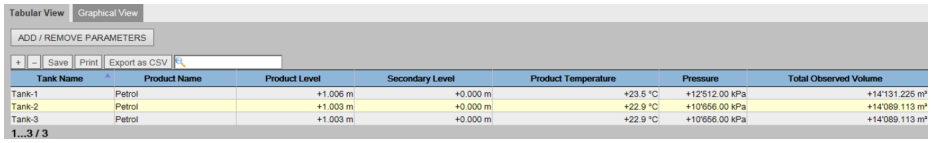
- On the **Transfers** - <Product Transfer Group Name> screen, click the **Graphical View** tab.
  - Tankvision displays the screen as follows:

The user, who is a guest can view the **Non Real Time Product Transfer Group Details** screen. The system displays the measured graphical information of the tanks at the time of selecting the relevant product transfer group. The user has to manually refresh the screen to view the latest measured graphical information.

8.2 Tabular View of the Product Transfer Group Details

To view the product transfer group details in tabular format

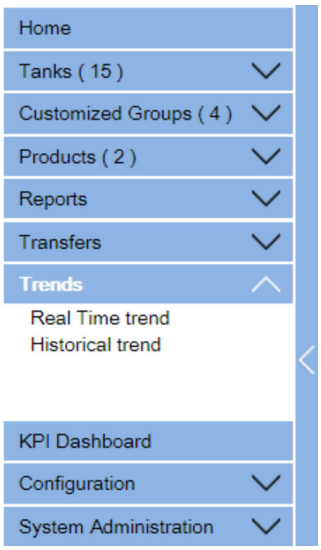
- On the **Transfers** - <Product Transfer Group Name> screen, click the **Tabular View** tab.
  - Tankvision displays the screen as follows:



The user, who is a guest can view the **Non Real Time Product Transfer Group Details** screen. The system displays the measured graphical information of the tanks at the time of selecting the relevant product transfer group. The user has to manually refresh the screen to view the latest measured graphical information.

9 The "Trends" menu

On the Navigation Tree, click the **Trends** header. It expands as follows:



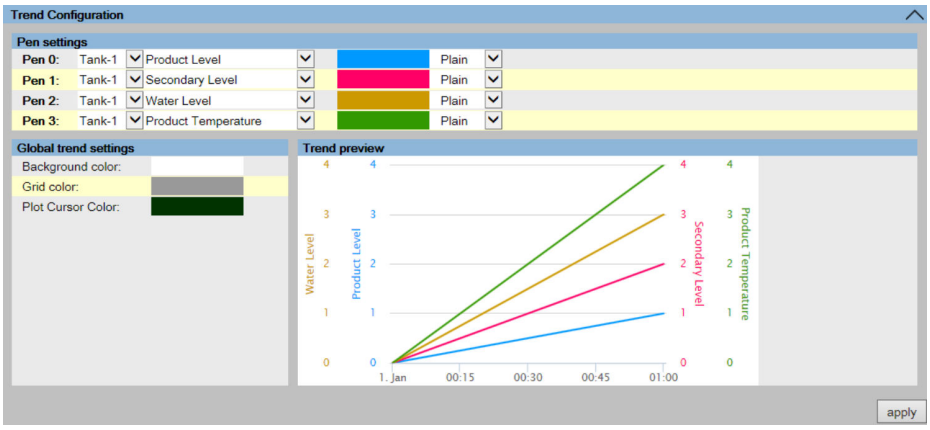
9.1 Real Time trend

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. In the navigation tree, click the **Trends** header. Click **Real Time trend**.
   ↳ Tankvision displays the screen as follows:

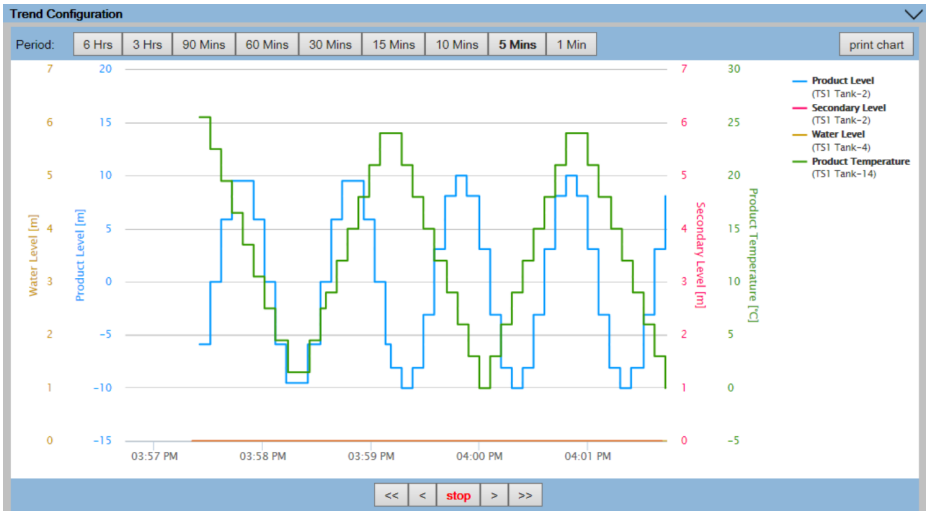


Pen settings
This section displays a list of pens (**Pen 0**, **Pen 1**, **Pen 2** and **Pen 3**) that are used to identify the parameters selected. Select the appropriate tanks, parameters, pen colors and pen style from the respective drop down lists.

Global trend settings
Select the **Background color**, **Grid color** and **Plot Cursor color** from the respective drop down lists.

Trend preview
See a preview of the real time trend plot with the currently selected settings.

2. Select the appropriate settings and click the **apply** button.
   ↳ Tankvision displays the screen as follows:



The line graphs are displayed based on the selection of tank parameters in the Trend Configuration area.

A plotter can be moved through the graphic area. According to the position of the plotter values are displayed in a field next to it. For example:

Click and drag with the mouse to zoom into the graph.

Period
The Period icons allow you to make changes to the current time window. The selected period (last 6 hours, 3 hours, 90, 60, 30, 15, 10, 5 minutes or the last minute) is displayed in the plotting area.

print chart
The **print chart** icon lets you print the current real time trend chart with a connected printer.

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.

run/stop
The run/stop icon lets you run or stop the real time trend. When the trend is running, **stop** is displayed. When the trend is stopped, **run** is displayed.

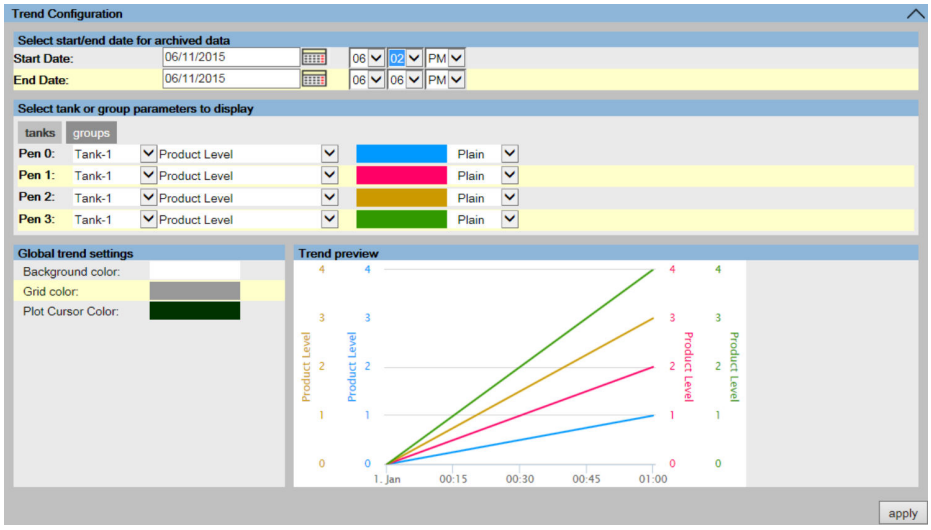
9.2 Historical Trend

The Tankvision system collects data from the tanks and monitors the values using a trend. A trend is a line graph which gives a pictorial representation of the recent changes in measured values over time. The **Historical trend** is hosted in the NXA820 unit. It depicts the measured values and elements 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. The historical trend shows (unlike the real time trend) historical data which are stored in the Tankvision unit. Up to 4 values can be plotted in one chart.

To view a historical trend

1. In the navigation tree, click **Historical trend** in the **Trends** header.
   ↳ Tankvision displays the screen as follows:



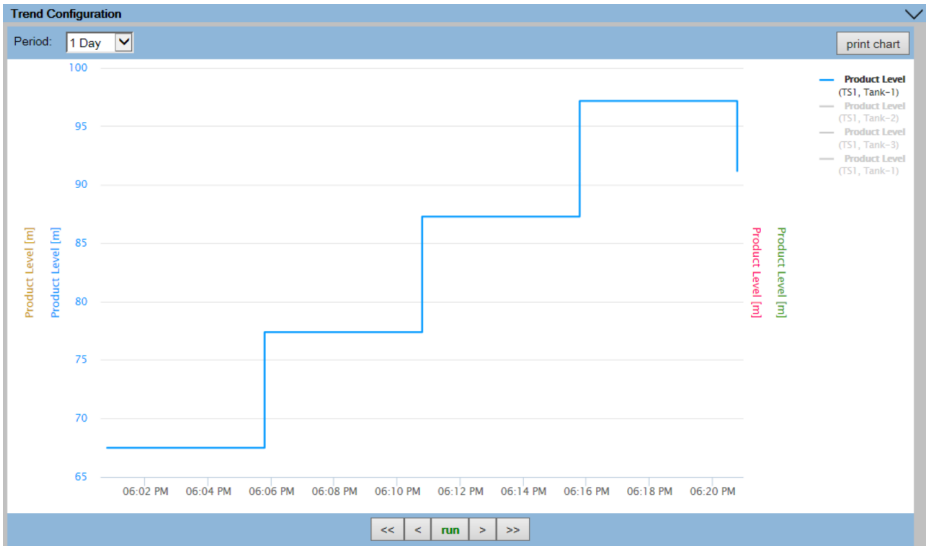
Select start/end date for archived data
Select the interval which should be displayed.

Select tank or group parameters to display
This section displays a list of pens (**Pen 0**, **Pen 1**, **Pen 2** and **Pen 3**) that are used to identify the parameters selected. Select **tanks** or **groups** tab. Select the appropriate tanks/tank groups, parameters, pen colors and pen style from the respective drop down lists.

Global trend settings
Select the **Background color**, **Grid color** and **Plot Cursosr color** from the respective drop down lists.

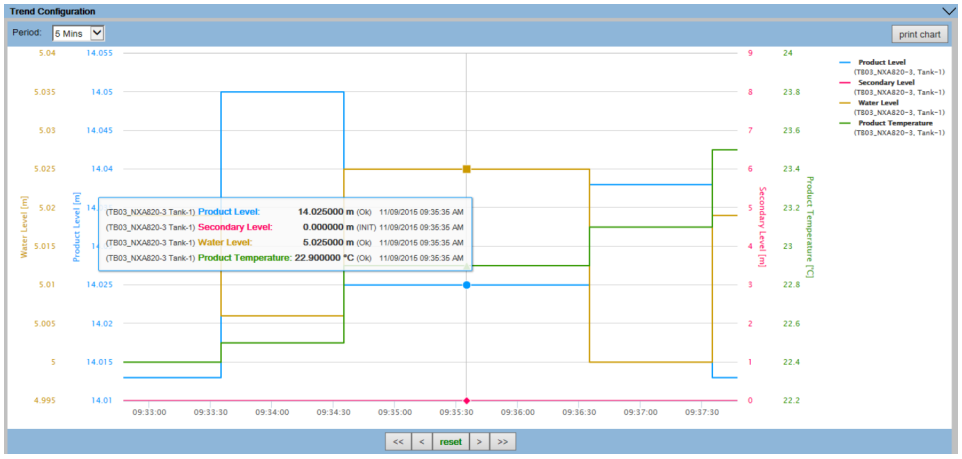
Trend preview
See a preview of the real time trend plot with the currently selected settings.

2. Select the appropriate settings and click the **apply** button.
   ↳ Tankvision displays the screen as follows:



The line graphs are displayed based on the selection of tank parameters in the Trend Configuration area.

A plotter can be moved through the graphic area. According to the position of the plotter values are displayed in a field next to it. For example:



Click and drag with the mouse to zoom into the graph.

Period
The Period drop down list allows you to make changes to the currently displayed time window. The selected period is displayed in the plotting area.

print chart
The **print chart** icon lets you print the current real time trend chart with a connected printer.

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 values in the historical trend.
< The **Go Previous** button shows the previous time window.
> The **Go Next** button shows the next time window.
>> The **Go Last** button shows the latest values in the historical trend.

run/stop
Without function.

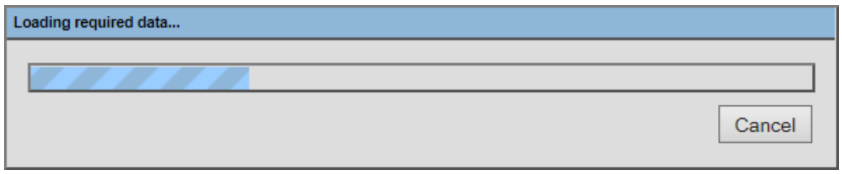
10 KPI Dashboards

Key Performance Indicators (KPIs) are predefined, calculable, sensible and not financial test parameters that provide the user of Tankvision with information for the evaluation and analysis of executed processes.

Data from the archive data base of the Tank Scanner NXA820 is loaded (not applicable for the interface-only version) which is the calculation basis of the KPIs. The KPIs are calculated and graphically displayed.

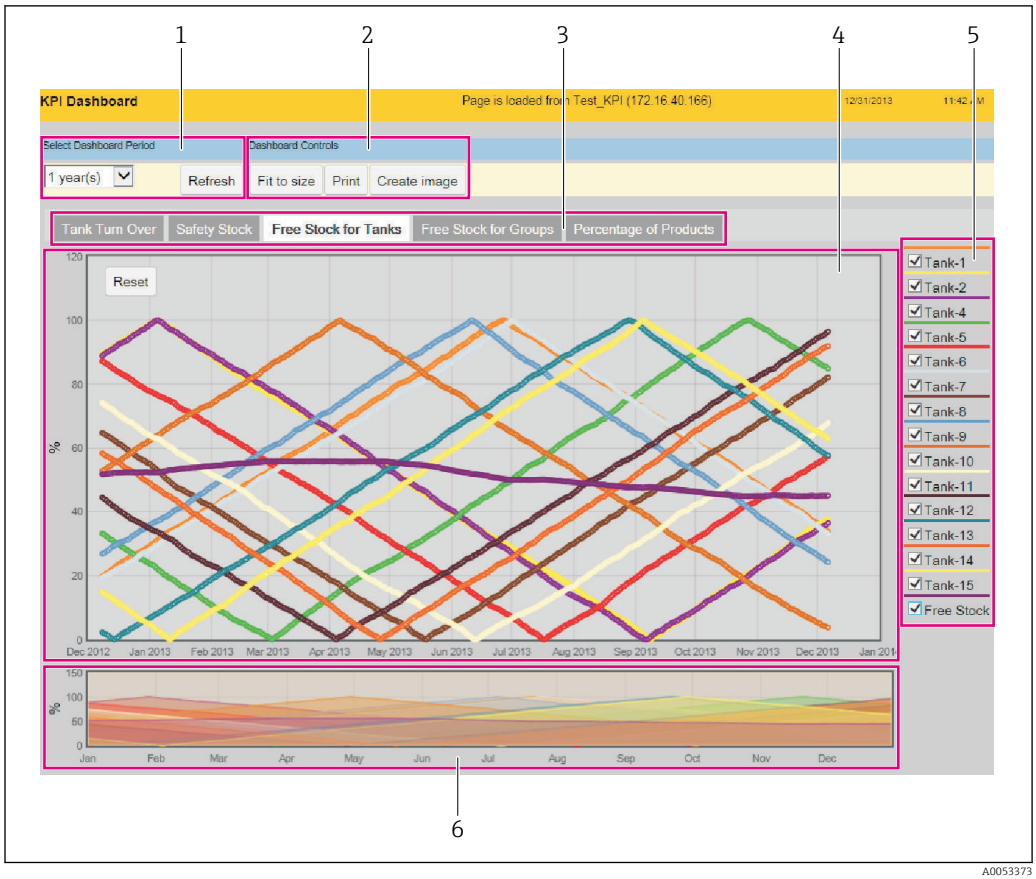
10.1 Starting KPI Dashboards

On the Navigation Tree, click the **KPI Dashboard** header. Tankvision displays a progress bar while retrieving data as follows.



The rest of the screen is locked while the progress bar is displayed.

10.2 Global Settings



1 *Select Dashboard Period*
2 *Dashboard Controls*
3 *Select KPI*
4 *KPI Graphic Area*
5 *Select Tanks/Groups and Free Stock*
6 *Select Shown Time Interval*

Select Dashboard Period

Select the period for which the KPI data are displayed from the drop down list and click **Refresh**.

Dashboard Controls

Click **Fit to size** to fit the KPI Dashboard in your browser window.
Click **Print** to print the chart on a connected printer.
Click **Create image** to create an image of the chart. The image can be saved with browser functions.

Select KPI

Select the appropriate KPI to be displayed.

KPI Graphic Area

The KPI Graphic Area includes a chart of the selected KPI for the selected Tanks/Groups over the selected Dashboard Period.

Select Tanks/Groups and Free Stock

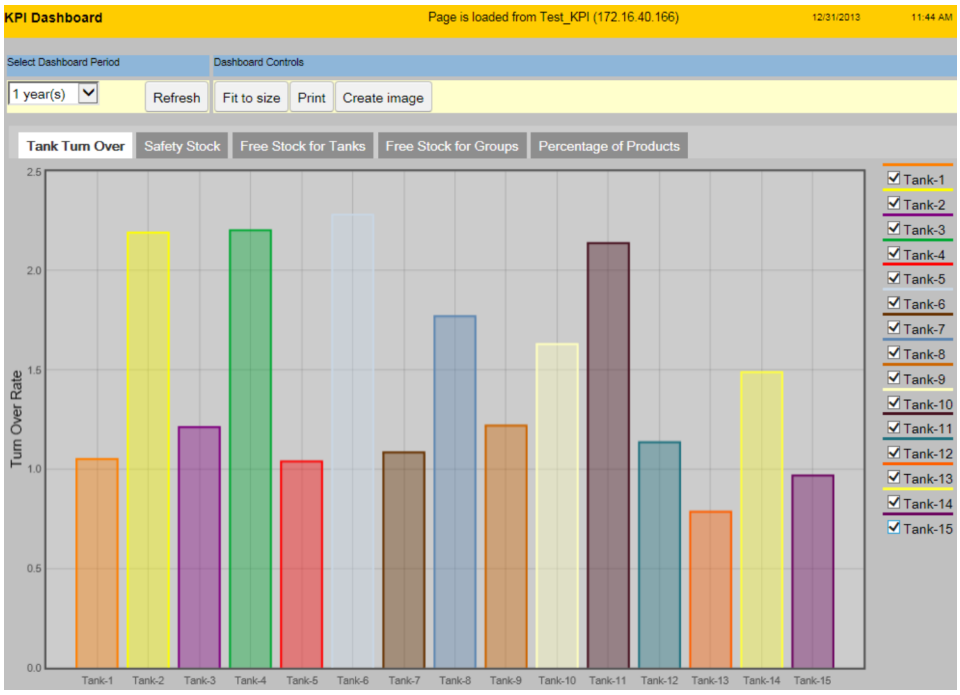
Select the appropriate Tanks/Groups or Free Stock to be displayed.
As default, only the first tank in the list ist selected.
Not available for all KPIs.

Select Shown Time Interval
Click and drag to select the time interval that is displayed in the KPI Graphic Area.
Click **Reset** in the upper left corner of the KPI Graphic Area to reset the displayed period to default.
Not available for all KPIs.

10.3 Tank Turn Over KPI

The **Tank Turn Over** KPI indicates how often a tank is turned over during the selected period.

Select the **Tank Turn Over** KPI. Tankvision displays the screen as follows.



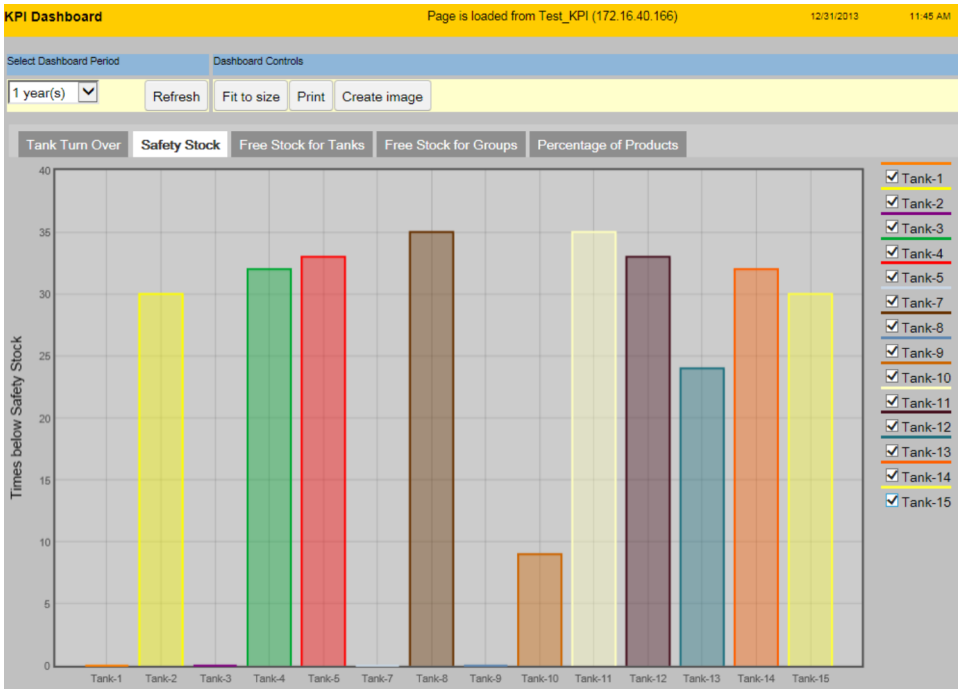
To select the tanks to be displayed, select/clear the check boxes in the list on the right of the KPI Graphic Area.

10.4 Safety Stock KPI

The **Safety Stock** KPI indicates how often the volume of a tank has undershot the "Safety Stock Volume" during the selected period. The Safety Stock Volume Point is set by the TOV LA alarm. Therefore it is necessary to set the LA alarm for each tank.

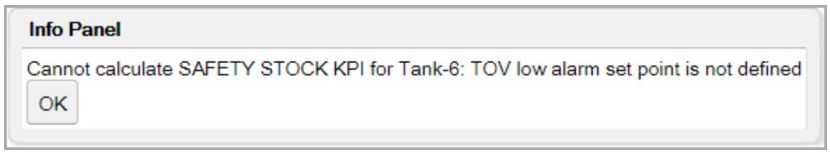
The **Safety Stock** KPI is calculated using the currently set LA alarm. Thus, the LA alarm can be set retroactively.

Select the **Safety Stock** KPI. Tankvision displays the screen as follows.



To select the tanks to be displayed, select/clear the check boxes in the list on the right of the KPI Graphic Area.

If the LA alarm is not set for one or more tanks, the following info panel is displayed listing all the tanks without a set LA alarm. Click **OK** to acknowledge.

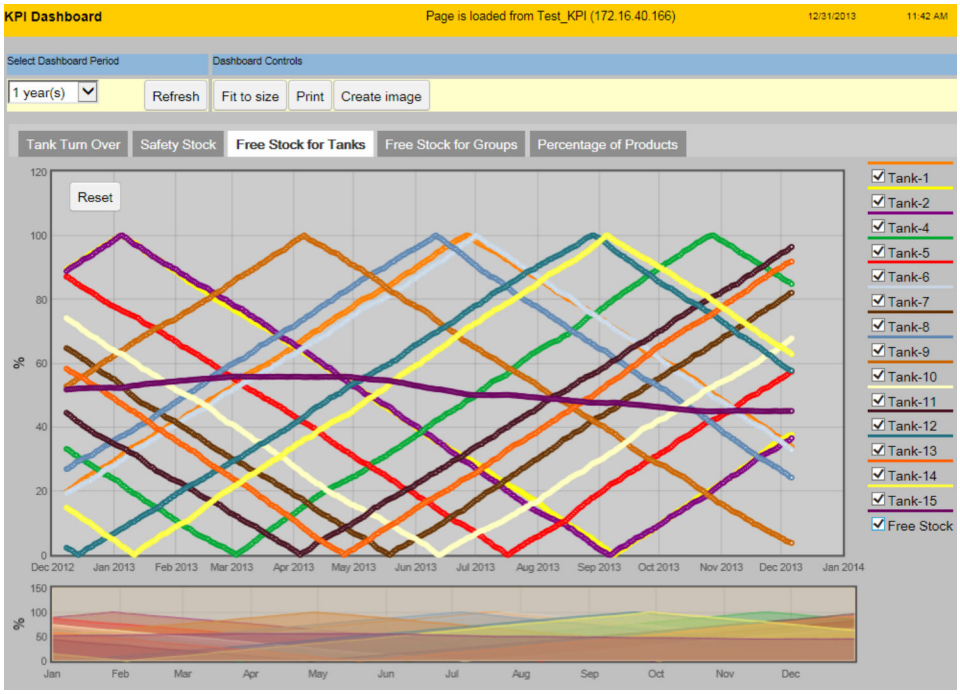


10.5 Free Stock KPI for Tanks

The Free Stock KPI for tanks indicates the IN STOCK values for each tank as well as the FREE STOCK value relating to all tanks.

The Free Stock is the overall sum of the free capacities of all tanks (not just the selected tanks).

Select the **Free Stock for Tanks** KPI. Tankvision displays the screen as follows.

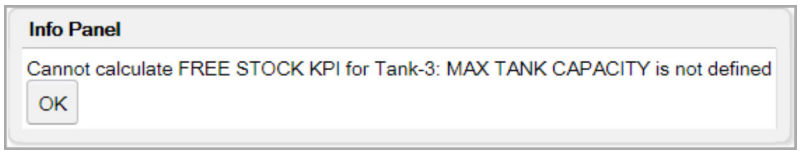


To select the tanks and the Free Stock to be displayed, select/clear the check boxes in the list on the right of the KPI Graphic Area.

In the Select Shown Time Interval field, click and drag to select the time interval that is displayed in the KPI Graphic Area.

Click **Reset** in the upper left corner of the KPI Graphic Area to reset the displayed period to default.

If the MAX TANK CAPACITY is not configured for one or more tanks, the following info panel is displayed listing all the tanks without a configured MAX TANK CAPACITY. These tanks are not included in the calculation of the Free Stock. Click **OK** to acknowledge.

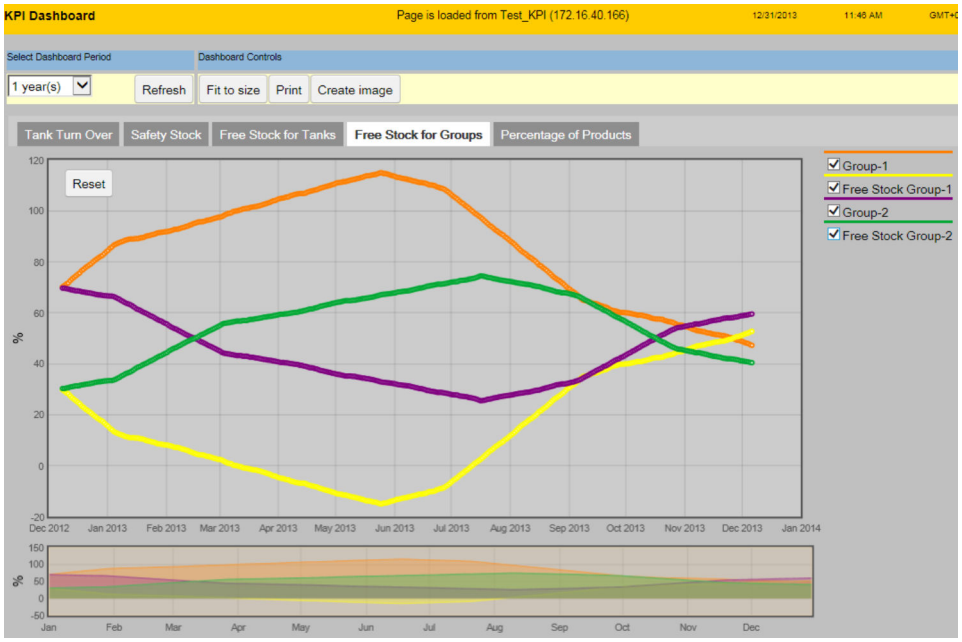


10.6 Free Stock KPI for Groups

The Free Stock KPI for groups indicates the IN STOCK values for each group as well as the FREE STOCK values relating to each group.

The Free Stock for the group is the overall sum of the free capacities of all tanks contained in the group.

Select the **Free Stock for Groups** KPI. Tankvision displays the screen as follows.



To select the groups and the Free Stocks to be displayed, select/clear the check boxes in the list on the right of the KPI Graphic Area.

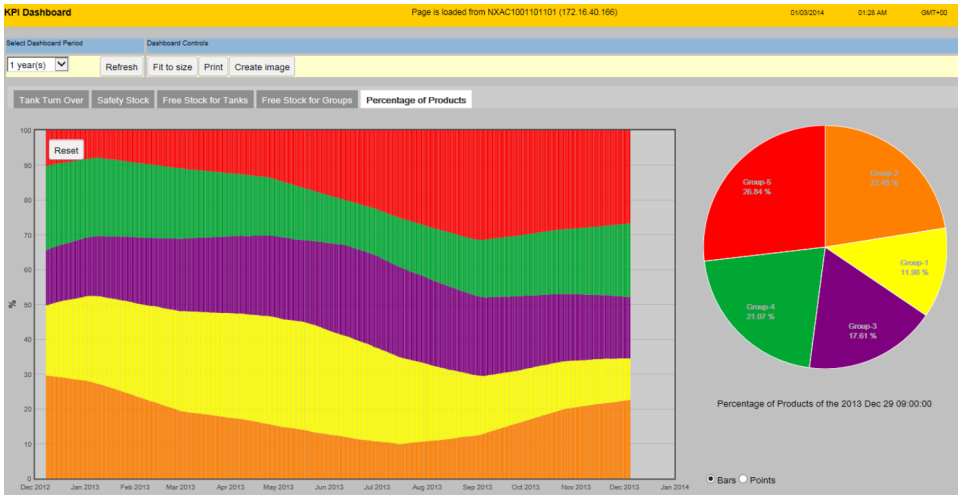
In the Select Shown Time Interval field, click and drag to select the time interval that is displayed in the KPI Graphic Area.

Click **Reset** in the upper left corner of the KPI Graphic Area to reset the displayed period to default.

10.7 Percentage of Products KPI

The **Percentage of Products** KPI shows the percental distribution of Products/Groups during the selected period.

Select the **Percentage of Products** KPI. Tankvision displays the screen as follows.



The pie chart on the right displays the position in the KPI Graphic Area that the mouse cursor is currently pointing at.

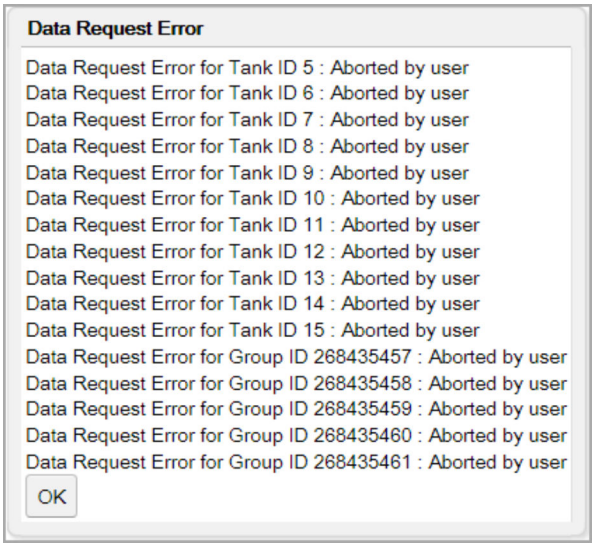
Clicking into the KPI Graphic Area locks the position for the pie chart. Clicking one more time releases the position.

You can zoom in with double clicking into the KPI Graphic Area or by using the scroll wheel. Zoom out with the scroll wheel or with the **Reset** button.

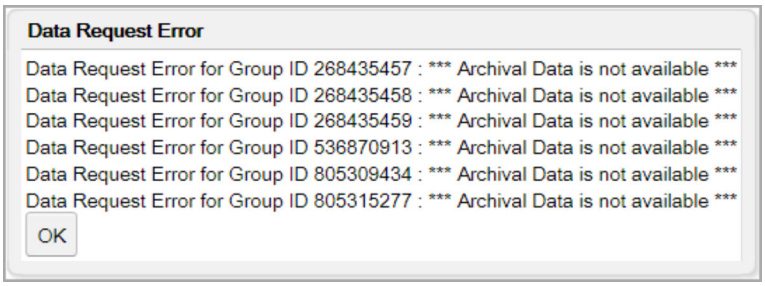
Choose between **Bars** and **Points** as display style of the KPI Graphic Area (**Bars** is default).

10.8 Errors

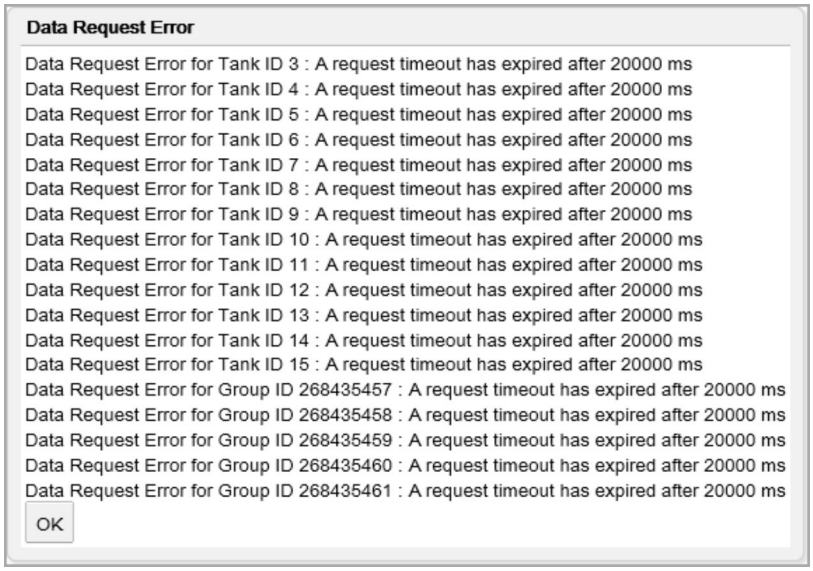
If, after starting **KPI Dashboard**, **Cancel** was clicked on the progress bar, Tankvision displays the following error.



If no archive data are available for one or more tanks, Tankvision displays the following error listing the concerned tanks.



If **KPI Dashboard** is running and the connection to the Tank Scanner is lost (LAN error), Tankvision displays the following error.

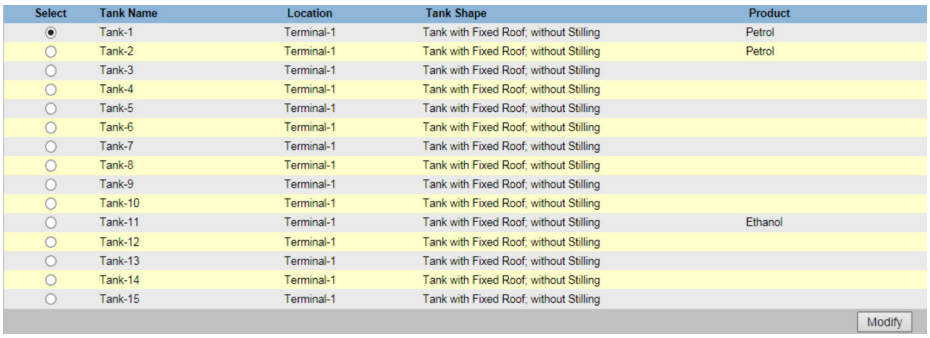

Data Request Error
Data Request Error for Tank ID 3 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 4 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 5 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 6 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 7 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 8 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 9 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 10 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 11 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 12 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 13 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 14 : A request timeout has expired after 20000 ms
Data Request Error for Tank ID 15 : A request timeout has expired after 20000 ms
Data Request Error for Group ID 268435457 : A request timeout has expired after 20000 ms
Data Request Error for Group ID 268435458 : A request timeout has expired after 20000 ms
Data Request Error for Group ID 268435459 : A request timeout has expired after 20000 ms
Data Request Error for Group ID 268435460 : A request timeout has expired after 20000 ms
Data Request Error for Group ID 268435461 : A request timeout has expired after 20000 ms
OK

11 The "Configuration" – "Tanks" menu – Tank Details

The working of the entire Tankvision system depends on the tanks and their contents. The Tankvision system acquires measured data from the gauges, processes these data using Tank Inventory calculations and then presents the data on the Tankvision interface for the user to view or access. Some of the inventory data such as volume and mass depend on the tank configuration and the product assigned to the tank.

To configure a tank

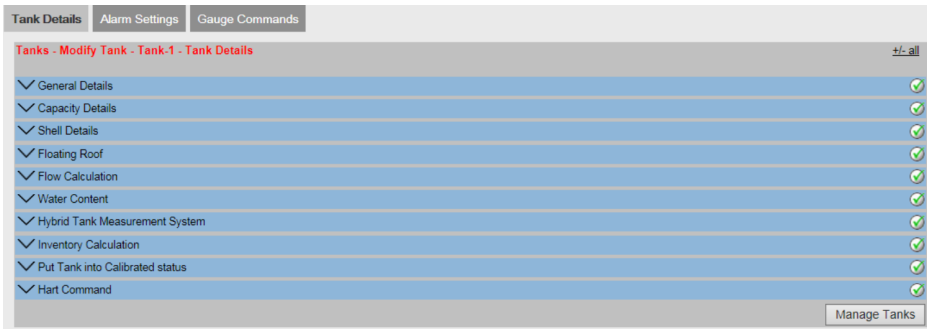
1. On the Navigation Tree, click the **Configuration** header. Click **Tanks**. (The number of tanks configured is displayed in brackets next to the Header's name).
   ↳ The **Manage Tanks** screen appears:



Select	Tank Name	Location	Tank Shape	Product
◉	Tank-1	Terminal-1	Tank with Fixed Roof, without Stilling	Petrol
○	Tank-2	Terminal-1	Tank with Fixed Roof, without Stilling	Petrol
○	Tank-3	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-4	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-5	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-6	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-7	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-8	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-9	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-10	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-11	Terminal-1	Tank with Fixed Roof, without Stilling	Ethanol
○	Tank-12	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-13	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-14	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-15	Terminal-1	Tank with Fixed Roof, without Stilling	

Modify

2. Select the appropriate tank by clicking on the selection box in front of the tank.
3. Click the **Modify** button to modify the tank details.
   ↳ Tankvision displays the **Tank Details** screen as follows:



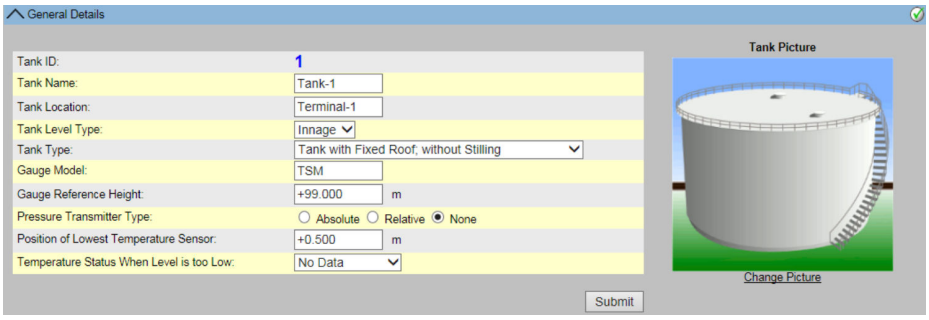
With the **Manage Tanks** button, you can step back to the **Manage Tanks** screen.

11.1 General Details

The **General Details** screen allows the user to view and modify the general details of the tank according to the requirements.

To configure the general details of the tank

1. Click ⌄ on **General Details**.
   ↳ Tankvision displays the screen as follows:



Tank ID
Each tank in the system has a unique numerical identifier ranging from 1 to 15. This ID is used in the system to refer to the tank to display the tank data, perform product transfer, generate reports, etc. This field is not editable.

Tank Name
Enter the name of the tank. Each tank in the Tankvision system has a unique name for reference, which should not exceed 16 characters in length. The data type for this field is alphanumeric and can contain the special characters "-" and "_" (hyphen and underscore).

Tank Location
Enter the location of the Tank. This field is used to identify the tank and enables the creation of a tank group based on the physical location of the tank in a tank farm.
The data type for this field is alphanumeric and can contain all special characters.

Tank Level Type
Select the appropriate settings in which way the measured value is transmitted from gauge. Innage or Ullage.

Tank Type
Select the appropriate type of tank from the drop down list.
This field indicates whether the tank has a floating roof or not. This enables the Tankvision system to decide whether to perform the floating roof adjustment during tank calculation.

Gauge Model
Enter the appropriate gauge model name or number for the tank.
The data type for this field is alphanumeric and can contain all special characters.

Gauge Reference Height
Enter the appropriate height of the gauge or tank top. The field is used to convert the product ullage level to the innage level. The data type for this field is numeric.

Pressure Transmitter Type
Enter the appropriate pressure type option. This field specifies, whether the measured pressure is absolute or relative if the pressure is measured using a pressure gauge.

Position of Lowest Temperature Sensor
Enter the value of the position of the lowest temperature sensor.
This field indicates the level of the lowest temperature sensor. If the product level falls below the position of lowest temperature sensor, then the temperature measured by this sensor can no more be considered as product temperature in the tank calculations.

Temperature Status When Level is too Low
Select the appropriate temperature status from the drop down list.
This field indicates the temperature status when the product level drops below the position of the lowest temperature sensor. This enables the system to change the value of the temperature status to an existing value in the drop down list.

Change Picture
Click the **Change Picture** link to change the picture of the tank.
Refer to section "Change Tank Picture" (→ 81) for more details.

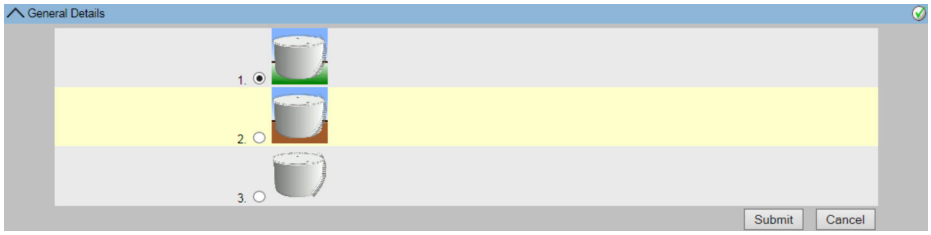
2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to save the tank general details.
4. After saving the settings, Tankvision displays a confirmation message.

An event is generated after configuring the tank general details. The event details can be viewed in the **Event** overview.

11.1.1 Change Tank Picture

To change the tank picture

1. Click the **Change picture** link on the **General Details** screen.
   ↳ Tankvision displays the screen as follows:



2. Click the appropriate option to select the picture.
3. Click the **Submit** button to save the tank image or click the **Cancel** button to exit.
4. Tankvision returns to the **General Details** screen.

