Operating Instructions
Tankvision Professional NXA85
Tankvision LMS NXA86B
System Configuration

Endress+Hauser [EH]

People for Process Automation
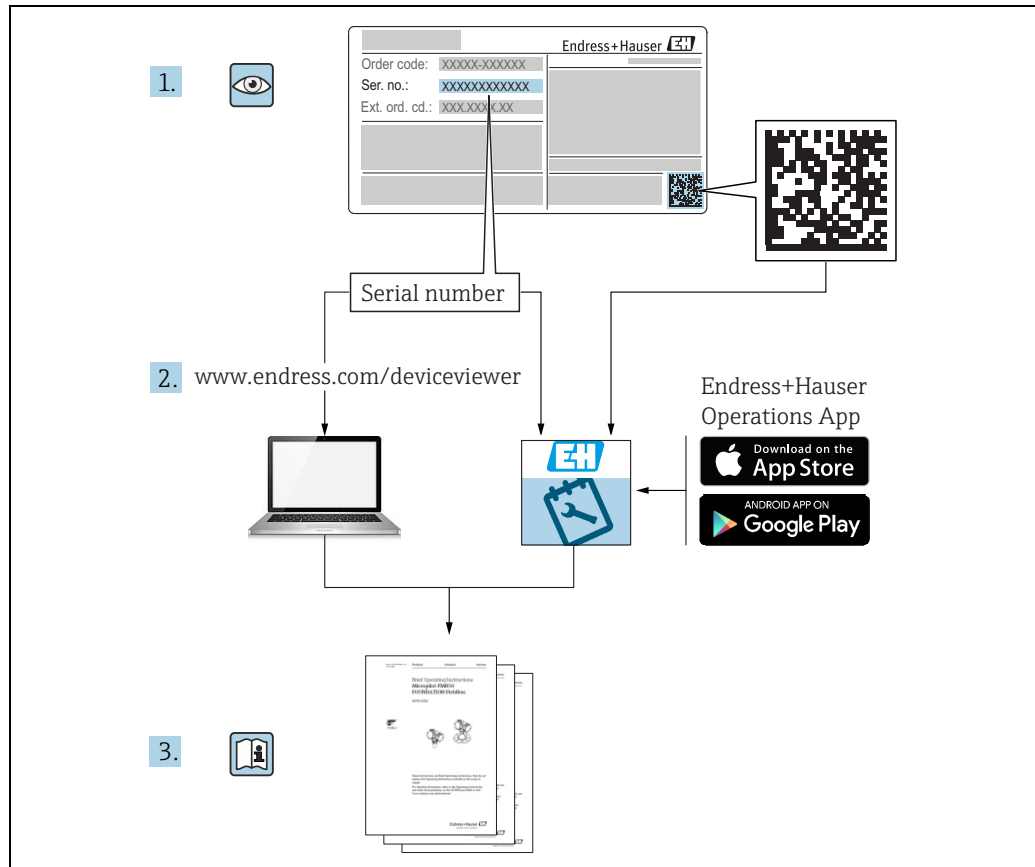
A0023555

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

Version history

Document version	Valid for SW version	Changes to the previous version
BA00390G_18.18	18.1.1	Compatibility with Windows 10 and Windows Server 2016
BA00390G_19.20	18.3.1	Function added: Remote Radio Client Configuration
BA00390G_20.22	18.3.2	Pipeline volumes as part of tank volumes selectable. Function removed: Web server
BA00390G_21.23-00	18.3.3	Compatibility with Windows 11 and Windows Server 2022. Minor changes to existing functionality

Table of Contents

1   About this document

1.1   Document function

This manual should support during the configuration of Tankvision Professional NXA85 and LMS NXA86B.
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   Software versions and certification

Due to the certification process with weights and measures agencies, the latest software version might only be certified at a later stage. Also some features might be incompatible with the weights and measure regulations and can therefore not be combined.

1.3   Symbols

1.3.1   Safety symbols

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

1.3.2   Electrical symbols

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

1.3.3 Symbols for certain types of information

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

1.3.4 Symbols in graphics

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

1.4 Documentation

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

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

- *W@M Device Viewer:* www.endress.com/deviceviewer - Enter the serial number from the nameplate

- *Endress+Hauser Operations App*: Enter the serial number from the nameplate or scan the matrix code on the nameplate

1.5 Registered trademarks

Microsoft®, Windows® and Internet Explorer®
Registered trademarks of the Microsoft Corporation

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

Java®
Registered trademark of Sun Microsystems, Inc.

Mozilla® Firefox®
Registered trademark of the Mozilla Foundation

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

All other marks are property of their respective owners.

2   Basic safety instructions

2.1   Requirements for the personnel

The personnel for installation, commissioning, diagnostics and maintenance must fulfill the following requirements:
- Trained, qualified specialists: must have a relevant qualification for this specific function and task.
- Are authorized by the plant owner/operator.
- Are familiar with federal/national regulations.
- Before 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 personnel must fulfill the following requirements for its tasks:
- 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   Application

Tankvision Professional NXA85

Tankvision Professional is specifically designed for operators of bulk storage facilities, marketing terminals, refineries and pipelines. It is designed to handle all the data acquisition, supervisory control and monitoring required in a single fully integrated solution.

Tankvision Professional integrates all major types of tank measurement instruments into one system.

All measured and calculated tank parameters are accessible to your tank farm and terminal operators as well as to connected host systems.
Multi-user operation is provided by the inbuilt Web Server offering the opportunity to access data at any connected location (local or remote) e.g. for administrative and accounting purposes.

Tankvision LMS NXA86

Tankvision LMS is a total LNG Tank Storage and Management solution for Peak Shaving, Receiving and Production LNG facilities. The LMS system has been designed to interface to all instruments commonly found on LNG storage tanks, and to collect and present the instrument data through a range of intuitive graphical user interfaces. A typical LNG Tank will have a wide range of measurement instruments to measure Liquid Level, Liquid Density,

Liquid and Vapour Temperature, Liquid and Vapour Pressure, Skin Temperature and much more.

Typically each tank would be fitted with an LTD gauge, two further level gauges configured as a Primary and Secondary, and an Alarm Gauge. The LTD gauge is a servo operated unit mounted on the tank roof. The purpose of the LTD gauge is to take accurate profiles of temperature and density throughout the liquid, and whilst not profiling provide continuous liquid level, temperature and density measurement. The Primary and Secondary gauges can be either servo and or radar operated units also mounted on the tank roof. The purpose of these gauges is to provide continuous liquid level measurement, and average liquid temperature measurement. They provide redundancy on the measurement of level and temperature. The average liquid temperature is derived from a multi-point temperature sensor device. The alarm gauge is often a servo or radar based gauge configured to provide volt free contact alarm status to an independent system.

An LMS system can operate in a simple standalone configuration or as a fully redundant system where security and integrity are of paramount importance. The LMS system has a flexible and scalable architecture allowing it to be tailored to a number of different applications easily.

2.3   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   Identification

3.1   Product identification

The following options are available for identification of the software:

- Nameplate specifications
- Order code with breakdown of the software features on the delivery note
- Enter serial numbers from nameplates in *W@M Device Viewer:*
  www.endress.com/deviceviewer - All information about the software is displayed.

3.2   Nameplate

The information that is required by law and is relevant to the device is shown on the nameplate, e.g.:
- Manufacturer identification
- Device name
- Order code
- Extended order code
- Serial number
- Barcode

3.3   Manufacturer address

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

Place of manufacture: See nameplate.

3.4   Order code and device version

To find out the version of your software, enter the order code indicated on the nameplate in the search screen at the following address:
www.products.endress.com/order-ident

4　　System Configuration

The System is provided with a suite of configuration tools allowing the user to create and configure their own database to reflect their own site configuration.

It is however recommended that any user wishing to configure a complete system attends a recognised training course at an approved support centre.

This manual assumes that the system software has been correctly installed in accordance with the Installation manual and any other release notes and instructions provided by the software manufacturer.

In order to successfully configure a system the following information will be required as a minimum:

- **Tank details** such as:
  - Tank Identity
  - Tank Shape
  - Tank Operating Parameters
  - Alarm set-points
  - Calibration Table
  - Product Name
- **Gauge details** such as:
  - Gauge Type
  - Gauge Address
  - Data Items supported

Endress+Hauser

5   Tank Capacity Data Configuration

5.1   Tank Capacity Data Configuration Introduction

Tank capacity tables are required to enable the system to calculate inventory data. Each capacity table needs to be either entered manually or imported from a comma separated value (.CSV) format text file.

The accuracy of the volumes calculated by the system is dependent upon the accuracy of the tank capacity points provided.

The utmost care must be taken when selecting the capacity points to be used. Where possible the original tank strap points should be entered to get the best accuracy. Access to this feature can be managed by the security system.

It is not necessary to use the same name for the Tank and the tank capacity table but this nomenclature has been used for the demonstration tables for simplicity.

5.2   Loading the Tank Capacity Table Module

To load the Tank Capacity Table Module, proceed as follows:

1. Select **Configuration** → **Tank Capacity Tables** from the main menu.

   The Tank Capacity Table module main window will be loaded as follows:

BA00390GEN_0272
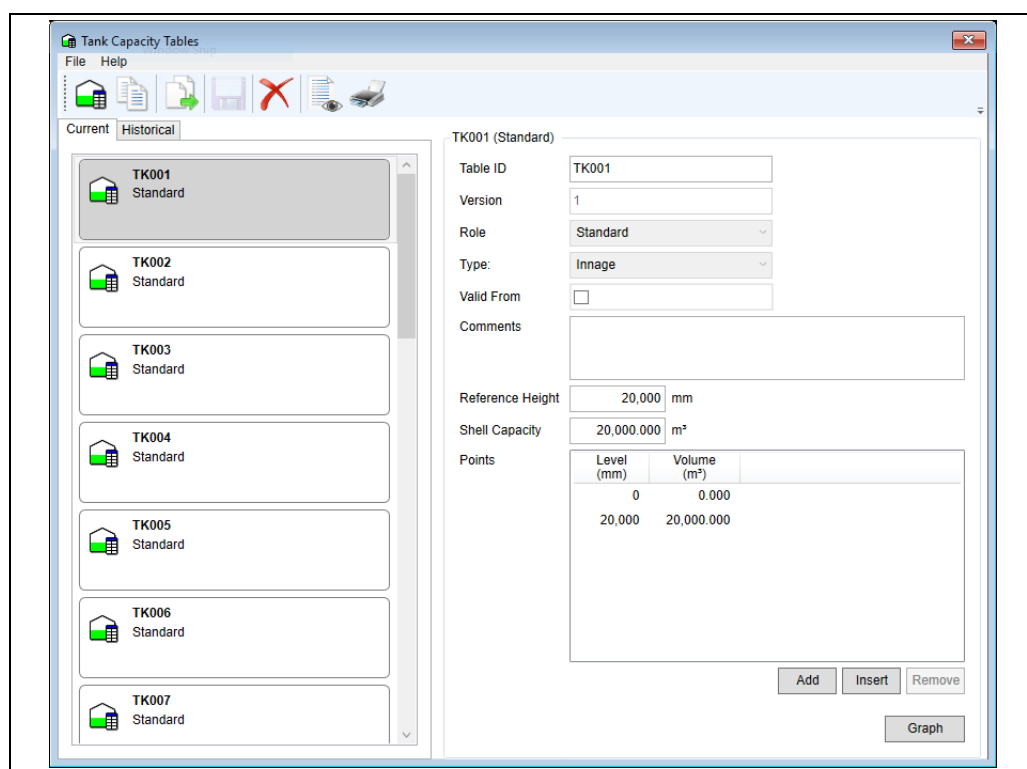
The list of tables will be populated with all tank capacity tables currently configured.

Tank Capacity Tables are assigned to tanks in the **Configuration** → **Configuration** menu option (→ 🗎 29).

- Selecting **File** → **New** from the menu will allow naming and editing of options and data to create a new tank capacity table.
- Selecting **File** → **Import Points** will cause the import points screen to be displayed for import of a CSV file.

5.3   Adding a New Tank Capacity Table

To add a new tank capacity table, proceed as follows:

1. Select **File → New**.
   The new tank capacity table window opens as follows:

BA00390GEN_0273

2. In the **Table ID** field enter a name for the new table and select whether the table role is **Standard**, **Water** or **Hydrostatic Deformation**.
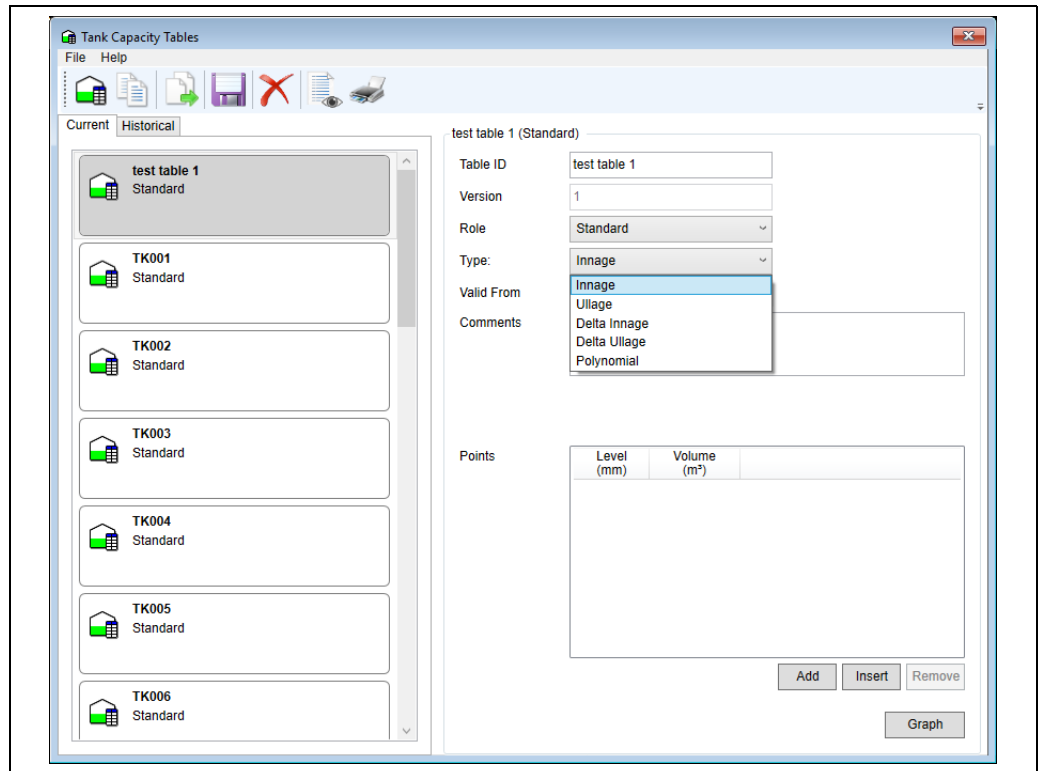
BA00390GEN_0274

3. Then select type from **Innage**, **Ullage**, **Delta Innage**, **Delta Ullage** or **Polynomial**.

4. Enter a valid **From** date in the format 01/04/2011 00:00 (invalid format is ignored).

5. Finally enter or import the points (up to 60,000) for the tank and then select **File →
Save**.

5.4   Importing a Tank Capacity Table

To import a tank capacity table, proceed as follows:

1. Click the **Import Points** icon (   ).
A dialog box will appear warning that any existing points will be replaced if you
continue.
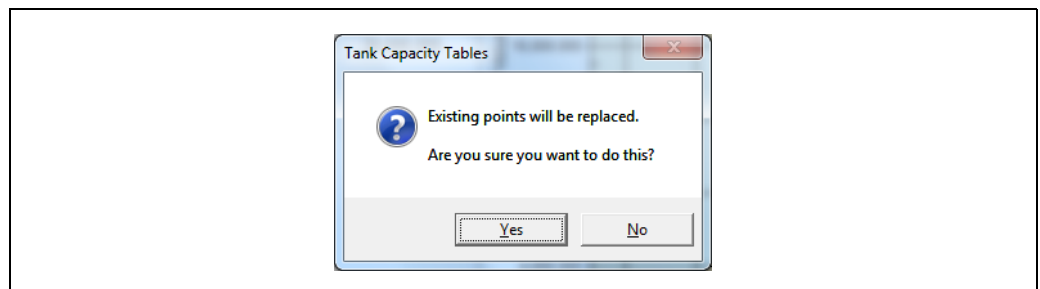
BA00390GEN_0004

If you choose to continue you will be prompted to enter a choice of **CSV**, **Excel** or **Database**
for the source data and given an option to change the engineering units for level and volume.