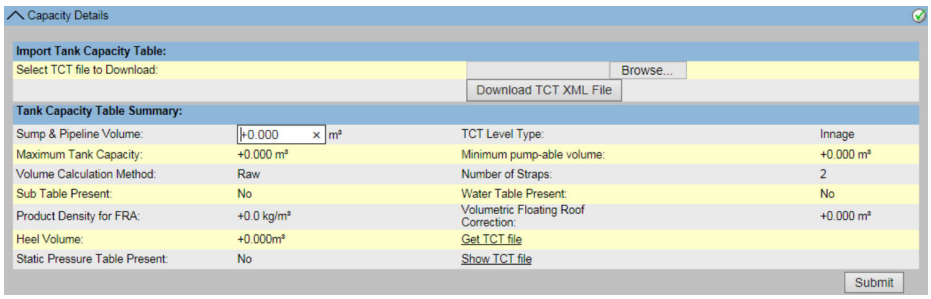
11.2 Capacity Details

Capacity Details are used to calculate the product volume from the product level. The most common industry method to measure the product volume is to use a Tank Capacity Table (TCT).

A TCT has a number of data points for each level in the tank and it gives the product volume corresponding to these levels. The **Capacity Details** screen allows you to view and modify the details of the tank in terms of the tank capacity table, total volume, minimum volume of the product that can be pumped out of the tank, etc.

To configure tank capacity details

1. Click on **Capacity Details**.
   ↳ Tankvision displays the screen as follows:



Select TCT file to Download
Enter the appropriate path to download the TCT file, or click the **Browse** button to search for an appropriate file location. The system reads the product level and uses the corresponding volume from the TCT as the product volume for further calculations. Read more about the TCT file contents below.

Sump & Pipeline Volume
Enter the value of the sump and pipeline volume. This field indicates the volume of the product contained in the sump and pipeline. The data type for this field is numeric.

Maximum Tank Capacity
Indicates the maximum volume which can be filled into a tank.

Volume Calculation Method
Value: Raw

Sub Table Present
Indicates wether a sub strapping table is present in the downloaded Tank Capacity Table.

Product Density for FRA
P_Density_FRA, if present is the density used to calculate the displaced volume.

Heel Volume
"Waste" volume, located on the tank bottom, it'll be substracted from the actual volume.

TCT Level Type
Defines the level type of entered straps in the Tank Capacity Table.
Values: Innage, Ullage

Minimum pumpable volume
Indicates the minimum pumpable volume of the attached pump on the tank.
While configuring a product transfer this should be considered as minimum batch size.

Number of Straps
Value shows the number of straps read from the Tank Capacity Table.

Water Table Present
Indicates whether a water table is present in the downloaded Tank Capacity Table.

Volumetric Floating Roof Correction
V_FRC, if present it is used to correct the volume.

Get TCT file
Link to download a Tank Capacity Table.

Static Pressure Table Present
Indicates whether a table for static pressure correction is present in the downloaded Tank Capacity Table.

View TCT file
Link to view a Tank Capacity Table.

2. Click the **Browse** button to search the TCT file location.
3. Click the **Download TCT XML File** button to download a TCT XML file from the system.
4. Enter the sump and pipeline volume in the **Sump & Pipeline Volume** field.
5. Click the **Submit** button to save the tank capacity details.
6. Tankvision displays the capacity details in the **Tank Capacity Table Summary** section, which is imported from the TCT file. After saving the details, Tankvision also displays a confirmation message.

An event is generated after configuring the tank capacity details. The event details can be viewed in the **Event** overview.

11.2.1 TCT XML file contents

The TCT file is a XML file, which provides the following information about the tank.

XML Tag	Definition
TCT_Date	TCT Date
TCT_CalDate	TCT Calibrated Date
Level_Type	Level Type
Volume_Method	Volume Method
Units Level	Units - Level Unit
Volume	- Volume Unit
Weight	- Weight Unit
P_Density_FRA	- Density Unit
FRA_TCT P_Density_FRA	Floating Roof Details - Used Liquid Density
V_FRC	- Volumetric FR Correction
Heel_Volume	Heel Volume
Max_Tank_Capacity	Max Tank Capacity
Total_Tank_Volume	Total Tank Volume
Min_Pump_Volume	Minimum Pumpable Volume
P_TCT CNT	Main TCT Table - Number of TCT straps
P_Strap	- - Each Strap
P_Level	- - - Level
P_Volume	- - - Volume
Sub_TCT	Sub TCT Present
Min_Sub_TCT_Level	Minimum Sub TCT level
P_S_TCT CNT	Sub TCT Table - Number of Sub TCT Straps
P_S_Strap	- - Each Strap
P_S_Level	- - - Level
P_S_Volume	- - - Volume
WATER_TCT	Water Table Present
Water CNT	Water Table - Number of Water TCT Straps
W_Strap	- - Each Strap
W_Level	- - - Level
W_Volume	- - - Volume
VSP_TABLE	Static Pressure Table Present
VSP_TABLE CNT	Static Pressure Table - Number of VSP straps
P_Strap	- - Each Strap
P_Level	- - - Level
VSP_Vol	- - - Volume

Sample TCT file


```xml
<?xml version ="1.0"?>
<?xml-stylesheet type ="text/xsl" href= "nxa820tct.xsl"?>
<Tankvision CRC ="12345">
  <TCT TCT_Date="3/28/2011" TCT_CalDate="3/28/2011" Sub_TCT="N" WATER_TCT="W_TCT" VSP_TABLE="Y">
    <Level_Type>Innage</Level_Type>
    <Units>
      <Level>mm</Level>
      <Volume>m3</Volume>
      <P_Density_FRA_Unit>kg/m3</P_Density_FRA_Unit>
    </Units>
    <FRA_TCT>
      <P_Density_FRA>1500</P_Density_FRA>
      <V_FRC>1</V_FRC>
    </FRA_TCT>
    <Heel_Volume>50</Heel_Volume>
    <Total_Tank_Volume>62369</Total_Tank_Volume>
    <Max_Tank_Capacity>61745</Max_Tank_Capacity>
    <Min_Pump_Volume>624</Min_Pump_Volume>
    <Volume_Method>RAW</Volume_Method>
    <P_TCT CNT="13">
        <P_Strap><P_Level>0</P_Level><P_Vol>87</P_Vol></P_Strap>
        <P_Strap><P_Level>50</P_Level><P_Vol>500</P_Vol></P_Strap>
        <P_Strap><P_Level>100</P_Level><P_Vol>1000</P_Vol></P_Strap>
        <P_Strap><P_Level>200</P_Level><P_Vol>2000</P_Vol></P_Strap>
        <P_Strap><P_Level>410</P_Level><P_Vol>5771</P_Vol></P_Strap>
        <P_Strap><P_Level>470</P_Level><P_Vol>6604</P_Vol></P_Strap>
        <P_Strap><P_Level>1000</P_Level><P_Vol>14047</P_Vol></P_Strap>
        <P_Strap><P_Level>1080</P_Level><P_Vol>25170</P_Vol></P_Strap>
        <P_Strap><P_Level>2440</P_Level><P_Vol>44039</P_Vol></P_Strap>
        <P_Strap><P_Level>2580</P_Level><P_Vol>45976</P_Vol></P_Strap>
        <P_Strap><P_Level>4160</P_Level><P_Vol>57809</P_Vol></P_Strap>
        <P_Strap><P_Level>10000</P_Level><P_Vol>80000</P_Vol></P_Strap>
        <P_Strap><P_Level>20000</P_Level><P_Vol>100000</P_Vol></P_Strap>
    </P_TCT>
    <W_TCT CNT="10">
        <W_Strap><W_Level>-1000</W_Level><W_Vol>0</W_Vol></W_Strap>
        <W_Strap><W_Level>-778</W_Level><W_Vol>222.22</W_Vol></W_Strap>
        <W_Strap><W_Level>-556</W_Level><W_Vol>444.44</W_Vol></W_Strap>
        <W_Strap><W_Level>-333</W_Level><W_Vol>666.66</W_Vol></W_Strap>
        <W_Strap><W_Level>-111</W_Level><W_Vol>888.88</W_Vol></W_Strap>
        <W_Strap><W_Level>111</W_Level><W_Vol>1111.1</W_Vol></W_Strap>
        <W_Strap><W_Level>333</W_Level><W_Vol>1333.32</W_Vol></W_Strap>
        <W_Strap><W_Level>555</W_Level><W_Vol>1555.54</W_Vol></W_Strap>
        <W_Strap><W_Level>778</W_Level><W_Vol>1777.76</W_Vol></W_Strap>
        <W_Strap><W_Level>1000</W_Level><W_Vol>1999.98</W_Vol></W_Strap>
    </W_TCT>
    <VSP_TABLE CNT="23">
       <P_Strap><P_Level>1000</P_Level><VSP_Vol>0</VSP_Vol></P_Strap>
       <P_Strap><P_Level>1100</P_Level><VSP_Vol>0</VSP_Vol></P_Strap>
       <P_Strap><P_Level>1200</P_Level><VSP_Vol>0</VSP_Vol></P_Strap>
       <P_Strap><P_Level>1300</P_Level><VSP_Vol>0</VSP_Vol></P_Strap>
       <P_Strap><P_Level>1400</P_Level><VSP_Vol>13</VSP_Vol></P_Strap>
       <P_Strap><P_Level>1500</P_Level><VSP_Vol>14</VSP_Vol></P_Strap>
       <P_Strap><P_Level>1600</P_Level><VSP_Vol>16</VSP_Vol></P_Strap>
       <P_Strap><P_Level>1700</P_Level><VSP_Vol>22</VSP_Vol></P_Strap>
       <P_Strap><P_Level>1800</P_Level><VSP_Vol>28</VSP_Vol></P_Strap>
       <P_Strap><P_Level>1900</P_Level><VSP_Vol>34</VSP_Vol></P_Strap>
       <P_Strap><P_Level>2000</P_Level><VSP_Vol>40</VSP_Vol></P_Strap>
       <P_Strap><P_Level>3000</P_Level><VSP_Vol>102</VSP_Vol></P_Strap>
       <P_Strap><P_Level>4000</P_Level><VSP_Vol>215</VSP_Vol></P_Strap>
       <P_Strap><P_Level>5000</P_Level><VSP_Vol>360</VSP_Vol></P_Strap>
       <P_Strap><P_Level>6000</P_Level><VSP_Vol>542</VSP_Vol></P_Strap>
       <P_Strap><P_Level>7000</P_Level><VSP_Vol>789</VSP_Vol></P_Strap>
       <P_Strap><P_Level>8000</P_Level><VSP_Vol>1073</VSP_Vol></P_Strap>
       <P_Strap><P_Level>9000</P_Level><VSP_Vol>1403</VSP_Vol></P_Strap>
       <P_Strap><P_Level>10000</P_Level><VSP_Vol>1802</VSP_Vol></P_Strap>
       <P_Strap><P_Level>11000</P_Level><VSP_Vol>2237</VSP_Vol></P_Strap>
       <P_Strap><P_Level>12000</P_Level><VSP_Vol>2728</VSP_Vol></P_Strap>
       <P_Strap><P_Level>13000</P_Level><VSP_Vol>3270</VSP_Vol></P_Strap>
       <P_Strap><P_Level>20000</P_Level><VSP_Vol>5000</VSP_Vol></P_Strap>
    </VSP_TABLE>
  </TCT>
</Tankvision>
```


A0053369

Observe the following information regarding the TCT file!

- The date format should be according to the configuration done. E.g. if the format is MM/DD/YYYY the value should be like 01/21/2005 (Note the leading zeros in date and month.)
- If the FRA Calculation Configuration is to be read from the TCT XML, the user needs to configure the tank to have a Floating Roof using the **Tank General Details** screen and the **Floating Roof Adjustment Method** in Floating Roof should be configured as **Fra In Tct**. If the user has not done these setting, system will ignore the data even if they are present in the TCT XML.
- The name of the TCT XML should not contain spaces or special characters such as #, %, @, & etc.
- If the precision digit configuration settings are changed, the user needs to download the TCT XML again to reflect the changes.
- The user can add normal XML comments in the TCT XML.

Example

```
<P_TCT CNT="2">
<P_Strap>
<P_Level>0</P_Level>
<! -- Prev value = 0 -->
<P_Vol>0.1</P_Vol>
</P_Strap>
```

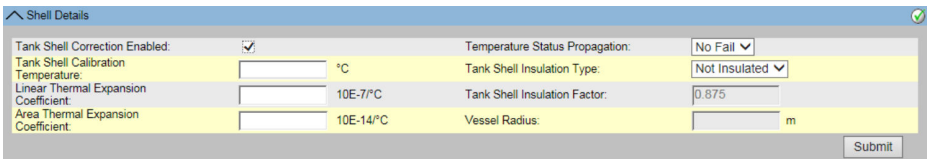
11.3 Shell Details

The tanks are often made of iron, steel or other suitable alloys. The tank shell often undergoes dimensional changes as a result of thermal expansion. The change in dimension of the tank shell results in a change of the apparent product level, thereby introducing an error in the subsequent volume calculations. The volume therefore needs to be corrected by the Correction of the Tank Shell Deformation (CTSh) based on the tank shell details configured for a tank.

The **Shell Details** screen allows you to view and modify the details of the tank in terms of the tank shell thermal expansion coefficient, insulation factor, etc.

To configure tank shell details

1. Click ⌄ on **Shell Details**.
   ↳ Tankvision displays the screen as follows:



Tank Shell Correction Enabled
Select the check box to allow the system to apply tank shell correction to the product volume.
Clear the check box to prevent the system from applying tank shell correction to the product volume.

Tank Shell Calibration Temperature
Enter the temperature at which the tank shell was calibrated.
The system uses the tank shell calibration temperature from this field to calculate the tank shell correction factor. The data type for this field is numeric.

Linear Thermal Expansion Coefficient
Enter the linear thermal expansion coefficient of the tank shell material.
The system uses the linear thermal expansion coefficient value from this field to calculate the tank shell correction factor. The value of the linear thermal expansion coefficient for the tank shell material should be greater than zero. The data type for this field is numeric.

Area Thermal Expansion Coefficient
Enter the appropriate value for the Area thermal expansion coefficient of the tank shell material.
The system uses the Area thermal expansion coefficient value from this field to calculate the tank shell correction factor. The value of the area thermal expansion coefficient of the tank shell material should be greater than zero. The data type for this field is numeric.

Temperature Status Propagation
Select the appropriate temperature status from the drop down list. This field indicates the temperature status propagation, when the automatic temperature is not available.

Tank Shell Insulation Type
Select the appropriate Tank shell insulation type from the drop down list. The system uses the Tank shell insulation type value from this field to calculate the tank shell correction factor.
The tank shell insulation types are:
- **Not Insulated** (according to API) - If this type is selected, the Tank Shell Insulation Factor will be +0.8750. This value is not editable.
- **Insulated** - If this type is selected, the Tank Shell Insulation Factor will be +1.0000. This value is not editable.
- **Custom** - If this type is selected, the Tank Shell Insulation Factor field is editable, and an appropriate value can be entered to calculate the tank shell temperature.

Tank Shell Insulation Factor
Enter the appropriate tank shell insulation factor. This field is enabled when the user selects the **Custom** option in the **Tank Shell Insulation Type** field. The system uses the tank shell insulation factor to calculate the tank shell temperature. The value for the tank shell insulation factor is between zero and one. The data type for this field is numeric.

Vessel Radius
Enter the vessel radius of the tank. The value of the vessel radius should be greater than 0. The system uses the vessel radius for the tank calculations. The data type for this field is numeric.

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

An event is generated after configuring tank shell details. The event details can be viewed in the **Event** overview.

Error Messages
- "Error: Invalid Calibration Temperature Input Format"
  This message appears if the tank shell calibration temperature entered by the user is not a valid real number.
- "Error: Invalid Linear Thermal Coefficient Input Format"
  This message appears if the value of the linear thermal coefficient, entered by user is not a valid real number.
- "Error: Invalid Linear Thermal Coefficient"
  This message appears if the value of the linear thermal coefficient entered by user is greater than the internally defined limit.
- "Error: Invalid Area Thermal Coefficient"
  This message appears if the value of the Area Thermal Coefficient entered by user is not a valid real number.
- "Error: Invalid Area Thermal Coefficient Input Format"
  This message appears if the value of the Area thermal coefficient for entered by user is greater than the Maximum Thermal Coefficient.
- "Error: Fill Out All Mandatory Entries"
  This message appears if the user has not entered the value for Linear or Area thermal coefficient.
- "Error: Invalid Insulation Factor"
  This message appears when the value of the tank shell insulation factor entered by user is not a valid real number or is less than zero or greater than one.

11.4 Floating Roof

A tank can often have a floating roof. A floating roof is called so because it floats on the product stored in the tank. The roof moves up or down along with product level. Since the roof is floating on the tank, it displaces some amount of product depending on the weight of the roof and the density of the product. This displacement in product level results in a

different apparent level, introducing an error into the volume calculations. The product volume therefore needs to be corrected.

A floating roof often has supporting legs. The roof can be rested on these legs when the level is too low or the tank is empty. This allows maintenance staff to enter below the roof for carrying on tank maintenance. Based on the product level, the floating roof can be landed on the legs or floating on the product. However, in a certain range of product level, the floating roof can be partially landed. This zone is called 'critical zone'. In the Tankvision system there can be two critical zones related to the position of the floating roof legs.

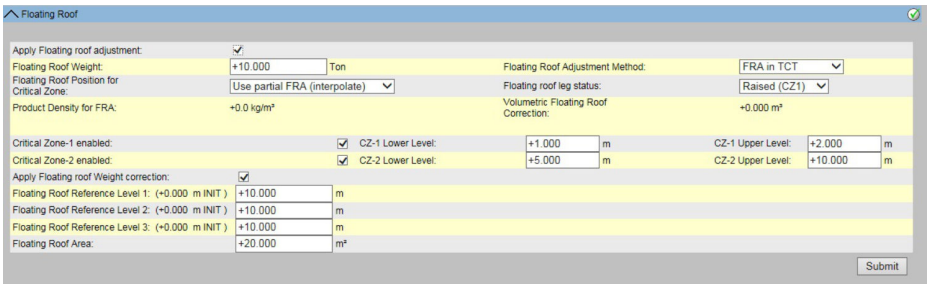
The fields in the **Floating Roof** screen are enabled if the **Tank Type** in the **General Details** screen is selected as **Tank with external floating roof, without stilling well**, **Tank with external floating roof, with stilling well**, **Tank with internal floating roof, without stilling well**, or **Tank with internal floating roof, with stilling well**.

If the **Tank Type** is selected as **Tank with Fixed roof, without stilling well**, **Tank with Fixed roof, with stilling well**, **Open Tank**, **Spherical Tank**, or **Bullet tank**, the fields in the **Floating Roof** screen are disabled and the message "This Tank Has No Floating Roof" is displayed.

The **Floating Roof** screen allows the user to view and modify the details of the tank in terms of the floating roof adjustment type, critical zone details, etc.

To configure the floating roof details

1. Click ⌄ on **Floating Roof**.
   ↳ Tankvision displays the screen as follows:



Apply Floating roof adjustment
Select the check box to enable Floating roof adjustment (FRA). The text and check boxes of all the floating roof adjustment fields on the screen are now editable.
Clear the check box to disable the floating roof adjustment.

Floating Roof Weight
Enter the floating roof weight. This field indicates the weight of the floating roof and is used for the floating roof adjustment factor of the tank, which has a floating roof.
The data type for this field is numeric.

Floating Roof Adjustment Method
Select the appropriate floating roof adjustment method from the drop down list. The system uses the selected method to calculate the floating roof adjustment of the relevant tank.
The methods are as follows:
- **FRA in TCT** - Floating Roof Adjust is present in TCT, and it should be used for calculating FRA
- **FRA not in TCT** - Floating Roof Adjust is not present in TCT, and it needs to be calculated using floating roof weight
- **Japanese Method** - This is a special adjustment method applied primarily in Japan. For details please contact your Endress+Hauser service organisation.

Floating Roof Position for Critical Zone
Select the appropriate Floating Roof Position (FRP) for the Critical Zone from the drop down list. This field allows the system to apply the appropriate floating roof position correction factor to the tank, when the floating roof is in the critical zone.
The positions are as follows:
- **Apply full FRA** - When the floating roof is in the critical zone, apply the calculated FRA
- **Do not apply FRA** - When the floating roof is in the critical zone, do not apply FRA i.e. FRP status is 1
- **Use partial FRA (interpolate)** - When the floating roof is in the critical zone, interpolate FRP between the critical zone- lower level and upper level based on the product level
- **Do not calculate FRA and GOV**

Floating roof leg status
Select the appropriate floating roof leg status from the drop down list.
The system uses the floating roof leg status along with the product level and the critical zone level to determine whether the floating roof is landed on the legs, is floating or is in the critical zone.

Critical Zone – 1 enabled
Select the check box to enable critical zone 1. This field, if selected, enables the fields **CZ-1 Lower Level** and **CZ–1 Upper level**. The system uses this field to check if the floating roof is in critical zone 1. Critical zone 1 is used when the floating roof leg status is "raised".

CZ–1 Lower Level
Enter the value for the critical zone 1 lower level. This field is used to check if the tank floating roof is in critical zone 1 (see drawing below).

CZ–1 Upper Level
Enter the value for the critical zone – 1 upper level. This field is used to check if the tank floating roof is in critical zone 1 (see drawing below).

Critical Zone – 2 enabled
Select the check box to enable critical zone 2.
Clear the check box to disable critical zone 2.
This field, if selected, enables the fields **CZ-2 Lower Level** and **CZ-2 Upper level**.
The system uses this field to check if the floating roof is in critical zone 2.
Critical zone 2 is used when the floating roof leg status is "lowered".

CZ–2 Lower Level
Enter the appropriate value for the critical zone 2 lower level. This field is used to check if the tank floating roofs in critical zone 2 (see drawing below).

CZ–2 Upper Level
Enter the appropriate value for the critical zone 2 upper level. This field is used to check if the tank floating roofs in critical zone 2 (see drawing below).

Apply Floating Roof Weight Correction
Select the check box to enable Floating Roof weight correction. The text of all floating roof weight correction on the screen is not editable.
Clear the check box to disable Floating roof weight correction.

Floating Roof Reference Level 1
Enter the reference height of level device 1 when the floating roof position is not changed due to heavy rain/snow or other.

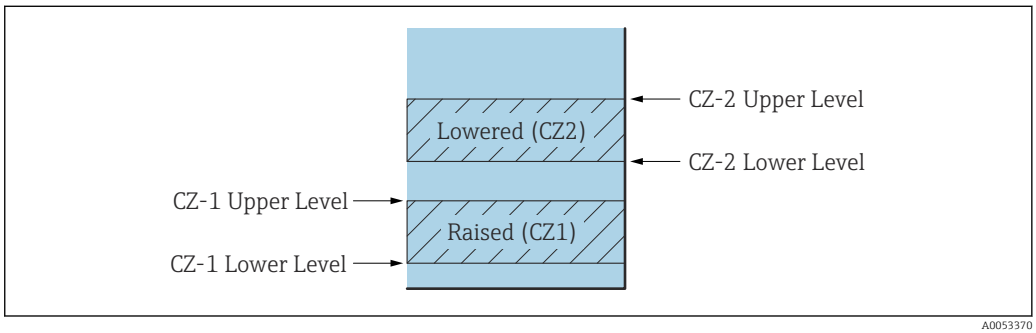
Floating Roof Reference Level 2
Enter the reference height of level device 2 when the floating roof position is not changed due to heavy rain/snow or other.

Floating Roof Reference Level 3
Enter the reference height of level device 3 when the floating roof position is not changed due to heavy rain/snow or other.

Floating Roof Area
Enter surface area of Floating roof in contact or submerged in the product.

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

An event is generated after configuring the tank floating roof details. The event details can be viewed in the **Event** overview.



PTB "Bruttovolumen":

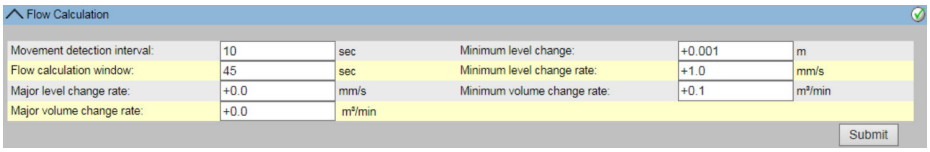
FRA is applied, settings are sealed if leg status is changed to "lower" (maintenance position) values are no longer displayed as W&M approved.

11.5 Flow Calculation

The **Flow Calculation** screen allows the user to view and modify the details of the tank in terms of flow calculation, minimum level change, minimum flow rate etc.

To configure flow calculation details

1. Click on **Flow Calculation**.
   ↳ Tankvision displays the screen as follows:



Movement detection interval
Enter the value for the movement detection interval.
The system compares the level data just received with the level data one interval ago. For example: If the movement detection interval is set at 10 seconds and the system receives new data, it compares the new data with the data received 10 seconds ago. If the change in the product level exceeds the **Minimum level change**, the system detects that there is movement in the product level. The data type for this field is numeric.

Minimum level change
Enter the value for the minimum level change.
This field indicates the minimum change in the product level used to detect the start of a product transfer. The data type for this field is numeric.

Flow calculation window
Enter the value for the flow calculation window. This field indicates the time period over which the rate of change of the product level is calculated.

Minimum level change rate
Enter the value for the minimum level change rate of the product. This field indicates the minimum rate of change of the product level used to detect the start of a product transfer. The data type for this field is numeric.

Major level change rate
Enter the value for the major level change rate of the product.
This field indicates the major rate of change of the product level used to detect the start of a product transfer. The data type for this field is numeric.

Minimum volume change rate
Enter the value for the minimum volume change rate of the product.
This field indicates the minimum rate of change of volume of the product used to detect the end of a product transfer. That data type for this field is numeric.

Major volume change rate
Enter the value for the major volume change rate of the product.
This field indicates the major rate of change of volume of the product used to detect the start of a product transfer. That data type for this field is numeric.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to proceed to save the flow calculation details.
4. After saving the changes, Tankvision displays a confirmation message.

An event is generated after configuring the flow calculation details. The event details can be viewed in the **Event** overview.

Error Messages
- "Error: Movement Detection Interval Above Max Value"
  This message appears when the value of the Movement detection interval entered by the user is greater than 15 s.
- "Error: Movement Detection Interval Below Min Value"
  This message appears when the value of the Movement detection interval entered by the user is less than 3 s.
- "Error: Minimum Level Change Below Min Value"
  This message appears when the value of Minimum level change entered by the user is less than 0.
- "Error: Minimum Level Change Above Max Value"
  This message appears when the value of Minimum level change entered by the user is greater than 99.
- "Error: Flow Calculation Window Below Min Value"
  This message appears when the value of the flow calculation window entered by the user is less than 5 s.
- "Error: Flow Calculation Window Above Max Value"
  This message appears when the value of the flow calculation window entered by the user is greater than 120 s.
- "Error: Minimum Level Change Rate Below Min Value"
  This message appears when the value of the minimum level change rate entered by the user is less than 0.
- "Error: Minimum Level Change Rate Above Max Value"
  This message appears when the value of the minimum level change rate entered by the user is greater than 999.
- "Error: Major Level Change Below Min Value"
  This message appears when the value of Major level change rate entered by the user is less than 0.
- "Error: Major Level Change Above Max Value"
  This message appears when the value of the major level change rate entered by the user is greater than 999 mm/s.
- "Error: Minimum Volume Change Rate Above Max Value"
  This message appears when the value of the minimum volume change rate entered by user is greater than 999999 m3/s.

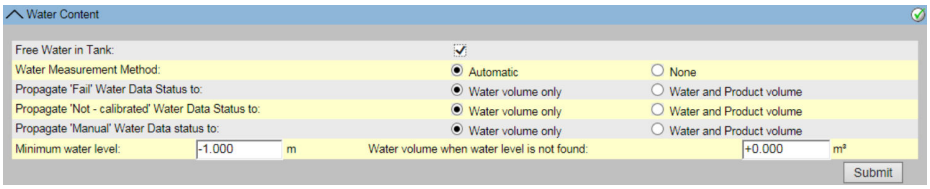
- "Error: Minimum Volume Change Rate Below Min Value"
  This message appears when the value of the major volume change rate entered by user is less than 0.
- "Error: Major Volume Change Rate Above Max Value"
  This message appears when the value of the major level change rate entered by user is greater than 999999 m3/s.
- "Error: Major Volume Change Rate Below Min Value"
  This message appears when the value of the major level change rate entered by user is less than 0.

11.6 Water Content

The **Water Content** screen allows the user to view and modify the details of the tank in terms of water in tank, measurement, status propagation etc.

To configure the water content calculation details

1. Click on **Water Content**.
   ↳ Tankvision displays the screen as follows:



Free Water in Tank
Select the check box to enable the system to measure the content of free water in the tank. Clear the check box to prevent the system from measuring the content of free water in the tank. This field indicates whether the tank has water or not. If selected, this field enables the system to perform free water volume calculations.

Water Measurement Method
Select the appropriate water measurement method. The system uses this field to display the water level and Free Water Volume status based on the water measurement method selected.

Propagate "Fail" Water Data Status to
Select the appropriate option. The system uses this field to propagate a "fail" water data status to **Water volume only** or **Water and Product volume**.

Propagate "Not - Calibrated" Water Data Status to
Select the appropriate option. The system uses this field to propagate a "Not - Calibrated" water data status to **Water volume only** or **Water and Product volume**.

Propagate "Manual" Water Data Status to
Select the appropriate option. The system uses this field to propagate a "Manual" water data status to**Water volume only** or **Water and Product volume**.

Minimum water level
Enter the appropriate value for the minimum water level in the tank.
The minimum water level is used, when water level is not found. The system uses this value, when the water level falls below the minimum water level mark in the tank.

Water volume when water level is not found
Enter the appropriate value of the water volume, when the water level is not found. When water level is below the minimum water level, the system treats it as "water not found". In this case, the water volume entered in this field is used as water volume.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to save the settings, or click the **Cancel** button to exit.

4. After saving the settings, Tankvision displays a confirmation message.

An event is generated after configuring the water content calculation details. The event details can be viewed in the **Event** overview.

Error Messages

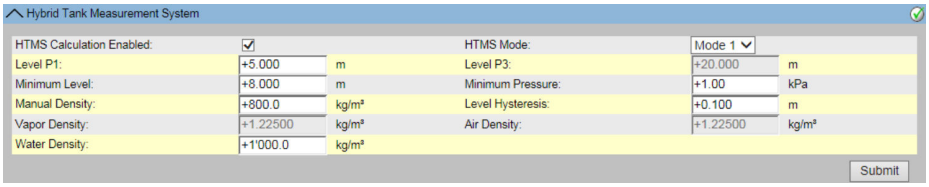
- "Error: Invalid Water Volume"
  This message appears when the value of the Water volume entered by the user is not a valid real number.
- "Error: Water Volume Value not In Range"
  This message appears when the value of the Water volume entered by user is less than 0 m^3.
- "Error: Water Volume Value not In Range"
  This message appears when the value of the Water volume entered by user is greater than 999 999 m^3.

11.7 Hybrid Tank Measurement System

The **Hybrid Tank Measurement System** (HTMS) screen allows the user to enable a calculation method for the observed density. It is based on input parameters product level, water level, tank top and bottom pressure, the local gravity (see "Environment Settings") and configuration parameters described below.

To configure the HTMS calculation details

1. Click on **Hybrid Tank Measurement System**.
   ↳ Tankvision displays the screen as follows:



HTMS calculation enabled
Select check box to enable the system to calculate the density at measured conditions.

HTMS Mode
Select the calculation mode from drop down list. Unneeded configuration parameters are greyed out based on the mode selection:
- **Mode 1**: Calculation uses bottom pressure sensor
- **Mode 2**: Calculation uses top and bottom pressure sensor

Level P1
Distance between pressure sensor 1 (bottom pressure sensor) and datum plate.

Level P3
Distance between pressure sensor 3 (top pressure sensor) and datum plate.

Minimum Level
Minimum input level value to start the calculation. Otherwise an error condition is used.

Minimum Pressure
Minimum input pressure to start the calculation. Otherwise an error condition is used. In **Mode 1** bottom pressure value is used, in **Mode 2** the difference between top and bottom pressure values is used.

Manual Density
Density value for error conditions

Level Hysteresis
Hysteresis value applied to the level value at minimum level condition

Vapor Density
Density value for the vapor density

Air Density
Density value for the air density

Water Density
Density value for the water density

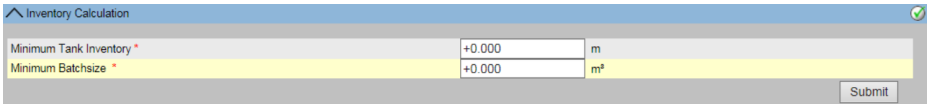
2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to save the settings.
4. After saving the settings, Tankvision displays a confirmation message.

11.8 Inventory Calculation

The **Inventory Calculation** screen allows the user to view and modify the details of the tank in terms of tank inventory calculations.

To configure the tank inventory calculation details

1. Click on **Inventory Calculation**.
   ↳ Tankvision displays the screen as follows:



Minimum Tank Inventory
Enter the minimum tank inventory. This field indicates the minimum tank inventory value. The product transfer cannot be considered as W&M approved, if the product level in the tank at the beginning or end of product transfer is less or equal than the configured value. The data type for this field is numeric.

Minimum Batchsize
Enter the minimum batch size. This field indicates the minimum batch size value. The product transfer cannot be considered as W&M approved, if the batch size for the product transfer is less than the minimum batch size. The data type for this field is numeric.

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

An event is generated after configuring the inventory calculation details. The event details can be viewed in the **Event** overview.

11.9 Put Tank into Calibrated Status

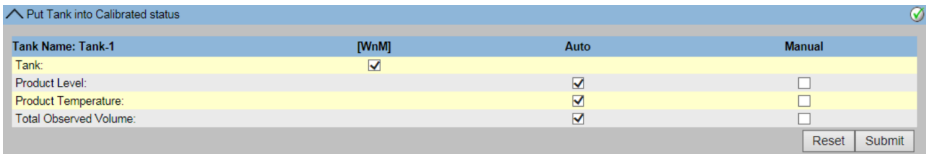
Tankvision generates various tank inventory reports and displays tank inventory data on web pages. A report or data displayed on the report can be W&M approved only if the tank is W&M calibrated. The user can set the tank and tank parameters into the W&M calibrated status. Once the tank is set in the W&M calibrated status, it means the tank configuration is W&M approved.

Subsequently, the system becomes W&M approved only after the W&M switch is "closed". The W&M switch is protected by a mechanical W&M seal (sticker). Only a W&M official or an accredited person can put the W&M seal.

The configuration of a tank that is marked as W&M calibrated cannot be modified after the W&M switch is closed.

To set the tank into calibrated status

1. Click ✓ on **Put Tank into Calibrated status**.
   ↳ Tankvision displays the screen as follows:



Tank Name
This field displays the name of the tank.

Tank
Select the check box to calibrate the tank.

Product Level/Product Temperature/Total Observed Volume (TOV)
Select the check box to calibrate the tank parameter:
- **Product level**
- **Product Temperature**
- **Total Observed Volume (TOV)**

The tank measured parameter can be marked as calibrated in auto mode or manual mode. Based on the actual parameter mode, the respective measured parameter calibrated status marked here is used to determine the calibrated status of the measured parameters, and therefore subsequently for calculated parameters.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to save the settings, or click the **Reset** button to reset the screen.
4. After saving the settings, Tankvision displays a confirmation message.

Observe the following information regarding the calibrated status!
- **Auto** means live data polled from the Fieldscan and **Manual** means manual data. With these checkboxes it is defined whether if the W&M values have to be live, manual or both.
- The W&M calibration status of the tank and tank parameters is propagated into reports and user interface pages.
- The W&M switch status should be "open" before setting the tank and tank parameters into the calibrated status.
- The W&M switch status should be changed to "close" after setting the tank and tank parameters into the calibrated status.
- An event is generated after creating or modifying the product. The event details can be viewed in the **Event** overview.
- In case of a closed W&M switch, a tank or its parameters can be taken out of the calibrated status, but putting it back or adding further tanks to W&M is not possible.
  Please note that changes in a configuration of a W&M approved system must be announced to the authorities (depending on local laws and regulations).

11.10 Hart Command

If available, Tankvision routes the communication from a field device parametrization tool (e.g. FieldCare) to a field device (e.g. Tank Side Monitor and its connected HART devices), via the field protocols Modbus and V1 (so called HART tunneling).

Creating/Disconnecting the HART tunnel is done automatically.

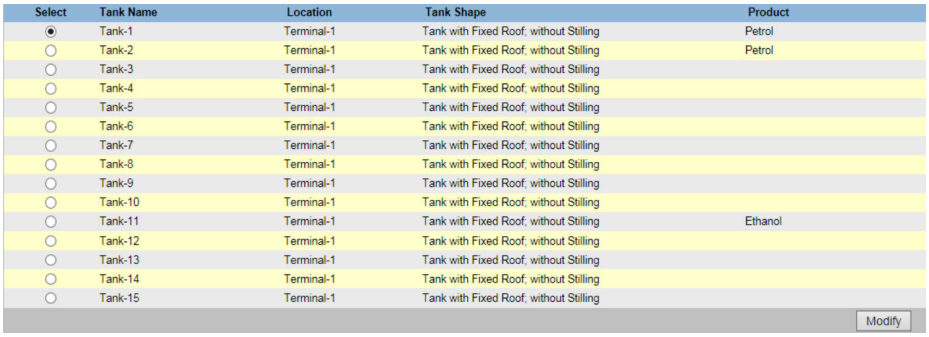
26 Hart Command screen

12 The "Configuration" – "Tanks" menu – Alarm Settings

Alarms are configured in order to define the "Hysteresis" value, the "hold off time" and various alarm set points for each tank and its parameters. The alarm settings screens allow you to store the Email address of an operator, so that he receives notifications for various alarms.

To configure alarms

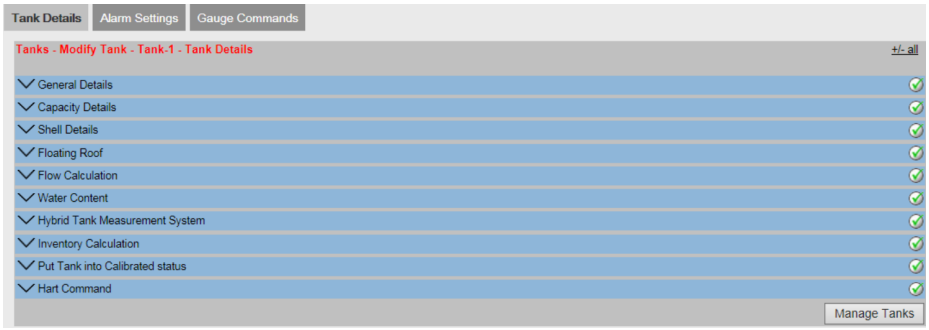
1. On the Navigation Tree, click the **Configuration** header. Click **Tanks**. (The number of tanks configured is displayed in brackets next to the Header's name.)
   ↳ Tankvision displays the screen as follows:



Select	Tank Name	Location	Tank Shape	Product
◉	Tank-1	Terminal-1	Tank with Fixed Roof, without Stilling	Petrol
○	Tank-2	Terminal-1	Tank with Fixed Roof, without Stilling	Petrol
○	Tank-3	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-4	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-5	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-6	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-7	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-8	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-9	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-10	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-11	Terminal-1	Tank with Fixed Roof, without Stilling	Ethanol
○	Tank-12	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-13	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-14	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-15	Terminal-1	Tank with Fixed Roof, without Stilling	

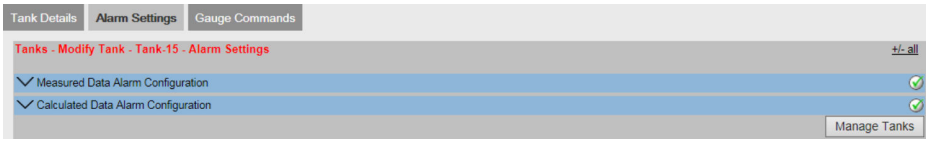
Modify

2. Select the appropriate tank.
3. Click the **Modify** button to modify the tank details.
   ↳ Tankvision displays the **Tank Details** screen as follows:



   Button **Manage Tanks**:
   Go back to the Manage Tanks Screen by clicking on the button **Manage Tanks**.

4. Click the **Alarm Settings** tab.
   ↳ Tankvision displays the **Alarm Settings** screen as follows:

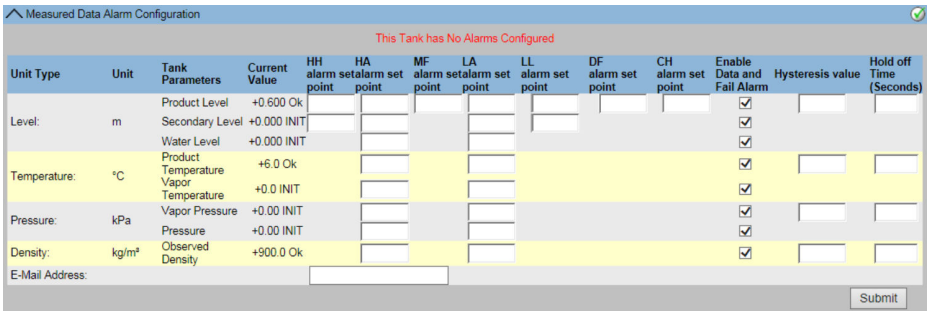


12.1 Measured Data Alarm Configuration

The **Measured Data Alarm Configuration** screen allows you to define set points for measured tank parameters such as the product levels, product temperature, pressure and density. Please refer to Chapter "Types of Alarms" for an explanation of alarm types.

To configure alarms for measured data

1. Click ⌄ on **Measured Data Alarm Configuration**.
   ↳ Tankvision displays the screen as follows:



Unit Type
This column displays a list of parameter types for which alarms can be set.

Unit
This column displays the Units corresponding to the parameters.

Tank Parameters
This column displays the different Tank parameters for which the set points are configured.

Current value
This column displays the current value of the corresponding tank parameters.

HH alarm set point
Enter the appropriate value for the HighHigh alarm set point.
This set point is used to detect whether the Product Level or Secondary Product Level has reached their respective HH alarm value. The **HH alarm set point** should be greater than set point for High alarm for level and less than the Gauge Reference Height. The data type for this field is numeric.

HA alarm set point
Enter the appropriate value for the HighAlarm set point. This set point is used to detect whether any of the following parameters have reached their respective HA alarm value, namely:
Product Level, **Secondary Level** [3], **Water Level**, **Product Temperature**, **Vapor Temperature**, **Vapor Pressure** and **Observed Density**.
The **HA Alarm set point** should be less than the HH alarm for the corresponding parameter and less than the Gauge Reference Height.
The data type for this field is numeric.

MF alarm set point
Enter the appropriate value for the Max Fill Alarm.
This alarm does apply for Product Level only. The **MF alarm set point** must be smaller than a configured HA alarm and greater than a configured LA alarm.

LA alarm set point
Enter the appropriate value for the LowAlarm set point.
This set point is used to detect whether any of the following parameters have reached their respective LA alarm value, namely:
Product Level, **Secondary Level**, **Product Temperature**, **Vapor Temperature**, **Vapor Pressure** and **Observed Density**.
The **LA alarm set point** should be greater than the LL alarm for the corresponding parameter and less than the Gauge Reference Height. The data type for this field is numeric.

3) A secondary level can be the position of a floating roof, for example. It might be useful to measure the product level and the floating roof position, to check if the floating roof always follows the product level and does not get stuck.

LL alarm set point
Enter the appropriate value for the LowLow alarm set point.
This set point is used to detect whether the Product Level or Secondary Product Level has reached their respective LL alarm value. The LL alarm should be smaller than or equal to the LL alarm for the product level, and less than the Gauge Reference Height. The data type for this field is numeric.

DF alarm set point
Enter the appropriate value for the DF alarm set point. DF alarm means "Difference Alarm" and is raised when the difference between the product level and the secondary level exceeds the set point value configured for DF alarm. The data type for this field is numeric.

CH alarm set point
Enter the appropriate value for the CH alarm set point. CH alarm means "Change Alarm" and is raised when the difference between the product level at LOCKED state of the tank and the current product level exceeds the set point value configured for CH alarm. The data type for this field is numeric.

Enable Data and Fail Alarm
Select the appropriate check boxes to enable data and fail alarm for the relevant tank parameters. Clear the appropriate check boxes to disable data and fail alarm for the relevant tank parameters.

Hysteresis Value
Enter the appropriate Hysteresis Value in the text box.
The hysteresis is applied to the respective alarm set points to prevent false toggling of the alarm status between "active" and "inactive" which might happen due to fluctuations in the measured value. For example, the product level could fluctuate due to waves on the product surface.
The data type for this field is numeric.

Hold off Time (seconds)
Enter the appropriate hold off time in the text box.
The hold off time is triggered when the actual value crosses the configured set point for an alarm. The alarm becomes active only after the actual value stays above or below the respective alarm set point for a time more than or equal to the hold off time. This prevents false alarm generations due to spikes in the actual values of data.
The data type for this field is numeric.

E-Mail Address
Enter the Email address of the user to whom the Email notification is to be sent whenever a new alarm is generated. The data type of the field is "text", which can accept valid Email addresses.

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

An event is generated after configuring the alarm set points. The event details can be viewed in the **Event** overview.

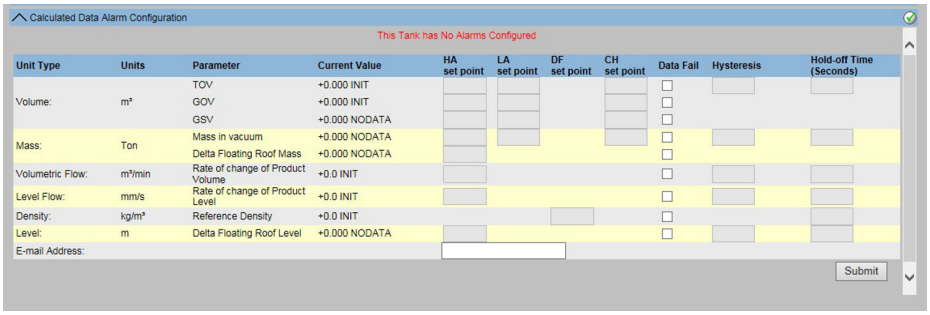
Error Messages
- "Error: ... Alarm Values are not in Order."
  This message appears in each of the following cases:
  - The value of a High High Alarm (HH Alarm) is lower than the value of a High Alarm (H Alarm), a Low Alarm (L Alarm) or a Low Low Alarm (LL Alarm).
  - The value of a High Alarm (H Alarm) is lower than the value of a Low Alarm (L Alarm) or Low Low Alarm (LL Alarm).
  - The value of a Low Alarm (L Alarm) is lower than the value of a Low Low Alarm (LL Alarm).
- "Error: ... Level Alarm Values Cannot be Greater Than GRH."
  This message appears when Product Level Alarm values, entered by the user, are greater than Maximum Gauge Reference Height.

12.2 Calculated Data Alarm Configuration

The **Calculated Data Alarm Configuration** screen allows the user to set various alarm set points for tank parameters such as product volume, mass, rate in change of product level, flow rate, hysteresis value and the hold off time.

To configure alarms for calculated data

1. Click on **Calculated Data Alarm Configuration**.
   ↳ Tankvision displays the screen as follows:



Unit Type
This column displays a list of the parameters types for which alarms can be set.

Units
This column displays the Units corresponding to the parameters.

Parameter
This column displays different parameters for which the set points are configured.

Current value
This column displays the current value of the corresponding parameters.

HA set Point
Enter the appropriate value for the HighAlarm set point. This set point is used to detect, whether any of the following parameters have reached their respective HA alarm value, namely: Total Observed Volume (**TOV**), Gross Observed Volume (**GOV**), Gross Standard Volume (**GSV**), **Mass in Vacuum** and Flow Rate. The data type for this field is numeric.

LA set Point
Enter the appropriate value for the LowAlarm set point. This set point is used to detect whether any of the following parameters have reached their respective LA alarm value, namely: Total Observed Volume (**TOV**), Gross Observed Volume (**GOV**), Gross Standard Volume (**GSV**) and **Mass in Vacuum**. The data type for this field is numeric.

DF set Point
Enter the appropriate value for the DF alarm set point. DF alarm means "Difference Alarm" and is raised when the difference between the actual measured density and the **Reference Density/Lab Reference Density** (set as manual data) exceeds the set point value configured for DF alarm. The data type for this field is numeric.

Data Fail
Select the appropriate check boxes to enable the data fail alarm for the relevant parameters.
Clear the appropriate check boxes to disable the data fail alarm for the relevant parameters.

Hysteresis
Enter the appropriate Hysteresis Value in the text box. The hysteresis is applied to the respective alarm set points to prevent false toggling of the alarm status between "active" and "inactive", which might happen due to fluctuations in the measured value. For example, the product level could fluctuate due to waves on the product surface. The data type for this field is numeric.

Hold off Time (Seconds)
Enter the appropriate hold off time in the text box. The hold off time is triggered when the actual value crosses the configured set point for an alarm. The alarm becomes active only after the actual value stays above or below the respective alarm set point for a time more than or equal to the hold off time. This prevents false alarm generations due to spikes in the actual values of data. The data type for this field is numeric.

E-Mail Address
Type the Email addresses of the user to whom the Email notification is to be sent, whenever new alarm is generated. The data type of the field is text, which can accept valid Email addresses.

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

An event is generated after configuring the alarm set points. The event details can be viewed in the **Event** overview.

Error Messages
- "Error: Volume Hysteresis Value not in Range"
  This message appears when the value of the Volume Hysteresis entered by the user is not between 0 to 999999.999 m^3.
- "Error: Mass Hysteresis Value not in Range"
  This message appears when the value of the Mass Hysteresis entered by the user is not between 0 to 999999999 kg.
- "Error: Rate of Change of Level Hysteresis Value not in Range"
  This message appears when the value of the Rate of Change of Level Hysteresis Value entered by the user is not between -999.99 to 999.99 mm/s.
- "Error: Rate of Change of Volume Hysteresis Value not in Range"
  This message appears when the value of the Rate of Change of Volume Hysteresis entered by the user is not between -999999.99 to 999999.999 m^3/min.
- "Error: TOV High Alarm Set Point Value not in Range"
  This message appears when the value of the TOV High Alarm Set Point entered by the user is not between 0 to 999999.999 m^3.
- "Error: TOV Low Alarm Set Point Value not in Range"
  This message appears when the value of the TOV Low Alarm Set Point entered by the user is not between 0 to 999999.999 m^3.
- "Error: GOV High Alarm Set Point Value not in Range"
  This message appears when the value of the GOV High Alarm Set Point entered by the user is not between 0 to 999999.999 m^3.
- "Error: GOV Low Alarm Set Point Value not in Range"
  This message appears when the value of the GOV Low Alarm Set Point entered by the user is not between 0 to 999999.999 m^3.
- "Error: GSV High Alarm Set Point Value not in Range."
  This message appears when the value of the GSV High Alarm Set Point entered by the user is not between 0 to 999999.999 m^3.
- "Error: GSV Low Alarm Set Point Value not in Range"
  This message appears when the value of the GSV Low Alarm Set Point entered by the user is not between 0 to 999999.999 m^3.
- "Error: Mass in Vacuum High Alarm Set Point Value not in Range"
  This message appears when the value of the Mass in Vacuum High Alarm Set Point entered by the user is not between 0 to 999999999 kg.
- "Error: Mass in Vacuum Low Alarm Set Point Value not in Range"
  This message appears when the value of the Mass in Vacuum Low Alarm Set Point entered by the user is not between 0 to 999999999 kg.

- "Error: Level Change Rate CH Alarm Set Point Value not in Range"
  This message appears when the value of the Level Change Rate CH Alarm Set Point entered by the user is not between -999.99 to 999.99 mm/s.
- "Error: Volume Flow Rate High Alarm Set Point Value not in Range"
  This message appears when the value of the Volume Flow Rate High Alarm Set Point entered by the user is not between 0 to 999999.999 m^3.
- "Error: Tank not configured. This tank has no alarms configured."
  This message appears when the user has no alarms configured.

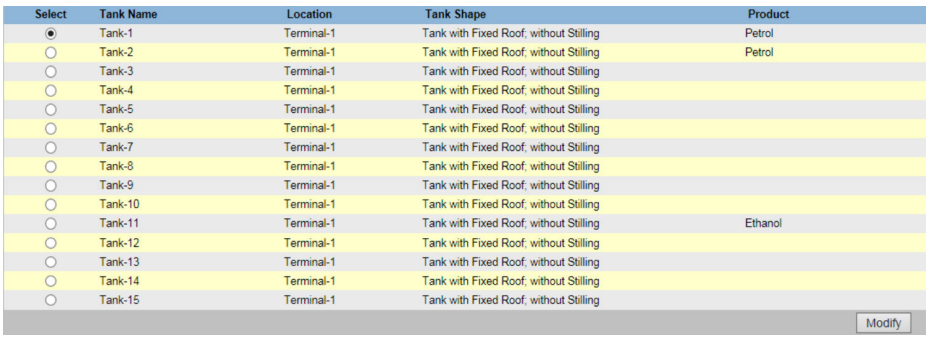
13 The "Configuration" – "Tanks" menu – Gauge Commands

The Gauge commands that are available for a tank are dependent on the gauge type. Information about gauge commands supported by a particular gauge is stored in a "gauge definition file". This enables the Tankvision system to retrieve the list of gauge commands from the gauge definition file. This function comes in use when you need to enable or disable a gauge command.

The **Configure Gauge Commands** screen allows you to enable or disable the gauge commands as per the system requirements.

To configure a gauge command

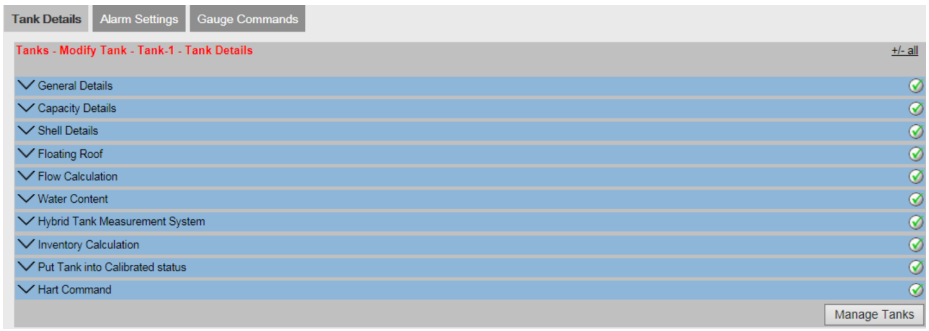
1. On the Navigation Tree, click the **Configuration** header. Click **Tanks**. (The number of tanks configured is displayed in brackets next to the Header's name.)
   ↳ Tankvision displays the screen as follows:



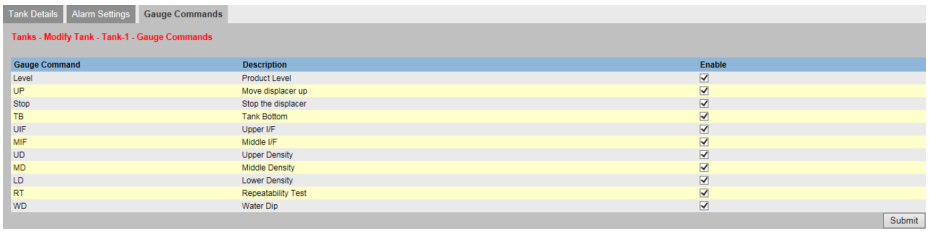
Select	Tank Name	Location	Tank Shape	Product
◉	Tank-1	Terminal-1	Tank with Fixed Roof, without Stilling	Petrol
○	Tank-2	Terminal-1	Tank with Fixed Roof, without Stilling	Petrol
○	Tank-3	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-4	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-5	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-6	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-7	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-8	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-9	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-10	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-11	Terminal-1	Tank with Fixed Roof, without Stilling	Ethanol
○	Tank-12	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-13	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-14	Terminal-1	Tank with Fixed Roof, without Stilling	
○	Tank-15	Terminal-1	Tank with Fixed Roof, without Stilling	

Modify

2. Click the appropriate option to select the tank name.
3. Click the **Modify** button to modify the tank details.
   ↳ Tankvision displays the **Tank Details** screen as follows:



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



Gauge Command	Description	Enable
Level	Product Level	☑
UP	Move displacer up	☑
Stop	Stop the displacer	☑
TB	Tank Bottom	☑
UIF	Upper I/F	☑
MIF	Middle I/F	☑
UD	Upper Density	☑
MD	Middle Density	☑
LD	Lower Density	☑
RT	Repeatability Test	☑
WD	Water Dip	☑

Submit

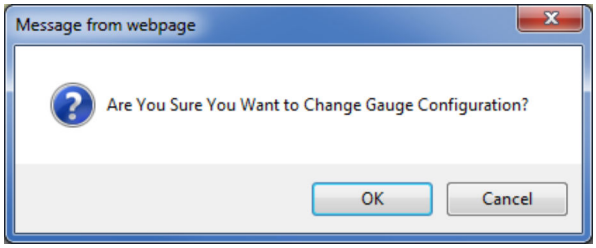
Gauge Command
This column displays a list of gauge commands available for that particular tank and gauge type. For the meaning of the gauge commands refer to the manual of the Proservo or Servo, respectively.
Examples:
- **Level**: follow medium to measure the product level
- **UP**: move the displacer up into the housing of the gauge (e.g. for maintenance)
- **Stop**: hold the displacer at the current position whatever happens

Description
This column displays a short description of the corresponding gauge command.

Enable
Select the appropriate check boxes to enable the gauge commands that are required.
Clear the appropriate check boxes to disable the gauge commands that are not required.
Only the enabled gauge commands can be scheduled or sent to the tank.
By default, the system selects all the check boxes in the Enable column.

The tank has to be configured for field scan before configuring the gauge command (**System Administration → Global Settings → Field Scan → Manage Field Scan Configuration**). If the tank is not configured for field scan, the list of gauge commands will not be displayed on this screen.

5. Enter the appropriate information in the relevant fields.
6. Click the **Submit** button to configure the gauge commands.
   ↳ Tankvision displays a confirmation screen as follows:



7. Click the **OK** button to change the Gauge Configuration.
8. After saving the settings, Tankvision displays a confirmation message.

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

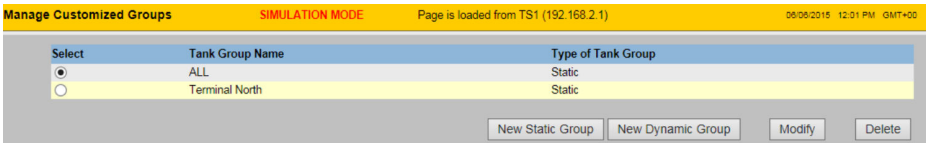
14 The "Configuration" – "Customized Groups" menu

A tank group is a collection of tanks. In the Tankvision system, tank groups are configured for better management of tanks. There are two types of tank groups:

- Static Tank Group: A static tank group is created by selecting tanks available in the system. For a static tank group, the user must select the appropriate tanks available to form a tank group. All selected tanks in a particular static tank group will be displayed on the screen. The screen will display the tank data dynamically on a real time basis.
- Dynamic Tank Group: A dynamic tank group is created by defining filtration criteria. For a dynamic tank group the user does not select the tanks. Instead, the user can define selection criteria using filters on tank elements such as Location, Tank Type and Tank Status. The screen will display the tank data dynamically on a real time basis for those tanks in the tank group meeting the dynamic tank group settings. For example, if a tank group is configured with active alarms, then whenever the tank has an active alarm, the tank will be shown in the tank group with active alarms.
  Tank groups by Product are automatically shown in the Navigation Tree.

To configure tank groups

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

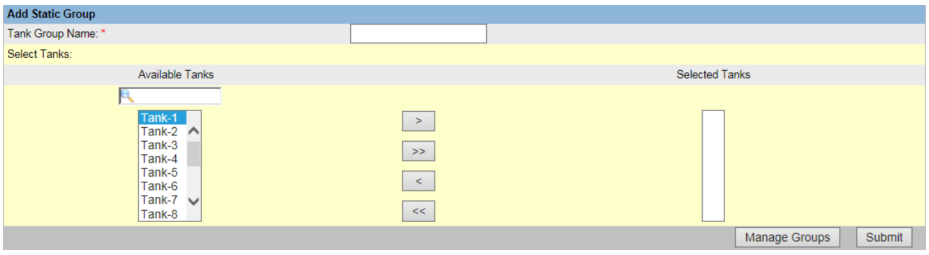


2. Click the **New Static Group** button to configure a static type of tank group, or click the **New Dynamic Group** to configure a dynamic type of tank group.

14.1 Static Tank Group

To configure a static type of tank group

1. Click the **New Static Group** button on the **Manage Customized Groups** screen.
   ↳ Tankvision displays the **Add Static Group** screen as follows:



Tank Group Name
Enter the name of the Tank Group. Each tank group in the Tankvision system has a specific name for reference which should not exceed 32 characters in length.
The data type for this field is alphanumeric.

Available Tanks
This list displays the tanks that are available for grouping.

Selected Tanks
This list displays the tanks that are grouped to the tank group.

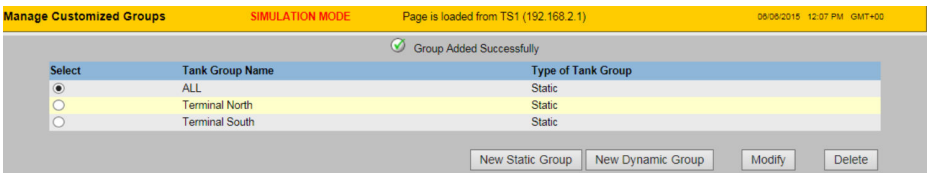
[>]
Click this button to transfer the selected tank(s) from the **Available Tanks** list to the **Selected Tanks** list. (Several tanks can be selected by holding the **Ctrl** button with clicking on the tanks)

[>>]
Click this button to transfer all tanks from the **Available Tanks** list to the **Selected Tanks** list.

[<]
Click this button to de-select the tank(s) from the **Selected Tanks** list to the **Available Tanks** list. (Several tanks can be selected by holding the **Ctrl** button with clicking on the tanks)

[<<]
Click this button to de-select all tanks from the **Selected Tanks** list to the **Available Tanks** list.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to add a static tank group.
   ↳ After saving the settings, Tankvision displays a confirmation message as follows:



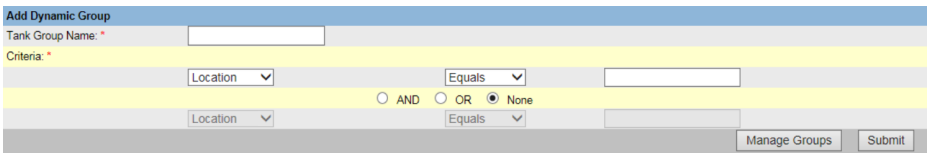
4. Click **Manage Groups** to get back to the customized groups overview without saving.

An event is generated after successfully adding, modifying or deleting the tank group. The event details can be viewed in the **Event** overview.

14.2 Dynamic Tank Group

To configure a dynamic tank group

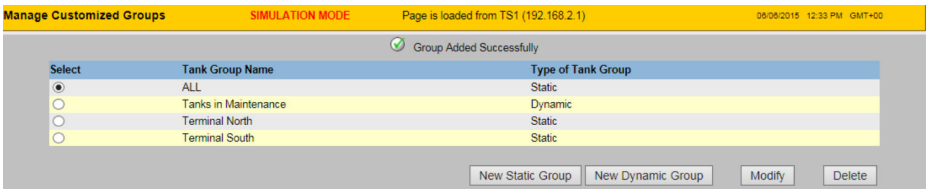
1. Click the **New Dynamic Group** button on the **Manage Customized Groups** screen.
   ↳ Tankvision displays the **Add Dynamic Group** screen as follows:



Tank Group Name
Enter the appropriate name of the Tank Group. Each tank group in the Tankvision system has a specific name for reference, which should not exceed 32 characters in length.
The data type for this field is alphanumeric.

Criteria
Select the appropriate option to filter the criteria:
- Select the relevant tank elements from the drop down list in the first column.
- Select the appropriate comparable option (Equals, Not Equals or Contains) from the drop down list in the second column.
- Type the appropriate data element in the third column, if **Location** is selected. Or, select the appropriate data element from the drop down list, if **Tank Type** or **Tanks Status** is selected in the first column of selection criteria.
- If two criteria are to be specified, then select the **And** or **Or** option to add a filtration criterion. Else, select the **None** option.

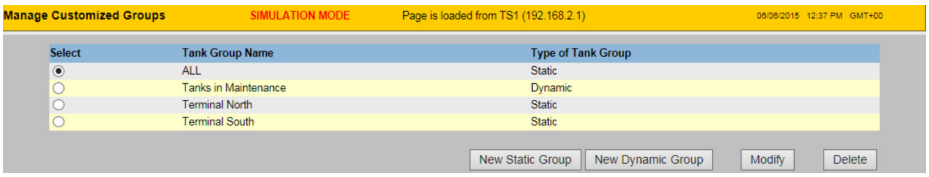
2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to add the dynamic tank group.
   ↳ After saving the settings, Tankvision displays a confirmation message as follows:



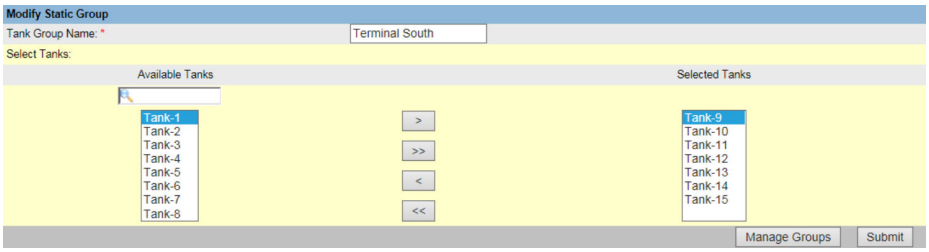
An event is generated after successfully adding, modifying or deleting the tank group. The event details can be viewed in the **Event** overview.

14.3 Modify Tank Groups

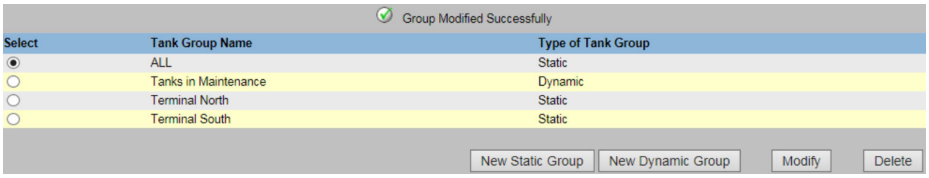
1. On the Navigation Tree, click the **Configuration** header. Click **Customized Groups**. (The number of tank groups configured is displayed in brackets next to the Header's name).
   ↳ Tankvision displays the screen as follows:



2. To modify a tank group, select the tank group and click the button **Modify**.
   ↳ Tankvision displays the screen as follows:

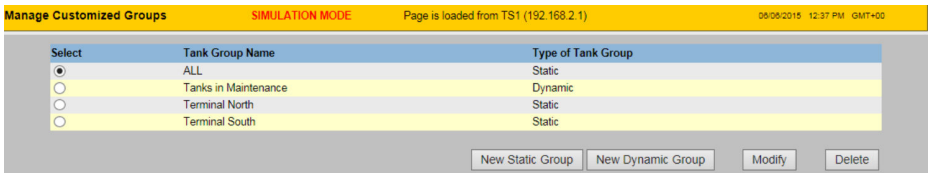


3. Modify the desired settings and click the **Submit** button to configure the settings.
   ↳ After saving the settings, Tankvision displays the following screen:

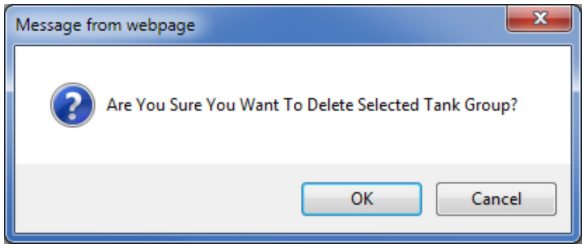


14.4 Delete Tank Groups

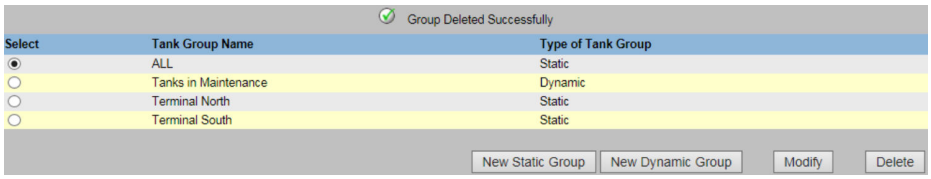
1. On the Navigation Tree, click the **Configuration** header. Click **Customized Groups**. (The number of tank groups configured is displayed in brackets next to the Header's name).
   ↳ Tankvision displays the screen as follows:



2. To delete a tank group, select the tank group and click the button **Delete**.
   ↳ Tankvision displays the screen as follows:



After deleting the Tank Group, Tankvision displays the following screen:



14.5 View Real Time Tank Group Details

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.

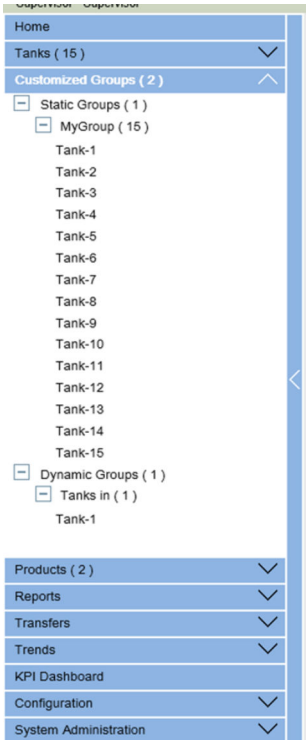
There are two types of Tank Groups:
- Static Tank Group: Tank group created by user
- Dynamic Tank Group: Tank group created by defining filtration criteria. (e.g. All tanks in locked status)

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.

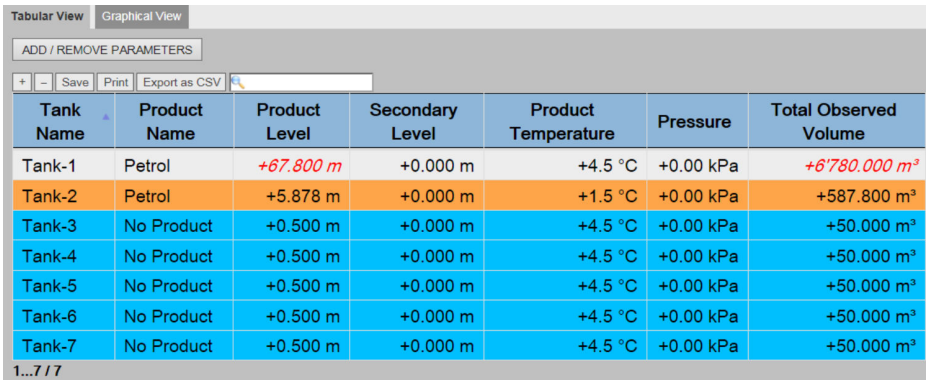
To view real time tank group details

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:



   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.

2. Click the <Tank Group> name to display the tank status in graphical and tabular format.
   ↳ Tankvision displays the screen as follows:



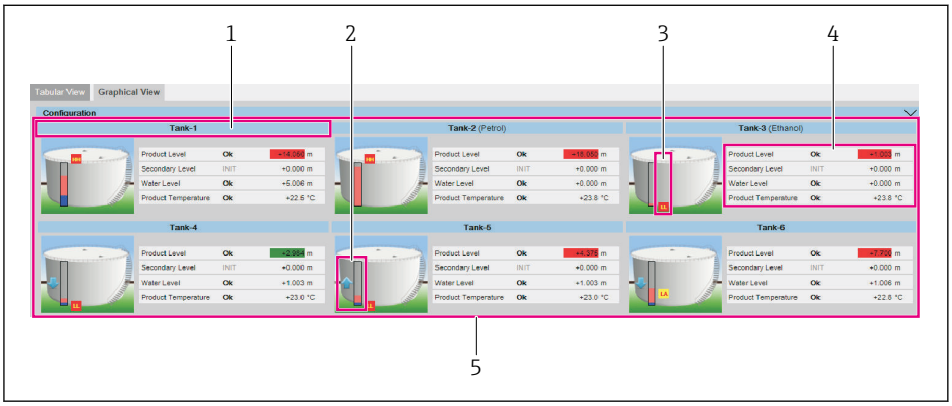
Tank Name	Product Name	Product Level	Secondary Level	Product Temperature	Pressure	Total Observed Volume
Tank-1	Petrol	+67.800 m	+0.000 m	+4.5 °C	+0.00 kPa	+6'780.000 m³
Tank-2	Petrol	+5.878 m	+0.000 m	+1.5 °C	+0.00 kPa	+587.800 m³
Tank-3	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³
Tank-4	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³
Tank-5	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³
Tank-6	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³
Tank-7	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³

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

14.5.1 Graphical View of the Tank Group Details

To view the tank group details in graphical format

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



1 *<Tank Name> and <Product Name>*
2 *Graphical Bar*
3 *Level of Alarm*
4 *Product Parameter*
5 *Tanks in a Tank group*

<Tank Name> and <Product Name>
The tank names and the product names are displayed for the selected tank group.

Graphical Bar
The graphical bar displays the product level and water level.
The arrow on the left side of the graphical bar indicates whether the product level is rising or falling.

Level of Alarm
The current level of alarm is displayed as per the alarm set points.

Product Parameter
Four parameters can be displayed for each tank, three of them can be freely configured under **Configuration**. Each parameter is displayed with name, status and unit.

The system also indicates the alarm acknowledgment 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

Tanks in a Tank group
The total number of tanks in a tank group is displayed as per the tank group parameter.

Graphical information for the tank group types

Static Tank Group
The system displays the measured graphical information of the tanks at the time of selecting the relevant tank group. The user has to manually refresh the screen to update the latest measured graphical information.

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.

- 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.
- 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.

14.5.2 Tabular View of the Tank Group Details

To view the tank group details in tabular format

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

Tabular View | Graphical View

ADD / REMOVE PARAMETERS

+ | − | Save | Print | Export as CSV

Tank Name	Product Name	Product Level	Secondary Level	Product Temperature	Pressure	Total Observed Volume
Tank-1	Petrol	+67.800 m	+0.000 m	+4.5 °C	+0.00 kPa	+6'780.000 m³
Tank-2	Petrol	+5.878 m	+0.000 m	+1.5 °C	+0.00 kPa	+587.800 m³
Tank-3	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³
Tank-4	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³
Tank-5	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³
Tank-6	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³
Tank-7	No Product	+0.500 m	+0.000 m	+4.5 °C	+0.00 kPa	+50.000 m³

1...7 / 7

For a list of all selectable parameter columns, refer to "Tabular View of the Product-Tank Group Details" .

The behavioral pattern of the tank group type is as follows:

Static Tank Group
The system displays the measured information of the tanks at the time of selecting the relevant tank group.

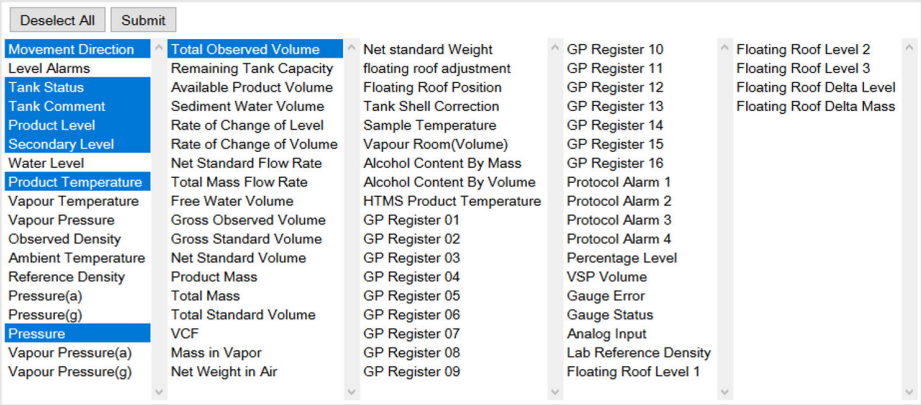
Dynamic Tank Group
The user can view the measured information of the tanks, which will be shown dynamically on the web page.

- 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.
- 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.

The **Non Real Time Tank Group Details** screen can be viewed by the user who is a guest. The system displays the measured information of the tanks at the time of selecting the relevant tank group. The user has to manually refresh the screen to view the latest measured graphical information.

To add columns to the tabular view

1. Click the **ADD / REMOVE PARAMETERS** button.
   ↳ The following pop-up window appears:



2. Select/deselect the columns you want to see/don't want to see.
3. Click the **Submit** button.
   ↳ The tabular view will show the selected values until further changes.

To zoom the tabular view

- Click the **+** button to zoom in and the **-** button to zoom out.

To save the tabular view settings

- Click the **Save** button to save the tabular view settings.

To print the tabular view

- Click the **Print** button to print the table as it is.

To export the tabular view

- Click the **Export as CSV** button to export the table, as it is, as a comma-separated values file.

To filter the tabular view

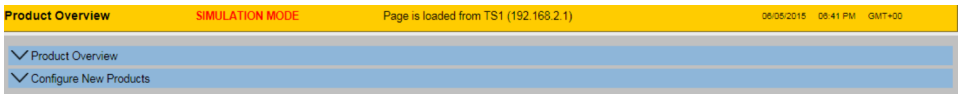
- Enter the filter criteria into the **Filter** field to filter the displayed data.

15 The "Configuration" – "Products" menu

The Tankvision system manages the inventory calculations of various products stored at a tank farm. The system calculates inventory data such as volume, mass, etc., based on the type of product that is present in the tank. In order to do this, the system allows the user to configure the properties of the product in the **Configuration → Products** menu.

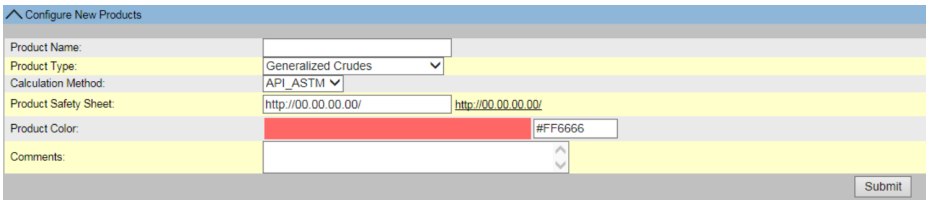
15.1 Adding, Modifying and Deleting Products

On the Navigation Tree, click the **Configuration** header. Click **Products**. (The number of products configured is displayed in brackets next to the Header's name.) Tankvision displays the screen as follows:



To add a product

1. Select **Configure New Products** by clicking on the ⌄ in front.
   ↳ Tankvision displays the screen as follows:

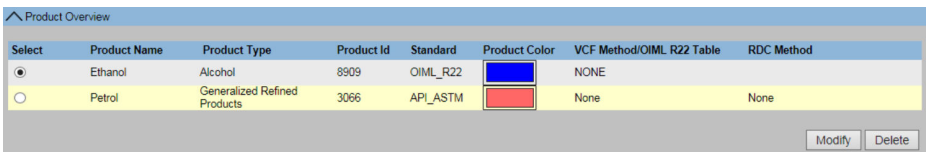


2. Enter the **Product Name** and configure the initial settings, like **Product Type** and **Calculation Method** (**API_ASTM** or **GBT**) and click on **Submit**.
3. Configure the product details as described in the following sections (→ 🗎 113).

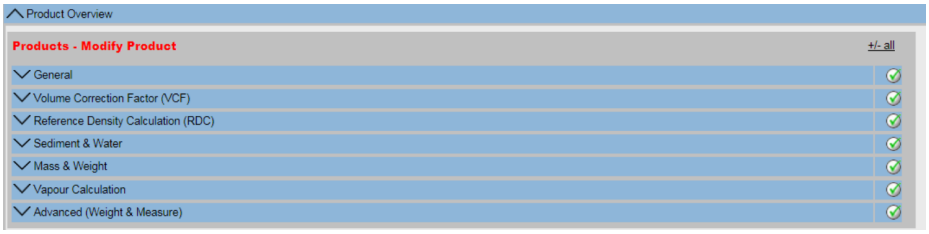
Observe the following information!
- The product configuration cannot be added while the system is W&M locked and the W&M switch is closed on the Tankvision unit.
- An event is generated after adding the product details. The event details can be viewed in the **Event** overview.

To modify product details

1. Open the **Product Overview** page and select the appropriate <Product Name> to modify the product details.
   ↳



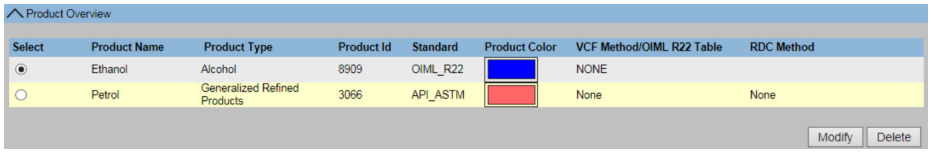
2. Click the **Modify** button.
   ↳ Tankvision displays the screen as follows:



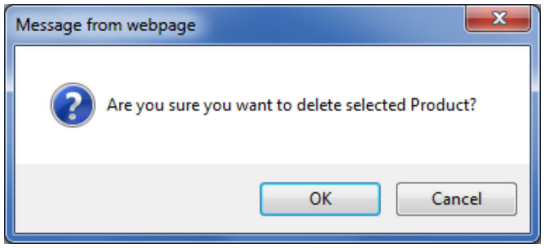
3. Configure the product details as described in the following sections.

Observe the following information!
- The product configuration cannot be modified while the system is W&M locked and the W&M switch is closed on the Tankvision unit.
- An event is generated after modifying the product details. The event details can be viewed in the **Event** overview.

To delete a product

1. Select the appropriate <Product Name> to delete the product.
   ↳ 

2. Click the **Delete** button.
   ↳ Tankvision displays the confirmation screen as follows:



3. Click the **OK** button to delete the selected product.
4. After saving the settings, Tankvision displays a confirmation message.

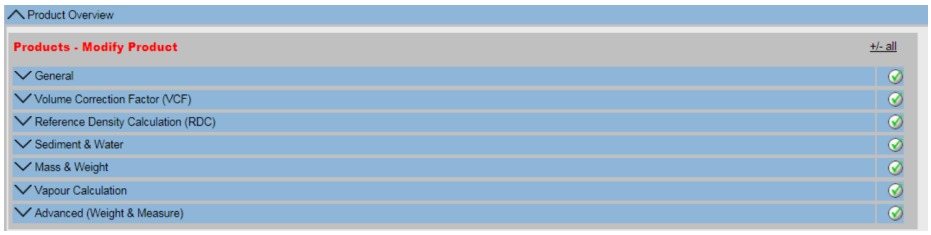
An event is generated after deleting the product. The event details can be viewed in the **Event** overview.

Error Messages
"Error: Product Assigned To Respective Tanks"
This message appears when the user tries to delete a product which is assigned to a tank.

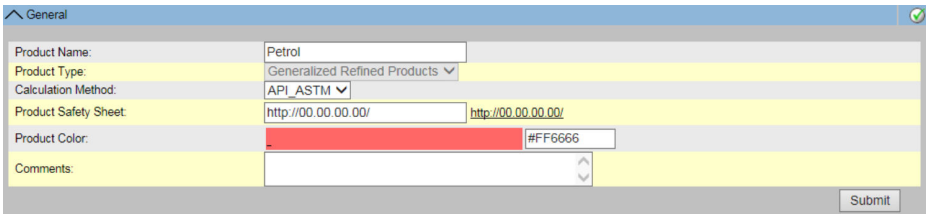
15.1.1 General

To configure the general details of the product

1. On the Navigation Tree, click the **Configuration** header. Click **Products**.
2. Select **Product Overview** by clicking on the ⌄ in front.
3. Select the appropriate <Product Name> and click **Modify** to configure the details of the product.
   ↳ Tankvision displays the screen as follows:



4. Click on **General** to configure the general details of the product.



Product Name
Enter the name of the product. This field displays the name of the product in the tank. The data type for this field is alphanumeric and can contain a few special characters. In this field, the usage of some of the special characters, such as, '%', '^', '#', '/', '|' and '\' is forbidden.

Product Type
Click this field to select the appropriate product type from the drop down list.
This field displays the product type. This enables the system to categorize the products into appropriate tables.

Calculation Method
Click this field to select the appropriate calculation method from the drop down list.
API_ASTM: Calculations according API/ASTM standards
GBT: Calculations according GBT standard

Product Safety Sheet
Enter the URL for the product safety sheet. The URL can be used to browse to the product safety sheet.

Product Colour
Select the appropriate colour from the colour palette. This field displays the colour chosen to represent the product. The product color is used in tank graphics to depict the product level using a bar graph.

Comments
Enter comments related to the product. This field displays comments (if any), with reference to the product. The data type for this field is alphanumeric and can contain all special characters.

5. Enter the appropriate information in the relevant fields.
6. Click the **Submit** button to configure the general details of the product.
7. After saving the settings, Tankvision displays a confirmation message.

An event is generated after creating or modifying the product. The event details can be viewed in the **Event** overview.

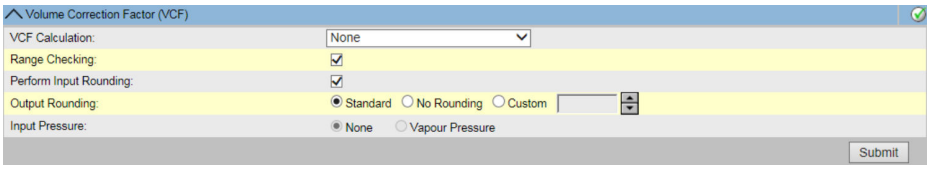
15.1.2 Volume Correction Factor (VCF)

The product volume calculated using the product level is the volume under measuring conditions. If the product is a hydrocarbon, its density and volume change based on the temperature. The product volume needs to be corrected to "volume at standard or reference temperature". This correction is performed by using the Volume Correction Factor (VCF). The **Volume Correction Factor (VCF)** screen allows you to view and modify the settings for VCF calculation of the product.

To configure product VCF calculation details

1. On the Navigation Tree, click the **Configuration** header. Click **Products**.
2. Select **Product Overview** by clicking on the in front.
3. Select the appropriate <Product Name> and click **Modify** to configure the details of the product.

4. Click on **Volume Correction Factor (VCF)** to configure the details of the product.



Range Checking
Select the check box to enable range checking. Clear the check box to disable range checking. The VCF can be calculated from a configured table only, when the input density is within an acceptable range of the table. When the range checking is on, the system does not calculate VCF if the input density is out of range. To allow VCF calculation to proceed for all density values, range checking needs to be switched off.

Perform Input Rounding
Select the check box to enable input rounding. Clear the check box to disable input rounding.
When the input rounding is enabled, the system performs rounding off input values to the table based on the rounding rules of the table.

Output Rounding
Select the appropriate option by clicking on the relevant option. This field allows you to select the appropriate method for rounding of the output values in the VCF calculation.
API/ASTM: This field enables the system to round the input and output values of the inventory calculation in accordance with the API/ASTM standards.
No Rounding: This field enables the system to display the output values of the inventory calculation with decimals.
Custom: Select the Custom option, and enter the appropriate number of digits in the adjacent text box.
This field enables the system to round the output values of the inventory calculation to the number of digits as specified in the adjacent text box. You can round the values to between zero to nine digits. The data type for this field is numeric.

Table for VCF Calculation
Select the appropriate table for the VCF calculation from the drop down list. This field allows you to select an appropriate table to calculate the required VCF. Certain tables require additional configuration settings. When any such table is selected, the system displays related input fields. The user needs to enter appropriate values in these additional input fields specific to the respective table.

Input Pressure
API 2004 can use the product pressure as additional input to correct the volume. For all other corrections this option is not available and therefore disabled.

5. Enter the appropriate information in the relevant fields.
6. Click the **Submit** button to configure the VCF calculation.
7. After saving the settings, Tankvision displays a confirmation message.