BA00390GEN_0005
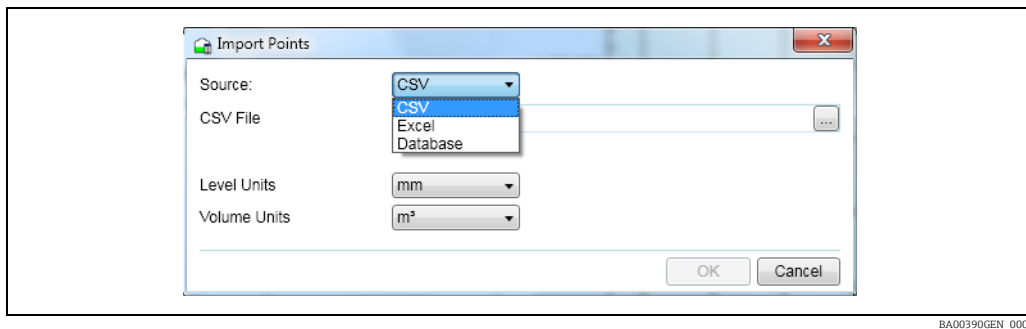
2. Enter the path or browse to the location source data file. Select the relevant file and click the **Open** button to import the calibration data into the database.

BA00390GEN_0006
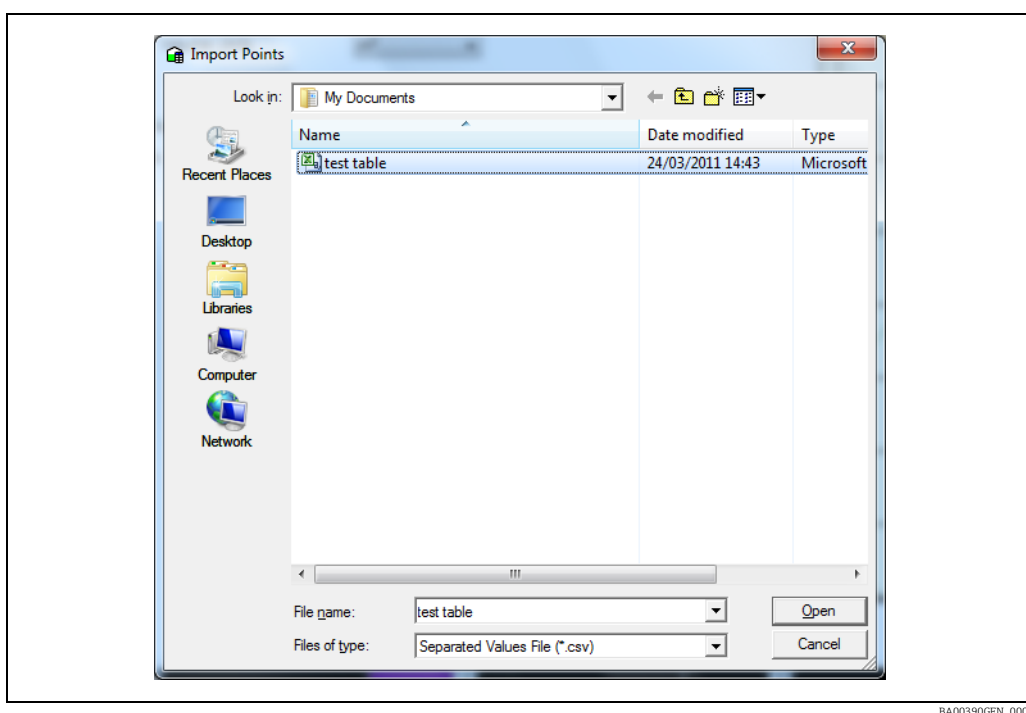
Any problems encountered while processing the data will be reported to the user. You will notice in the screenshots above a button labelled **Graph**. This opens a simple chart plot showing the characteristic of the calibration data. This is a useful aid to spot any erroneous data.

BA00390GEN_0276
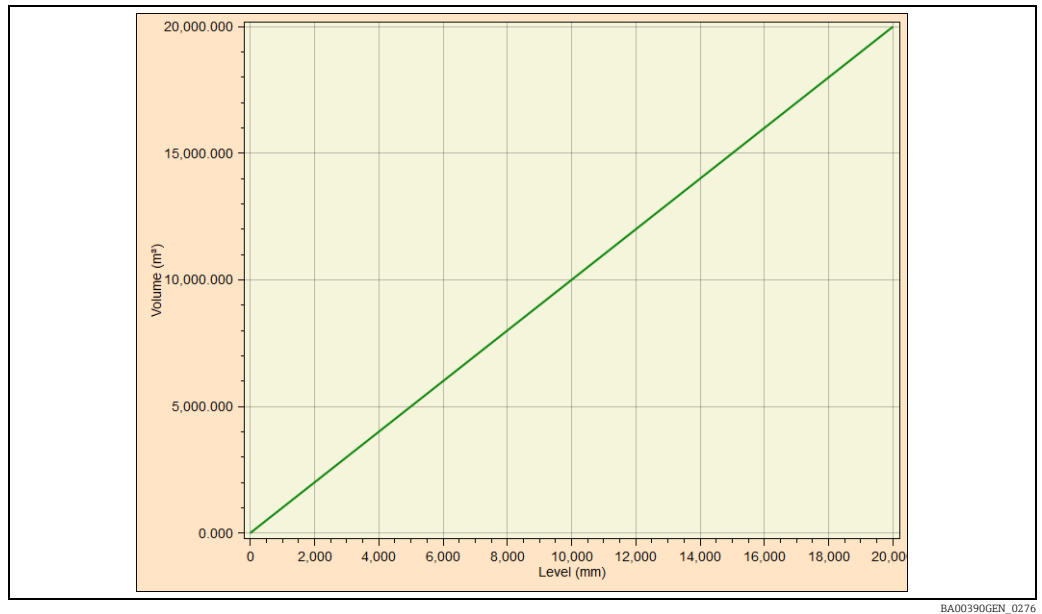
The plotted characteristic should be almost linear for Vertical Cylindrical tanks. For spherical and horizontal cylindrical tanks the plotted chart should exhibit a non-linear characteristic.

5.5   Viewing Existing Tables

1. Select **Configuration** → **Tank Capacity Tables** from the main menu.
   The Tank Capacity Module will be loaded (→ 📄 12).

2. Select a Capacity Table to view the points and data.

Tables which have been superseded by use of the **Valid From** field can be seen in the history tab.

5.6   Editing Values in an Existing Table

To edit values in an existing capacity table, proceed as follows:

1. Select the table to be edited from the list.
   If you have the necessary security access rights you will be able to edit the table of values.

2. Type in the new value and move off the row to save the changes locally to the table.

BA00390GEN_0277
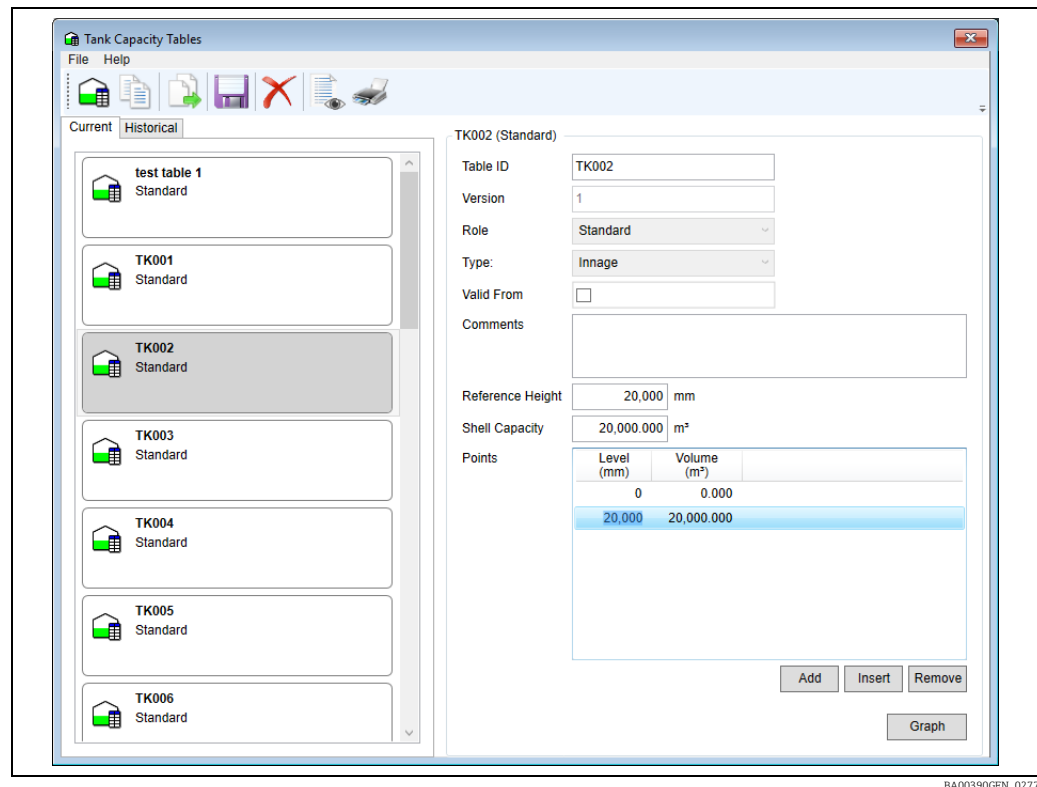
3. To save the changes click the 💾 icon on the tool-bar.

ℹ️   If the application is closed prior to saving the changes you will be prompted to save the changes.

5.7   Inserting an Extra Row

To insert an extra row, proceed as follows:

1. Select the row at which a record needs to be inserted by clicking with the left mouse button on the left hand side of the row.

2. Select the **Insert** option.
   A new row will be inserted.
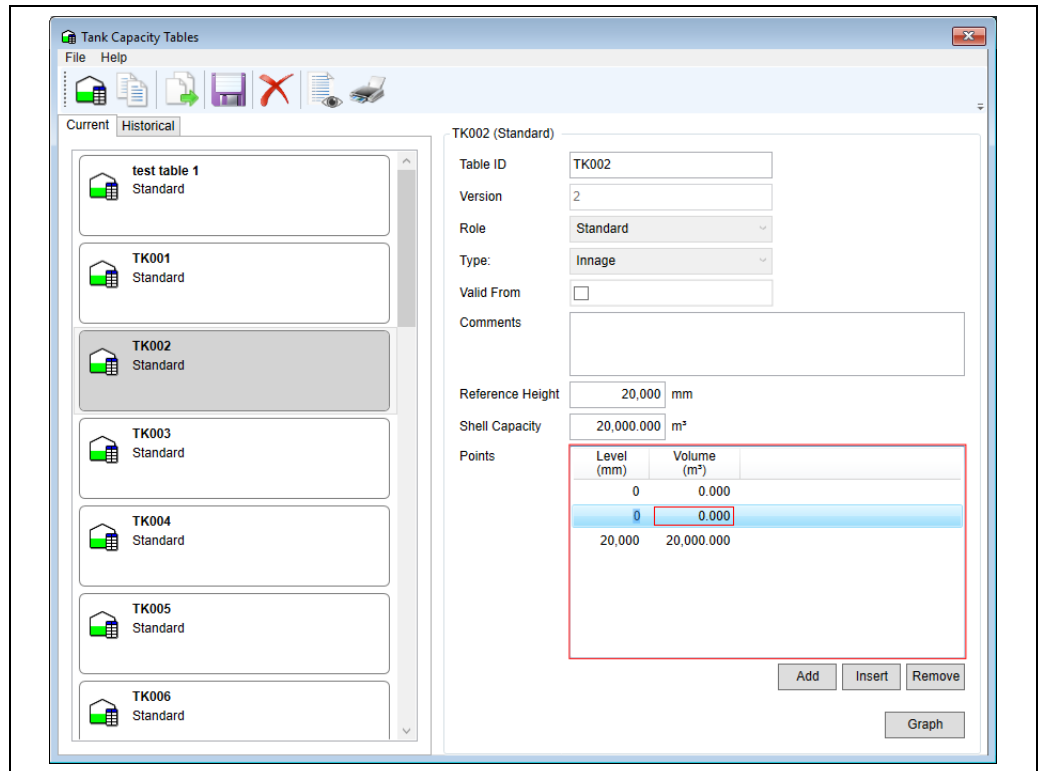
BA00390GEN_0278

3. Enter the data for the new row.

4. To save the changes to the database click the 💾 icon on the tool-bar.

ℹ️ If the application is closed prior to saving the changes you will be prompted to save the changes.

5.8   Addinging an Extra Row

Adding using the **Add** button is much the same as inserting (→ 📄 16) but appends a row to the end.

5.9   Deleting Rows

To delete a row, proceed as follows:

1. Select the row which needs to be deleted by clicking with the left mouse button on the left hand side of the row.

2. Select the **Delete** option.
   The row will be deleted.

3. To save the changes to the database click the 💾 icon on the tool-bar.

ℹ️ If the application is closed prior to saving the changes you will be prompted to save the changes.

5.10   Validity of Data

ℹ️ The user is not allowed to enter points in the wrong order, all levels and volumes must be larger than the previous one. The border around the data entry points will remain red until entered data is valid.

6   Density Table Configuration

6.1   Density Table Configuration Introduction

Density tables are required if the user has selected **Density Table** as a volume correction method.
The utmost care must be taken when selecting the density points to be used to get the best accuracy.
The use of this feature can be controlled by the security system.

6.2   Loading the Density Table Module

1. Select **Configuration** → **Density Tables** from the main menu.
   The Density Table module main window will be loaded as follows:
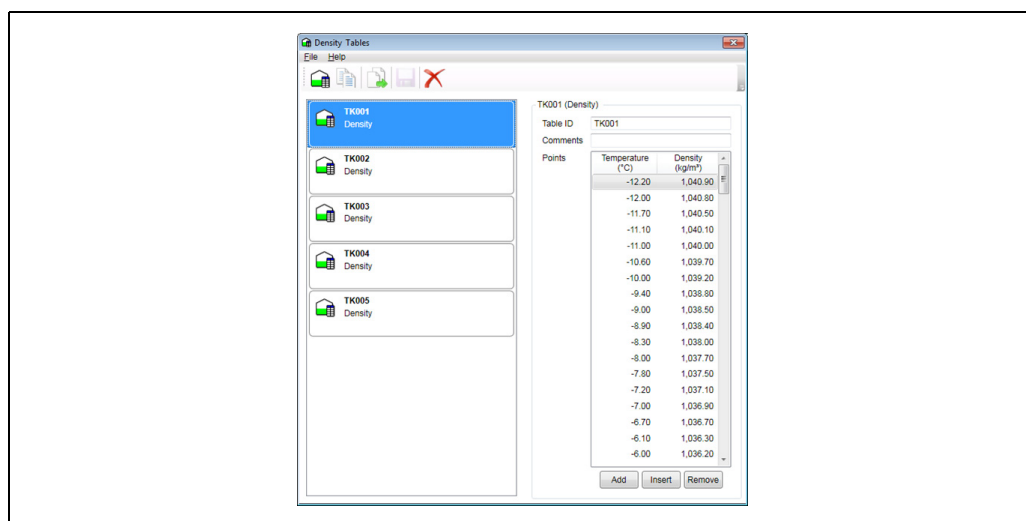
BA00390GEN_0011

The list of tables will be populated with all density tables currently configured.

ℹ️ Density tables are assigned to tanks in the **Configuration** → **Configuration** menu option.

- Selecting **File** → **New** from the menu will allow naming and editing of options and data to create a new density table.
- Selecting **File** → **Import Points** will cause the import points screen to be displayed for import of a CSV file.

6.3   Adding a Density Table

1. Select **File** → **New**.
   The new tank capacity table windows opens as follows:
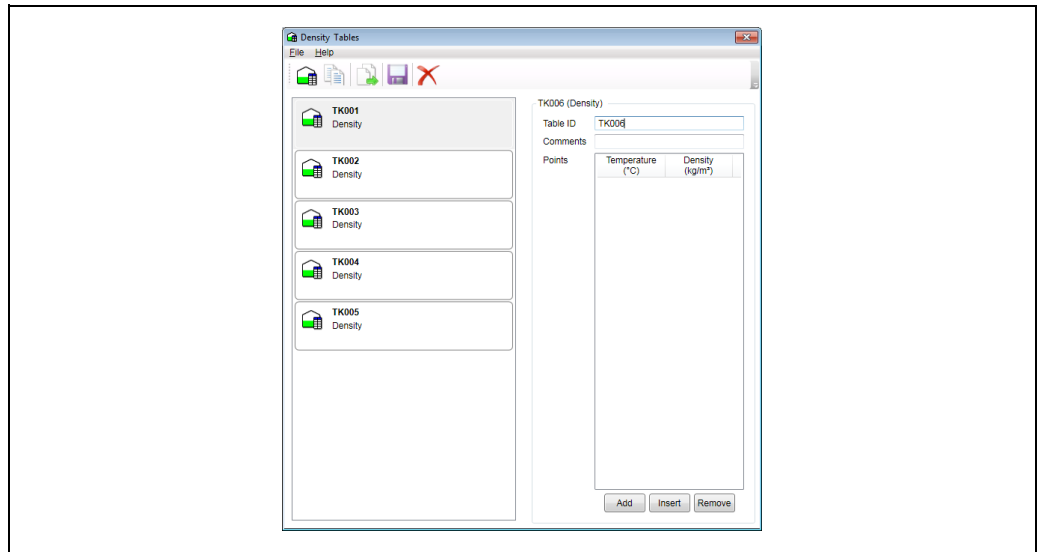
BA00390GEN_0012