Observe the following information!
- Configuring **Volume Correction Factor (VCF)** is enabled, if **General Product Configuration** is completed and saved.
- An event is generated after creating or modifying the product. The event details can be viewed in the **Event** overview.

15.1.3 Reference Density Calculation (RDC)

Similar to the product volume, the product density at the observed temperature needs to be corrected to the standard or reference density. This density is then used to calculate the product mass. The **Reference Density Calculation (RDC)** screen allows the user to view and modify the settings for RDC calculation of the product.

To configure product RDC calculation details

1. On the Navigation Tree, click the Configuration header. Click **Products**.
2. Select **Product Overview** by clicking on the ⌄ in front.
3. Select the appropriate <Product Name> and click **Modify** to configure the details of the product.
4. Click ⌄ on **Reference Density Calculation (RDC)**.
   ↳ Tankvision displays the screen as follows:

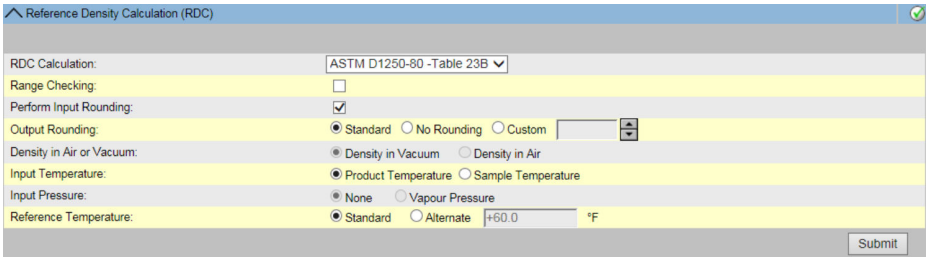


Table for RDC Calculation
Select the appropriate table for RDC calculation from the drop down list. This field allows you to select an appropriate table to calculate the required reference density. Certain tables require additional configuration settings. When any such table is selected, the system displays related input fields. The user needs to enter appropriate values in these additional input fields specific to the respective tables.

Range Checking
Select the check box to enable range checking. Clear the check box to disable range checking.
RDC can be calculated from a configured table only when the input density is within an acceptable range of the table. When the range checking is on, the system does not calculate RDC if the input density is out of range. To allow the RDC calculation to proceed for all density values, range checking needs to be switched off.

Perform Input Rounding
Select the check box to enable input rounding. Clear the check box to disable input rounding.
When the input rounding is enabled, the system performs rounding of input values to the table based on the rounding rules of the table.

Output Rounding
Select the appropriate option by clicking on the relevant option. This field allows you to select the appropriate method for rounding of the output values in the RDC calculation.
API/ASTM: This field enables the system to round the input and output values of the inventory calculation in accordance with the API/ASTM standards.
No Rounding: This field enables the system to display the output values of the inventory calculation with decimals.
Custom: Select the **Custom** option, and enter the appropriate number of digits in the adjacent text box.
This field enables the system to round the output values of the inventory calculation to the number of digits as specified in the adjacent text box. You can round the values to between zero to nine digits. The data type for this field is numeric.

Density in Air/Vacuum
Select if the density refers to atmospheric conditions (in air) or to the vacuum.

Input Temperature
Either the Product Temperature can be used as an input value for Reference Density calculation or a Sample Temperature (the temperature at which the sample was taken and measured).

Input Pressure
API 2004 can use the product pressure as additional input to correct the density. For all other corrections this option is not available and therefore disabled.

Reference Temperature
Select if the Standard Reference Temperature of 15 °C (60 °F) is used for the RDC Calculation or an Alternate Temperature.

5. Enter the appropriate information in the relevant fields.
6. Click the **Submit** button to configure the RDC calculation.
7. After saving the settings, Tankvision displays a confirmation message.

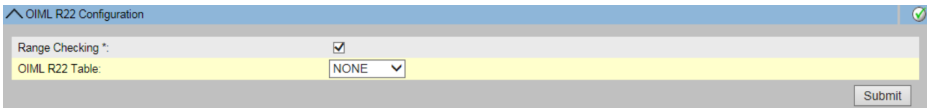
Observe the following information!
- Configuring **Reference Density Calculation (RDC)** is enabled if **General Produkt Configuration** is completed and saved.
- An event is generated after creating or modifying the product. The event details can be viewed in the **Event** overview.

15.1.4 OIML R22 Configuration

The product volume calculated using the product level is the volume under measuring conditions. If the product is a hydrocarbon, its density and volume change based on the temperature. The product volume needs to be corrected to "volume at standard or reference temperature". This correction is performed by using the OIML R22. The **OIML R22 Configuration** screen allows you to view and modify the settings for OIML R22 calculation of the product.

To configure OIML R22 details

1. On the Navigation Tree, click the **Configuration** header. Click **Products**.
2. Select **Product Overview** by clicking on the in front.
3. Select the appropriate <Product Name> and click **Modify** to configure the details of the product.
4. Click on **OIML R22 Configuration** to configure the details of the product.



Range Checking
Select the check box to enable range checking. Clear the check box to disable range checking. The OIML R22 can be calculated from a configured table only, when the input density is within an acceptable range of the table. When the range checking is on, the system does not calculate OIML R22 if the input density is out of range. To allow OIML R22 calculation to proceed for all density values, range checking needs to be switched off.

OIML R22 Table
Select the appropriate table for the OIML R22 calculation from the drop down list. This field allows you to select an appropriate table to calculate the required OIML R22. Certain tables require additional configuration settings. When any such table is selected, the system displays related input fields. The user needs to enter appropriate values in these additional input fields specific to the respective table.

The following tables are available for OIML R22 calculation:
- Table I
- Table II
- Table IIIA
- Table IVA
- Table VI
- Table VII

5. Enter the appropriate information in the relevant fields.
6. Click the **Submit** button to configure the OIML R22 calculation.
7. After saving the settings, Tankvision displays a confirmation message.

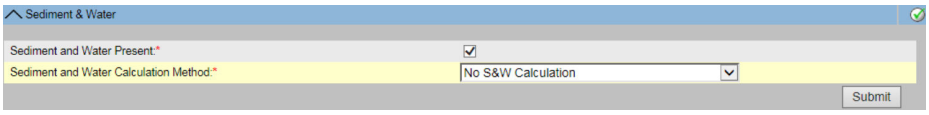
Observe the following information!
- Configuring **OIML R22 Configuration** is enabled, if **General Product Configuration** is completed and saved.
- Configuring **OIML R22 Configuration** is enabled only for alcohols.
- An event is generated after creating or modifying the product. The event details can be viewed in the **Event** overview.

15.1.5 Sediment & Water

The **Sediment & Water** screen allows you to view and modify the settings for the sediment and water content in the product.

To configure sediment and water details

1. On the Navigation Tree, click the **Configuration** header. Click **Products**.
2. Select **Product Overview** by clicking on the in front.
3. Select the appropriate <Product Name> and click **Modify** to configure the details of the product.
4. Click on **Sediment & Water**.
   ↳ Tankvision displays the screen as follows:



Sediment and Water present
Select the check box to enable other fields on the screen if sediment and water is present in the product. Clear the check box to disable other fields on the screen if sediment and water is not present in the product. This field allows you to configure the amount of sediment and water content in the product. Sediment and Water is a material that coexists with petroleum fluid, but is foreign to a petroleum fluid. This foreign material may include free water and sediment and emulsified or suspended water and sediment.

Sediment and Water Calculation Method
Select the appropriate sediment and water calculation method from the drop down list. The Tankvision system uses this field to calculate the sediment and water correction and apply it to the appropriate volume for further calculations.

The methods are as follows:
- **No S&W Calculation**
- **CSW Works on TOV**:
  Correction for Sediment and Water is applied to total observed volume.
- **CSW Works on (TOV-FWV)**:
  Correction for Sediment and Water is applied to (Total Observed Volume - Free Water Volume).
- **CSW Works on {(TOV-FWV)*CTSH}**:
  Correction for Sediment and Water is applied to {(Total Observed Volume - Free Water Volume) * Tank Shell Correction}.
- **CSW Works on {(TOV-FWV)*CTSH}-+FRA**:
  Correction for Sediment and Water is applied to [|{(Total Observed Volume - Free Water Volume) * Tank Shell Correction} +- Floating Roof Adjustment|].
- **CSW Works on GOV**:
  Correction for Sediment and Water is applied to Gross Observed Volume.
- **CSW Works on GSV**:
  Correction for Sediment and Water is applied to Gross Standard Volume.

5. Enter the appropriate information in the relevant fields.
6. Click the **Submit** button to configure the sediment and water content in the product.
7. After saving the settings, Tankvision displays a confirmation message.

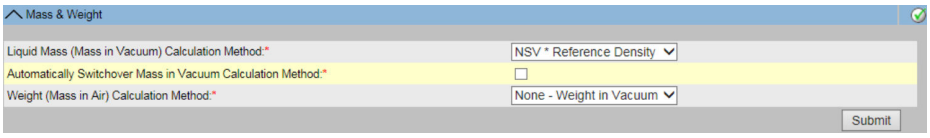
Observe the following information!
- Configuring **Sediment & Water** is enabled if **General Product Configuration** is completed and saved.
- An event is generated after creating or modifying the product. The event details can be viewed in the **Events** overview.

15.1.6 Mass & Weight

The **Mass & Weight** screen allows you to view and modify the settings for the product mass and weight calculation.

To configure mass calculation details

1. On the Navigation Tree, click the **Configuration** header. Click **Products**.
2. Select **Product Overview** by clicking on the ⌄ in front.
3. Select the appropriate <Product Name> and click **Modify** to configure the details of the product.
4. Click ⌄ on **Mass & Weight**.
   ↳ Tankvision displays the screen as follows:



Liquid Mass (Mass in vacuum) Calculation Method
Select the appropriate liquid mass calculation method from the drop down list. The system calculates the product liquid mass (mass in vacuum) using the method configured in this field.

The methods are as follows:
- **NSV*Reference Density**: Calculate mass using Net Standard Volume and Reference density
- **GSV*Reference Density**: Calculate mass using Gross Standard Volume and Reference density
- **GOV*Observed Density**: Calculate mass using Gross Observed Volume and Observed density
- **GOV*Reference Density**: Calculate mass using Gross Observed Volume and Reference density

Automatically Switchover Mass in Vacuum Calculation Method
Select the check box to automatically switchover the mass in the vacuum calculation method.
Clear the check box to prevent automatic switchover of the mass in the vacuum calculation method. RDC or VCF calculation can fail in certain cases (for example, if the input values are out of range, resulting in a "fail" status of the reference density and or standard volume). In this case, the liquid mass cannot be calculated using the reference density and standard volume. If automatic method switchover is enabled, the system will use appropriate methods to calculate the mass using the observed density and observed volume.

Weight (Mass in Air) Calculation Method
Select the appropriate weight calculation method from the drop down list. The system calculates the product liquid weight (Mass in air) using the method configured in this field.

If **Custom** is selected from the drop down list, the system displays the fields **Vapor Density**, **Brass Density** and **Air Density**.

Vapor Density
Enter the value of the vapor density for the product. This field is enabled if the user selects **Custom** in the **Weight (Mass in Air) Calculation Method** field. The value of the vapor density cannot be equal to the brass density. This field is mandatory when the method to calculate the product weight is Custom. The data type for this field is numeric.

Brass Density
Enter the value of brass density for the product. This field is enabled if the user selects **Custom** in the **Weight (Mass in Air) Calculation Method** field. The value of the brass density cannot be equal to the vapor density or 0 (zero). This field is mandatory when the method to calculate the product weight is **Custom**. The data type for this field is numeric.

Air Density
Enter the value of air density for the product. This field is enabled if the user selects **Custom** from the **Weight (Mass in Air) Calculation Method** field. This field is mandatory when the method to calculate the product weight is **Custom**. The data type for this field is numeric.

5. Enter the appropriate information in the relevant fields.
6. Click the **Submit** button to configure the product mass and weight calculation.
7. After saving the settings, Tankvision displays a confirmation message.

Observe the following information!
- Configuring **Mass & Weight** is enabled if **General Product Configuration** is completed and saved.
- An event is generated after creating or modifying the product. The event details can be viewed in the **Event** overview.

15.1.7 Vapor Calculation

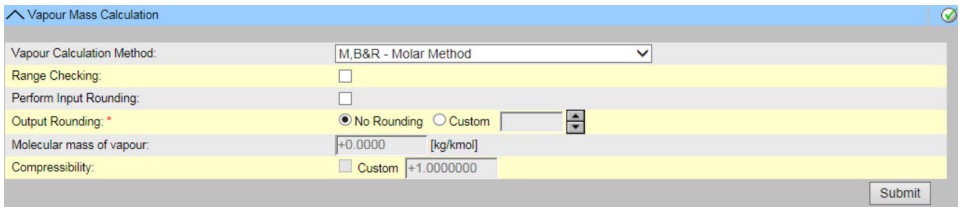
The **Vapor Calculation** screen allows you to view and modify the Vapor settings of the product.

1. On the Navigation Tree, click the **Configuration** header. Click **Products**.
2. Select **Product Overview** by clicking on the ⌄ in front.
3. Select the appropriate <Product Name> and click **Modify** to configure the details of the product.
4. Click ⌄ on **Vapor Calculation**.
   ↳ Tankvision displays screen as follows:

Vapor Mass Calculation
Defines the calculation of the Vapor Mass: Vapor Density Mode, Equivalent Method

5. Configure the product details as descriped in the following sections.

Vapor Mass Calculation



Vapor Calculation Method
Allows to configure the vapor calculation method.

Range Checking
Perform the range checking for the input variables according to the standard allowed range values.

Perform Input Rounding
Perform input rounding according to the method defined rounding criteria.

Output Rounding
Define if an output rounding has to be applied. In custom mode a configuration box allows to enter a rounding value.

Molecular mass of vapour
Define the molecular mass of the vapour.

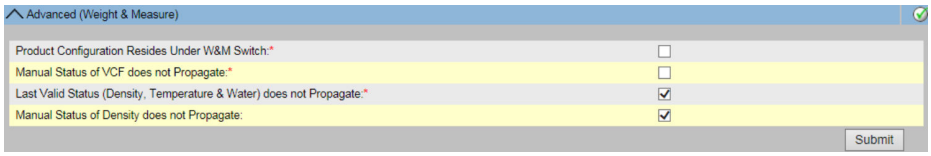
Compressibility
Define the compressibility of the vapour.

15.1.8 Advanced (Weight & Measure)

The **Advanced (Weight & Measure)** screen allows you to view and modify the advanced weight and measures settings of the product.

To configure product W&M settings

1. On the Navigation Tree, click the **Configuration** header. Click **Products**.
2. Select **Product Overview** by clicking on the in front.
3. Select the appropriate <Product Name> and click **Modify** to configure the details of the product.
4. Click on **Advanced (Weight & Measure)**.
   ↳ Tankvision displays the screen as follows:



Product Configuration Resides Under W&M Switch
When this check box is selected, the product configuration can be protected for W&M aspects, and the product configuration cannot be modified when the W&M switch has been closed.

Manual Status of VCF does not Propagate
Select this check box, if the system should not propagate the manual status of the VCF to obtain the standard volume. Clear the check box to enable the system to ensure that the manual status of the VCF propagates to obtain the standard volume.

Last Valid Status (Density, Temperature & Water) does not Propagate
Select this check box to disallow the system to use the values of the last valid status for density, temperature and water in subsequent calculations. The user may select this field when the current values for density, temperature and water are available.
Clear the check box to allow the system to use the values of the last valid status for density, temperature and water, in subsequent calculations. The user may clear this field when the current values for density, temperature and water are not available.

Manual Status of Density does not Propagate
Select the check box to disallow the system from using the values of the manual status of the density in the subsequent calculations. Clear the check box to allow the system to use the values of the manual status of the density in the subsequent calculations.

5. Enter the appropriate information in the relevant fields.

6. Click the **Submit** button to configure the advanced weight and measures settings.
7. After saving the settings, Tankvision displays a confirmation message.

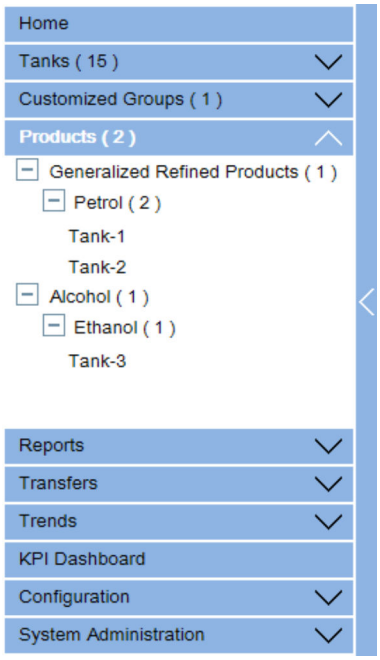
Observe the following information!
- **Advanced (Weight and Measures)** is enabled, if **General** has been configured.
- An event is generated after creating or modifying the product. The event details can be viewed in the **Event** overview.

15.2 View Product Tank Groups

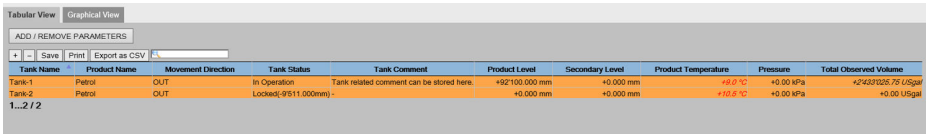
The Tankvision system has a product-tank group feature, where the user can view different products stored in various tanks.

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:



2. In the above figure, the <Product Types> created by the authorized personnel are displayed under the **Products** header. Below the <Product Types> the <Product Name> is displayed. 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:



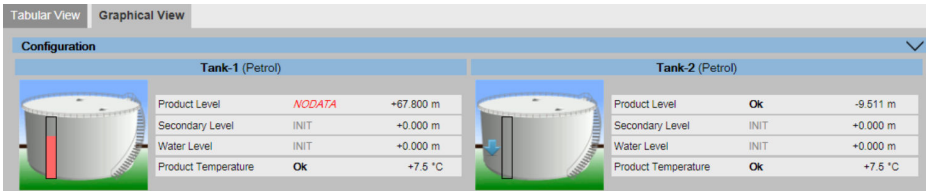
4. By default, the system displays the tabular view of the product group in the **Products** - <Product Name> screen.

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.

15.2.1 Graphical View of the Product-Tank Group Details

To view the product-tank group details in graphical format

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



<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 point.

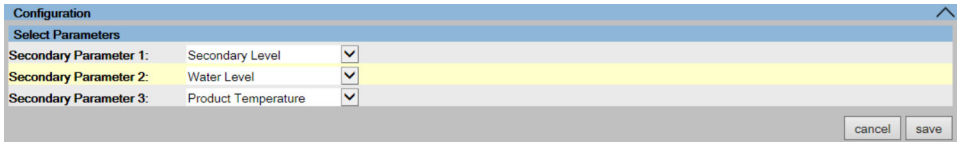
Graphical Bar
The graphical bar displays the product level and water level.

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 acknowledgment 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.

Click on **Configuration**. Tankvision displays the screen as follows:



Select the secondary parameters that are displayed in the Graphical View from the drop down lists.

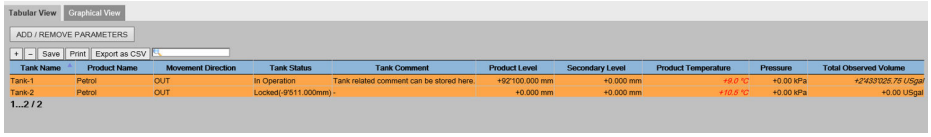
Click the **save** button to save the configuration. The configuration is changed for all tanks.

Click **cancel** to exit.

15.2.2 Tabular View of the Product-Tank Group Details

To view the product-tank group details in tabular format

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



Description of the screen:

Displayed columns are selectable (how to add columns to the tabular view, see below):
- Tank Name
- Product Name
- Movement Direction
- Level Alarms
- Tank Status
- Tank Comment
- Product Level
- Secondary Level
- Water Level
- Product Temperature
- Vapour Temperature
- Vapour Pressure
- Observed Density
- Ambient Temperature
- Reference Density
- Total Observed Volume (TOV)
- Remaining Tank Capacity
- Available Product Volume
- Sediment Water Volume
- Rate of Change of Level
- Rate of Change of Volume
- Net Standard Flow Rate
- Total Mass Flow Rate
- Free Water Volume (FWV)
- Gross Observed Volume (GOV)
- Gross Standard Volume (GSV)
- Net Standard Volume
- Product Mass
- Total Mass
- Total Standard Volume
- VCF
- Mass in Vapor
- Net Weight in Air
- Net standard Weight
- floating roof adjustment
- Floating Roof Position
- Tank Shell Correction
- Sample Temperature
- Vapour Room(Volume)
- Alcohol Content By Mass
- Alcohol Content By Volume
- GP Register
- Protocol Alarm
- Percentage Level
- VSP Volume

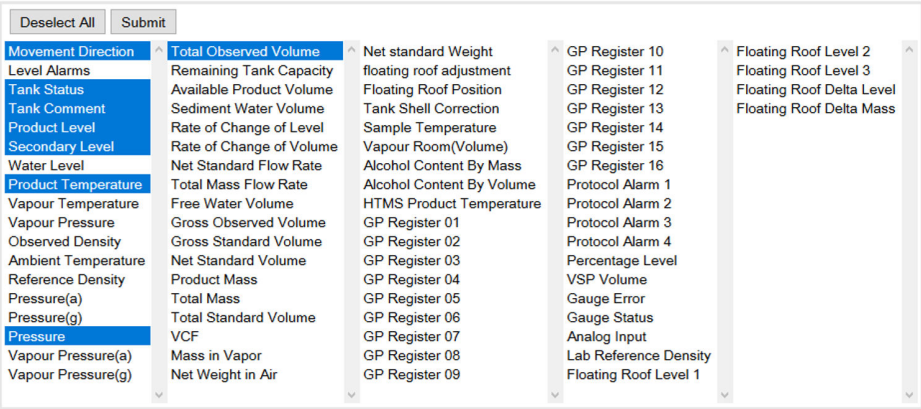
- Gauge Error
- Gauge Status
- Analog Input
- Lab Reference Density
- Floating Roof Level 1
- Floating Roof Level 2
- Floating Roof Level 3
- Floating Roof Delta Level
- Floating Roof Delta Mass

Description of the colours:
- Blue: indicates that the level is moving up
- Brown: indicates that the level is moving down
- Other colour: indicates that the level is not changing or remains in a certain delta.

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. Click the **ADD / REMOVE PARAMETERS** button.
   ↳ The following pop-up window appears:



2. Select/deselect the columns you want to see/don't want to see.
3. Click the **Submit** button.
4. The tabular view will show the selected values until further changes.

To zoom the tabular view

- Click the **+** button to zoom in and the **-** button to zoom out.

To save the tabular view settings

- Click the **Save** button to save the tabular view settings.

To print the tabular view

- Click the Print button to print the table as it is.

To export the tabular view

- Click the **Export as CSV** button to export the table, as it is, as a comma-separated values file.

To filter the tabular view

- Enter the filter criteria into the **Filter** field to filter the displayed data.

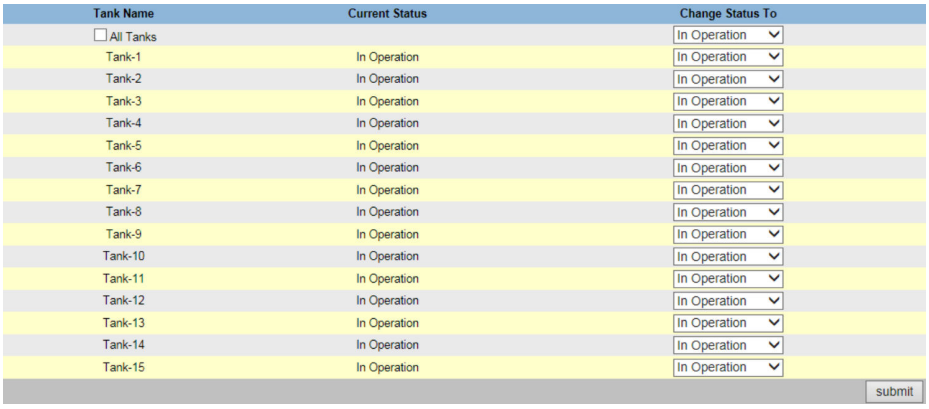
16 The "Configuration" – "Tank Status" menu

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

The **Tank Status** screen allows you to change the status of all local tanks at once.

To change the tank status

1. On the Navigation Tree, click the **Configuration** header. Click **Tank Status**.
   ↳ Tankvision displays the screen as follows:



Tank Name	Current Status	Change Status To
All Tanks		In Operation
Tank-1	In Operation	In Operation
Tank-2	In Operation	In Operation
Tank-3	In Operation	In Operation
Tank-4	In Operation	In Operation
Tank-5	In Operation	In Operation
Tank-6	In Operation	In Operation
Tank-7	In Operation	In Operation
Tank-8	In Operation	In Operation
Tank-9	In Operation	In Operation
Tank-10	In Operation	In Operation
Tank-11	In Operation	In Operation
Tank-12	In Operation	In Operation
Tank-13	In Operation	In Operation
Tank-14	In Operation	In Operation
Tank-15	In Operation	In Operation

submit

Tank Name
This column displays the tank names.
Select the **All Tanks** checkbox to change the status for all tanks at once.

Current Status
This column displays the current status of the tanks.

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" for the activities that can be performed under various tank statuses, and to "Tank Status Indicator" 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.

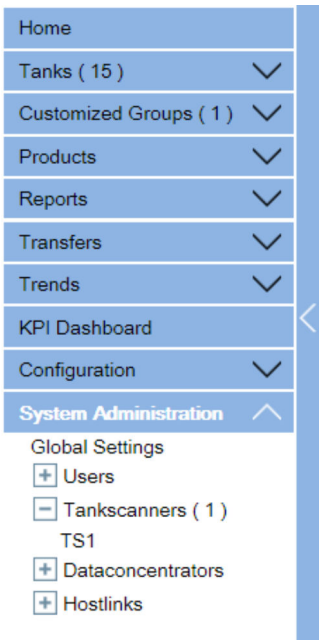
An event is generated after changing the tank status. The event details can be viewed in the **Event** overview.

17 The "System Administration" menu

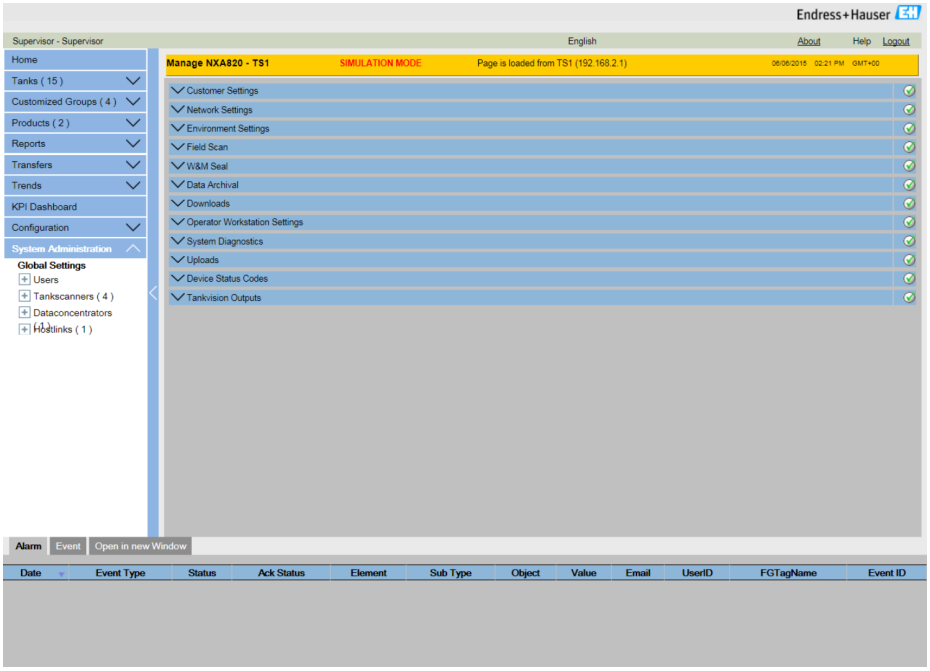
The user should have access rights to configure the system settings. If the user is accessing the web page without valid access rights, then the system will not allow the user to configure the system settings.

To configure the system settings

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



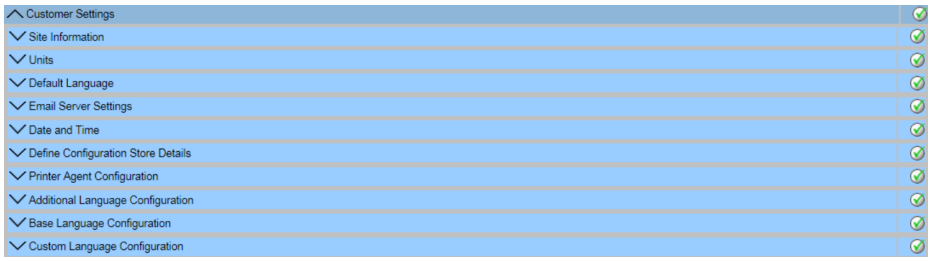
2. Click **Global Settings**.
   ↳ Tankvision displays the screen as follows:



17.1 Customer Settings

To Configure Global Customer Settings

- Click on **Customer Settings**.
  - Tankvision displays the screen as follows:

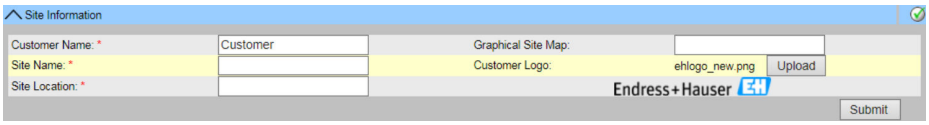


17.1.1 Site Information

"Site" refers to the location, where the Tankvision system is installed. The user can configure the site settings in this section.

To configure the site information

1. Click on **Site Information**.
   - Tankvision displays the **Site Information** screen as follows:



Customer Name
Enter the name of your company or customer.

Site Name
Enter the name of the site, where the Tankvision system is being installed.

Site Location
Enter the location name of the site, where the Tankvision system is being installed.

Graphical Site Map
Enter the URL to a graphical site map web page, which contains a tank site map.

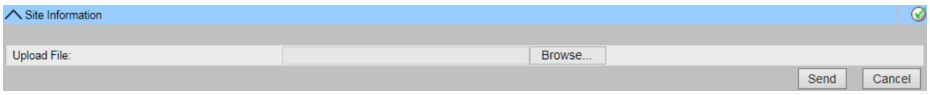
Customer Logo
Click the **Upload** button to select the appropriate customer's company logo.
The image size must not exceed 32x32 Pixels.
The file name for this field can be alphanumeric.
For more information → 129.

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 the configuration of the site information. The event details can be viewed in the **Event** overview.

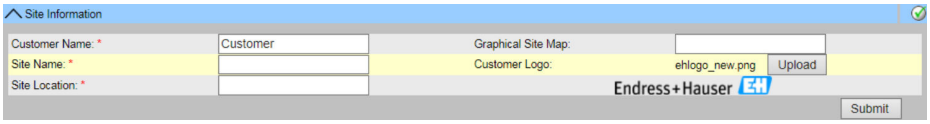
Upload Customer Logo

1. Click the **Upload** button on the **Site Information** screen.
   ↳ Tankvision displays the screen as follows:



Upload File
Enter the location from where you want to upload the file, or click the **Browse** button and select the location.

2. Click the **Send** button to proceed, or click the **Cancel** button to exit.
   ↳ Tankvision displays the uploaded logo and the file name on the **Site Information** screen as follows:



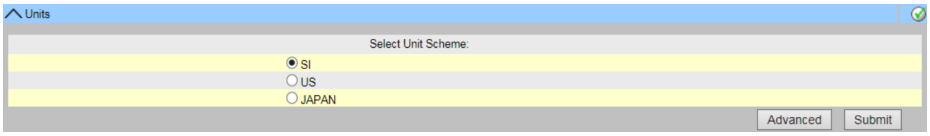
3. Click the **Submit** button. Tankvision displays the new logo on the System Header of the Tankvision screen.

17.1.2 Units

The Tankvision system displays various inventory data or parameters. Each parameter has a specific unit of measurement. The units can be configured to suite the customer requirements. The Tankvision system comes with three standard schemes for units - SI, US and Japanese. Based on the scheme, appropriate units are pre-selected for different physical quantities or parameters. When a scheme is customized, it is indicated with the suffix 'Customised' next to the scheme. Only a user with valid access rights (for example, supervisor/ technician) can change the units setting.

To configure units

1. Click on **Units**.
   ↳ Tankvision displays the **Units** screen as follows:



SI (default)
The SI scheme chooses units based on International System of Units (SI).

US
The US scheme chooses units, which are prevalent in USA, viz. mm, deg F, gallons, etc.

JAPAN
The Japanese scheme chooses units, which are prevalent in Japan, viz. mm, g/ml, kilo liter, etc.

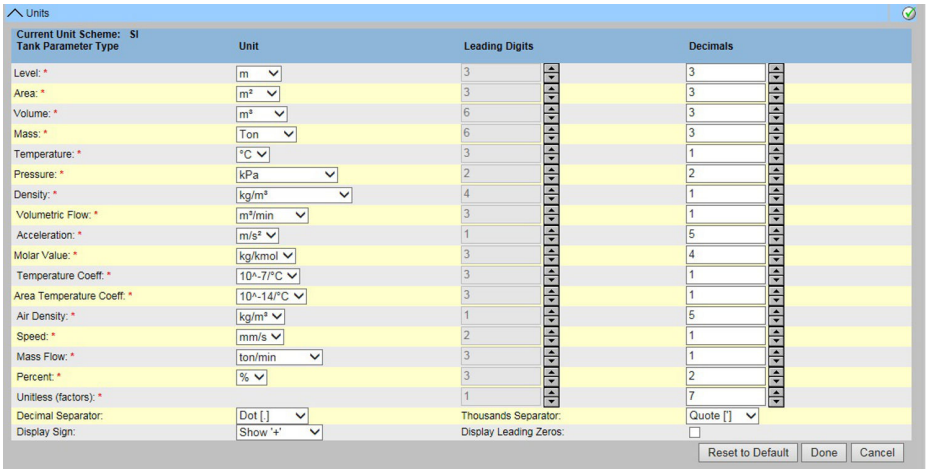
2. Select the appropriate unit scheme option.
3. Click the **Submit** button to proceed, or click the **Advanced** button to set up the advanced unit configuration. Tankvision displays a confirmation screen.
4. Click the **OK** button to save the details.

5. After saving the settings, Tankvision displays a confirmation message.

An event is generated after configuring the unit settings. The event details can be viewed in the **Event** overview.

Advanced Units Configuration

1. Click the **Advanced** button on the **Units** screen.
   ↳ Tankvision displays the screen as follows:



Current Unit Scheme
Displays the name of the current unit scheme.

Decimal Separator
Select the appropriate decimal separator from the drop-down list. For approved systems in Germany (PTB) the decimal separator must be a comma and the thousands separator none, dot or space (no comma, no quote).

Thousands Separator
Select the appropriate thousands separator from the drop-down list. For approved systems in Germany (PTB) the decimal separator must be a comma and the thousands separator none, dot or space (no comma, no quote).

Display Sign
Select this check box to display the sign (+) or (-) before each number.

Display Leading Zeroes
Select this check box to enable the **Leading Digits** column.
Clear the check box to disable the **Leading Digits** column.

Tank Parameter Type
This column displays the types of tank parameters that can be configured for the Tankvision system.

Unit
Select the appropriate unit from the drop-down list. The drop-down lists provide a list of units corresponding to each tank parameter type.

Leading Digits
Select or enter the number of leading digits. This field is enabled if the **Display Leading Zeros** check box is selected. This option allows the user to set the number of digits for every tank parameter type. If necessary, leading zeros are added to the number. The number of leading digits should not exceed 10.

Decimals
Select or enter the number of decimal digits. This field allows you to set the number of digits after the decimal separator for every tank parameter type. The number of decimals should not exceed 10.

2. Enter the appropriate information in the relevant fields.
3. Click the **Done** button to save the details. Click the **Reset To Default** button to apply the default settings of the system. Click the **Cancel** button to exit the screen without accepting the changes.
   ↳ Tankvision displays the **Units** screen.
4. Click the **Done** button to save the changes in the Units configuration. Tankvision displays a confirmation screen.
5. Click the **OK** button to save the details.
6. After saving the settings, Tankvision displays a confirmation message.

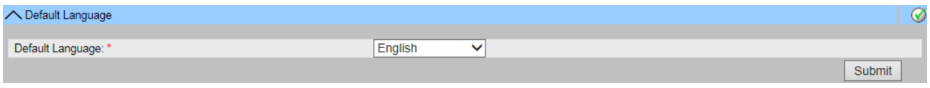
If you change the default settings for a specific unit scheme, the system displays **Customized** next to the unit scheme name on the **Units** screen.

17.1.3 Default Language

Tankvision provides a multi-lingual interface. The user can set the language according to the local requirements.

To configure the default language

1. Click ⌄ on **Default Language**.
   ↳ Tankvision displays the **Default Language** screen as follows:



Default Language
This field displays a list of the languages that have already been configured to be used in the Tankvision interface.

2. Select the appropriate language from the drop-down list.
3. Click the **Submit** button to proceed.
4. After saving the settings, Tankvision displays a confirmation message.

17.1.4 Email Server Settings

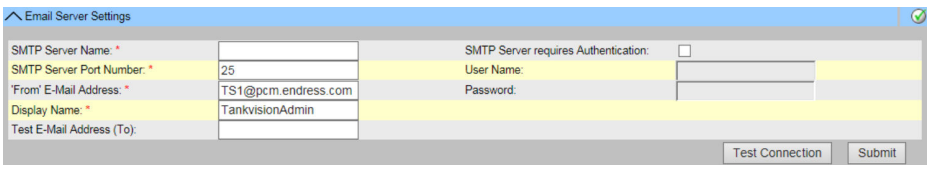
The Tankvision system sends Emails using a standard SMTP server, called the Email server.

The Tankvision system sends information about the alarm and event notifications, and other reports to the authorized user by Email.

If the system fails to send the Email, then the Email status in the **Alarm and Event Panel** section will be "Fail".

To configure the Email server

1. Click ⌄ on **Email Server Settings**.
   ↳ Tankvision displays the screen as follows:



SMTP Server Name
Enter the appropriate host name or the IP address of the SMTP server. The Tankvision system uses the SMTP server name to send Emails. The data type for this field is alphanumeric.

SMTP Server Port Number
Enter the appropriate port number of the SMTP server.
The data type for this field is numeric. The default SMTP Server Port number is 25.

"From" E-Mail Address
Enter the Email address that will be used as sender.
The data type for this field is alphanumeric. This entry is mandatory.

Display Name
Enter the Display Name of the sender. By default, the Display Name is TankvisionAdmin.
The data type for this field is alphanumeric.

SMTP Server Requires Authentication
Select this check box, if the SMTP server requires an authentication. This will enable the user name and password fields.

User Name
Enter the unique user name. This is the user name for SMTP server authentication.
The data type is alphanumeric and is case sensitive.

Password
Enter the password. This is the password for SMTP server authentication.

Test E-Mail Address (To):
Enter an Email address to test the Email settings. When clicking the **Test Connection** button, a test Email is sent to the address defined in this field.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to proceed, or click the **Test Connection** button to test the connection to the Email server.
4. After saving the settings, Tankvision displays a confirmation message.

An event is generated after configuring the Email Server. The event details can be viewed in the **Event** overview.

Email server settings can usually be requested from the Network administration.

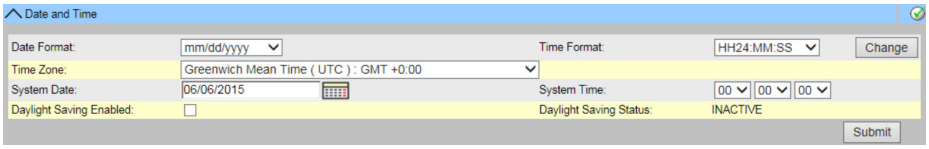
17.1.5 Date and Time

The system allows the user to configure date, time, time zone and the date-time formats.

The Tankvision system unit, which is configured as a Subscription Store, becomes a time server for other units subscribed to it for global configuration data.

To Configure Date and Time Settings

1. Click on **Date and Time**.
   ↳ Tankvision displays the screen as follows:



Date Format
Select the date format from the drop down list. This field allows you to set the required format for the date. This date format will be used to display the date on all Tankvision screens, reports, Emails and prints.

Time Format
Select the time format from the drop down list. This field allows you to set the required format for the time. This time format will be used to display the time on all the Tankvision screens.

Time Zone
Select the appropriate time zone from the drop-down list.

System Date
Enter the current date in the relevant date format. Alternatively, click on the calendar icon to choose the date.

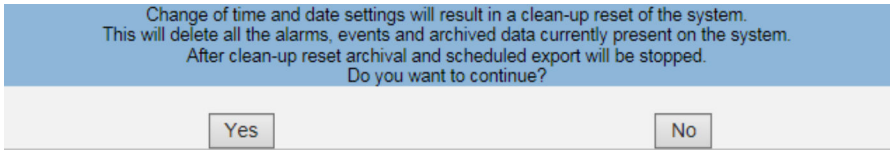
System Time
Enter the current time in the relevant time format.

Daylight Saving Enabled
Select this check box to enable the user to enter the appropriate daylight saving details. Clear the check box to prevent the user from entering the daylight saving details.

Daylight Saving Status
This field displays the daylight saving status. The system displays the **ACTIVE** status, if the **Daylight Saving Enabled** check box is selected.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button. Tankvision displays a message that a change of time and date settings will cause a clean-up reset of the system. Click **Yes** to continue, **No** to abort.

NOTICE
Risk of data loss
Changing the time and date settings and the resulting clean-up reset deletes the data on the device (e.g. archived data).
- Be careful when changing time and date settings.



4. After saving the settings, Tankvision displays a confirmation message.

An event is generated after configuring Date and Time. The event details can be viewed in the **Event** overview.

17.1.6 Configuration Store definition

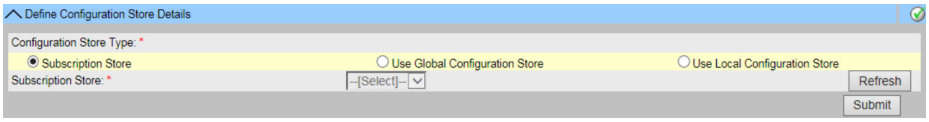
In a typical Tankvision system, most configuration settings are common for all Tankvision units within the network. Therefore, the time required for the configuration of the system can be minimized by defining one of the units to be a Subscription Store. The configuration settings are only performed on this Subscription Store. These settings are then distributed to the other units within the network.

For each Tankvision unit (i.e. Tank Scanner NXA820, Data Concentrator NXA821 or Host Link NXA822) within the network it is necessary to define if it is a Subscription Store or if it receives its configuration from a Subscription Store.

To do so, proceed as follows:

1. Login to the Tankvision unit and navigate to the **Global Settings** screen → 🗎 128. Click ⌄ on **Customer Settings**.

2. Click on **Define Configuration Store Details**.
   ↳ Tankvision displays the screen as follows:



3. **For the Subscription Store:** In **Configuration Store Type** select the option **Subscription Store** (Default)
4. **For the other units:** In **Configuration Store Type** select the option **Use Global Configuration Store**. In **Subscription Store** select the Subscription Store to which this unit is to be linked.
5. Click the **Submit** button to proceed, or click the **Refresh** button to reset the screen.
6. After saving the settings, Tankvision displays a confirmation message.

With the use of global configuration store the following information is transferred to the subscription units:
- Customer settings like site information (without customer specific logo), unit, E-mail server and day and time settings (configurations of languages and printer agent must be done for every single device)
- Environment settings
- Products
- Users incl. user access rights

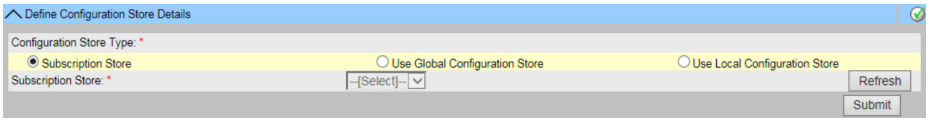
Global settings could be changed later on, also after assigning other units. It is highly recommended to use an NXA820 as subscription store.