2. In the **Table ID** field enter a name for the new table.
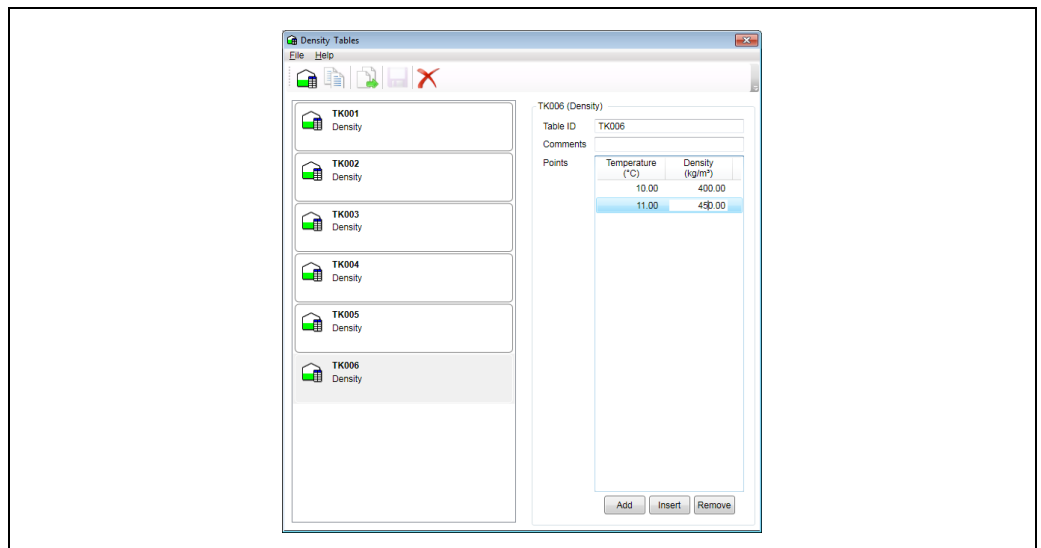
BA00390GEN_0013

3. Finally enter or import the points (up to 200) for the tank and then click **File → Save**.

6.4   Importing a Density Table

1. Select **Table → Import**.
   A dialog box will appear warning that any existing points will be replaced if you
   continue.
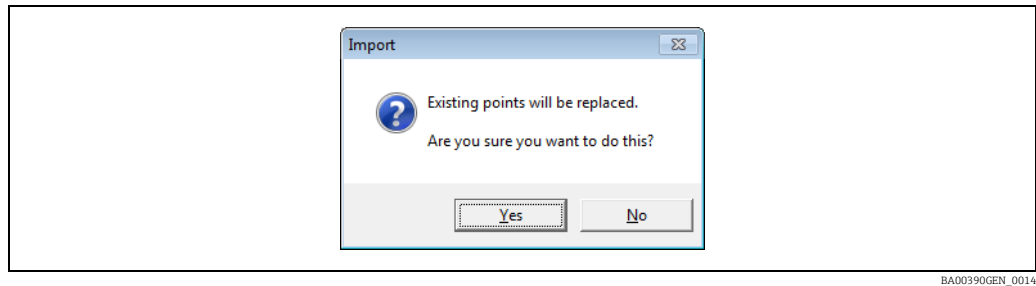
BA00390GEN_0014

If you choose to continue, you will be prompted to choose the CSV file containing the source data and given an option to change the engineering units for level and volume.
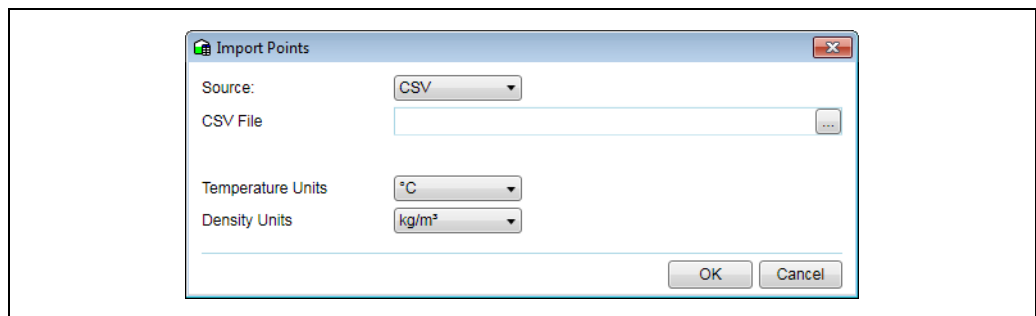
BA00390GEN_0015

Enter or browse for the source data file details.
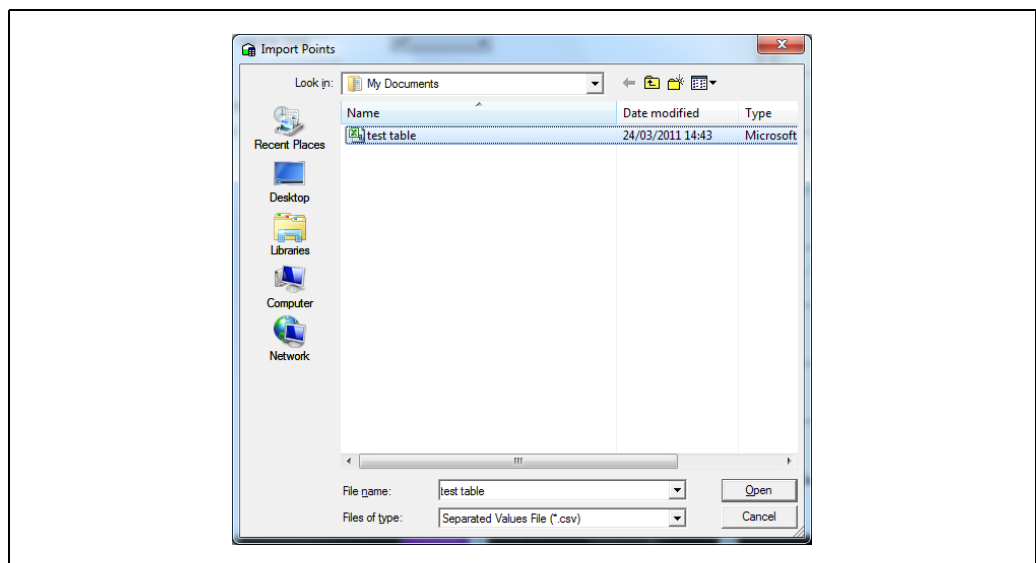
BA00390GEN_0016

2. Select the relevant file and click the **OK** button to import the calibration data into the database.
Any problems encountered whilst processing the data will be reported to the user.

6.5 Viewing Existing Tables

1. Select **Configuration** → **Density Tables** from the main menu.
The Density Table Module will be loaded as follows:
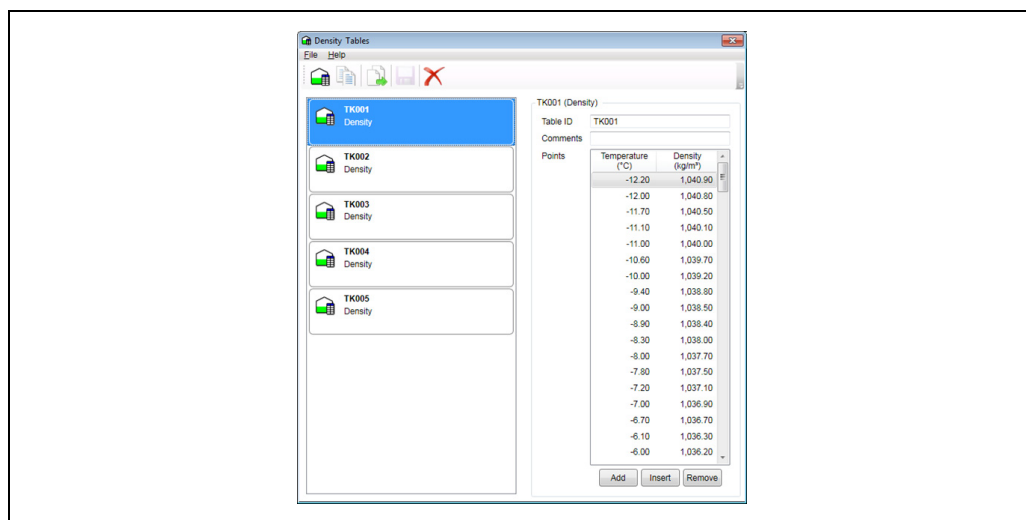
BA00390GEN_0011

2. Select a Density Table to view the points and data.

6.6   Editing Values in an Existing Table

1. Select the table to be edited from the list. If you have the necessary security access rights you will be able to edit the table of values.

2. Type in the new value and move off the row to save the changes locally to the table. The row will be deleted.

3. To save the changes to the database click the 💾 button on the tool-bar.

🛈 If the application is closed prior to saving the changes you will be prompted to save the changes.

6.7   Inserting an Extra Row

1. Select the row at which a record needs to be inserted by clicking with the left mouse button on the left hand side of the row.

2. Select the **Insert** option.
A new row will be inserted.
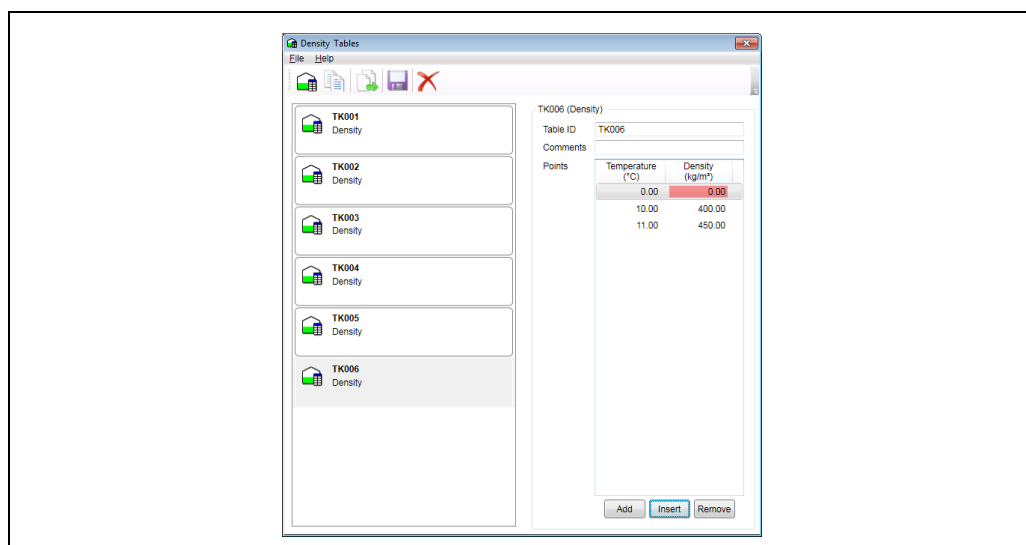
BA00390GEN_0018

3. Enter the data for the new row.

4. To save the changes to the database click the ⊟ icon on the tool-bar.

ⓘ If the application is closed prior to saving the changes you will be prompted to save the changes.

ⓘ Adding is much the same as inserting but appends a row to the end of the list of points.

6.8 Deleting Rows

1. Select the row which needs to be deleted by clicking with the left mouse button on the left hand side of the row.

2. Select the **Delete** option.
   The row will be deleted.

3. To save the changes to the database click the ⊟ icon on the tool-bar.

ⓘ If the application is closed prior to saving the changes you will be prompted to save the changes.

6.9 Validity of Data

ⓘ The user is not allowed to enter points that are out of the temperature or density range. The border around the data entry points will remain red until entered data is valid.

7 Configuration Tool

The configuration tool allows entry and editing of the main tank, device and inventory operating parameters.
It is essential that all applicable parts of this configuration are configured correctly and accurately. Failure to do so may result in loss of field communications and/or inaccurate inventory calculations.

The configuration tool can be notionally divided into several sections:

1. DCC Configuration
   a. DCC Host Settings

   b. Port Settings

2. Tank Configuration
   a. Sites
      ▶Tanks
        – Tank Properties
        – Tank Capacity Table assignments
        – Tank Metrics
        – Hybrid Settings
        – Device Mappings
        – Alternate Live Data Sources
        – Product Characteristics
        – Tank Inventory Control Settings

Within the configuration tool some data items are dependent on other settings. Indeed some fields are not vis- ible or enabled until they are called for by the setting of another parameter. These are briefly listed below.
The use of this feature can be controlled by the security system.

7.1 Inter-relation of configuration items

Some settings are specific to certain calculation methods, these are listed below:

7.1.1 Product Characteristics screen

Details Section
- JIS (Japanese Industrial Standards) Calculation Method is only enabled when a JIS Volume Correction Method and a floating roof tank shape are selected.
- Selecting GBT or GBT(Direct_Weight) implies that a Hydrostatic deformation Table is in use. Not applying such a table will result in the failure of calculated values.

VCF Settings Section
- Enraf polynomial constants A and B require the EnrafChem2Poly or EnrafChemPoly1 volume correction method. Constants C, D and E are only available when EnrafChemPoly1 is selected.
- The label 'Chemical Concentration' changes to 'Alcohol strength by volume' or 'Alcohol strength by mass' depending on the type of chemical calculation selected and should always be entered as a percentage.

Type of calculation	Label
HMD, Nitric	Chemical Concentration
OIML R22 STRxVOL	Alcohol strength by volume
JIS K2250 STRxVOL	Alcohol strength by volume
OIML R22 STRxMASS	Alcohol strength by mass

- Product Reference Temperature can only be changed if the selected volume correction method does not specify a fixed reference temperature to be used.

• Temperature Correction Factor and Density Correction Factor can only be specified if the corresponding volume correction methods of **TCF** or **DCF** (respectively) are selected.

All Sections

• It is possible to allocate certain characteristics to products using the Product Configuration tool (→ 🖹 82). If such a product is selected in the Details Section then the characteristics of that product will override and disable the corresponding settings in this configuration tool. This is made clear to the user and will be demonstrated later in this manual.

7.1.2   Tank Metrics screen

Floating roof settings are only enabled if the tank shape is set as Vertical Cylinder (Floating Roof).

7.2   Launching the Configuration Tool

1. Select the **Configuration** → **Configuration** option from the main menu.
   The initial display is shown below.
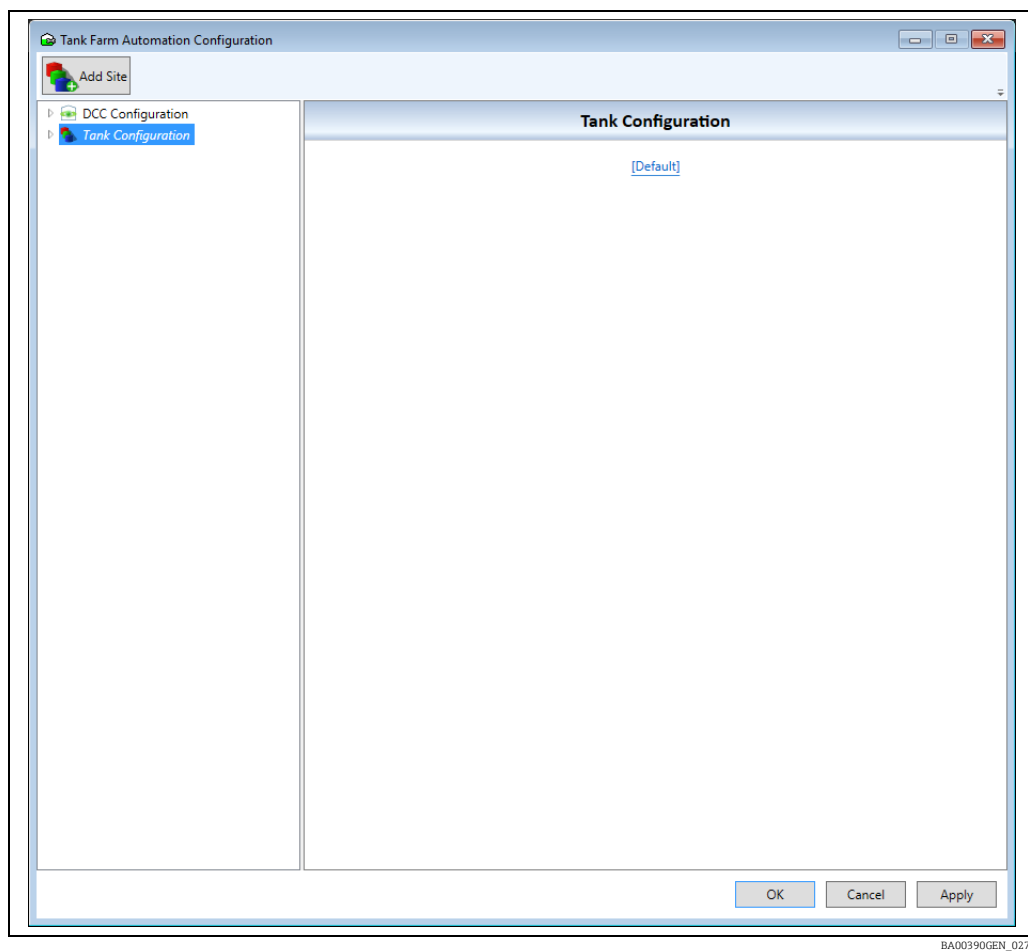
BA00390GEN_0279