17.1.7 Define Configuration Store Details

The Tankvision system is a distributed system, which comprises several Tankvision units working together in a single network. The configuration for most of these units is common. Hence, these configuration settings are performed in one single Tankvision unit, which acts as a subscription store. A subscription store minimizes the time taken for configuration and avoids any duplication of activity in the Tankvision system. It circulates its configuration to other Tankvision units in the form of Global Settings. Sometimes, a Tankvision unit might need to use global configuration settings that are different from the subscription store. In this case, the Tankvision unit's settings can be configured by using a local configuration, so that it neither affects nor is affected by the subscription store.

To define configuration store details

1. Click on **Define Configuration Store Details**.
   ↳ Tankvision displays the screen as follows:



Configuration Store Type
Click the appropriate option to select the relevant configuration store type for this Tankvision unit.
Subscription Store: This option configures the NXA unit to act as "Global Subscription Store". Other units can subscribe to this subscription store to get the global configuration. Any part of the global configuration changed on the subscription store is also updated on the subscribing units and vice versa.
Use Global Configuration Store: This option enables the NXA unit to use an existing Subscription Store for global configuration. If the system is configured to use the global

configuration store, the unit subscribes to the global subscription store to receive any configuration changes.
Use Local Configuration Store: This option enables the NXA unit to use the local configuration, which is different from that of the global subscription store. Any global configuration changed on the global subscription store does not affect the NXA unit configured to use local configuration store and vice versa. The configuration is not accessable for other units (unlike the subscription store).

Subscription Store
Select the appropriate subscription store. This field is used to refer to a subscription store when the Tankvision unit is configured to use a global configuration store. This field is enabled only if the **Use Global Configuration Store** option is selected. This field displays a list of the Tankvision units configured as a subscription store. To get the latest list of global subscription stores, click the **Refresh** button.

When the subscription store becomes active in the network, the global configuration settings at the subscription store overwrite the global configuration settings on all other Tankvision units. Thus, any changes made to the global configuration locally will be lost.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to proceed, or click the **Refresh** button to reset the screen.
4. After saving the settings, Tankvision displays a confirmation message.

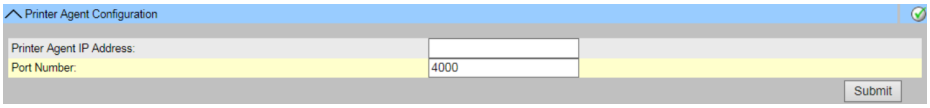
An event is generated after configuring the Subscription Store. The event details can be viewed in the **Event** overview.

17.1.8 Printer Agent Configuration

Tankvision can generate scheduled tank reports which can be printed via a printer without human intervention. This task is performed by the Printer Agent, which can be uploaded to the operator station from any Tankvision unit (→ 🗎 185). When the Printer Agent has been installed, it can be configured as follows.

To configure the Printer Agent

1. Click on **Printer Agent Configuration**.
   ↳ Tankvision displays the screen as follows:



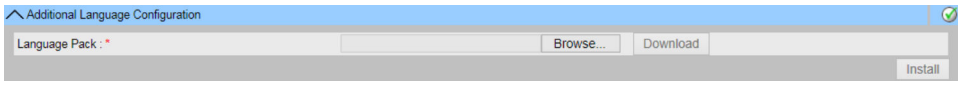
Printer Agent IP Address
Enter the IP address of the computer on which the Printer Agent is installed.

Port number
Enter the port of the computer that the printer agent is listening (waiting). For details refer to the DOC-filed contained in the printer agent folder.

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

An event is generated after configuring the Printer Agent. The event details can be viewed in the **Event** overview.

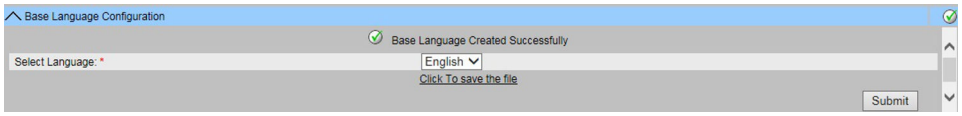
17.1.9 Additional Language Configuration



27 *Additional Language Configuration*

- Download of one additional language pack (beside the pre installed one(s)).
- Type in the location or use the **Browse** button.
- Download to Tankvision by clicking on **Download** button.
- The additional language is shown in the meta data header.
- Can be selected as default language (→ 131) or as based language (→ 136).

17.1.10 Base Language Configuration

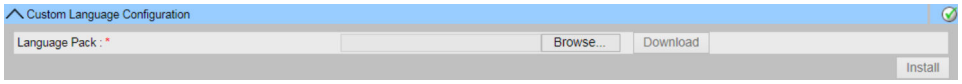


28 *Base Language Configuration*

The base language is used as "template" for customer specific screen. Select the appropriate base language from the drop down list and confirm by clicking the **Submit** button.

After pressing the **Submit** button, wait until the language pack is generated. It can be downloaded to the computer by pressing the **Click To Save the file** link.

17.1.11 Customer Language Configuration



29 *Customer Language Configuration*

Customer language = Integration of customer specific screens (modified screens based on Tankvision pages).

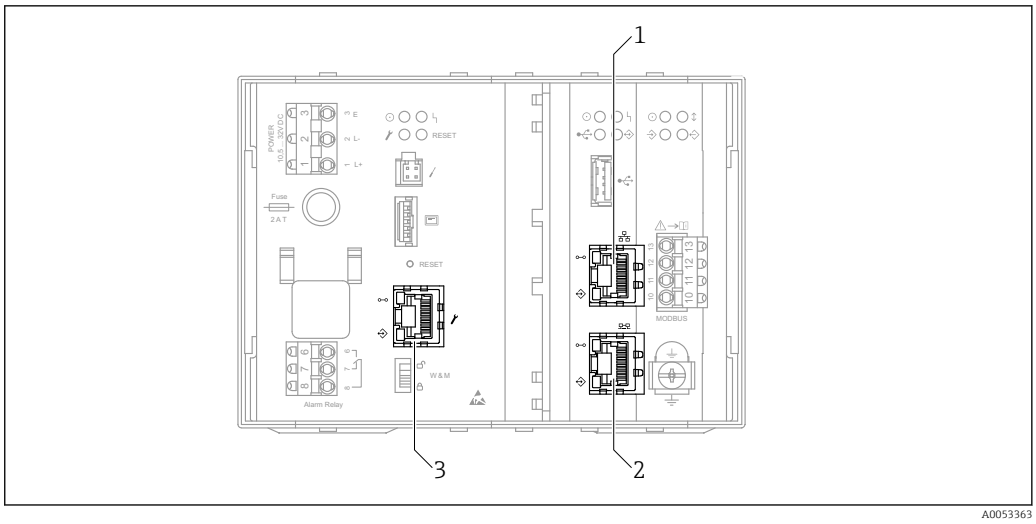
- Download of one additional language pack (beside the pre installed one(s)).
- Type in the location or use the **Browse** button.
- Download to Tankvision by clicking on **Download** button.
- The additional language is shown in the meta data header.
- Can be selected as default language (→ 131) or as based language (→ 136).

17.2 Network Setting

All Tankvision units are connected to each other using Ethernet and exchange data over TCP/IP. Tankvision provides a web-based user interface, which allows the user to use the Tankvision functionality by any standard web browser.

17.2.1 Tankvision Network Configuration

Each Tankvision unit has three LAN ports as shown in the figure below.



30 *The picture refers to NXA820. NXA821 and NXA822 have the same LAN ports.*

1 *System LAN port*
2 *Sync-Link LAN port*
3 *Service LAN port*

System LAN port
Connects the Tankvision unit to the network.
The IP address of the System LAN port can be defined in **Primary IP Address** (→ 138)

Sync-Link LAN port
in preparation

Service LAN Port
Connects the Tankvision unit to a local computer only for local commissioning and service operations. The IP address of the Service LAN Port is 192.168.1.1

17.2.2 Configure the Network

The Tankvision system allows the user to configure or to modify the network settings of the Tankvision unit.

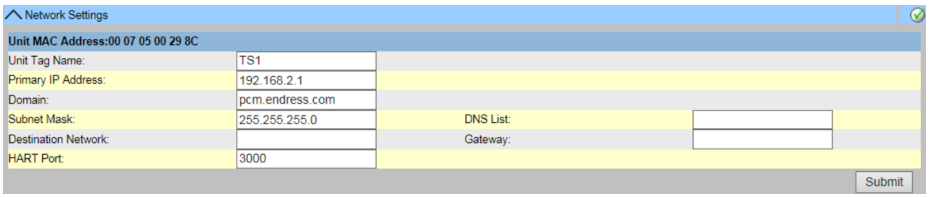
First time configuration of a Tankvision unit

When configuring a Tankvision unit for the first time, proceed as follows:

1. Connect a laptop to the Service LAN port. Make sure that the laptop is configured to get a dynamic IP address from a DHCP server.
2. Open the internet browser and enter the following URL: http://192.168.1.1
3. Login to Tankvision (User ID = Super; Password = Super)
4. Navigate to **System Administration** → **Global Settings** → **Network Settings** (see below)
5. Set the correct IP address and further network settings.
6. Disconnect the laptop and connect the Tankvision unit to the network via the System LAN port.
7. Continue to configure the Tankvision unit.

To configure the network settings

1. Click ⌄ on **Network Settings**.
   ↳ Tankvision displays the screen as follows:



NXA82x Unit Tag Name
Enter the tag name for the Tankvision unit. This field indicates the TCP/IP host name for the Tankvision unit. This name will be displayed in the left menu as the Tankvision unit identifier.
The tag name is alphanumeric and can contain the special characters '-' and '_' (hyphen and underscore).

Primary IP Address
Enter the IP address for the Tankvision unit. The primary IP address is used by the Tankvision unit to participate in system functionality. The data type for this field is IP address.

The IP range 192.168.1.xxx cannot be used.

Domain
Enter the domain address. The domain is the network identification of a server.
The data type for this field is alphanumeric and can contain the characters '-", '_' and '.' (hyphen, underscore and dot).

Subnet Mask
Enter the appropriate Subnet Mask. The Subnet Mask is used by TCP/IP services and applications to determine whether a given IP address on an inter-network is a local network address or a remote network address. The data type for this field is IP address.

Destination Network (not mandatory)
Used to add manual entries into the network routing table.
For details contact the Endress+Hauser service.

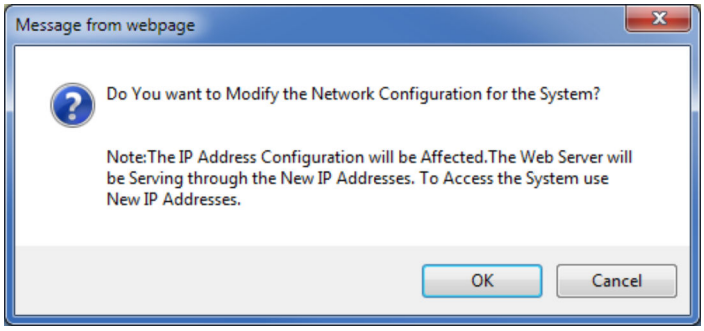
HART Port
Change the remote configuration network communication port.

DNS List (not mandatory)
Enter the IP address for the DNS list. This is a list of IP addresses of DNS servers. A DNS server is used to resolve host names into IP addresses on a TCP/IP network. If you don't have access to a DNS server, enter 1.1.1.1. The data type for this field is IP address.

Gateway
Enter the IP address of the Gateway. The gateway forwards IP addresses to other TCP/IP networks. For details contact the Endress+Hauser service.

2. Enter the appropriate information in the relevant fields.

3. Click the **Submit** button to proceed.
   ↳ The system displays a confirmation box as follows:



4. Click the **OK** button to proceed, or click the **Cancel** button to exit.
5. After saving the settings, the Tankvision unit restarts automatically (wait approx. 3 min).

If you don't know the correct IP address, please contact your local network administrator. If you want to use an isolated LAN network, use the IP address 192.168.2.xxx and set the subnet mask to 255.255.255.0

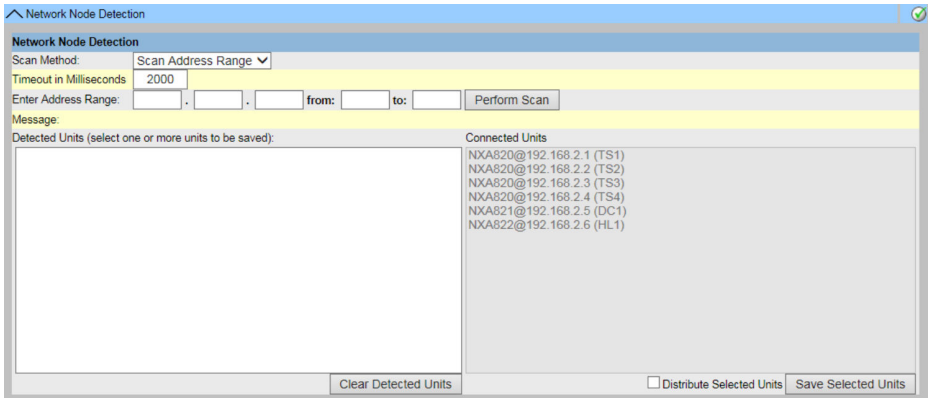
Network Node Detection

The Network Node Detection helps to detect and connect to all devices in the same network.

This is a precondition for a global/local scenario (e.g. to use a Data Concentrator NXA821 as a Global Store or for the usage of Subscription Stores).

To do so, proceed as follows:

1. Login to the Tankvision unit as "Supervisor" and navigate to the **Global Settings** screen as described in "Network settings". Click on **Customer Settings**.
2. Click on **Network Node Detection**.
   ↳ Tankvision displays the screen as follows:



Scan Method
Select the appropriate Scan Method from this field. Choose between scanning for a single IP address (**Scan Address**) and scanning a range of IP addresses (**Scan Address Range**).

Timeout in Milliseconds
Enter the appropriate scan timeout (in milliseconds) in the text box.

Enter Address
Enter the known IP address of a device in the network into the text boxes.
This filed is only available when **Scan Address** was selected for **Scan Method**.

Enter Address Range
Enter a range of IP addresses, that are in the same network as the current device, into the text boxes.
This filed is only available when **Scan Address Range** was selected for **Scan Method**.

Message
Displays a message after the scan, e.g. how many devices were detected.

Detected Units
Lists all the devices that were detected during a scan.

Connected Units
Lists all devices that are already connected to the current device.

Distrubute Selected Units
Select the check box to distribute the selected **Detected Units** to all connected units when clicking **Save Selected Units**.
Clear the check box to save the selected **Detected Units** only to the current device when clicking **Save Selected Units**.

3. Enter the appropriate information in the relevant fields.
4. Click **Perform Scan** to start the Network Node Detection. During the scan a progress bar is displayed. The rest of the screen is locked while the progress bar is displayed.
5. Click on the detected units (multiple selection by holding the **Ctrl** key while clicking) to select the detected units that are to be saved. Click **Save Selected Units** to save the selected units (and the current device). Click **Clear Detected Units** to clear the **Detected Units**.

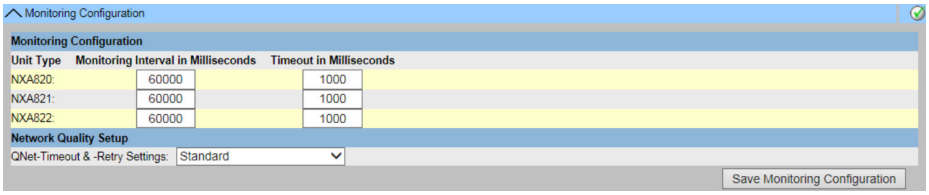
If a device in the network is removed or replaced, repeat the Network Node Detection to update the connected devices.

Monitoring Configuration

Configure the interval and timeout for monitoring the other devices in the network as well as the network quality.

To do so, proceed as follows:

1. Login to the Tankvision unit as "Supervisor" and navigate to the **Global Settings** screen as described in "Network settings".
2. Click on **Customer Settings**.
3. Click on **Monitoring Configuration**.
   ↳ Tankvision displays the screen as follows:



Unit Type
Displays the device type (Tank Scanner NXA820, Data Concentrator NXA821, Host Link NXA822).

Monitoring interval in Milliseconds
Enter the appropriate interval, in which the current device checks if the other devices in the network are available, in the text box.

Timeout in Milliseconds
Enter the appropriate timeout for the availability check of the other devices in the network in the text box.

QNet-Timeout & -Retry Setings
Select the appropriate network quality. The names of the settings are self-explanatory.

4. Enter the appropriate information in the relevant fields.
5. Click the **Save Monitoring Configuration** button.

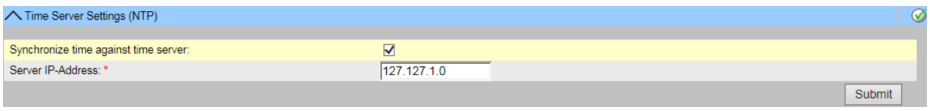
Time Server Settings

The availability of the Time Server Settings depends on the Configuration Store Type selected in "Define Configuration Store Details".

Synchronize the time of the device with a time server in the network.

To do so, proceed as follows:

1. Login to the Tankvision unit as "Supervisor" and navigate to the **Global Settings** screen as described in "Network settings".
2. Click on **Customer Settings**.
3. Click on **Time Server Settings (NTP)**.
   ↳ Tankvision displays the screen as follows:



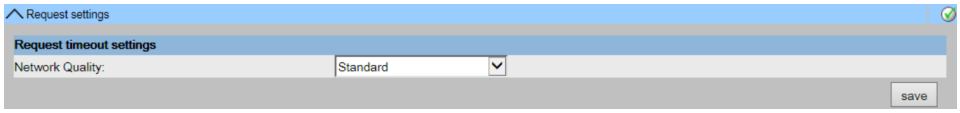
Synchronize time against time server
Select the check box to synchronize the system time of the current device with a time server in the network.
Clear the check box to use the system time of the current device.
Only available if **Subscription Store** is selected as the **Configuration Store Type** in **Define Configuration Store Details** (refer to "Subscription Store definition").
Not available if **Use Local Configuration Store** is selected as the **Configuration Store Type**, because this setting always uses the system time of the current device.
If **Use Global Configuration Store** is selected as the **Configuration Store Type**, the IP address of the configured Subscription Store is automatically used as time server.

Server IP-Address
Enter the appropriate IP address of a time server. The IP address has to be available in the network of the current device.
Entering the IP address "127.127.1.0" (default) synchronizes with the system time of the current device.
If an invalid IP address is entered and **Submit** button is clicked, the field returns to the last valid IP address.
This field is only available if the **Synchronize time against time server** check box is available and selected.
NOTE! Do not use other Tankvision devices as time servers.

4. Enter the appropriate information in the relevant fields.
5. Click the **Submit** button.

The time of synchronization depends, amongst other things, on the network quality.

Request settings



31 Request settings

By selecting the network type a certain timeout configuration is set, so that connection delays are considered normal and not as errors. For example, replies over local network are faster than via wireless or internet connection.

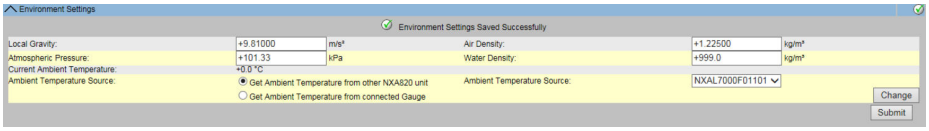
17.3 Environment Settings

Environment Settings allows you to store and view information about the surrounding environment of the place where the Tankvision system is installed. This information comprises local gravity, atmospheric pressure and density of air and water.

The ambient temperature is a special parameter. In a given installation there is typically only one source of ambient temperature. This source can be the ambient temperature fetched from a spot temperature gauge on one of the tanks or a manually entered value. In the ambient temperature scan configuration for NXA820, the user can specify whether this unit receives the ambient temperature from the connected gauge or from some other NXA820 unit.

To configure the environment settings

1. Click on **Environment Settings**.
   ↳ Tankvision displays the screen as follows:



Local Gravity
Enter the appropriate value for the local gravity.
This field indicates the local gravity of the region where the Tankvision system is installed. The value of the local gravity should be configured in SI units only and should be greater than zero. The default value is +9.81 m/s^2.
The data type for this field is numeric.

Air Density
Enter the appropriate value for the air density. This field indicates the density of air in the region where the Tankvision system is installed. The value of the air density should be configured in SI units only and should be greater than zero. The default value is +1.225 kg/m^3.
The data type for this field is numeric.

Atmospheric Pressure
Enter the appropriate value for the atmospheric pressure. This field indicates the atmospheric pressure in the region where the Tankvision system is installed. The value of the atmospheric pressure should be configured in SI units only. The data type for this field is numeric.

Water Density
Enter the appropriate value for the water density. This field indicates the density of water in the region where the Tankvision system is installed. The value of the water density should be configured in SI units only and should be greater than zero. The default value is +999 kg/m^3.
The data type for this field is numeric.

Current Ambient Temperature
This field displays the Current Ambient Temperature used by the system for inventory calculations. The Current Ambient Temperature is obtained from NXA820 Ambient Temperature Source.
This field is only available for NXA820.

Ambient Temperature Source
To get the ambient temperature from another NXA820 unit, select **Get Ambient Temperature from other NXA820 unit** and select the NXA820 unit in the network from where this unit receives the ambient temperature in the **Ambient Temperature Source** drop down list.
To get the ambient temperature from a gauge connected to this unit, select **Get Ambient Temperature from connected Gauge**.
User can select **Change** button to refresh the ambient temperature fetched from the specific source.
This option is only available for NXA820.

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

An event is generated after configuring the Environment Settings. The event details can be viewed in the **Event** overview.

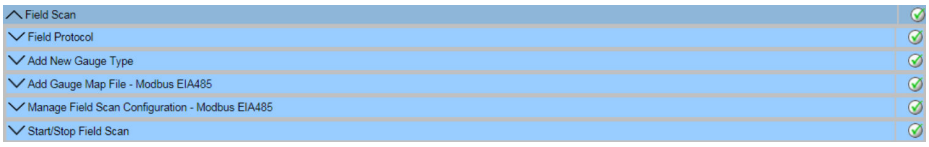
17.4 Field Scan - Modbus EIA485

This section is valid for the Modbus protocol. For other field protocols refer to the following sections:
- "Configure Field Scan - Sakura V1" → 146
- "Configure Field Scan - Whessoe WM550" → 150

The most important function of NXA820 is acquiring measured data from gauges installed in tanks. NXA820 receives measured data by means of field scanning. The measured data comprise tank parameters such as product level, product temperature, pressure, observed density, etc.

To Configure the Field Scan Settings

- Click on **Field Scan**.
  - Tankvision displays the screen as follows:

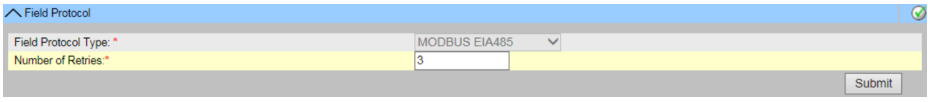


17.4.1 Field Protocol

In order to perform field scanning, the Field Protocol needs to be configured.

To configure the field protocol

1. Click on **Field Protocol**.
   - Tankvision displays the screen as follows:



Field Protocol Type
Displays the field protocol.

Number of Retries
Type in the number of retries for the system to initiate Field Scanning. This field indicates the number of retries, before a field scan failure for a gauge is determined by the system. The data type used in this field is numeric. By default, the Tankvision system selects 3 as the Number of Retries.

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 configuring the field protocol. The event details can be viewed in the **Event** overview.

17.4.2 Add New Gauge Type

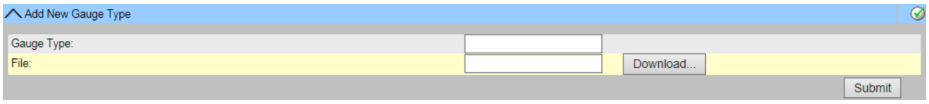
Specify a device that is not considered as standard.

The available XML files for the default Gauge Types can be altered to modify the standard behavior. For example, in case of a communication malfunction of the Tank Side Monitor, the XML file can be changed in order to keep the last valid value or return to 0.

The corresponding XML file is available in the **Uploads** menu and can be altered and downloaded under a new name.

To add a new gauge type

1. Click on **Add New Gauge Type**.
   ↳ Tankvision displays the screen as follows:



Gauge Type
Enter the name of the new gauge type.

File
Enter the location from where you want to download the gauge type file. You can also click the **Download** button to select the location.

2. Enter the name of the new gauge type and download a gauge type XML file.
3. Click the **Submit** button.

17.4.3 Add Gauge Map File - Modbus EIA485

For each Modbus device you need a special map to recognize the device in Tankvision. By default basic maps for Tank Side Monitor (NRF), Proservo (NMS), Micropilot (MNR), Gauge Link (NXA20) and Remote Terminal Unit (RTU) are present on the Tankvision Tank Scanner unit. Ask your local Endress+Hauser service to provide the correct map file.

To add a Gauge Map File

1. Click on **Add Gauge Map File**.
   ↳ Tankvision displays the screen as follows:

2. Click the **Browse** button and navigate to the required gauge file. Double-click the file name to enter it into the **Gauge Map File** field.

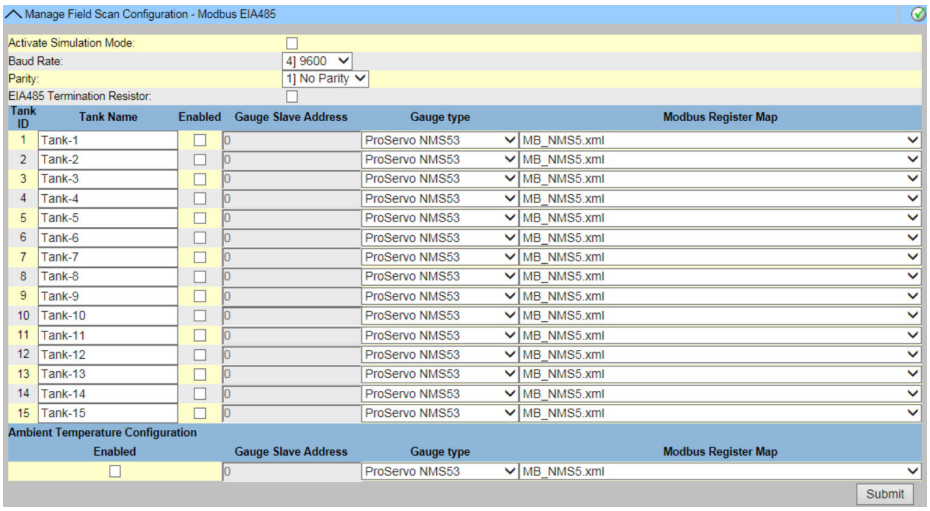
3. Click the **Download File** button to download the map file to the Tankvision unit.
4. Click the **Submit** button to activate the gauge map file.

17.4.4 Manage Field Scan Configuration – Modbus EIA485

The **Manage Field Scan Configuration - Modbus EIA485** screen displays serial configuration details and gauge configuration details.

To Manage the Field Scan Configuration using Modbus EIA485

1. Click ⌄ on **Manage Field Scan Configuration - Modbus EIA485**.
   ↳ Tankvision displays the screen as follows:



Baud Rate
Select the baud rate for Modbus communication from the drop down list. Default 9600

Parity
Select the parity of the Modbus signal from the drop-down list. Default no parity.

EIA485 Termination Resistor
Enables or disables the termination resistor on the fieldbus for RS485. Only needed for long fieldbus cables to reduce signal reflections.

Tank Configuration:

Tank ID
Each tank in the Tankvision system has a unique numerical value ranging from 1 to 15. This ID represents the network address used by NXA820 for scanning the Tank Data. Cannot be changed.

Tank Name
Actual tank name, which can be modified here as well as in the tank configuration (refer to "General Details").

Enabled
Select the check box to enable the field scanning of the respective tank.

Gauge Slave Address (DEC)
This field is enabled, if the **Enabled** check box is selected. Enter the gauge slave address, which is configured between the NXA820 system and the gauge for communication. The gauge slave address can be any number from 1 to 247.

Gauge type
Select the appropriate Gauge Type from the drop-down list. This field is mandatory.

Modbus Register Map
Select the appropriate register map file for tank and gauge (only Registermaps downloaded to Tankvision can be used. "Add Gauge Map File - Modbus EIA485" → 144).

Ambient Temperature Configuration:

Enabled
Select the check box to configure the ambient temperature.

Gauge Slave Address
Enter the slave address of the gauge providing the ambient temperature.

Gauge type
Select the appropriate Gauge Type from the drop-down list. This field is mandatory.

V1 Map File
Select the appropriate V1 Map File from the drop-down list. If the appropriate Map File is not available it must be added by the **Add Gauge Map File function** (→ 148).

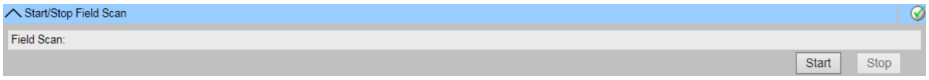
2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button.
4. After saving the settings, Tankvision displays a confirmation message.

17.4.5 Start/Stop a Field Scan

This option allows the user to start the field scan after configuring the field scan. Similarly, the field scan can be stopped at any point of time by using this option.

To start or stop field scanning

1. Click on **Start/Stop Field Scan**.
   ↳ Tankvision displays the screen as follows:



2. Click the **Start** button to start the field scanning. The **Start** button is enabled, if the field scan is not started. Once the field scan is started, the **Start** button is disabled, and the **Stop** button is enabled. To stop the field scanning, click the **Stop** button.

An event is generated, when the field scan is started or stopped. The event details can be viewed in the **Event** overview.

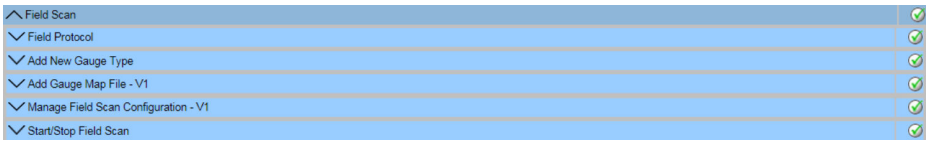
17.5 Configure Field Scan - Sakura V1

This section is valid for the Sakura V1 protocol. For other field protocols refer to the following sections:
- "Field Scan - Modbus EIA485" → 143
- "Configure Field Scan - Whessoe WM550" → 150

The most important function of NXA820 is acquiring measured data from gauges installed in tanks. NXA820 receives measured data by means of field scanning. The measured data comprise tank parameters such as product level, product temperature, pressure, observed density, etc.

To Configure the Field Scan Settings

- Click on **Field Scan**.
  - Tankvision displays the screen as follows:

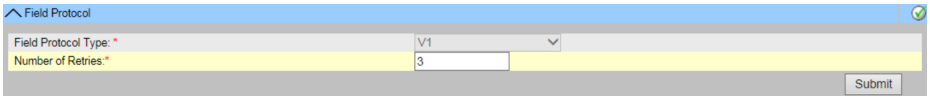


17.5.1 Field Protocol

In order to perform field scanning, the Field Protocol needs to be configured.

To configure the field protocol

1. Click on **Field Protocol**.
   - Tankvision displays the screen as follows:



Field Protocol Type
The protocol type is displayed.

Number of Retries
Type the number of retries for the system to initiate Field Scanning. This field indicates the number of retries, before a field scan failure for a gauge is determined by the system.
The data type used in this field is numeric. Default 3 Retries.

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 configuring the field protocol. The event details can be viewed in the **Event** overview.

17.5.2 Add New Gauge Type

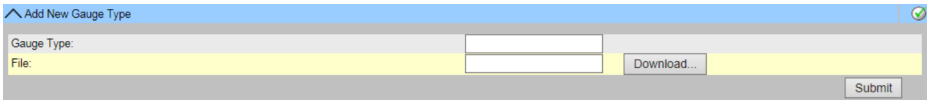
Specify a device that is not considered as standard.

The available XML files for the default Gauge Types can be altered to modify the standard behavior. For example, in case of a communication malfunction of the Tank Side Monitor, the XML file can be changed in order to keep the last valid value or return to 0.

The corresponding XML file is available in the **Uploads** menu and can be altered and downloaded under a new name.

To add a new gauge type

1. Click on **Add New Gauge Type**.
   - Tankvision displays the screen as follows:



Gauge Type
Enter the name of the new gauge type.

File
Enter the location from where you want to download the gauge type file. You can also click the **Download** button to select the location.

2. Enter the name of the new gauge type and download a gauge type XML file.
3. Click the **Submit** button.

17.5.3 Add Gauge Map File - V1

For each parity V1 device you need a special map to recognize the device in Tankvision. By default basic maps for Tank Side Monitor (NRF), Proservo (NMS), Micropilot (MNR), Gauge Link (NXA20) and Remote Terminal Unit (RTU) are present on the Tankvision unit. Ask your local Endress+Hauser service to provide the correct map file.

To add a Gauge Map File

1. Click on **Add Gauge Map File**.
   ↳ Tankvision displays the screen as follows:

2. Click the **Browse** button and navigate to the required gauge file. Double-click the file name to enter it into the **Gauge Map File** field.
3. Click the **Download File** button to download the map file to the Tankvision unit.
4. Click the **Submit** button to activate the gauge map file.

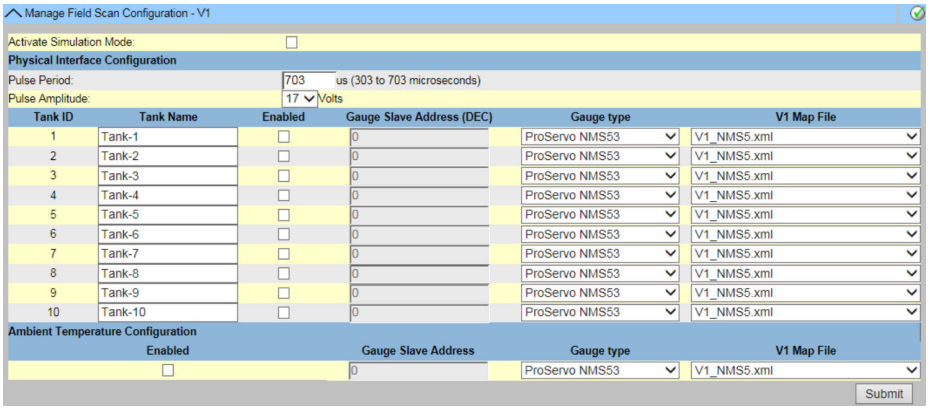
17.5.4 Manage Field Scan Configuration - V1

In this screen it is possible to select the address and the V1 map to be used for each gauge.

Before changing the field scan configuration it is necessary to stop the field scan (→ 149).

To manage the field scan configuration

1. Click on **Manage Field Scan Configuration - V1**.
   ↳ Tankvision displays the screen as follows:



Physical Interface Configuration:

Pulse Period
Defines the pulse period (comparable to the baud rate).

Pulse Amplitude
Allows to amplify the signal in case of long cables or poor signal transmission.

Tank Configuration:

Tank ID
Each tank in the Tankvision system has a unique numerical value ranging from 1 to 10. This ID represents the network address used by NXA820 for scanning the Tank Data.

Tank Name
Enter the user defined tank name into this field.

Enabled
Select the check box to enable the field scanning of the respective tank.

Gauge Slave Address (DEC)
This field is enabled, if the **Enabled** check box is selected.
Enter the gauge slave address, which is configured between the NXA820 system and the gauge for communication. The gauge slave address can be any number from 1 to 247.
NOTE! Be aware that some gauges are limited to a different range of possible addresses (for example up to 99 for NRF590).

Gauge type
Select the appropriate Gauge Type from the drop-down list. This field is mandatory.

V1 Map File
Select the appropriate V1 Map File from the drop-down list. If the appropriate Map File is not available it must be added by the "Add Gauge Map File - V1" function (→ 🗎 148).

Ambient Temperature Configuration:

Enabled
Select the check box to configure the ambient temperature.

Gauge Slave Address
Enter the slave address of the gauge providing the ambient temperature.

Gauge type
Select the appropriate Gauge Type from the drop-down list. This field is mandatory.

V1 Map File
Select the appropriate V1 Map File from the drop-down list. If the appropriate Map File is not available it must be added by the "Add Gauge Map File - V1" function (→ 🗎 148).

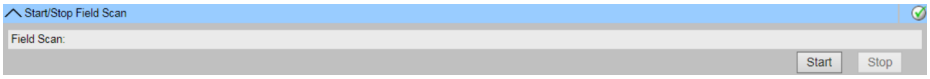
2. Enter the appropriate option in the relevant fields.
3. Click the **Submit** button.
4. After saving the settings, Tankvision displays a confirmation message.

17.5.5 Start/Stop a Field Scan

This option allows the user to start the field scan after configuring the field scan. Similarly, the field scan can be stopped at any point of time by using this option.

To start or stop field scanning

1. Click on **Start/Stop Field Scan**.
   ↳ Tankvision displays the screen as follows:



2. Click the **Start** button to start the field scanning. The **Start** button is enabled, if the field scan is not started. Once the field scan is started, the **Start** button is disabled, and the **Stop** button is enabled. To stop the field scanning, click the **Stop** button.

An event is generated, when the field scan is started or stopped. The event details can be viewed in the **Event** overview.

17.6 Configure Field Scan - Whessoe WM550

This section is valid for the Whessoe WM550 communication protocol. For other field protocols refer to the following sections.

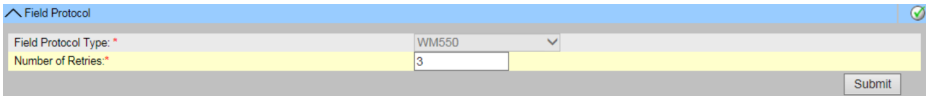
The most important function of NXA820 is acquiring measured data from gauges installed in tanks. NXA820 receives measured data by means of field scanning. The measured data comprise tank parameters such as product level, product temperature, pressure, observed density...

17.6.1 Field Protocol

In order to perform field scanning, the Field Protocol needs to be configured.

To configure the field protocol

1. Click on **Field Protocol**.
   ↳ Tankvision displays the screen as follows:



Field Protocol Type
The protocol type is displayed.

Number of Retries
Typ of number of retries for the system to initiate Field Scanning. This field indicates the number of retries, before a field scan failure for a gauge is determined by the system. The data typ used in this field is numeric. Default 3 retries.

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

An event is generated after configuring the field protocol. The event details can be viewed in the **Event** overview.

17.6.2 Add New Gauge Type

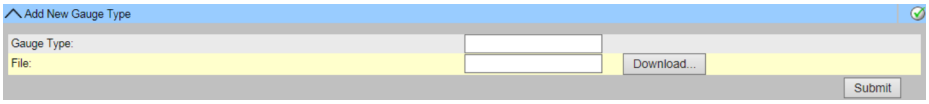
Specify a device that is not considered as standard.

The available XML files for the default Gauge Types can be altered to modify the standard behavior. For example, in case of a communication malfunction of the Tank Side Monitor, the XML file can be changed in order to keep the last valid value or return to 0.

The corresponding XML file is available in the **Uploads** menu and can be altered and downloaded under a new name.

To add a new gauge type

1. Click on **Add New Gauge Type**.
   ↳ Tankvision displays the screen as follows:



Gauge Type
Enter the name of the new gauge type.

File
Enter the location from where you want to download the gauge type file. You can also click the **Download** button to select the location.

2. Enter the name of the new gauge type and download a gauge type XML file.
3. Click the **Submit** button.

17.6.3 Add Gauge Map File

For each parity WM550 device you need a special map to recognize the device in Tankvision. By default basic maps for Tank Side Monitor (NRF), Proservo (NMS), Micropilot (MNR), Gauge Link (NXA20) and Remote Terminal Unit (RTU) are present on the Tankvision unit. Ask your local Endress+Hauser service to provide the correct map file.

To add a Gauge Map File

1. Click on **Add Gauge Map File**.
   ↳ Tankvision displays the screen as follows:

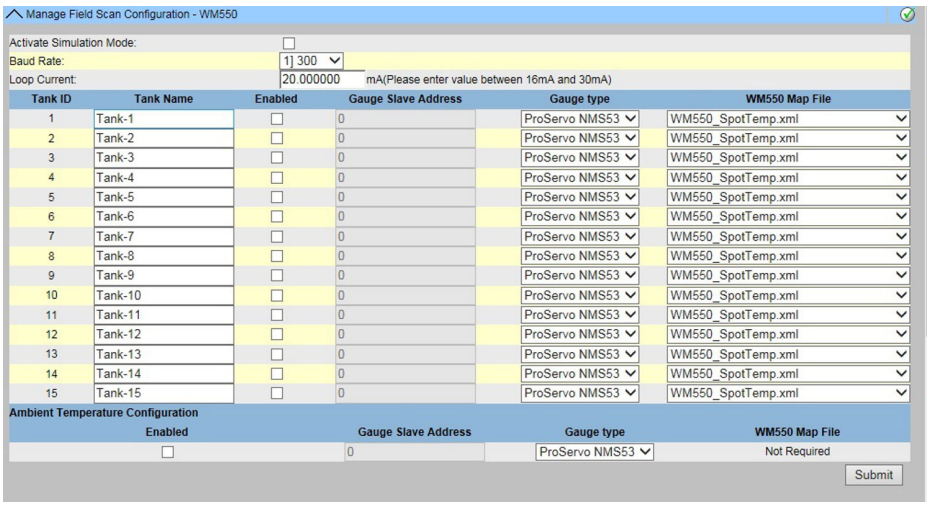
2. Click the **Browse** button and navigate to the required gauge file. Double-click the file name to enter it into the **Gauge Map File** field.
3. Click the **Download File** button to download the map file to the Tankvision unit.
4. Click the **Submit** button to activate the gauge map file.

17.6.4 Manage Field Scan Configuration

In this screen it is possible to select the address and the Whessoe WM550 map to be used for each gauge. Before changing the field scan configuration it is necessary to stop the field scan, → 149.

To manage the field scan configuration

1. Click on **Manage Field Scan Configuration - WM550**.
   ↳ Tankvision displays the screen as follows:



Physical Interface Configuration:

Baud Rate
Defines the WM550 protocol baud rate. Possible values are 300, 600, 1200, 1800, 2400, 4800.

Loop Current
This field defines the current in the Whessoe WM550 loop to be set by the internal electronic. This current will be hold by the Master regardless the number of slaves that are connected. Possible values ranges between 16 mA and 30 mA.

Tank Configuration:

Tank ID
Each tank in the Tankvision system has a unique numerical value ranging from 1 to 15. This ID represents the network address used by NXA820 for scanning the Tank Data.

Tank Name
Enter the user defined tank name into this field.

Enabled
Select the check box to enable the field scanning of the respective tank.

Gauge Slave Address (DEC)
This field is enabled, if the **Enabled** check box is selected. Enter the gauge slave address, which is configured between the NXA820 system and the gauge for communication. The gauge slave address can be any number from 0 to 63 for the Whessoe WM550.

Gauge Type
Select the appropriate Gauge Type from the drop-down list. This field is mandatory.

WM550 Map File
Select the appropriate WM550 Map File from the drop-down list. If the appropriate map File is not available it must be added by the **Add Gauge Map File** function.

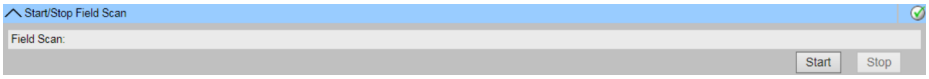
2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button.
4. After saving the settings, Tankvision displays a confirmation message.

17.6.5 Start/Stop Field Scan

This option allows the user to start the field scan after configuring the field scan. Similarly, the field scan can be stopped at any point of time by using this option.

To start or stop field scanning

1. Click on **Start/Stop Field Scan**.
   ↳ Tankvision displays the screen as follows:



2. Click the **Start** button to start the field scanning. The **Start** button is enabled, if the field scan is not started. Once the field scan is started, the **Start** button is disabled, and the **Stop** button is enabled. To stop the field scanning, click the **Stop** button.

An event is generated, when the field scan is started or stopped. The event details can be viewed in the **Event** overview.

17.7 W&M Seal

The W&M seal allows you to view the W&M sealing status and to perform the access configuration for W&M secured systems.

To Change the W&M Approved Status

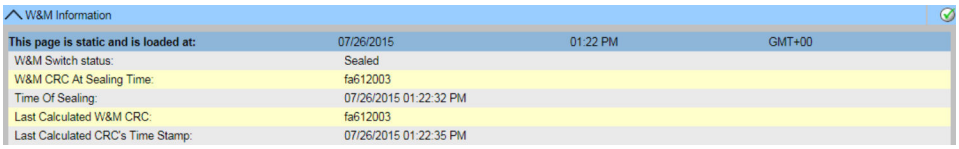
- Click ⌄ on **W&M Seal**.
  - ↳ Tankvision displays the screen as follows:

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.

17.7.1 W&M Information

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



W&M Information			
This page is static and is loaded at:	07/26/2015	01:22 PM	GMT+00
W&M Switch status:	Sealed		
W&M CRC At Sealing Time:	fa612003		
Time Of Sealing:	07/26/2015 01:22:32 PM		
Last Calculated W&M CRC:	fa612003		
Last Calculated CRC's Time Stamp:	07/26/2015 01:22:35 PM		

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.

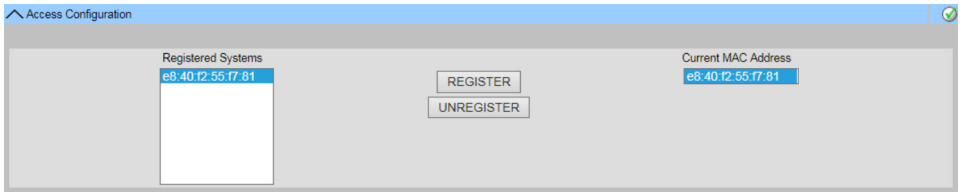
Time of sealing
Displays the date and time the sealing took place.

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 step
Displays date and time of the last calculated W&M checksum.

17.7.2 Access Configuration

In sealed systems only registered Users/PC's are allowed to have access to the system functionality. The access configuration provides the possibility to ensure the access. The access configuration is based on MAC Address.



Registered Systems
Displays the MAC Address of the currently registered PC.

- Registered:
  Registers the PC which is connected to the system (current workstation). The PC's must be in the same Network as Tankvision (no router/gateway in between). Registration must be performed from every PC which should have access to the system individually.
- Unregistered:
  To unregister PC(s) mark them in the list on the left hand side (select several by pressing "Ctrl" and marking them) and click **Unregister**. The unregistered PC's will not have access to the system after sealing.

Current MAC Address
Displays the current MAC Address of the workstation.

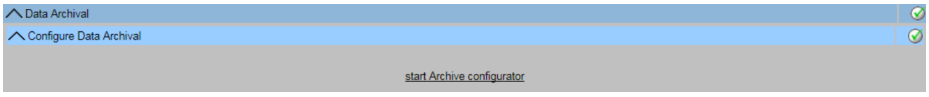
This section is sealed for editing after switching the W&M switch to close.

17.8 Data Archival

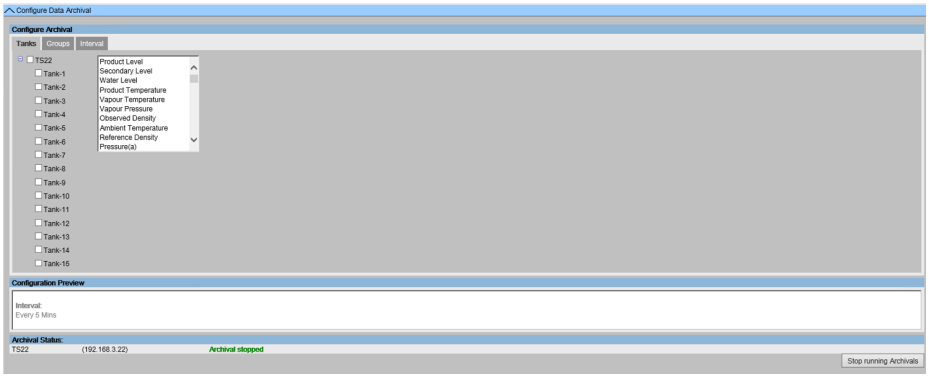
▶ Click on **Data Archival**.
↳ Tankvision displays the screen as follows:

17.8.1 Configure Data Archival

1. Click on **Configure Data Archival**.
   ↳ Tankvision displays the screen as follows:



2. Click **start Archive configurator** to start the Archive configurator.
   ↳ Tankvision displays the screen as follows:



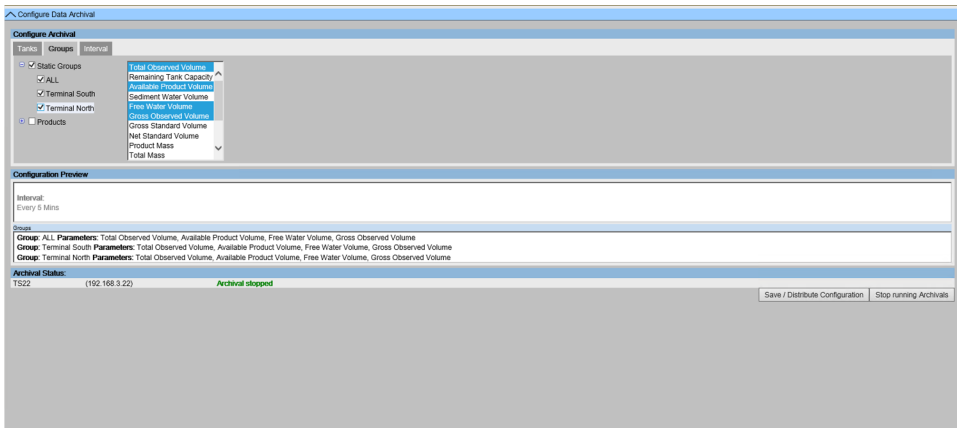
Configure Tanks and Tank Parameters

Click the **Tanks** tab. Tankvision displays the screen as follows:

Select the Tanks and Parameters for which to archive data. Each tank can be configured separately, depending on the currently selected tank.

Configure Tank Groups and Tank Group Parameters

Click the **Groups** tab. Tankvision displays the screen as follows:



Select the Tank Groups and Parameters for which to archive data. Each tank group can be configured separately, depending on the currently selected tank group.

Configure Interval

Click the **Interval** tab. Tankvision displays the screen as follows:

Select the Interval for data archival.
- **Every**: Select archival interval. Min archival interval: 1 min. Max archival interval: 1 week (7 days). Default: every 5 minutes.
- **Daily**: Specify a daily time for data archival. Also specify the archival interval in days.

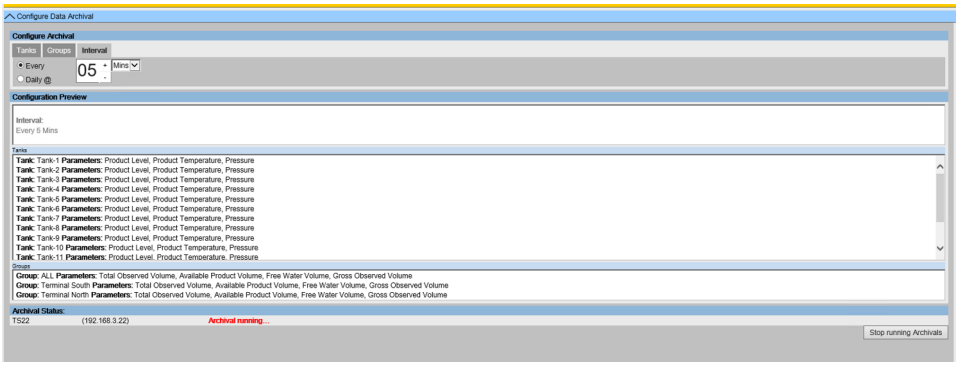
Be aware that archival interval is inversely proportional to the amount of logged parameters and the log frequency. This has a direct impact to the archived data retention time.

Save Configuration and Start/Stop Archival

A preview of the selected configuration is displayed in the **Configuration Preview** section.

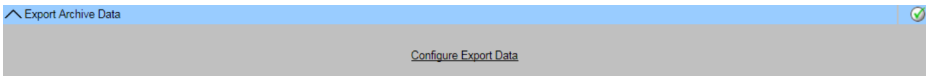
To save the selected configuration, click **Save / Distribute Configuration**.

To start data archival, click **Start running Archivals**. To stop data archival, click **Stop running Archivals**.



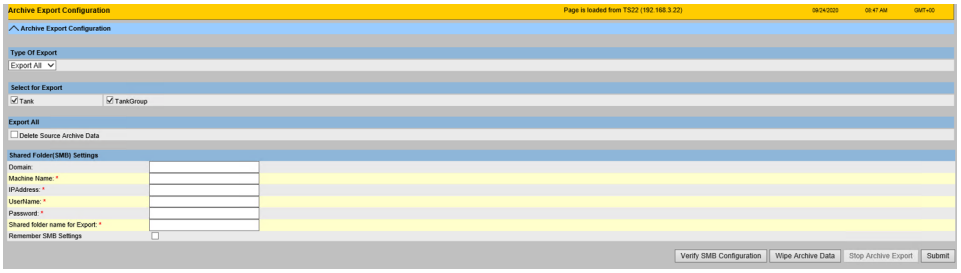
17.8.2 Export Archived Data

1. Click ⌄ on **Export Archived Data**.
   ↳ Tankvision displays the screen as follows:



2. Click **Configure Export Data**.

Configure Export Data



Type Of Export

Select the export type:
- Export All
- Manual
- Scheduled

An export type specific section is shown on the site.

Select for Export
Data selection of exported data:
- Tank
- TankGroup

Export All
When this export type is selected, a complete set of stored data can be exported. User can define if source shall be deleted after successful export by selecting **Delete Source Archive Data**.

Manual
When this export type is selected, the user can configure a manual export (one time event). Select the dates and times for the export data and confirm them with **Set Date/ Time**.

Scheduled
When this export type is selected, the user can configure a scheduled export. Select a start date and an interval and confirm them with **Set Date/Time**.

Shared Folder (SMB) Settings
Select and specify the access to a shared folder on any server/computer in the network to save the export data in. The Server Message Block (SMB) protocol is used.

Click **Verify SMB Configuration** to test the configured connection.

Click **Wipe Archive Data** to erase the archived data on the Tank Scanner units.

NOTE! After this operation all old archive data from Tank Scanner will be deleted.

Click **Stop Archive Export** to stop scheduled archive exports.

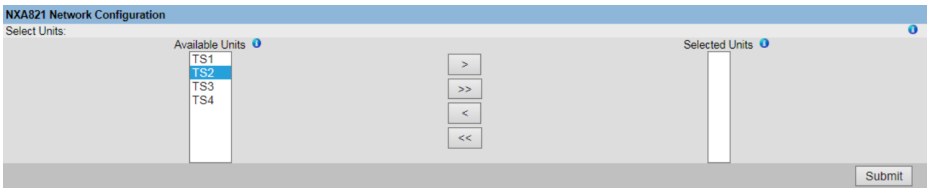
Click **Submit** to save the Archive Export Configuration.

17.9 Tank Scanner Unit and Tank Assignment

Up to 15 Tank Scanners with their tanks can be assigned to the Data Concentrator. All tanks can then directly be accessed via the Data Concentrator. Tank Groups can be formed containing tanks connected to different Tank Scanners.

To assign a Tank Scanner NXA820 to the Data Concentrator NXA821

1. If in the Tank Scanner interface, click the **System Administration** header. Click **Dataconcentrators** and select the <Data Concentrator>. If in the Data Concentrator interface, click the **System Administration** header. Click **Global Settings**.
2. Click on **Tank Scanner Unit and Tank Assignment**.
   ↳ Tankvision displays the screen as follows:



Available Units
This list displays the <tank name(s)> that are available for grouping.

Selected Units
This list displays the <tank name(s)> that are grouped to the tank group.

Click this button to transfer the selected Tank Scanner(s) from the **Available Tanks** list to the **Selected Tanks** list.

>>
Click this button to transfer all Tank Scanners from the **Available Tanks** list to the **Selected Tanks** list.

<
Click this button to de-select the Tank Scanner(s) from the **Selected Tanks** list to the **Available Tanks** list.

<<
Click this button to de-select all Tank Scanners from the **Selected Tanks** list to the **Available Tanks** list.

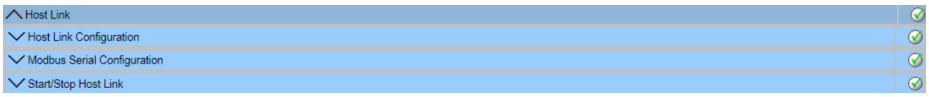
3. Move all Tank Scanner units that are to be assigned to the Data Concentrator into the **Selected Units** Field.
4. Click the **Submit** button to add assign the Tank Scanners to the Data Concentrator.

When the Tank Scanners NXA820 have been assigned to the Data Concentrator NXA821, all the connected Tanks can be operated via the NXA821 as well as via the respective NXA820.

17.10 Host Link

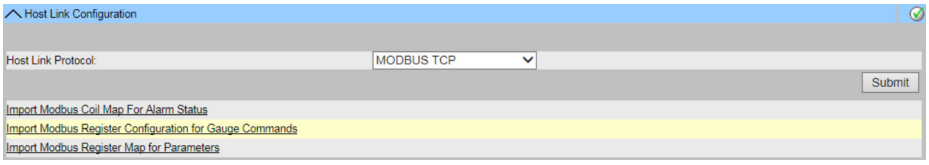
The Host Link NXA822 provides an interface for a host system to access inventory data from a Tank Scanner NXA820. To configure the Host Link settings, proceed as follows:

1. If in the Tank Scanner interface, click the **System Administration** header. Click **Hostlinks** and select the <Host Link>. If in the Host Link interface, click the **System Administration** header. Click **Global Settings**.
2. Click ⌄ on **Host Link**.
   ↳ Tankvision displays the screen as follows:



17.10.1 Host Link Configuration

1. Click ⌄ on **Host Link Configuration**.
   ↳ Tankvision displays the screen as follows:



2. Select **MODBUS TCP, MODBUS RS232 / EIA485** or **Entis+** from the **Host Link Protocol** drop-down list. By default, the system displays **MODBUS RS232 / EIA485**.
3. Click the **Submit** button to save the host link protocol type. After saving the settings, Tankvision displays a confirmation message.

Observe the following information!
- An event is generated after setting the host link type. The event details can be viewed in the **Event** overview.
- The system displays **MODBUS Serial Configuration** (for MODBUS RS232 / EIA485) or **MODBUS TCP Configuration**, respectively, on the following sub-header.

17.10.2 Import Modbus Coil Map For Alarm Status

The MODBUS Input Status (1X) is used to provide an Active or In-active alarm status. The MODBUS Coil Status (0X) is used for acknowledging the alarm and to provide the "Alarm Acknowledgement" status.

The MODBUS coil map can be configured as an XML file. The XML file contains the configuration for mapping alarms and acknowledgement statuses for the associated Tank.

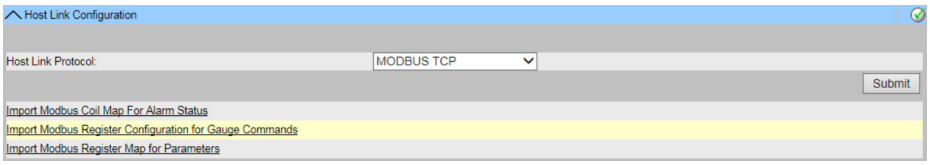
NXA822 helps the user to import the XML file containing the coil map for alarm status and acknowledgement status.


```xml
  <?xml version="1.0"?>
- <NXA822_MODBUS_ALARM_STATUS_MAP CRC="0">
        <!-- P_LEVEL -->
  - <MAP_ENTRY>
        <IP_ADDR>TS1</IP_ADDR>
        <Tank_Id>1</Tank_Id>
        <Alarm>HH</Alarm>
        <Param_Name>P_LEVEL</Param_Name>
        <StatusCoil>10001</StatusCoil>
        <AckCoil>00001</AckCoil>
    </MAP_ENTRY>
  + <MAP_ENTRY>
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- S_LEVEL -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- W_LEVEL -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- P_TEMP -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- V_TEMP -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- V_PRESS-->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- P_PRESS-->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- P_OBS_D -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- TOT_OBS_VOL -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- GROSS_OBS_VOL -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- GROSS_STD_VOL -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- P_MASS -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- TOTOBS_FLW_RATE -->
  + <MAP_ENTRY>
        <!-- P_LVLCHNG_RATE -->
  + <MAP_ENTRY>
  + <MAP_ENTRY>
        <!-- GOV -->
        <!-- MASS -->
  </NXA822_MODBUS_ALARM_STATUS_MAP>
```


32 *Sample XML for "MODBUS coil map for alarm status"*

To import an XML file containing a MODBUS coil map for alarm status information

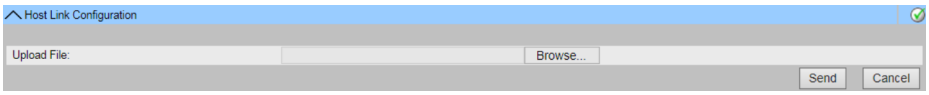
1. Click ⌄ on **Host Link Configuration**.
   ↳ Tankvision displays the screen as follows:



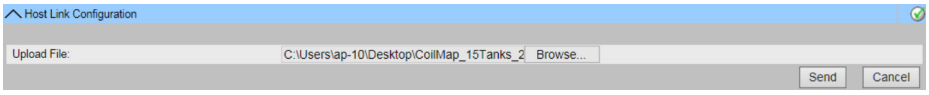
2. Click **Import MODBUS Coil Map For Alarm Status**.
   ↳ Tankvision displays the screen as follows:

Select XML file for MODBUS coil map for Alarm Status
Click the **Import** button to import the XML file containing the coil map.

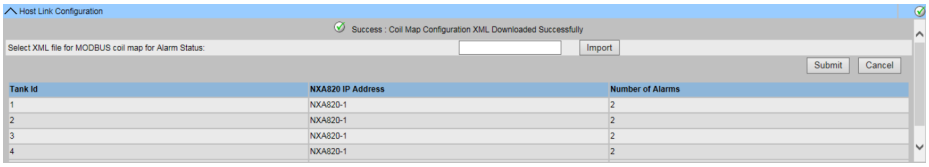
3. Click the **Import** button to import the file.
   ↳ Tankvision displays the screen as follows:



4. Click the **Browse** button to import the file. Tankvision displays the screen for selecting the XML file from the appropriate location.
5. Enter the location from where you want to upload the file or click the **Browse** button and select the XML from the appropriate file location.
   ↳



6. Click the **Send** button to proceed.
   ↳ The system displays the XML file next to the **Select XML file for MODBUS register map for Gauge Commands** field.
7. Click the **Submit** button.
   ↳ After successfully downloading the coil map configuration XML file, Tankvision displays a confirmation message.



Tank Id
This column displays the identity of tanks corresponding to the NXA820 IP Address.

NXA820 IP Address
This column displays the unit tag name of NXA820.

Number of Alarms
This column displays the number of alarms configured for each tank unit.

Observe the following information!
- The updated list of alarms configured for each associated tank to NXA822 is displayed on the **Import MODBUS Coil Map for Alarm Status** screen.
- An event is generated after downloading the coil map configuration XML file. The event details can be viewed in the **Event** overview.

17.10.3 Import Modbus Register Configuration for Gauge Commands

MODBUS register for gauge commands is used to send gauge commands for a tank and to display the status of the currently active gauge command.

The MODBUS register for gauge commands can be configured in an XML file.

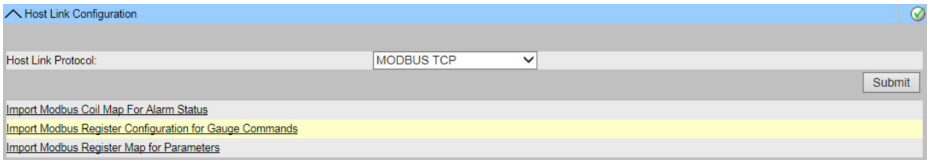
NXA822 helps the user to import the XML file containing the gauge command configuration.

```xml
<?xml version="1.0"?>
- <NXA822_MODBUS_GAUGE_CMD_CONFIG CRC="0">
  - <CONFIG_ENTRY>
      <IP_ADDR>TS1</IP_ADDR>
      <Tank_Id>1</Tank_Id>
      <Cmd_Register>40020</Cmd_Register>
      <Status_Register>30020</Status_Register>
    </CONFIG_ENTRY>
  - <CONFIG_ENTRY>
      <IP_ADDR>TS1</IP_ADDR>
      <Tank_Id>2</Tank_Id>
      <Cmd_Register>40021</Cmd_Register>
      <Status_Register>30021</Status_Register>
    </CONFIG_ENTRY>
  - <CONFIG_ENTRY>
      <IP_ADDR>TS1</IP_ADDR>
      <Tank_Id>3</Tank_Id>
      <Cmd_Register>40022</Cmd_Register>
      <Status_Register>30022</Status_Register>
    </CONFIG_ENTRY>
  </NXA822_MODBUS_GAUGE_CMD_CONFIG>
```

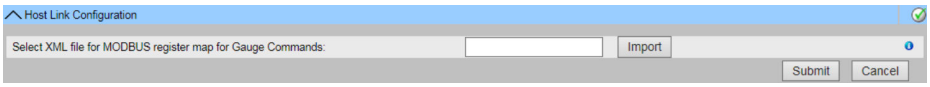

33 Sample XML for "Register Configuration for Gauge Commands"

To import an XML file containing a MODBUS register configuration for gauge command

1. Click on **Host Link Configuration**.
   ↳ Tankvision displays the screen as follows:

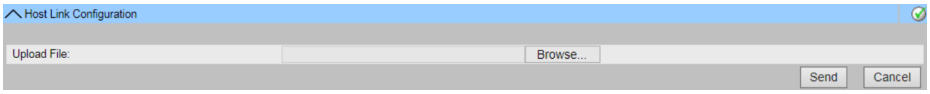


2. Click **Import MODBUS Register Configuration for Gauge Commands**.
   ↳ Tankvision displays the screen as follows:

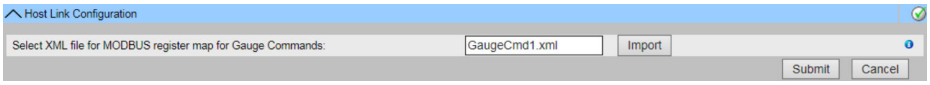


Select XML file for MODBUS register map for Gauge Commands
Click the Import button to import the XML file containing the gauge command configuration.

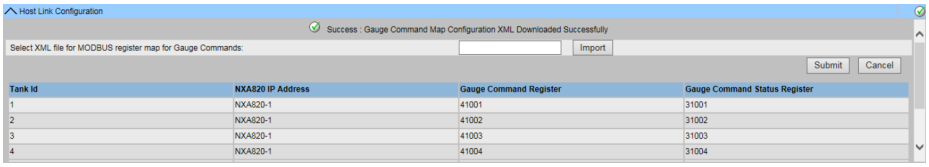
3. Click the **Import** button to import the file.
   ↳ Tankvision displays the screen as follows:



4. Click the **Browse** button to import the file. Tankvision displays the screen for selecting the XML file from the appropriate location.
5. Enter the location from where you want to upload the file or click the **Browse** button and select the XML from the appropriate file location.
6. Click the **Send** button to proceed.
   ↳ The system displays the XML file against the **Select XML file for MODBUS register map for Gauge Commands** screen as follows:



7. Click the **Submit** button.
   ↳ After successfully downloading the gauge command map configuration XML file, Tankvision displays a confirmation message.



Tank Id
This column displays the identity of tanks corresponding to the NXA820 IP Address.

NXA820 IP Address
This column displays the unit tag name of NXA820.

Gauge Command Register
The register allows to send a command to the Gauge.

Gauge Command Status Register
This register provides the status of the command send to the Gauge.

Observe the following information!
- The updated list of gauge command register and gauge command status register for each associated tank is displayed on the **Import MODBUS Register Configuration for Gauge Commands** screen.
- An event is generated after downloading the gauge command map configuration XML file. The event details can be viewed in the **Event** overview.

17.10.4 Import Modbus Register Map for Parameters

The Modbus register map provides information about the mapping of MODBUS registers to the appropriate tank parameters.

The Modbus register map for tank parameters can be configured in an XML file.

The XML file can be developed in two different structures, viz, "simple approach" and "XML with orientation". In the simple approach the register addresses for all the parameters are explicitly provided by the user in XML.

In the XML with data orientation approach the register addresses are generated implicitly based on the orientation type and the block addresses provided by the user.

The orientation can be data or elements. If the orientation type is elements, then all tanks of one parameter are grouped in consecutive registers.

If the orientation type is data, then all the parameters of a tank are grouped. When the orientation parameters are grouped according to the orientation specified, the groups formed by the orientation are called blocks, and the address of the first register of the block is the block address.

NXA822 helps the user to import the XML file containing the tank parameters configuration from an appropriate network location.

```xml
<?xml version="1.0" encoding="UTF-8"?>
- <NXA822_MODBUS_PARAM_MAP CRC="0">
    <STATUS_INPUT>YES</STATUS_INPUT>
    <STATUS_HOLDING>NO</STATUS_HOLDING>
  - <MAP_ENTRY>
      <IP_ADDR>TB16_NXA820-1</IP_ADDR>
      <Tank_Id>1</Tank_Id>
      <Param_Name>P_LEVEL</Param_Name>
      <Input_Reg_Start>33002</Input_Reg_Start>
      <Holding_Reg_Start>43002</Holding_Reg_Start>
      <Scalar>1.0</Scalar>
      <Offset>0.0</Offset>
      <Packing_Format>IEEE754</Packing_Format>
    </MAP_ENTRY>
  - <MAP_ENTRY>
      <IP_ADDR>TB16_NXA820-1</IP_ADDR>
      <Tank_Id>1</Tank_Id>
      <Param_Name>P_TEMP</Param_Name>
      <Input_Reg_Start>33005</Input_Reg_Start>
      <Holding_Reg_Start>43005</Holding_Reg_Start>
      <Scalar>1.0</Scalar>
      <Offset>0.0</Offset>
      <Packing_Format>IEEE754</Packing_Format>
    </MAP_ENTRY>
  - <MAP_ENTRY>
      <IP_ADDR>TB16_NXA820-1</IP_ADDR>
      <Tank_Id>1</Tank_Id>
      <Param_Name>S_LEVEL</Param_Name>
      <Input_Reg_Start>33008</Input_Reg_Start>
      <Holding_Reg_Start>43008</Holding_Reg_Start>
      <Scalar>1.0</Scalar>
      <Offset>0.0</Offset>
      <Packing_Format>IEEE754</Packing_Format>
    </MAP_ENTRY>
  - <MAP_ENTRY>
      <IP_ADDR>TB16_NXA820-1</IP_ADDR>
      <Tank_Id>1</Tank_Id>
      <Param_Name>W_LEVEL</Param_Name>
      <Input_Reg_Start>33011</Input_Reg_Start>
      <Holding_Reg_Start>43011</Holding_Reg_Start>
      <Scalar>1.0</Scalar>
      <Offset>0.0</Offset>
      <Packing_Format>IEEE754</Packing_Format>
    </MAP_ENTRY>
  </NXA822_MODBUS_PARAM_MAP>
```


34 Sample XML for "Register Map for Parameters having simple approach"

```xml
<?xml version="1.0"?>
- <NXA822_MODBUS_PARAM_MAP CRC="0">
    <MAP_ORIENTATION>Elements</MAP_ORIENTATION>
  - <MAP_ELEMENTS>
    - <ELEMENT>
        <Name>P_LEVEL</Name>
        <Scalar>1.0</Scalar>
        <Offset>0.0</Offset>
        <Packing_Format>IEEE754</Packing_Format>
      </ELEMENT>
    - <ELEMENT>
        <Name>P_TEMP</Name>
        <Scalar>1.0</Scalar>
        <Offset>0.0</Offset>
        <Packing_Format>IEEE754</Packing_Format>
      </ELEMENT>
    - <ELEMENT>
        <Name>S_LEVEL</Name>
        <Scalar>1.0</Scalar>
        <Offset>0.0</Offset>
        <Packing_Format>IEEE754</Packing_Format>
      </ELEMENT>
    - <ELEMENT>
        <Name>W_LEVEL</Name>
        <Scalar>1.0</Scalar>
        <Offset>0.0</Offset>
        <Packing_Format>IEEE754</Packing_Format>
      </ELEMENT>
    </MAP_ELEMENTS>
  - <INPUT_BLOCKS>
      <INPUT_REG_START>33001</INPUT_REG_START>
      <STATUS_INPUT>YES</STATUS_INPUT>
    </INPUT_BLOCKS>
  - <HOLDING_BLOCKS>
      <HOLDING_REG_START>43001</HOLDING_REG_START>
      <STATUS_HOLDING>NO</STATUS_HOLDING>
    </HOLDING_BLOCKS>
  - <TANKS>
    - <TANK>
        <IP_ADDR>TB16_NXA820-1</IP_ADDR>
        <ID>1</ID>
      </TANK>
    </TANKS>
  </NXA822_MODBUS_PARAM_MAP>
```

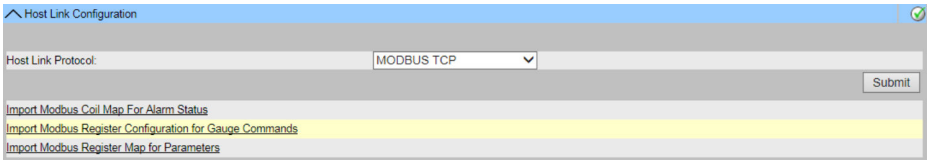

35 Sample XML for "Register Map for Parameters having orientation type as elements"

```xml
<?xml version="1.0"?>
- <NXA822_MODBUS_PARAM_MAP CRC="0">
    <MAP_ORIENTATION>Data</MAP_ORIENTATION>
  - <MAP_ELEMENTS>
    - <ELEMENT>
        <Name>P_LEVEL</Name>
        <Scalar>1.0</Scalar>
        <Offset>0.0</Offset>
        <Packing_Format>IEEE754</Packing_Format>
      </ELEMENT>
    - <ELEMENT>
        <Name>P_TEMP</Name>
        <Scalar>1.0</Scalar>
        <Offset>0.0</Offset>
        <Packing_Format>IEEE754</Packing_Format>
      </ELEMENT>
    - <ELEMENT>
        <Name>S_LEVEL</Name>
        <Scalar>1.0</Scalar>
        <Offset>0.0</Offset>
        <Packing_Format>IEEE754</Packing_Format>
      </ELEMENT>
    - <ELEMENT>
        <Name>W_LEVEL</Name>
        <Scalar>1.0</Scalar>
        <Offset>0.0</Offset>
        <Packing_Format>IEEE754</Packing_Format>
      </ELEMENT>
    </MAP_ELEMENTS>
  - <INPUT_BLOCKS>
      <INPUT_REG_START>33001</INPUT_REG_START>
      <STATUS_INPUT>YES</STATUS_INPUT>
    </INPUT_BLOCKS>
  - <HOLDING_BLOCKS>
      <HOLDING_REG_START>43001</HOLDING_REG_START>
      <STATUS_HOLDING>NO</STATUS_HOLDING>
    </HOLDING_BLOCKS>
  - <TANKS>
    - <TANK>
        <IP_ADDR>TB16_NXA820-1</IP_ADDR>
        <ID>1</ID>
      </TANK>
    </TANKS>
  </NXA822_MODBUS_PARAM_MAP>
```


36 Sample Register Map for Parameters file having orientation type as data

To import an XML file containing the MODBUS register map for parameters

1. Click ▼ on **Host Link Configuration**.
   ↳ Tankvision displays the screen as follows:

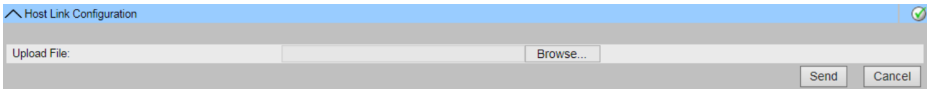


2. Click **Import Modbus Register Map for Parameters**.
   ↳ Tankvision displays the screen as follows:

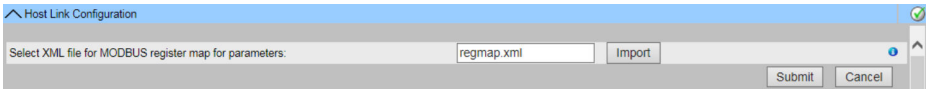
Select XML file for MODBUS register map for Gauge Commands

Click the **Import** button to import the XML file containing the gauge command configuration.

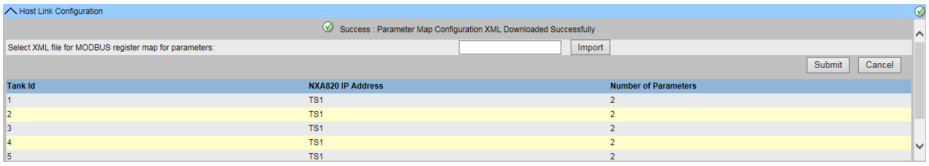
3. Click the **Import** button to import the file.
   ↳ Tankvision displays the screen as follows:



4. Click the **Browse** button to import the file. Tankvision displays the screen for selecting the XML file from the appropriate location.
5. Enter the location from where you want to upload the file, or click the **Browse** button and select the XML file from the appropriate location.
6. Click the **Send** button to proceed.
   ↳ The system displays the XML file next to the **Select XML file for MODBUS register map for parameters** screen as follows:



7. Click the **Submit** button.
   ↳ After successfully downloading the parameter map configuration XML file, Tankvision displays a confirmation message.



Tank Id
This column displays the identity of the tanks corresponding to the NXA820 IP Address.

NXA820 IP Address
This column displays the unit tag name of the NXA820.

Number of Parameters
This column displays the number of parameters configured for each tank unit.

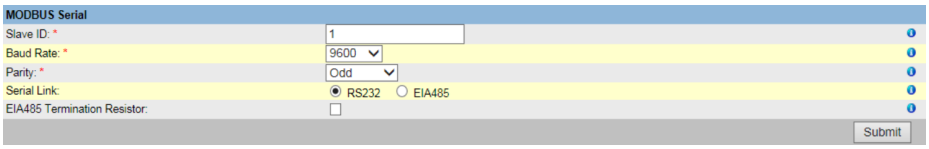
Observe the following information!
- The updated list of gauge command registers and gauge command status registers for each associated tank to NXA822 is displayed on the **Import MODBUS Register Configuration for Gauge Commands** screen.
- An event is generated after downloading the gauge command map configuration XML file. The event details can be viewed in the **Event** overview.

17.10.5 MODBUS Serial

If **MODBUS Serial** is selected in the **Host Link configuration** section, then the system will allow to configure parameters related to MODBUS Serial.

To configure Modbus Serial

1. Click ⌄ on **Modbus Serial Configuration**.
   ↳ The system displays the **MODBUS Serial** screen as follows:



Slave ID
Assign a unique and valid slave ID to your NXA822 unit.
The data type for this field is positive integer in the range of 1 to 247.

Baud Rate
Select the appropriate baud rate from the drop-down list.
The default baud rate is 1200 bits per second.

Parity
Select the appropriate parity for serial communication from the drop-down list.

Serial Link
Select the appropriate physical layer. This field allows you to select either RS232 or EIA485.

EIA485 Termination Resistor
Select the check box to enable the EIA485 Termination Resistor. Clear the check box to disable the EIA485 Termination Resistor.

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

Observe the following information!
- NXA822 initializes the serial link using the **Baud Rate** and **Parity** settings.
- An event is generated after configuring the MODBUS Serial settings. The event details can be viewed in the **Event** overview.

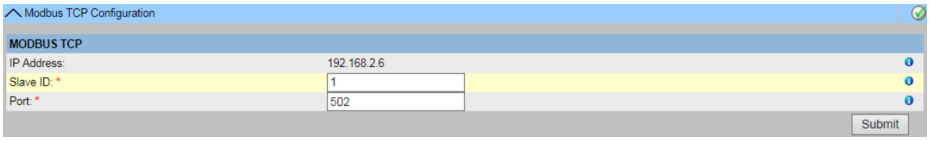
Manual data or data from external systems can also be written via the Modbus interface of the Host Link NXA822. As external systems generally write the values continuously it is not required to set the parameter to the "manual data" status on the Tank Scanner NXA820. Setting the parameters to "manual data" will imply a higher load on the Tank Scanner unit as the values would be continuously saved on the flash drive which is only necessary for manual data set from the Tankvision user interface as it is entered only once. Hence the flash drive is then also subjected to fail sooner due to the high writing cycles.

17.10.6 Modbus TCP Configuration

If **MODBUS TCP** is selected in the **Host Link Protocol** section, then the system will allow to configure parameters related to MODBUS TCP.

To configure Modbus TCP

1. Click on **Modbus TCP Configuration**.
   ↳ The system displays the **MODBUS TCP** screen as follows:



IP Address
The system displays the IP address which is configured in the network settings.

Slave ID
Assign a unique and valid slave ID to your NXA822 unit.
The data type for this field is positive integer in the range of 1 to 247.

Port
Enter a unique port number on which you want to configure the NXA822 MODBUS slave.
The data type for this field is positive integer in the range of 1 to 32767.

2. Enter the appropriate options in the relevant fields.

3. Click the **Submit** button. After saving the settings, Tankvision displays a confirmation message.

An event is generated after configuring the MODBUS TCP settings. The event details can be viewed in the **Event** overview.

Manual data or data from external systems can also be written via the Modbus interface of the Host Link NXA822. As external systems generally write the values continuously it is not required to set the parameter to the "manual data" status on the Tank Scanner NXA820. Setting the parameters to "manual data" will imply a higher load on the Tank Scanner unit as the values would be continuously saved on the flash drive which is only necessary for manual data set from the Tankvision user interface as it is entered only once. Hence the flash drive is then also subjected to fail sooner due to the high writing cycles.

17.10.7 Entis Host Protocol

Introduction

Introduction Entis+ host protocol

Enraf provides for their tank systems Entis+ the Entis Host protocol to connect to host system. The physical layer is normally the RS232 interface, but in our case also RS485 is possible.

Protocol structure

The protocol is designed as ASCII-Protocol. The transmission flow is quite simple:

The Host sends a request and the "Entis system" must answer. There is no special handshake between both. The telegram is starting with STX (Hex02) followed by data. The data and additional information are separated by a separator sign. The telegram is ending with an ETX (Hex03). A Block control character is added, either before or after the ETX. The structure is as following for the Host request:

[STX]<request code no.><name><command, request><data><[ETX][LRC], e.g for an Entity request code 1. [STX]1TNK-01[ETX][LRC]

The answer telegram is depending on the packet type requested:

[STX]<execution code>/<name>/<data>/[ETX][LRC], e.g. for an Entity request code 1.

[STXJ0/TNK-01/07-28-92/11:58:24/_269/-1-/+/_21.0/-/NORMAL/B/_727.40/_32.65/_27.62/_20.09[ETX][LRC].

The execution code indicates the status of the reply package:
- "0" request executed successfully
- "1" request NOT executed successfully
- "2" the last entity in a successfull group request

Supported codes by the NXA822 are:
- The entity request, code 1, which is used to get the data of one tank.
- The group request, code 2, to get the data of all tanks a defined group.
- The download command, code 3, to write a density value to a tank on the NXA820.

Manual data or data from external systems can also be written via the Entis+ interface of the Host Link NXA822. As external systems generally write the values continuously it is not required to set the parameter to the "manual data" status on the Tank Scanner NXA820. Setting the parameters to "manual data" will imply a higher load on the Tank Scanner unit as the values would be continuously saved on the flash drive which is only necessary for manual data set from the Tankvision user interface as it is entered only once. Hence the flash drive is then also subjected to fail sooner due to the high writing cycles.

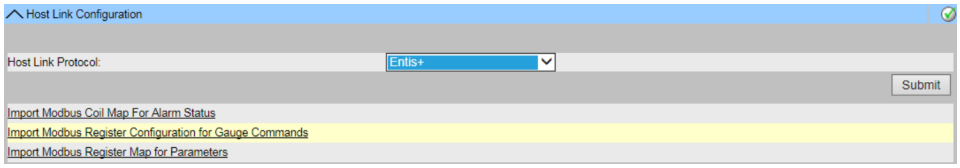
Configuration

The configuration of the Entis host protocol consists of two different parts:

One is the Web-based configuration of the protocol properties, the other part is the XML-based settings of the tank names and groups.

Selection Entis Host

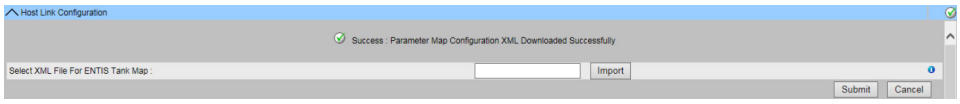
To use the Entis host protocol select in system in the **Host Link** menu the submenu **Host Link Configuration**. In **Host Link Protocol** select **Entis+** and click **Submit**.



After changing the **Host Link Protocol**, the Home screen is displayed.

The file has to be downloaded like the Hostlink configuration XML-file:

In the **Host Link Configuration** menu select **Import Tank Map XML For Entis**. Then you can download and submit the tank map for the Hostlink.



If the syntax of the XML file is correct the date will be accepted.

A XML file has to be created defining group names and tank names to specify what can be polled by the Host.

The important tags are:
- Group tag: GROUP_ENTRY NAME=**"Group name"**>
- Tag to specify the NXA820 source: <HOST NAME=**"QNX224"**>
- Tank name tag: <TANKNAME>Tank name</TANKNAME>

The group name and tank name must match the specified name length in the protocol (6 or 8 characters maximum length). The names are either included in the start tag (group, NXA820 name) or between start and end tag (tank name).

Entis host refers to a tank with tank name and therefore it is important that tank names are unique across NXA820 units.