Each part of the configuration tool will be dealt with below in the order shown above (→ 🖹 23).

7.3   DCC Configuration

7.3.1   DCC Host Settings

Please refer to the DCC Configuration manual BA00391G.

7.4   Tank Configuration

7.4.1   Sites

In Tankvision Professional/LMS tanks are always associated with a site which may be a user defined site or the system provided **Default** site.

Adding a site

New sites can be added either by right-clicking on the **Tank Configuration** tree item or by selecting the **Tank Configuration** tree item and clicking the **Add Site** tool-bar button (see below).
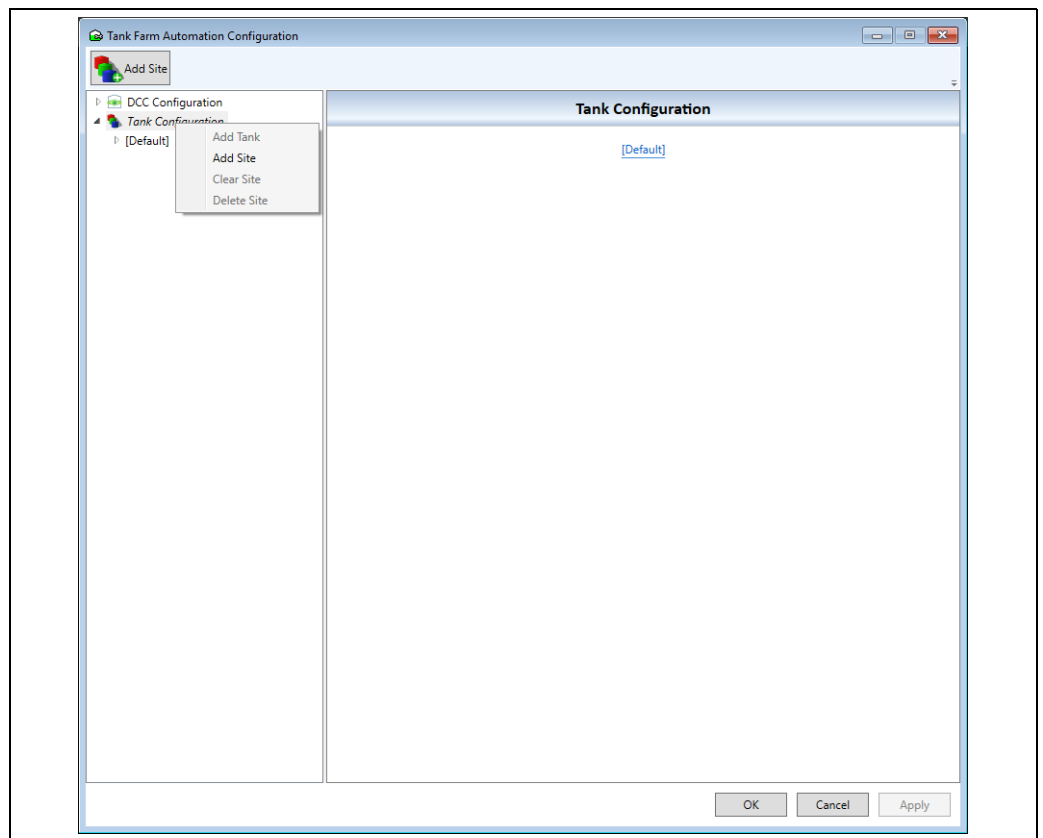
BA00390GEN_0280

Once added the site name should be changed to reflect the users' preference (see below).
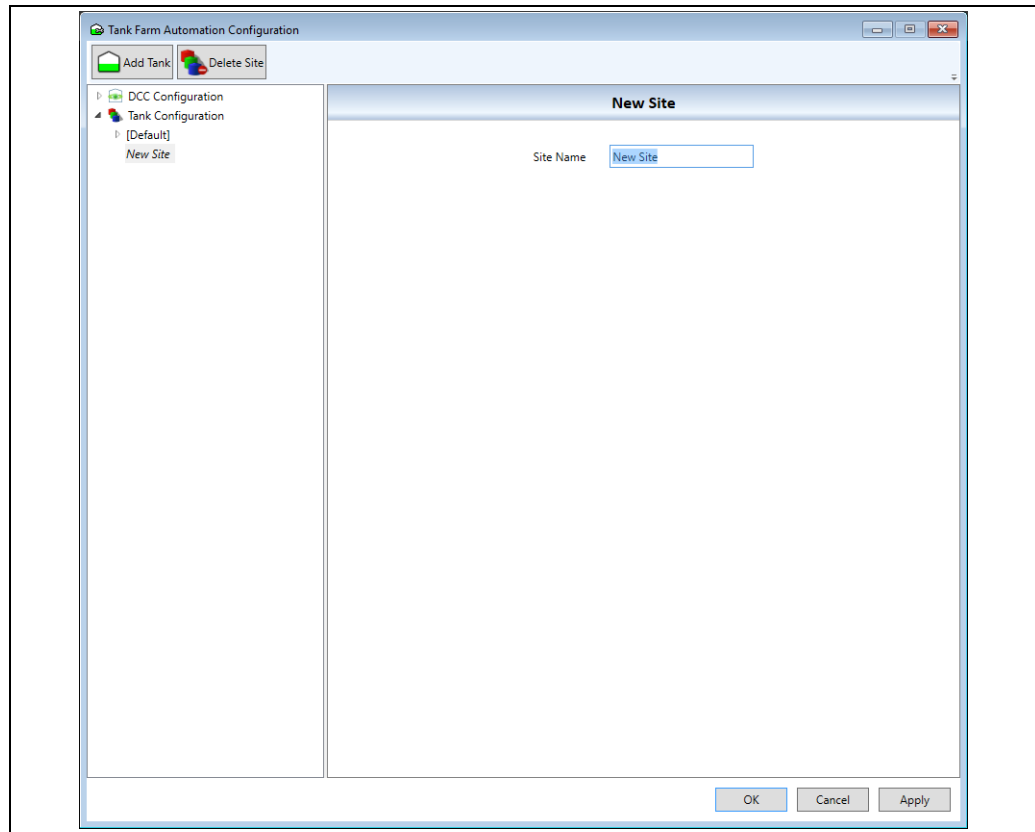
BA00390GEN_0281

Maintaining a site

There are a number of options available to maintain a site.