See below a sample XML for import file:

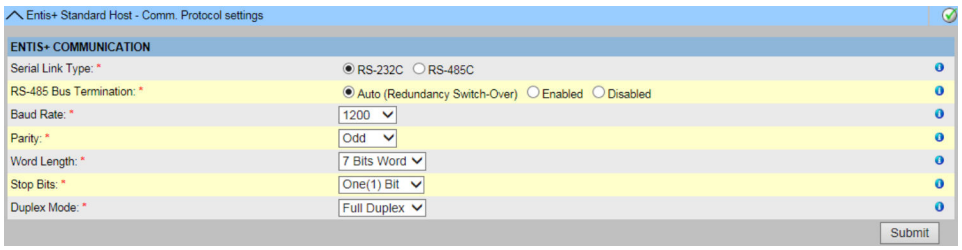
```
  <?xml version="1.0"?>
- <NXA822_ENTIS_MAP>
  - <GROUP_ENTRY NAME="ALL">
    - <HOST NAME="TS1">
        <TANKNAME>T-1</TANKNAME>
        <TANKNAME>T-2</TANKNAME>
        <TANKNAME>T-3</TANKNAME>
        <TANKNAME>T-4</TANKNAME>
        <TANKNAME>T-5</TANKNAME>
        <TANKNAME>T-6</TANKNAME>
        <TANKNAME>T-7</TANKNAME>
        <TANKNAME>T-8</TANKNAME>
        <TANKNAME>T-9</TANKNAME>
        <TANKNAME>T-10</TANKNAME>
        <TANKNAME>T-11</TANKNAME>
        <TANKNAME>T-12</TANKNAME>
        <TANKNAME>T-13</TANKNAME>
        <TANKNAME>T-14</TANKNAME>
        <TANKNAME>T-15</TANKNAME>
      </HOST>
    </GROUP_ENTRY>
  </NXA822_ENTIS_MAP>
```

Common protocol configuration

The configuration of the Entis+ protocol consists of four submenus to configure:
- Communication protocol settings
- Entis+ Envelope settings
- Numeric settings
- Reply package settings

Entis+ standard host communication protocol settings

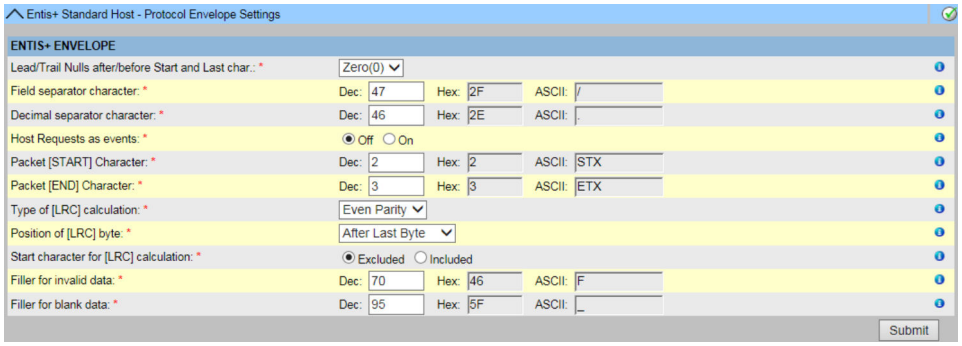
The protocol settings define the usual settings for a serial ports like baud rate, parity stop bits a.s.o.



The duplex setting is only interesting for the RS485 interface and depends on the wiring, two or four wires. RS232 is by default full duplex.

Entis+ standard host protocol envelope settings

In this chapter you can configure the frame settings of the **Entis+** host protocol.



Field Separator character
The field separator character divides the individual fields in a reply packet, to make it more readable. You can choose any available character as the field separator.

Decimal separator character
You can choose to separate the integer and fractional part of values in a packet with either a comma (",") or a point (".").

Host requests as events
You can choose to record every request the HOST makes in the list of events. If the HOST is making frequent requests it is better to disable this option otherwise the <F9> event screen will be swamped when you run the Master Program. But if only occasional requests are made, enabling this option provides a good means of monitoring Host communications.

Packet [START] character
Selection of the telegram start character. The default is STX but any unused ASCII character is available.

Packet [END] character
Selection of the telegram end character. The default is ETX.

Type of [LRC] calculation
In Host communications longitudinal redundancy checking helps detect corrupted packets. You can choose from the following checks:

- No Check:
  If the protocols used by the HOST do not have LRC checking, the LRC facility may be disabled. In this case, the only checking will be parity checking (see communication protocol above).
- Odd Parity:
  This is defined by ANSI X 3.28 as follows: The BCC is generated by taking a binary sum independently (without carry) on each of the seven individual levels of the transmitted code. At each level, the number of one bits (including any in the BCC) is odd. In the summation, the STX is excluded when it is selected and the ETX is included.
- Even Parity:
  The same as above except that the number of one bits is even.

Position of the [LRC] byte
You can choose to have the LRC byte before the end character or after it. If you select the LRC byte to appear before the end character, it will be inverted when it happens to be the same as the end character. So, if your end character is [ETX], ordinal 3, and in one instance the LRC also happens to be [ETX], then the LRC is inverted to 127-3, the ordinal 24. (For 8 bit words this is 255-3, the ordinal 252). For example, with the LRC after the End character:
Request record for TANK-1: [STX]1TANK-1[ETX][LRC]
And with the LRC before the End character:
Request record for TANK-1: [STX]1TANK-1[LRC][ETX]

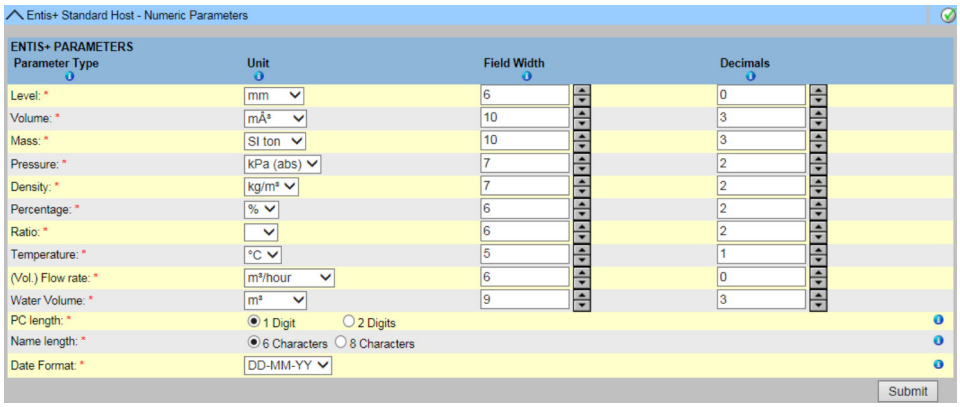
Start character in [LRC] calculation
You can select whether the start character should be included or excluded in the LRC calculation. Normally it is excluded.

Filler for invalid data
A field which is undefined or invalid due to a fail condition will have all the character positions filled with this character. You can select any available character, the default is "*".

Filler for blank data
Leading blank position in the <name> field are always filled in with ASCII spaces but those preceding numeric fields can be selected. The default setting is the underscore, "_". The numerical values are right-justified and the remaining spaces are filled with the filler for blank data character.

Entis+ standard host protocol numeric settings

Here you define the format and the dimensions of the transfered values.



Units
The drop down menu shows the available units for this specific value type you can select.

Field width
You can enter a width from 4 to 15 characters in one field. This data were right-justified (the last figure always occupies the last possible field space). If the number is too large for the field width that you have configured, then the field is filled with the invalid data character.

Observe the following information!
- Decimal points or commas are also a character.
- If the data length is to large, the field is filled with the "invalid" character.

Decimals
You can enter a number from 0 to 8 to set the number of numerals after the decimal point or comma.

Special parameters:

PC length
The Product Code (PC) for chemical products contains a numbered code (between 00 and 99). If the system uses chemical products, select 2, else select 1. The filler for blank data is used to fill a two character field with a single character code.

Name length
Selection of the width for whether the product/group name will consists of 6 or 8 characters. The names in the name field are left-justified.

Date format
This parameter gives you the possibility to select the format the date displayed. You can either have the European DD-MM-YY format or the U.S standard MM-DD-YY format.

Entis+ reply package

In the reply package you define the values to be transmitted for a single entity or a group line. This reply package format is according to the version 5.23x of the Entis+ protocol with the important difference that you can't select some additional information of the original specification!

Not available is SW (software alarm), HW (hardware alarm) and EX (external alarm)!

In the telegram all of these information of a parameter is separated by the field separator.

Entis+ Standard Host - Reply package

ENTIS+ REPLY PACKET

Parameter	Sign	Value	Status
Date:		☑	
Time:		☑	
Displacer Level:	☐	☐	☐
Product Level:	☐	☑	☑
Product Temperature:	☑	☑	☑
Water Level:	☐	☐	☐
Water Volume:	☐	☐	☐
Vapour Pressure:	☐	☐	☐
Observed density:	☐	☐	☐
Ref. Density:	☐	☑	☑
Volume Corr. Factor:	☐	☐	☐
S&W Percentage:	☐	☐	☐
Gas (Liq in Vap) ratio:	☐	☐	☐
Liquid in Vapour Volume:	☐	☐	☐
Vapour Mass:	☐	☐	☐
Flow rate:	☐	☐	☐
T.O.V.:	☐	☑	☐
G.O.V.:	☐	☐	☐
G.S.V.:	☐	☑	☐
N.S.V.:	☐	☐	☐
T.G.S.V.:	☐	☐	☐
Room Available (Re. Capacity):	☐	☐	☐
Available Vol. (Pump. Vol.):	☐	☐	☐
Liquid Mass:	☐	☐	☑
Total Mass:	☐	☐	☑
Product Name:		☑	
Product Code:		☑	
Ref. Temp:	☐	☐	
Mass calculation medium:		☐	

Submit

As in all pages a selection or changes has to be submitted with the Submit button.

Start / stop Hostlink

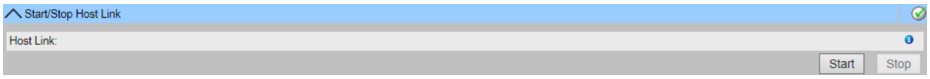
Starting the Hostlink communication will block all settings for changes of the parameter.

17.10.8 Start/Stop Host Link

When it has been configured, the Host Link can be started.

To start the host link

1. Click ⌄ on **Start/Stop Host Link**.
   ↳ Tankvision displays the screen as follows:



2. Click the **Start** button to activate the host link, or click the **Stop** button to deactivate the host link. If the Host Link is not activated, then the **Start** button will be enabled and the **Stop** button will be disabled. Likewise, if the Host Link is activated, then the **Stop** button will be enabled and the **Start** button will be disabled.

17.11 Downloads

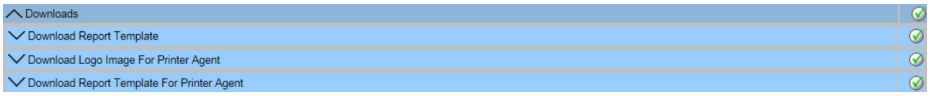
17.11.1 Download Report Templates

Tankvision generates various tank inventory reports. Reports are generated using report templates. The parser in the system parses the report templates, and generates the final report based on the inventory data. Tankvision provides default or standard templates for tank inventory reports. Tankvision also allows the user to add new report templates.

If you need help to create a new report template, contact your Endress+Hauser service representative.

To download a New Report Template

1. Click ⌄ on **Downloads**.
   ↳ The Downloads header expands as follows:



2. Click ⌄ on **Download Report Template**.
   ↳ Tankvision displays the screen as follows:

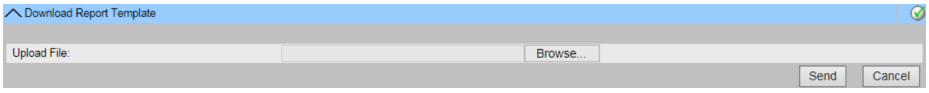
Report Type
Select the appropriate report type from the drop-down list. There are the following report types:
- Product Transfer Report
- Tank Delta Report (only available if "stand alone" has been selected in the network) settings)
- Tank Details Report (only available if "stand alone" has been selected in the network)
- Tank Group Details Report (only available if "stand alone" has been selected in the network)
- Inventory Report

Language
Select the appropriate language name from the drop-down list.

Template Name
Enter the name of the template in this field. The data type is alphanumeric. The system does not accept special characters and spaces in the template name.

File
Enter the location from where you want to download the file. You can also click the **Download** button to select the location.

3. Click the **Download** button.
   ↳ Tankvision displays the screen as follows:



4. Click the **Browse** button, select the file name, and click the **Open** button.
   ↳ The file name is displayed in the **Upload File** text box.
5. Click the **Send** button.
   ↳ Tankvision displays the screen as follows:

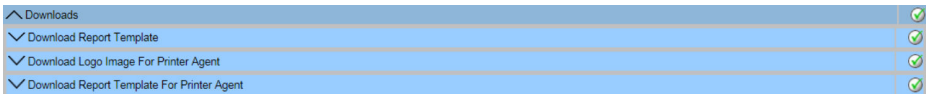
6. Click the **Submit** button.
7. After saving the settings, Tankvision displays a confirmation message.

Observe the following information!
- The system generates an event when a new report template is downloaded. This information can be viewed in the **Event** tab.
- It is impossible to repeat or reuse old template names.

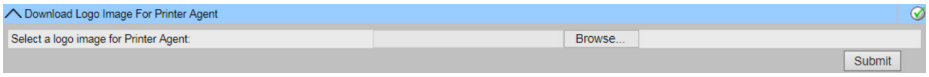
17.11.2 Download Logo Image For Printer Agent

To Download the Logo Image For Printer Agent

1. Click ⌄ on **Downloads**.
   ↳ The **Downloads** header expands as follows:



2. Click ⌄ on **Download Logo Image For Printer Agent**.
   ↳ Tankvision displays the screen as follows:



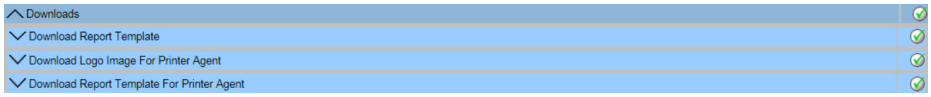
3. Click the **Browse** button, select the file name, and click the **Open** button.
4. The file name is displayed in the **Upload File** text box.
5. Click the **Submit** button.
6. After saving the settings, Tankvision displays a confirmation message.

17.11.3 Download Report Templates For Printer Agent

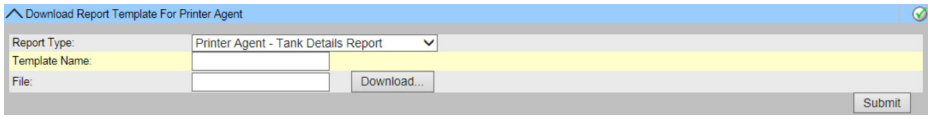
Tankvision generates various tank inventory reports. Reports are generated using report templates. The parser in the system parses the report templates, and generates the final report based on the inventory data. Tankvision provides default or standard templates for tank inventory reports. Tankvision also allows the user to add new report templates. If you need help to create a new report template, contact your Endress+Hauser service representative.

To download Report Template for Printer Agent

1. Click on **Downloads**.
   ↳ The **Downloads** header expands as follows:



2. Click on **Download Report Template for Printer Agent**.
   ↳ Tankvision displays the screen as follows:

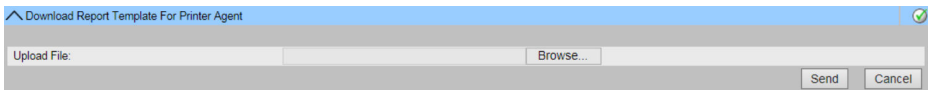


Report Type
Select the appropriate report type from the drop-down list. There are the following report types:
- Tank Delta Report (only available if "stand alone" has been selected in the network) settings)
- Tank Details Report (only available if "stand alone" has been selected in the network)
- Tank Group Details Report (only available if "stand alone" has been selected in the network)

Template Name
Enter the name of the template in this field. The data type is alphanumeric.
The system does not accept special characters and spaces in the template name.

File
Enter the location from where you want to download the file. You can also click the **Download** button to select the location.

3. Click the **Download** button.
   ↳ Tankvision displays the screen as follows:



4. Click the **Browse** button, select the file name, and click the **Open** button.
5. The file name is displayed in the **Upload File** text box.
6. Click the **Send** button.
   ↳ Tankvision displays the screen as follows:

7. Click the **Submit** button.

8. After saving the settings, Tankvision displays a confirmation message.

The system generates an event when a new report template is downloaded. This information can be viewed in the **Event** tab. It is impossible to repeat or reuse old template names.

17.12 Operator Workstation Settings

Like any other web based system where users access the system via a web browser, Tankvision uses the concept of user sessions to maintain user specific data for a session of user interactions with the system. A new session is created whenever an user accesses the system via a web browser. The user session is automatically removed after a session timeout, which occurs after a certain interval of user inactivity.

The Tankvision system uses user sessions to hold user settings and user data changed by the user. The session is also used to validate user credentials. User credentials are used to verify the user's access rights to change the system configuration.

However, while viewing tank data using the system, it is essential that operators are able to view the data in an unobstructed manner without having to logon again and again as a result of session timeout. This is accomplished by identifying a certain computer as an "Operator Workstation". If the Tankvision web pages are accessed from an operator workstation, the user can view the real-time tank information in an unobstructed manner once the user has logged onto the system.

To set or mange the operator workstation

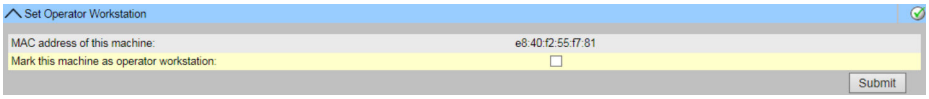
- Click on **Operator Workstation Settings**.
  - Tankvision displays the screen as follows:

17.12.1 Set Operator Workstation

The user has to specify the IP address of the local machine to be used as operator workstation.

To set the operator workstation

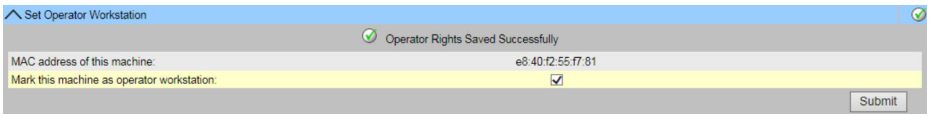
1. Click on **Set Operator Workstation**.
   - Tankvision displays the screen as follows:



MAC address of this machine
Displays the MAC address of user's Personal Computer from where the operator is accessing the Tankvision system web pages.

Mark this machine as operator workstation
Select the check box to mark the machine as the user's or operator workstation.

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 setting the operator work station. The event details can be viewed in the **Event** overview.

17.12.2 Manage the Operator Workstation

The MAC address of the operators workstation that was set to configure the operator's right can be deleted by this option.

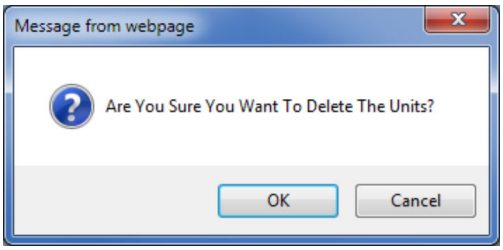
To delete an operator workstation

1. Click on **Manage Operator Workstation**.
   ↳ Tankvision displays the screen as follows:

Operator Workstation MACs
The system displays the MAC addresses of the operator workstations.

Remove as Operator Workstation
The system displays the MAC address(es) of operators workstations that have to be removed. The IP addresses appear in this column after clicking on the right arrow.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to remove the MAC address(es) of operator workstation(s).
   ↳ Tankvision displays a confirmation screen as follows:

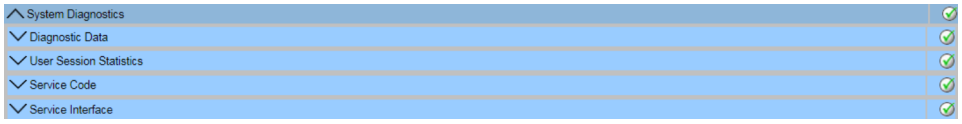


4. Click the **OK** button.
5. After saving the settings, Tankvision displays a confirmation message.

An event is generated after deleting the MAC address of an operator workstation. The event details can be viewed in the **Event** overview.

17.13 System Diagnostics

The system diagnostic tools are intended for service operations only and should not be used for standard operations of the Tankvision system.



37 System Diagnostics

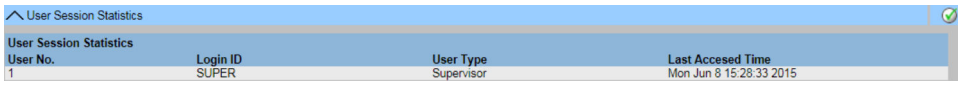
17.13.1 Diagnostic Data

Diagnostic data provides general status and diagnostic information like the number of times restarted and the temperature limits reached. This is a valuable tool to recognize unsafe conditions that could become a future failure.

38 Diagnostic data

17.13.2 User Session Statistics

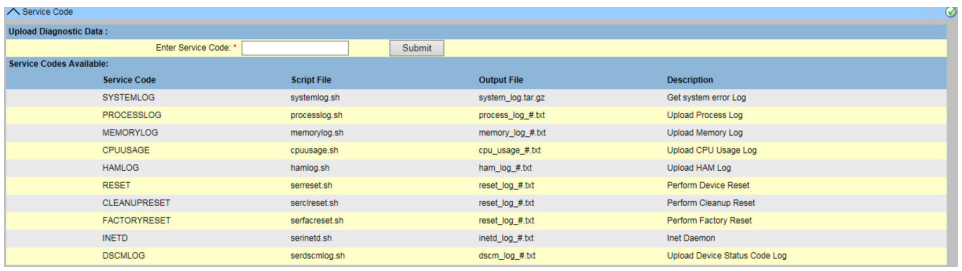
Provides useful information of users and user login activities. It allows to know which user logged in last via a **Last Accessed Time** stamp.



39 User Session Statistics

17.13.3 Service Codes

Service Codes is a service area that allows to execute predefined tasks by the operative system. As service codes are tasks like generate advanced diagnostic information, restart the unit, apply an historical archive clean up reset or execute a factory default settings reset.



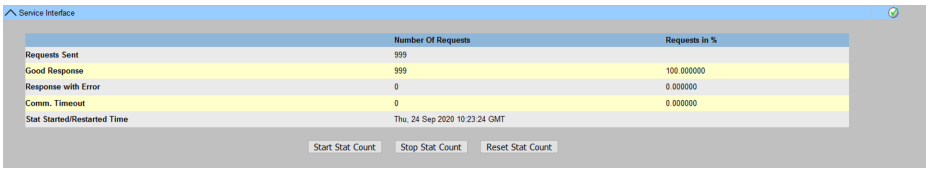
40 Service Code

17.13.4 Service Interface

The requests from the Tank Scanner NXA820 and the ensuing responses from the field devices are evaluated in this screen. This screen is only for service purposes.

To display the service interface

- Click on **Service Interface**.
  - Tankvision displays the screen as follows:



Requests Sent
The number of total requests sent by the Tank Scanner NXA820.

Good Response
The number of requests / percentage of total requests that got a good response from the field device.

Response with Error
The number of requests / percentage of total requests that got a response with error from the field device.

Comm. Timeout
The number of requests / percentage of total requests that got no response from the field device.

Stat Started/Restarted Time
Time at which the evaluation was started; i.e. the time at which the **Start Stat Count** or **Reset Stat Count** button was pressed.
Press the **Stop Stat Count** button to stop the evaluation.

Alternatively, install the **Service Interface** application, → 191.

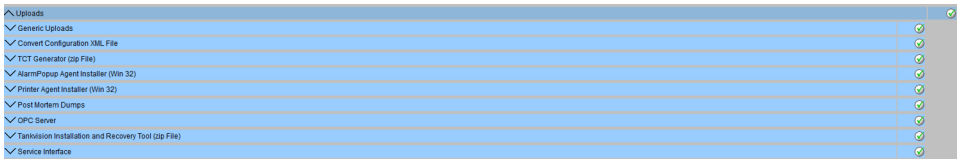
Open the **Service Interface** application after successful installation and click the **Start Stat Count** button.

The application offers more detailed service information.

A separat operating manual for the Service Interface application is available and will be installed on the PC during the application installation process.

Click the Windows **Start** button and navigate to the **Tankvision ServiceIface** folder, where you will find the manual.

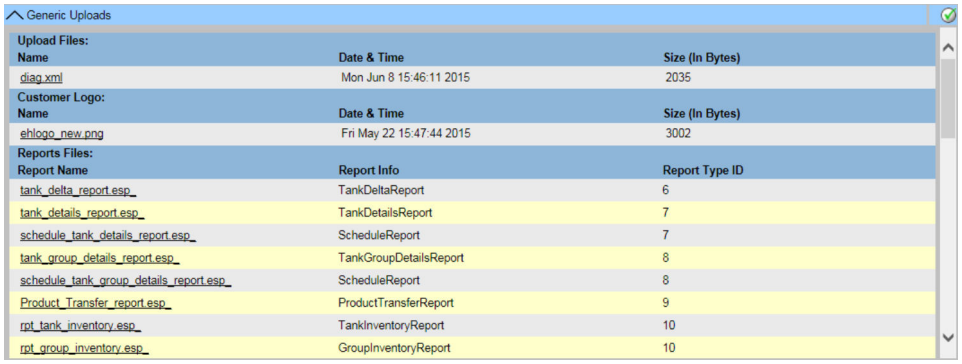
17.14 Uploads



41 Uploads

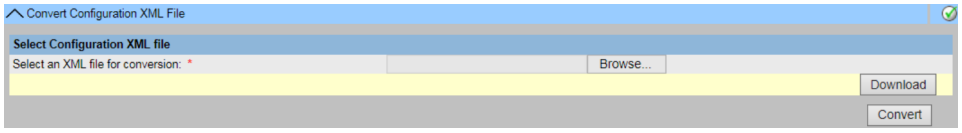
17.14.1 Generic Uploads

Contains generic data to be uploaded from the Tankvision unit, e.g. diagnostic files.



42 *Generic Uploads*

17.14.2 Convert Configuration XML-File



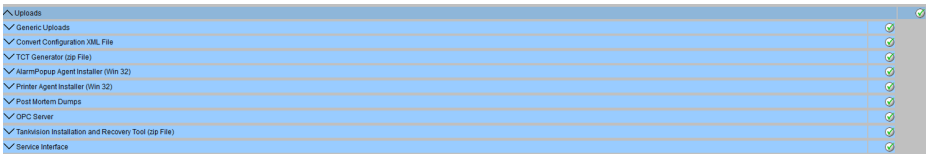
43 *Convert Configuration XML-File*

17.14.3 Alarm Popup Agent (Win 32)

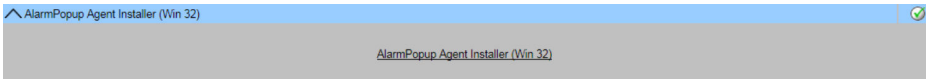
The Tankvision system raises various alarms pertaining to tank farm operations. The alarms are raised based on the measured and calculated tank data and the alarm settings. It is ideal for the operators to receive the alarm notification on their computer screen in the form of a pop up window.

To upload the installation files of the alarm pop up agent

1. Click on **Uploads**.
   ↳ The **Uploads** header expands as follows:

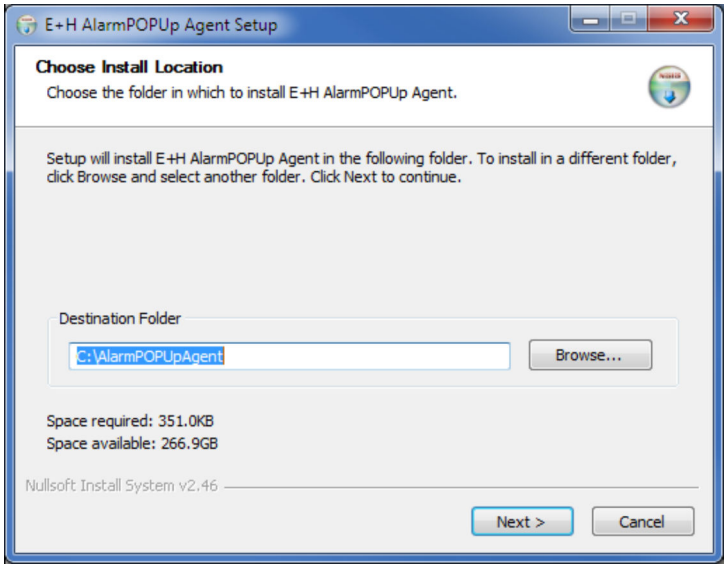


2. Click on **AlarmPopup Agent Installer (Win 32)**.
   ↳ Tankvision displays the screen as follows:

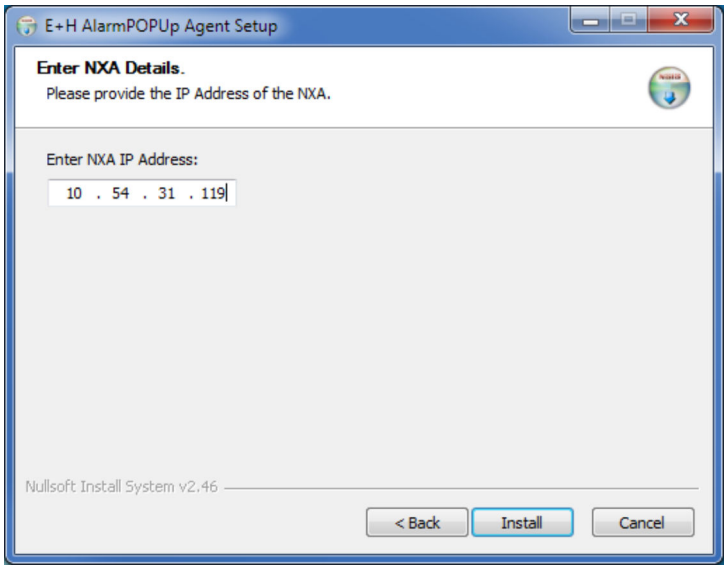


3. Click the **AlarmPopup Agent (Win 32)** link.
   ↳ Tankvision displays the **File Download** pop up window.
4. Click the **Save** button to download "APA_Setup.exe" to the operator's local computer.

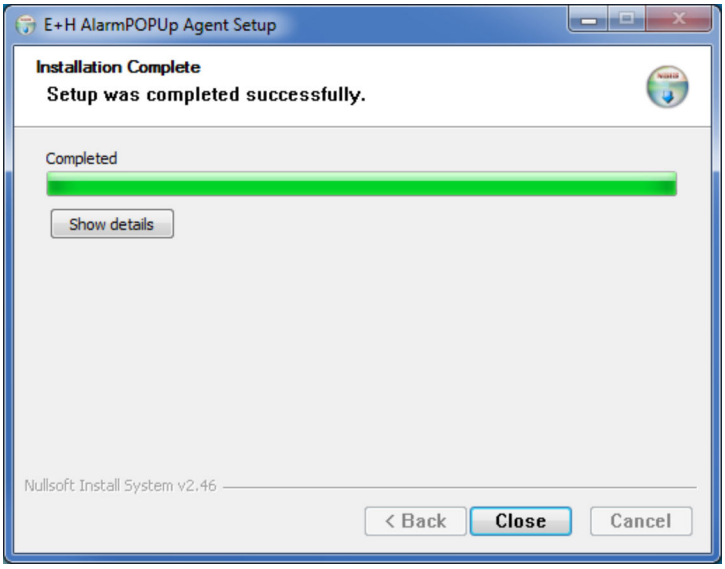
5. Run the setup to install the Alarm Popup Agent.
   ↳ The following screen is displayed:



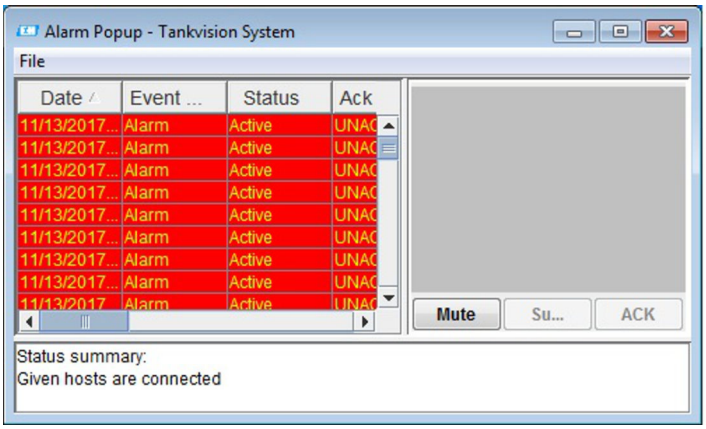
6. Enter the IP Address of the device where the Alarm Popup Agent should connect. After entering the IP Address click on **Install**.
   ↳



7. When setup completed successfully.
   ↳ The following screen is displayed:



8. Click on the **Close** button.
   ↳ Then the following screen will be displayed:



Bottom of application shows summary of status information like message or error occurs during application execution. The alarm pop up window remains on top of other windows on the Operator's PC. The alarm pop up window cannot be closed or minimized unless all alarms are acknowledged.

<Tank Name>
This field displays the tank name.

<Alarm Type>
This field displays the alarm type.

<Alarm Status>
This field displays the alarm status.

<Parameter>
This field displays the alarm generating parameter.

<Value>
This field displays the values of the corresponding parameter.

<Date>
The system displays the date of the alarm.

Mute
The alarm popup window provides an audible alarm notification.
Click the **Mute** button to silence the audible alarm notification.

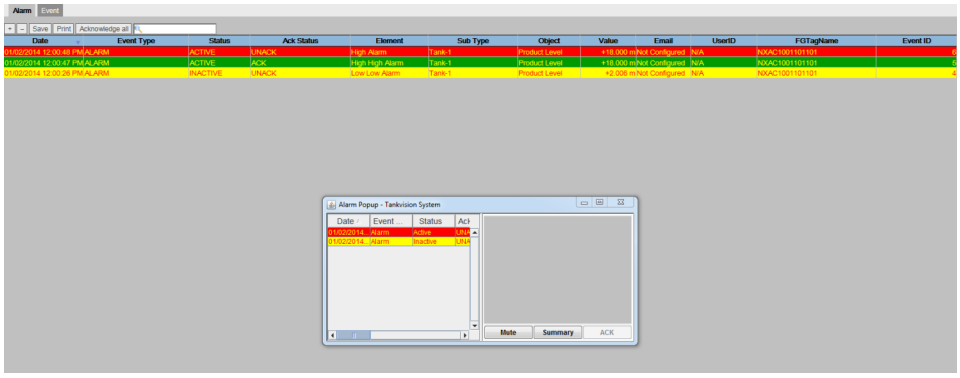
ACK
Click the **ACK** button to acknowledge the alarm.

Summary
Click the **Summary** button to view a summary of the alarm. The user can acknowledge the alarm from the summary of alarm overview screen.

Alarm Overview Description

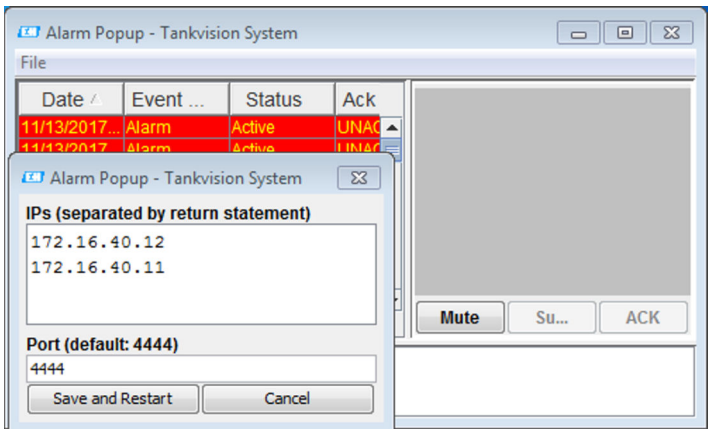
Make sure that the specific condition is under control and click the appropriate alarm details from the Alarm Overview list. After selecting the appropriate alarm details, click the **ACK** button to acknowledge the alarm. This acknowledgement status is broadcast to all Tankvision units.

Alternatively, click the **Summary** button to view the summary of alarms.



To configure multiple Tank scanners, go to **File** → **Configure** and provide multiple IP Addresses as shown in below figure. Each IP address has to be entered in a separated line.

Press on **Save and Restart** button which will restart the application with the new configuration.



Date
This column displays the date and time at which the alarm was raised.

Event Type
This column displays 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 displays the acknowledgement status.
ACK: This term indicates that the alarm is acknowledged.
UNACK: This term indicates that the alarm is not acknowledged.

Element
This column displays 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 alarm set point value, the system raises an alarm.

Sub Type
This column displays the severity of alarm that is raised. Alarm types range from those with highest priority to those with least priority. Some alarm sub-types are: **HH**, **HA**, **HL**, **LA** etc.
Reference: For more details on alarm sub-type, refer to "Types of Alarms".

Object
This column displays the source of the alarm such as a tank, product, user or the Tankvision unit.

Value
This column displays the measured value of the data element, due to which the alarm was raised, with its corresponding unit of measurement.

Email
This column displays the Email delivery status: whether an Email was sent successfully to the configured mail server or not.
OK: This term signifies that the Email was sent successfully.
FAILED: This term signifies that the Email sending failed.

UserID
This column displays the user name, who has logged in to the system at the time of alarm generation.

FGTagName
This column displays the tag name of the Tankvision unit, which has raised the alarm. The FGTagName is a host name of the server.

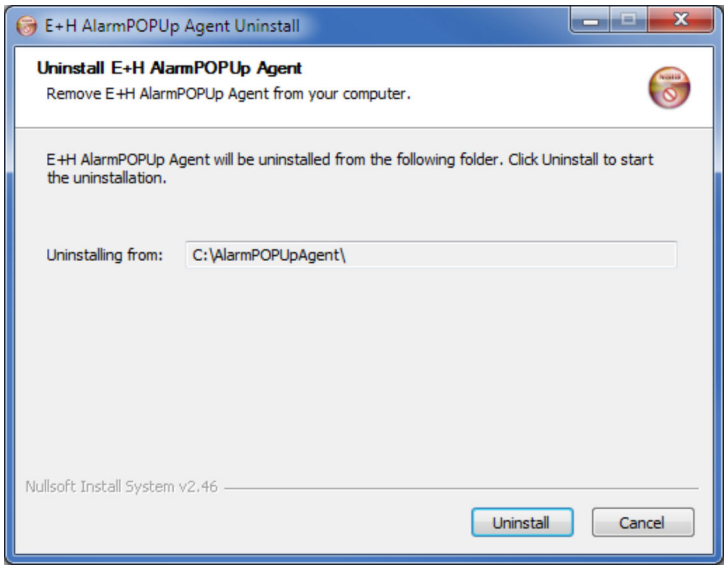
Event ID
This column displays the event ID of the alarm. Every Tankvision unit has a unique numerical ID.

Make sure that the specific condition is under control, and click the **ACK** button to acknowledge the alarm. This acknowledgement status is broadcast to all Tankvision units.

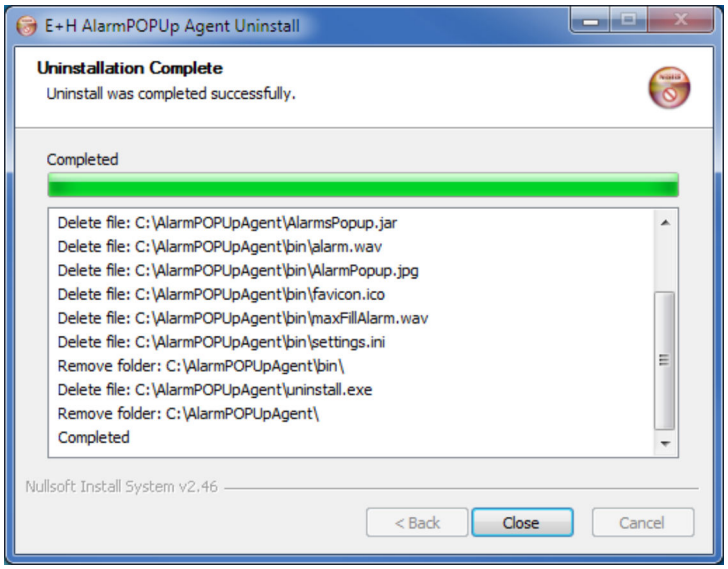
Observe the following information!
- When more than one user acknowledges the alarm at the same time, the system will record the first user as the user who acknowledged the alarm and for all other users, the system will display the error message "Alarm has already been acknowledged".
- Whenever you acknowledge an alarm, the system raises and displays the appropriate event.

To uninstall the alarm pop up notification

1. Use the uninstaller provided by the Alarm Popup Agent. Click **Uninstall**.



2. When setup completed successfully the following screen is displayed:

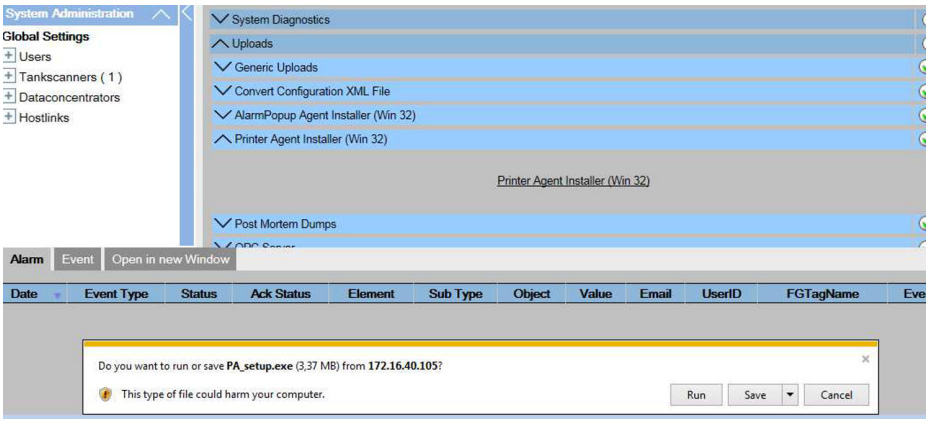


17.14.4 Printer Agent (Win 32)

Scheduled reports generated by the Tankvision system can be printed automatically without user intervention. This task is performed by the Printer Agent which can be uploaded to the computer from the Tankvision system.

To upload the Printer Agent

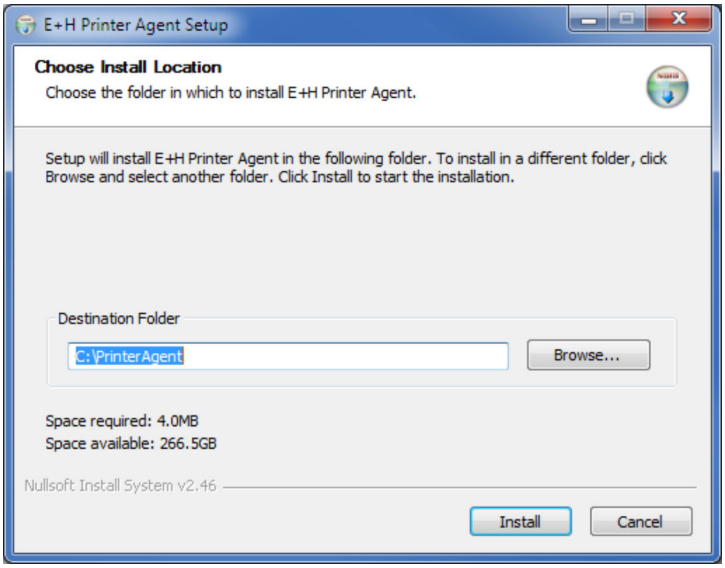
1. Click ⌄ on **Printer Agent Installer (Win 32)** on the **Uploads** screen.
   ↳ Tankvision displays the screen as follows:



2. Click the **Printer Agent Installer (Win 32)** link. Tankvision displays the **File Download** pop up window.
3. Click the **Save** button to download "PA_setup.exe" to the operator's local computer.

To install the Printer Agent

1. Run the "PA_setup.exe" to install the Printer Agent.
   ↳

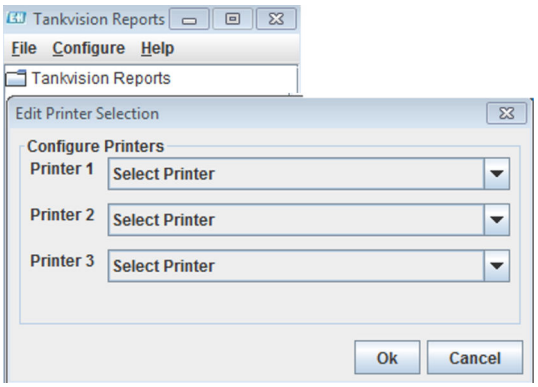


2. After the installation the Printer Agent will start automatically and asks the user to configure the printers.

To configure the Printer Agent

1. If the Printer Agent will not start automatically after installation, open the Printer Agent from Windows Start Menu.

2. From Printer Agent UI go to **Configure** → **Configure Printers**. Configure Printer 1, Printer 2 or Printer 3.



44 *Select 1 up to 3 printers where the reports shall be printed*

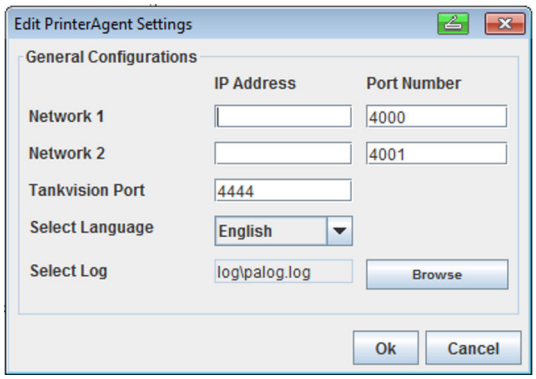
3. Select the printer you want to change.
4. Open **Configure Printer Agent** from **Configuration** to configure the Port number and network addresses.

Here, the user provides the LAN IP Address of the computer where the printer agent is installed. The user has the option to configure multiple IP addresses of the computer.

IP Address: IP Address of the computer where the Printer agent is installed.

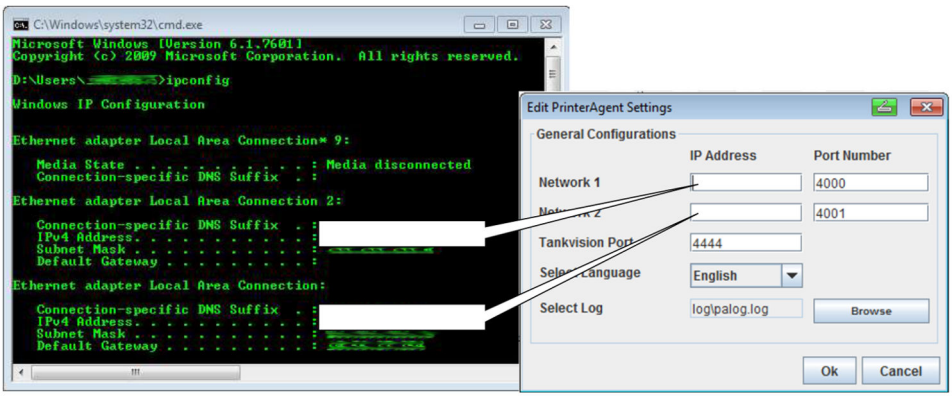
If the user has two network cards and wants to connect both networks with the Tank Scanner, the user should provide the IP address in both, Network 1 and Network 2. Otherwise just provide the Network 1 IP address and keep Network 2 as blank.

Port Number: Port number associated with the network.



Example:

To find the required IP addresses for the Computer the command prompt can be used. Type ipconfig to get IP addresses and enter same IP addresses on the Printer Agent.



- In order to print a report from the Tank Scanner, the user has to provide the correct configuration on the Tank Scanner which will be explained in the next sections.
- Changing the printer agent port through printer agent will take effect after restarting the printer agent.

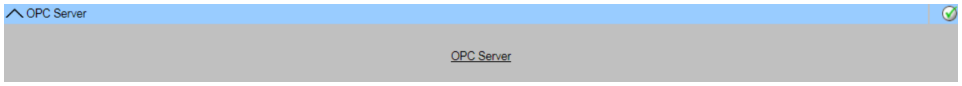
17.14.5 Post Mortem Dumps

Post Mortem Dumps are used for advanced service operations only and should not be used for normal operation.

17.14.6 OPC Server

An OPC Server is an application running on a PC serving data to an according OPC Client.

For details regarding operation and configuration of the OPC Server, refer to the document BA01137G "Tankvision OPC Server".



45 OPC Server

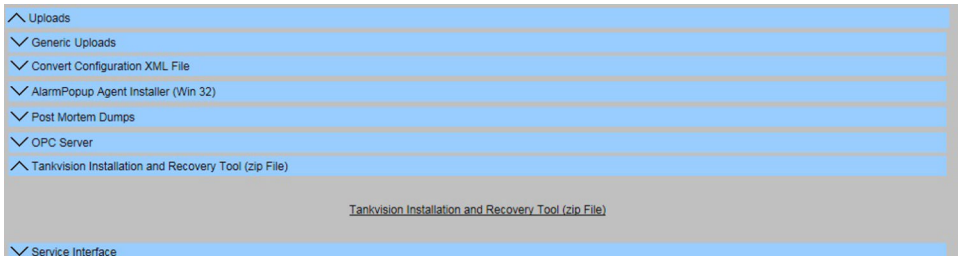
17.14.7 Tankvision Installation and Recovery Tool

The Tankvision Installation and Recovery Tool is an application running on a PC allowing the complete application and configuration of Tankvision unit to be saved as safety copy to a hard drive. It also enables the user to install an update to the latest version including the migration of the configuration.

The migration of the configuration is only possible when updating from version 01.06.00 onwards (version before update) to a later version.

Tankvision Installation and Recovery Tool

Click on **Tankvision Installation and Recovery Tool (zip file)** under **Configuration** → **Uploads** → **Tankvision Installation and Recovery Tool** and save the zip file to your PC.



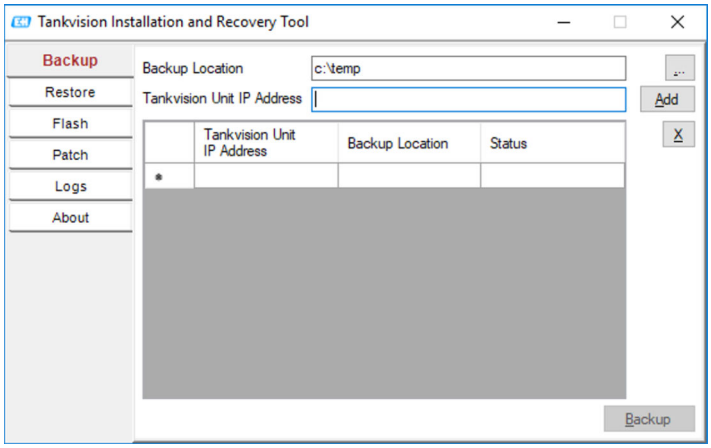
The Tankvision Installation and Recover Tool requires no installation. Simply uncompress the Tankvision_Installation_and_Recovery_Tool.zip archive and copy the contents to your computer.

Use the Tankvision Installation and Recovery Tool

Backup

To create a backup job of a Tankvision unit, the Backup Location where it has to be saved must be selected with [...] (on the local PC or on a network drive) and the IP address must be filled. With **Add** the job will be added to the Job list. Multiple Tankvision backup jobs can be queued. Each job can be canceled by selecting the job line and use [X].

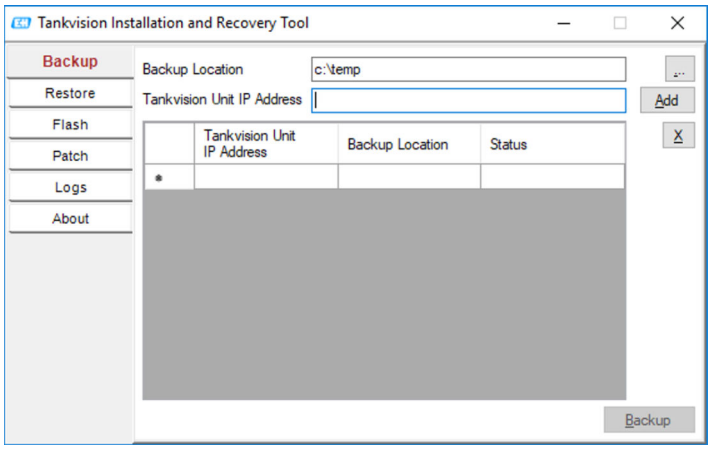
To start the backup jobs use **Backup**.



Restore

To create a restore job of a Tankvision unit, the Backup Location must be selected with [...] (on the local PC or on a network drive) and the IP address must be filled. With **Add** the job will be added to the Job list. Multiple Tankvision restore jobs can be queued. Each job can be canceled by selecting the job line and clicking the [X] button.

To start the restore jobs use **Restore**.



Flash

To create a flash job of a Tankvision unit, the location of the installation files must be selected with [...] (on the local PC or on a network drive) and the IP address must be filled.

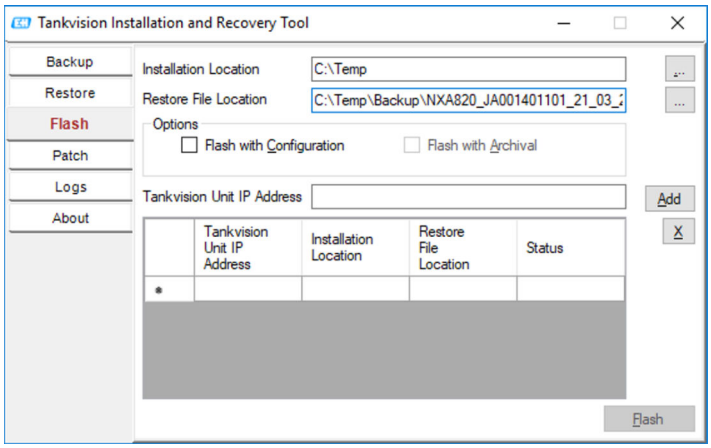
With **Add** the job will be added to the Job list. Multiple Tankvision restore jobs can be queued. Each job can be canceled by selecting the job line and clicking the [X] button.

To start the restore jobs use **Flash**.

To update a Tankvision unit and keep the configuration a backup must be taken first. Then the Backup location must be selected with ... (on the local PC or on a network drive) in addition before adding the job. In this case the check box **Flash with configuration** must be active and if the archive data has to be transferred as well then the check box **Flash with Archival**.

The location where the backup is saved has to be unique for each Tankvision unit, if the same folder is selected the same backup would be used for each job and would lead to IP address conflicts in the network.

Flash with Archival can only be selected if **Flash with Configuration** is selected as well.

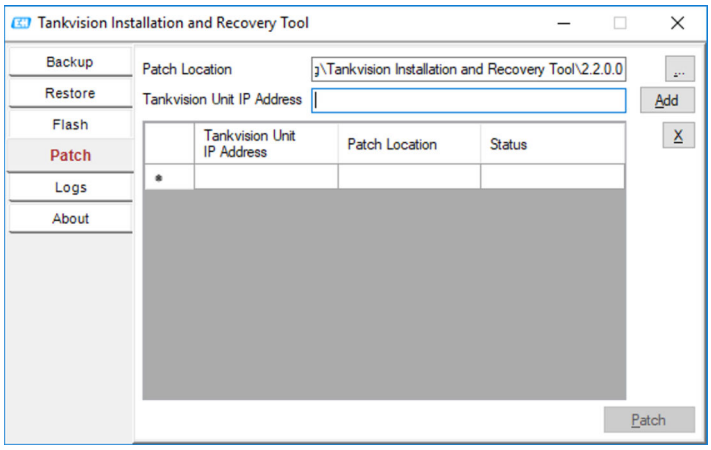


Patch

The Patch zip file contains some of the bug fixes binaries prepared for the specified software version. To apply the patch, the user must select the provided patch file and the Tankvision unit IP address.

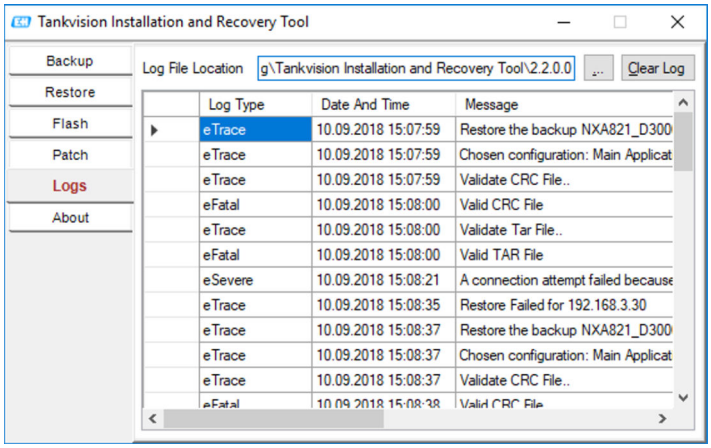
By clicking the **Add** button, the job will be added to the Job list. Multiple Tankvision restore jobs can be queued. Each job can be canceled by selecting the job line and clicking the button.

To start the patch jobs, click the **Patch** button.



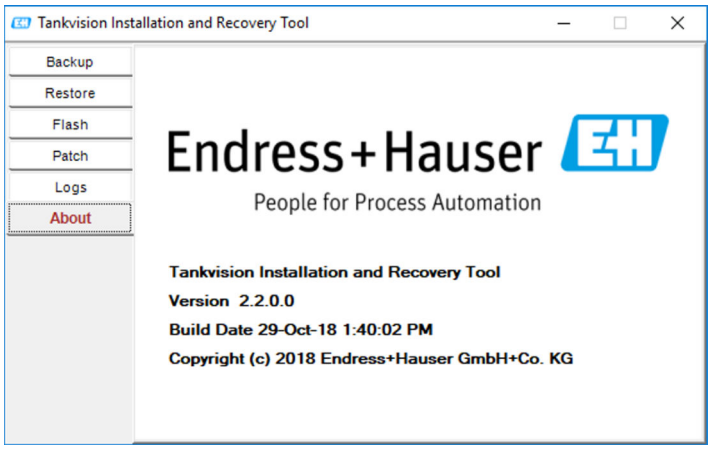
Logs

The log files register all actions made by this tool and are saved on the PC. It can be cleared with **Clear Log**. With ... the log file location can be changed.



About

About shows the version and the build date of the Tankvision Installation and Recovery Tool.



17.14.8 Service Interface

The Service Interface is an application running on a PC allowing the analysis of the field communication of the NXA820.

46 *Service Interface*

17.14.9 TCT Generator

The TCT Generator is an application allowing the user to generate TCT files for NXA820.

To install the TCT Generator

1. Go to **Configuration** → **Uploads** → **TCT Generator**, click on **TCT Generator (zip File)** and save the file to your PC.

   ↳

2. Uncompress the saved folder and open the file **index.html** with a web browser.
3. Follow the instructions.

17.15 Device Status Codes

The Device Status Codes are intended only for service tasks. They should not be used for standard operations.

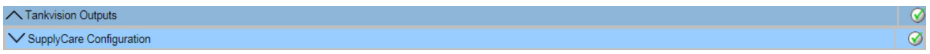
Diagnostic Code	Short Text	Cause	Possible Solution
F101	NXA 820 Conn. Lost	Unable to Communicate with NXA820	–
F301	Data Mem. Fault	Failed to Detect or Initialize Data Flash Memory	–
F302	LAN Fault	LAN Cable Disconnected or Failed	–
F303	SYNC Fault	SYNC Link Cable Disconnected or Failed	–
F304	FPGA Error	Unable to access FPGA	–
F305	NV Data Error	The data in the NV memory does not match the RAM copy	–
F306	Order Code Error	The factory set order code is invalid, NXA is unable to startup	–
F307	Expansion Board Fault	Expansion board type does not match expected protocol type or failed to program FPGA	–
F308	Watchdog Error	Software Watchdog Error	–
F309	FS Security Error	Security policy compromised due to file-system error	–
F310	High CPU Load	High CPU Utilization	–
F311	Low Disk Space	Low Disk Space	–
F312	Low RAM	Low RAM	–
F313	Bad Thread	Bad Thread Status	–
F314	Reset by WD	Hardware reset by WatchDog	–
F315	CheckSum Error	CheckSum Error	–
F316	Language Error	Language Installation Error	–
F317	Access Cnfg Err	Access Configuration Error: No machines registered for access	–
F318	FPGA Config Err	fpga.conf file is corrupted or not available	To reprogram with proper SREC
F319	RTC LowVolt Err	Real Time Clock Battery Low voltage Detected	The battery might have drained if the kit was off for a long duration
F320	Time Read Err	Real Time Clock Read Error	Check if i2cdriver started and working fine
F321	Time maybe bad!	Time maintained by the RTC might be wrong	Confirm and set the time on the kit
F322	RTC Nvmgr Err	RTC could not access NV memory to store or retrive time	Check if nvmanager started and working fine
C324	Archive Export Started	–	–
F325	NAND not accessible	NAND Flash damaged	–
F326	NAND Write exceeded	NAND Flash Write operation exceeded	–
F327	NAND Write stop exceeded	NAND Flash Write operation stop exceeded	–
F328	Database corrupted	Configuration database corrupted	–

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

17.16 Tankvision Outputs

To set or manage the Tankvision Outputs

- Click on **Tankvision Outputs**.
  - Tankvision displays the screen as follows:

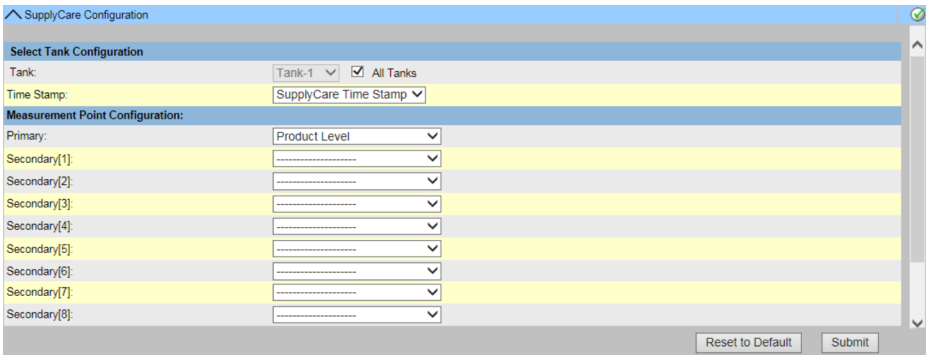


17.16.1 SupplyCare Configuration

Configure the parameters that the Tank Scanner NXA820 provides when polled by SupplyCare Enterprise.

To set or mange the SupplyCare Configuration

1. Click ⌄ on **SupplyCare Configuration**.
   ↳ Tankvision displays the screen as follows:



Tank
Select the tank from the drop-down list for which to configure the parameters that are provided for SupplyCare.
Either configure each tank individually or select the **All Tanks** check box to configure the same parameters for all tanks.

Time Stamp
Choose between the SupplyCare Time Stamp and the Tank Scanner NXA820 Time Stamp for the provided parameters.

Measurement Point Configuration
Configure the parameters for the tank(s) selected in the **Tank** field, that are provided when polled by SupplyCare.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to save the settings, or click the **Reset to Default** button to reset the screen to the default values.
4. After saving the settings, Tankvision displays a confirmation message, inculding the name of the .esp page which must be entered by the user in the Gateway configuration page of SupplyCare Enterprise.

An event is generated after setting the Tankvision Outputs. The event details can be viewed in the **Event** overview.

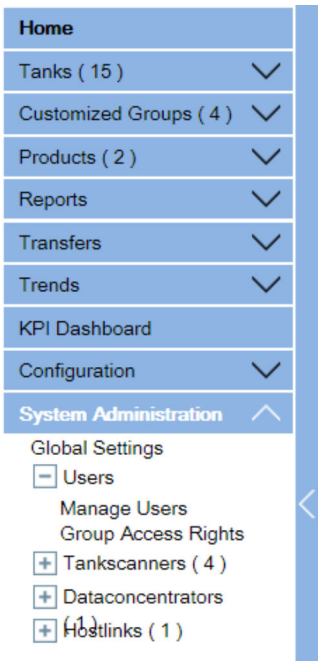
18 The "System Administration" – "Users" menu

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.

To manage users and group access rights

- On the Navigation Tree, click the **System Administration** header. Click **Users**.
  - It expands as follows:



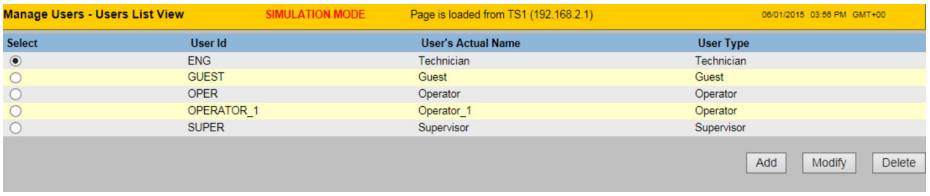
18.1 Manage Users

The **Manage Users** screen displays a list of all the users in the Tankvision system. It provides the necessary interface that allows the authorized persons to make changes in a user's access rights to the Tankvision system, in particular:

- Add a new user
- Modify the user details
- Delete an existing User

To view the manage users screen

- On the Navigation Tree, click the **System Administration** header. Click **Users**. Click **Manage Users**.
  - Tankvision displays the screen as follows:



User View
The **User View** tab displays the list of users.

Group Rights
The **Group Rights** tab displays the details of access rights given to the respective users.

Add
Click the **Add** button to add a new user.

Modify
Click the **Modify** button to modify the user details.

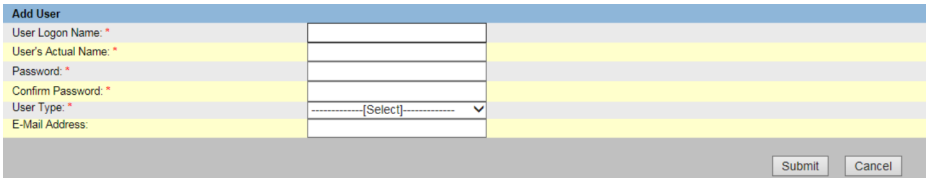
Delete
Click the **Delete** button to delete a user.

18.1.1 Adding a new user

The Tankvision system provides hierarchical user types and secure access to the system. The Tankvision system allows the user to add a new user with specific user type rights.

To add a new user

1. Click the **Add** button.
   ↳ Tankvision displays the screen as follows:



User Logon Name
Enter the user's logon name. The data type is alphanumeric and is case sensitive.

User's Actual Name
Enter the full name of the user. This field will display data in text format.

Password
Enter the user's password. The data type is alphanumeric and case sensitive. It can be between 3 to 8 characters in length. All characters in this field will appear as masked for security reasons.

Confirm Password
Re-type the password for confirmation.

User Type
Select the appropriate user type from the drop down list. The types of users are predefined in terms of the user's designation. They are used to group the users according to their access rights to the Tankvision system.

E-Mail Address
Enter the Email address of the user. The user will get all system alerts on this Email address.

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to save the details of the user, or click the **Cancel** button to exit.
4. After saving the settings, Tankvision displays a confirmation message.

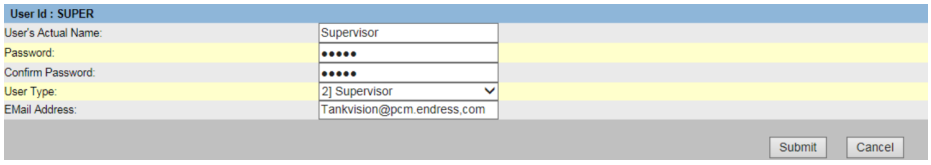
An event is generated after adding a new user. The event details can be viewed in the **Event** overview.

18.1.2 Modifying existing users' details

This section explains how to modify the existing users' details.

To modify the details of an existing user

1. Select the appropriate **User ID** option on the **User list** view.
2. Click the **Modify** button.
   ↳ Tankvision displays the screen as follows:



User's Actual Name
Enter the full name of the user. This field will display data in text format.

Password
Enter the user's password. The data type is alphanumeric and case sensitive. It can be between 3 to 8 characters in length. All characters in this field will appear as masked for security reasons.

Confirm Password
Re-enter the password for confirmation.

User Type
Select the appropriate user type from the drop down list. The types of users are predefined in terms of the user's designation. They are used to group the users according to their access rights to the Tankvision system.

E-Mail Address
Type the Email address of the user. The user will get all system alerts on this Email address.

3. Enter the appropriate information in the relevant fields.
4. Click the **Submit** button to modify the details of the user, or click the **Cancel** button to exit.
5. After saving the settings, Tankvision displays a confirmation message.

An event is generated after modifying the details of a user. The event details can be viewed in the **Event** overview.

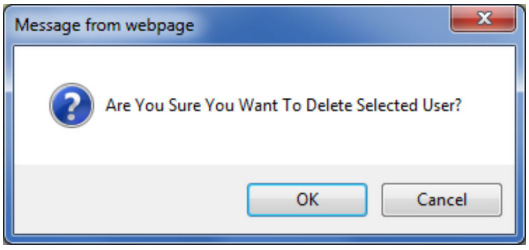
18.1.3 Deleting an Existing User

This section allows you to delete an existing user's login information data, thereby denying access to any user who does not have a valid or enlisted user name and password.

To delete an existing user

1. Select the appropriate **User ID** option on the **User list** view.

2. Click the **Delete** button.
   ↳ Tankvision displays the following dialog box:



3. Click the **OK** button to delete the user, or click the **Cancel** button to exit.
4. After saving the settings, Tankvision displays a confirmation message.

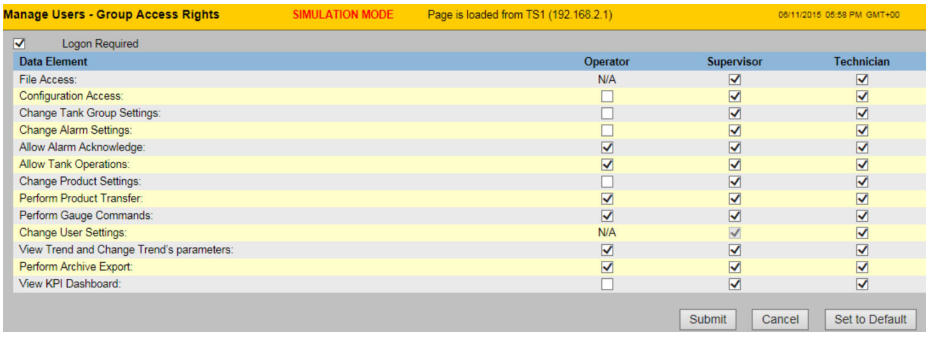
An event is generated after deleting a user. The event details can be viewed in the **Event** overview.

18.2 Managing the User Access Rights

The Tankvision system has predefined user group access rights, which may be used for managing the user's access right. Each user belongs to a particular user group depending on his profile in the company. The users can access only those features of the system, which are available to their user group.

To manage the user access rights

1. On the Navigation Tree, click the **System Administration** header. Click **Users**. Click **Group Access Rights**.
   ↳ Tankvision displays the screen as follows:



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.

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
- **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 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

2. Enter the appropriate information in the relevant fields.
3. Click the **Submit** button to save the group access rights, or click the **Cancel** button to exit.
4. Click the **Set To Default** button to return to the default settings.
5. After saving the settings, Tankvision displays a confirmation message.

An event is generated after modifying user access rights. The event details can be viewed in the **Event** overview.

19 Other Global Settings

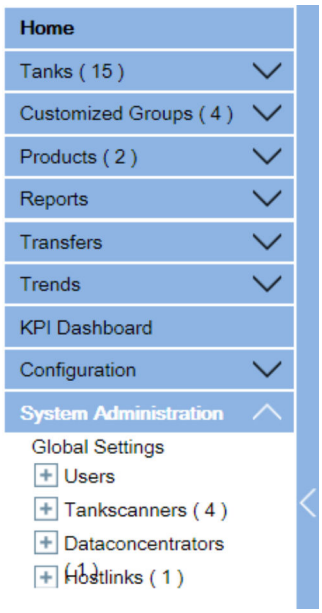
In this chapter, you will learn how to:
View and configure other Tankvision units's global settings

The Tankvision system comprises various Tankvision subsystems, such as, NXA820, NXA821 and NXA822. Each subsystem serves a specific functionality.

The system shows various Tankvision units in the domain network. In this system, the user can view other Tankvision units. The authorized user can also change the global configuration settings of other Tankvision units.

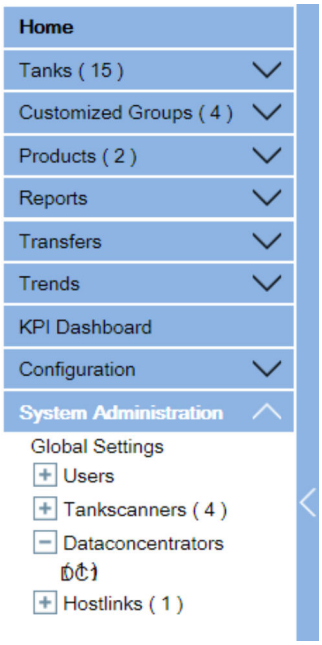
To view and configure other Tankvision unit's global setting

1. On the Navigation Tree, click the **System Administration** header.
   ↳ The **System Administration** header expands as follows:

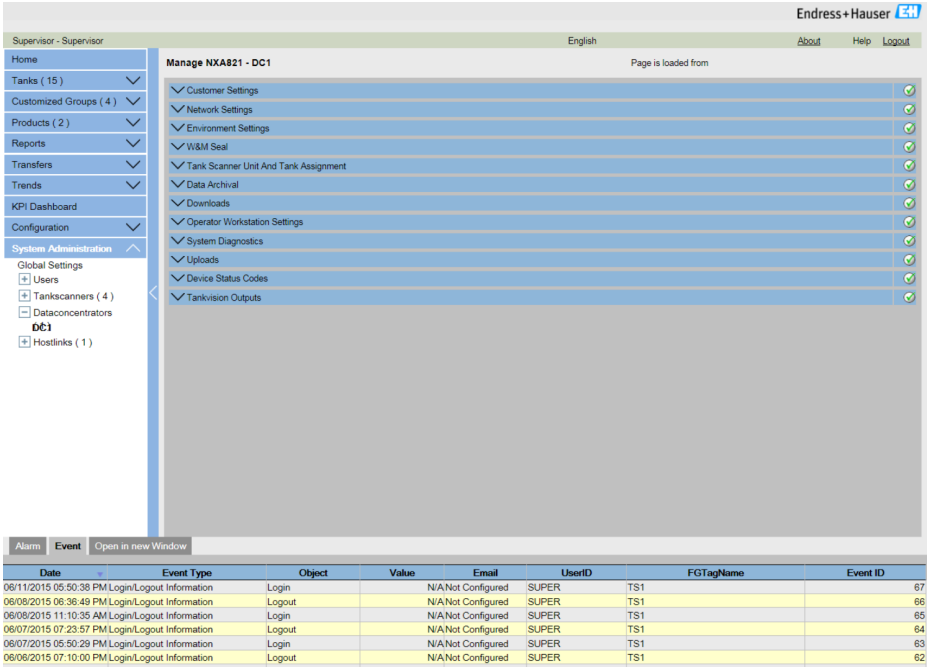


2. The above figure displays the <Tankvision Subsystem>, viz, Tank Scanning Units (NXA820), Data Concentrators (NXA821) and Host Links (NXA822). The Tank Scanning Units, Data Concentrators, and Host Links consists of all the NXA820, NXA821 and NXA822 units respectively in that domain network.

3. Click the ⊞ adjacent to <Tankvision Subsystem>.
   ↳ Tankvision displays the screen as follows:



4. Click the <Unit Name>.
   ↳ Tankvision displays the global settings screen of the <Unit Name>, which is as follows:



5. The user may view the global configuration settings, and edit the settings.

The system generates an event if the global settings are edited. The event details are displayed in the **Event** tab of that particular Tankvision unit, which is edited.

20 The Alarm and Event Panel

20.1 Overview of the Alarm and Event Panel

The Alarm and Event Panel of the Tankvision system displays an overview of the Alarm 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.

20.1.1 Alarm Summary

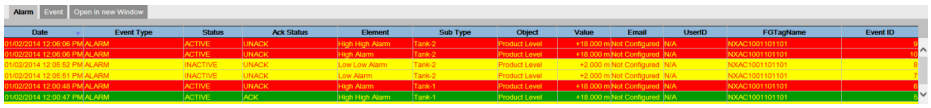
Alarms:

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

- Click the **Alarm** tab.
  - ↳ Tankvision displays the "Alarm" information as follows:



Date	Event Type	Status	Ack Status	Element	Sub Type	Object	Value	Email	UserID	FOTagName	Event ID
01/02/2014 12:06:06 PM	ALARM	ACTIVE	UNACK	High High Alarm	Tank-2	Product Level	+18.000 m	Not Configured	N/A	NXAC1001101101	9
01/02/2014 12:06:06 PM	ALARM	ACTIVE	UNACK	High Alarm	Tank-2	Product Level	+18.000 m	Not Configured	N/A	NXAC1001101101	10
01/02/2014 12:05:52 PM	ALARM	INACTIVE	UNACK	Low Low Alarm	Tank-2	Product Level	+2.000 m	Not Configured	N/A	NXAC1001101101	8
01/02/2014 12:05:51 PM	ALARM	INACTIVE	UNACK	Low Alarm	Tank-2	Product Level	+2.000 m	Not Configured	N/A	NXAC1001101101	7
01/02/2014 12:00:48 PM	ALARM	ACTIVE	UNACK	High Alarm	Tank-1	Product Level	+18.000 m	Not Configured	N/A	NXAC1001101101	2
01/02/2014 12:00:47 PM	ALARM	ACTIVE	ACK	High High Alarm	Tank-1	Product Level	+18.000 m	Not Configured	N/A	NXAC1001101101	1

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.

Email
This column indicates the Email delivery status: whether an Email was sent successfully to the configured mail server or not.
OK: The Email was successfully sent.
FAILED: The Email-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.

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

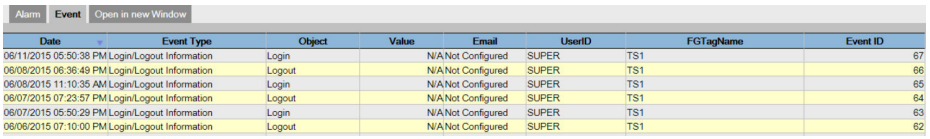
20.1.2 Event Summary

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

- Click the **Event** tab.
  - Tankvision displays the "Event" information as follows:



Date	Event Type	Object	Value	Email	UserID	FGTagName	Event ID
06/11/2015 05:50:38 PM	Login/Logout Information	Login	N/A	Not Configured	SUPER	TS1	67
06/08/2015 06:36:49 PM	Login/Logout Information	Logout	N/A	Not Configured	SUPER	TS1	66
06/08/2015 11:10:35 AM	Login/Logout Information	Login	N/A	Not Configured	SUPER	TS1	65
06/07/2015 07:23:57 PM	Login/Logout Information	Logout	N/A	Not Configured	SUPER	TS1	64
06/07/2015 05:50:29 PM	Login/Logout Information	Login	N/A	Not Configured	SUPER	TS1	63
06/06/2015 07:10:00 PM	Login/Logout Information	Logout	N/A	Not Configured	SUPER	TS1	62

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 Email delivery status: whether an Email was sent successfully to the configured mail server or not.
OK: The Email was successfully sent.
FAILED: The Email-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.

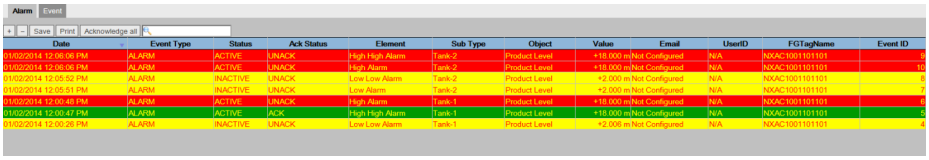
Event ID
This column indicates the Identification (ID) numbers of the Tankvision units in concern. Every Tankvision unit has a unique numerical ID.

20.1.3 Open Alarms and Events in new window

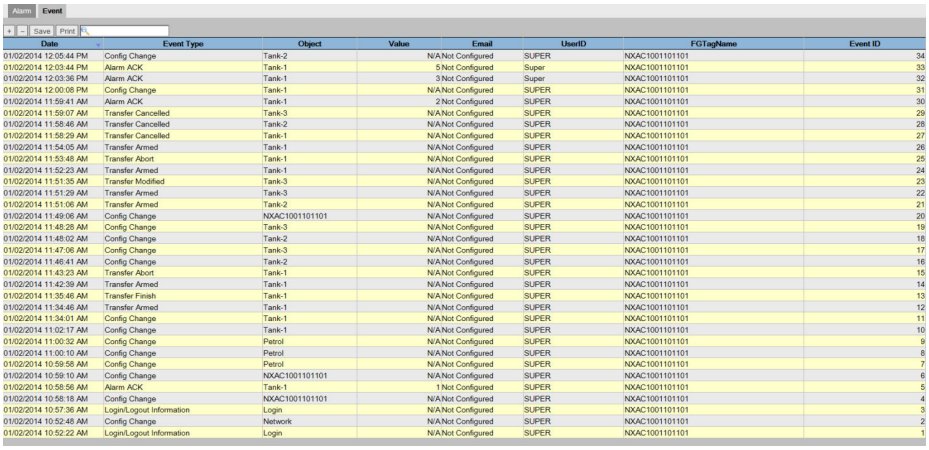
You can open alarms and events in a new window.

To open alarms and events in a new window

1. Click the **Open in new Window** tab.
   ↳ Tankvision displays a new "Alarm and Event" window as follows:



Date	Event Type	Status	Ack Status	Element	Sub Type	Object	Value	Email	UserID	FGTagName	Event ID
01/02/2014 12:06:06 PM	ALARM	ACTIVE	UNACK	High High Alarm	Tank-2	Product Level	+18.000 m	Not Configured	N/A	NXAC1001101101	10
01/02/2014 12:06:06 PM	ALARM	ACTIVE	UNACK	High Alarm	Tank-2	Product Level	+18.000 m	Not Configured	N/A	NXAC1001101101	10
01/02/2014 12:05:52 PM	ALARM	INACTIVE	UNACK	Low Low Alarm	Tank-2	Product Level	+2.000 m	Not Configured	N/A	NXAC1001101101	8
01/02/2014 12:05:51 PM	ALARM	INACTIVE	UNACK	Low Alarm	Tank-2	Product Level	+2.000 m	Not Configured	N/A	NXAC1001101101	7
01/02/2014 12:00:48 PM	ALARM	ACTIVE	UNACK	High Alarm	Tank-1	Product Level	+18.000 m	Not Configured	N/A	NXAC1001101101	6
01/02/2014 12:00:47 PM	ALARM	ACTIVE	ACK	High High Alarm	Tank-1	Product Level	+18.000 m	Not Configured	N/A	NXAC1001101101	5
01/02/2014 12:00:26 PM	ALARM	INACTIVE	UNACK	Low Low Alarm	Tank-1	Product Level	+2.006 m	Not Configured	N/A	NXAC1001101101	4



Date	Event Type	Object	Value	Email	UserID	FGTagName	Event ID
01/02/2014 12:05:44 PM	Config Change	Tank-2	N/A	Not Configured	SUPER	NXAC1001101101	34
01/02/2014 12:03:44 PM	Alarm ACK	Tank-1	5	Not Configured	Super	NXAC1001101101	33
01/02/2014 12:03:36 PM	Alarm ACK	Tank-1	3	Not Configured	Super	NXAC1001101101	32
01/02/2014 12:00:08 PM	Config Change	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	31
01/02/2014 11:59:41 AM	Alarm ACK	Tank-1	2	Not Configured	SUPER	NXAC1001101101	30
01/02/2014 11:59:07 AM	Transfer Cancelled	Tank-3	N/A	Not Configured	SUPER	NXAC1001101101	29
01/02/2014 11:58:46 AM	Transfer Cancelled	Tank-2	N/A	Not Configured	SUPER	NXAC1001101101	28
01/02/2014 11:58:29 AM	Transfer Cancelled	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	27
01/02/2014 11:54:05 AM	Transfer Armed	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	26
01/02/2014 11:53:48 AM	Transfer Abort	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	25
01/02/2014 11:52:23 AM	Transfer Armed	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	24
01/02/2014 11:51:35 AM	Transfer Modified	Tank-3	N/A	Not Configured	SUPER	NXAC1001101101	23
01/02/2014 11:51:29 AM	Transfer Armed	Tank-3	N/A	Not Configured	SUPER	NXAC1001101101	22
01/02/2014 11:51:06 AM	Transfer Armed	Tank-2	N/A	Not Configured	SUPER	NXAC1001101101	21
01/02/2014 11:49:06 AM	Config Change	NXAC1001101101	N/A	Not Configured	SUPER	NXAC1001101101	20
01/02/2014 11:48:28 AM	Config Change	Tank-3	N/A	Not Configured	SUPER	NXAC1001101101	19
01/02/2014 11:48:02 AM	Config Change	Tank-2	N/A	Not Configured	SUPER	NXAC1001101101	18
01/02/2014 11:47:06 AM	Config Change	Tank-3	N/A	Not Configured	SUPER	NXAC1001101101	17
01/02/2014 11:46:41 AM	Config Change	Tank-2	N/A	Not Configured	SUPER	NXAC1001101101	16
01/02/2014 11:43:23 AM	Transfer Abort	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	15
01/02/2014 11:42:39 AM	Transfer Armed	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	14
01/02/2014 11:35:46 AM	Transfer Finish	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	13
01/02/2014 11:34:46 AM	Transfer Armed	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	12
01/02/2014 11:34:01 AM	Config Change	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	11
01/02/2014 11:02:17 AM	Config Change	Tank-1	N/A	Not Configured	SUPER	NXAC1001101101	10
01/02/2014 11:00:32 AM	Config Change	Petrol	N/A	Not Configured	SUPER	NXAC1001101101	9
01/02/2014 11:00:10 AM	Config Change	Petrol	N/A	Not Configured	SUPER	NXAC1001101101	8
01/02/2014 10:59:58 AM	Config Change	Petrol	N/A	Not Configured	SUPER	NXAC1001101101	7
01/02/2014 10:59:10 AM	Config Change	NXAC1001101101	N/A	Not Configured	SUPER	NXAC1001101101	6
01/02/2014 10:58:56 AM	Alarm ACK	Tank-1	1	Not Configured	SUPER	NXAC1001101101	5
01/02/2014 10:58:18 AM	Config Change	NXAC1001101101	N/A	Not Configured	SUPER	NXAC1001101101	4
01/02/2014 10:57:36 AM	Login/Logout Information	Login	N/A	Not Configured	SUPER	NXAC1001101101	3
01/02/2014 10:52:48 AM	Config Change	Network	N/A	Not Configured	SUPER	NXAC1001101101	2
01/02/2014 10:52:22 AM	Login/Logout Information	Login	N/A	Not Configured	SUPER	NXAC1001101101	1

2. Select the **Alarm** or **Event** tab. The attributes are the same as described in "Alarm Summary" and "Event Summary" (see above).

To zoom the Alarm or Event view

- Click the **+** button to zoom in and the **-** button to zoom out.

To save the Alarm or Event view settings

- Click the **Save** button to save the **Alarm** or **Event** view settings.

To print the Alarm or Event view

- Click the **Print** button to print the table as it is.

To acknowledge all alarms

- Click the **Acknowledge all** button to acknowledge all alarms.

To filter the Alarm or Event view

- Enter the filter criteria into the **Filter** field to filter the displayed alarms or events.

20.2 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 below.

HH (High High Alarm)
Is Set off whenever the value of a data element rises 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)
Is Set off whenever the value of a data element rises 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)
Is Set off whenever the product level value rises above the MF set point and remains there for an interval greater than or equal to the hold-off time for the alarm.

LA (Low Alarm)
Is Set off 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)
Is Set off 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)
Is Set off 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 (refer to "The "Tank Status" tab).

DF (Difference Alarm)
Is Set off 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)
Is Set off whenever the gauge status received from a gauge indicates that the gauge has failed.

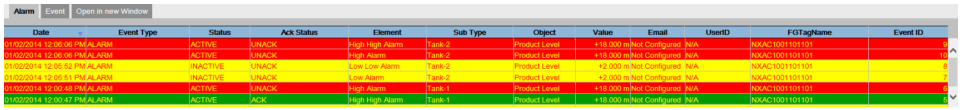
CO (Gauge Communication Error Alarm)
Is Set off whenever the communication with a gauge fails due to a timeout error.

TO (Time out / Age Alarm)
Is Set off whenever the data received from a gauge is too old.

SE (Flash drive is full)
Is Set off whenever the flash drive is full (e.g. due to archived data).

20.3 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

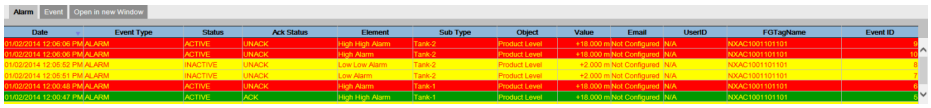
20.4 Acknowledging an Alarm

One of the important aspects of an alarm is alarm acknowledgment. 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

- Double-click the alarm in the alarm summary.



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

"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.

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