- **Add Tank**
  Add a new tank to an existing site.
  Either select the desired site and click the **Add Tank** tool-bar option or right-click the desired site and select **Add Tank**.
- **Clear Site**
  Clear the site of all tanks.
  Right-click the desired site and select **Clear Site**.
- **Delete Site**
  Delete the site completely.
  Either select the desired site and click the **Delete Site** tool-bar option or right-click the desired site and select **Delete Site**. The user will be presented with a warning before the site is actually deleted.
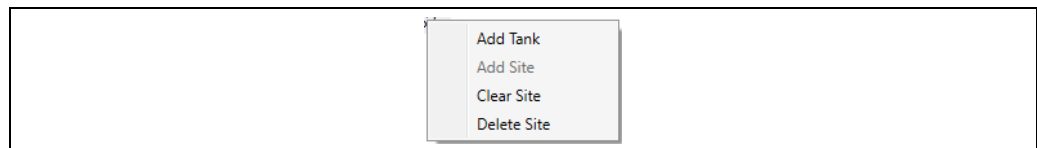
BA00390GEN_0282

7.4.2   Tanks

Expanding a site under the **Tank Configuration** section will display all currently configured tanks attached to that site.
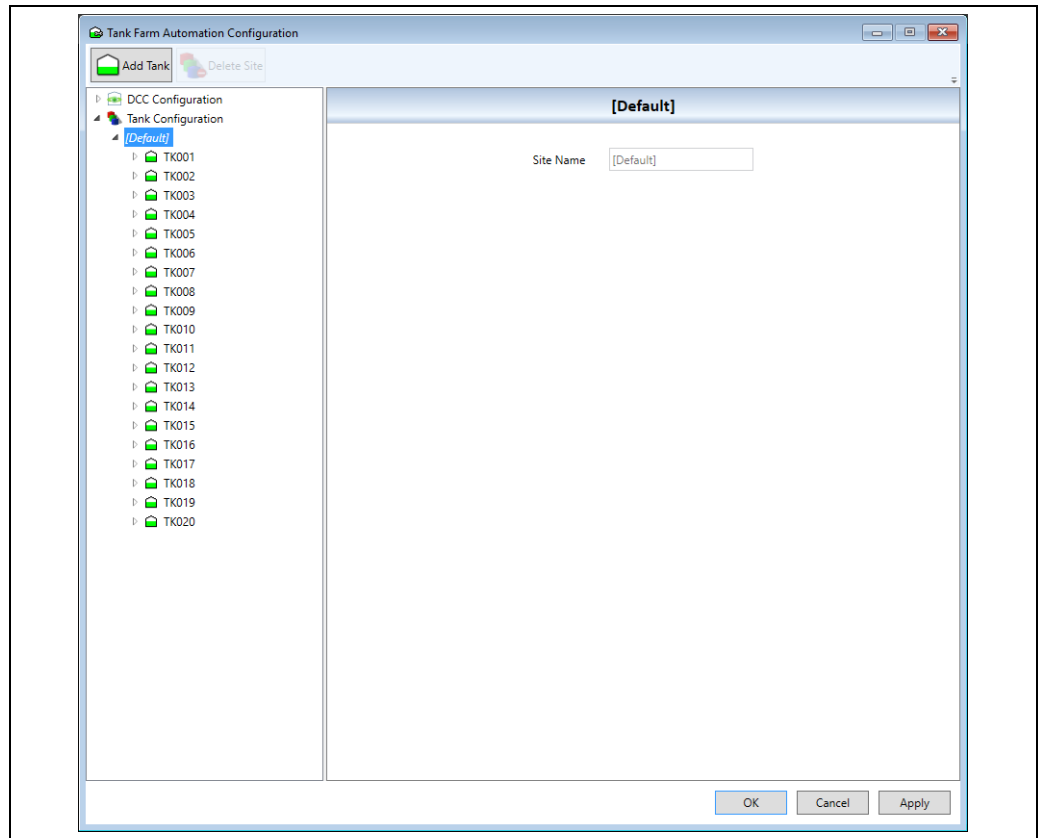
BA00390GEN_0283

Adding a Tank

To add a new tank to the tree view, right click on the site you wish to add the tank to, then click **Add Tank**. The dialog box below will be displayed:
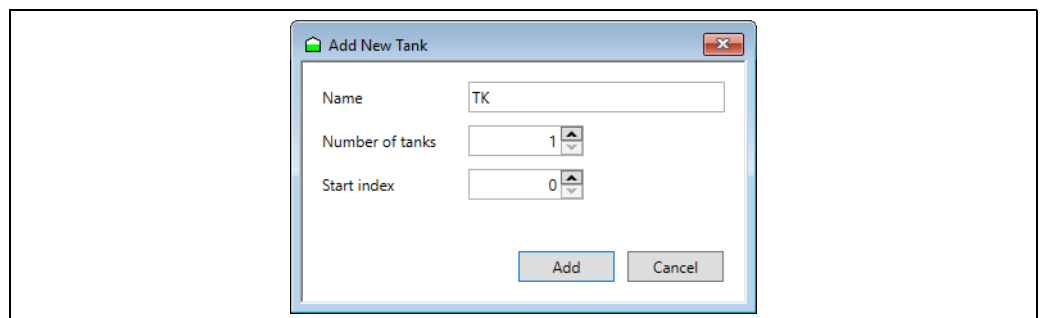
BA00390GEN_0284

Name

A template which the application uses to add multiple tanks at once. When adding multiple tanks, the tank prefix follows a specific syntax; any text characters in the field will be added to the prefix of the tank name. Any 0's indicate the trailing zeros after the prefix. E.g. if the tank prefix was 'TK000' and 10 tanks were added, they would be given the following names:
- TK001
- TK002
- TK003
- TK004
- TK005
- TK006
- TK007
- TK008

- TK009
- TK010

Number of tanks

The number of tanks that will be added. A maximum of 100 tanks can be added at once, and 5000 tanks can be added in total.

Start index

The number at which the new added tanks will start at. E.g. if the tank start count was 10 and 5 new tanks were added, the new tanks would start at 10 and count up 5 to 14.

Removing a tank

A tank can be removed by selecting the desired tank and clicking the **Delete Tank** tool-bar button or by right-clicking the desired tank and selecting **Delete Tank** from the pop-up menu.

Configuring a tank

Clicking on a tank expands the various configurable properties for that tank (see below).
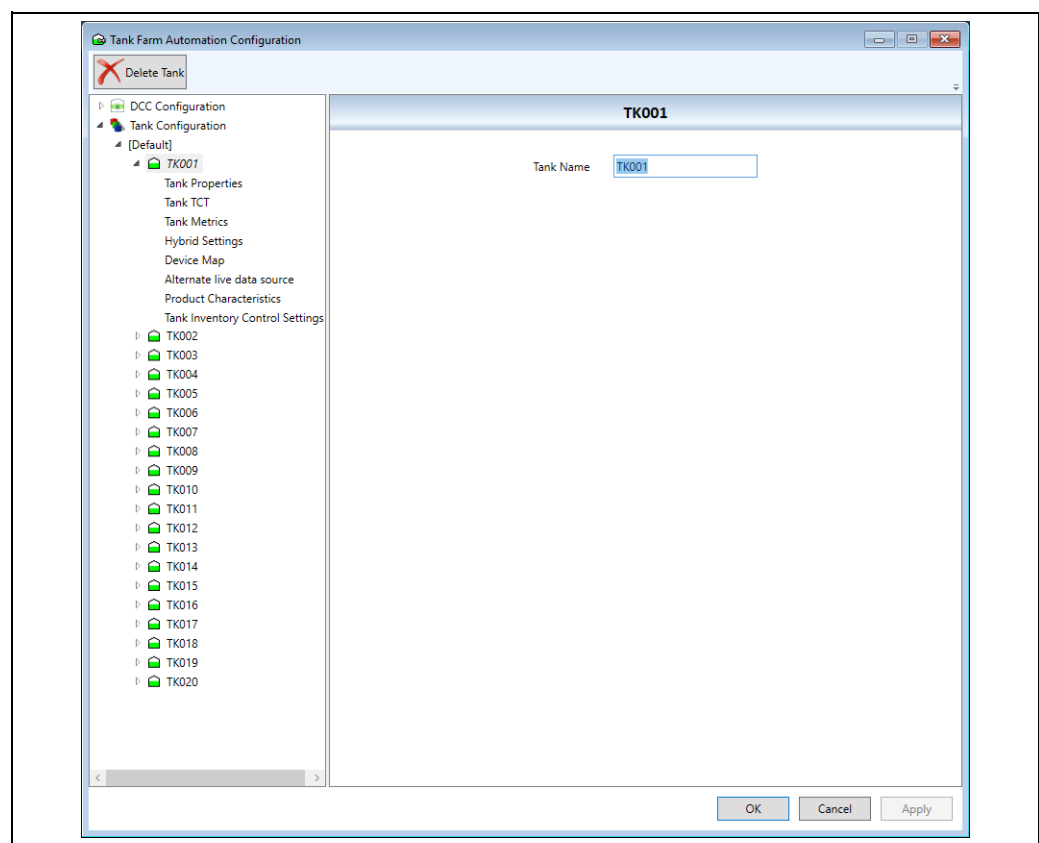
BA00390GEN_0285

In the initial screen the tank name can be edited. Clicking on any item below the tank opens the corresponding configuration section.

Tank Properties

Configure various generic properties of the tank.
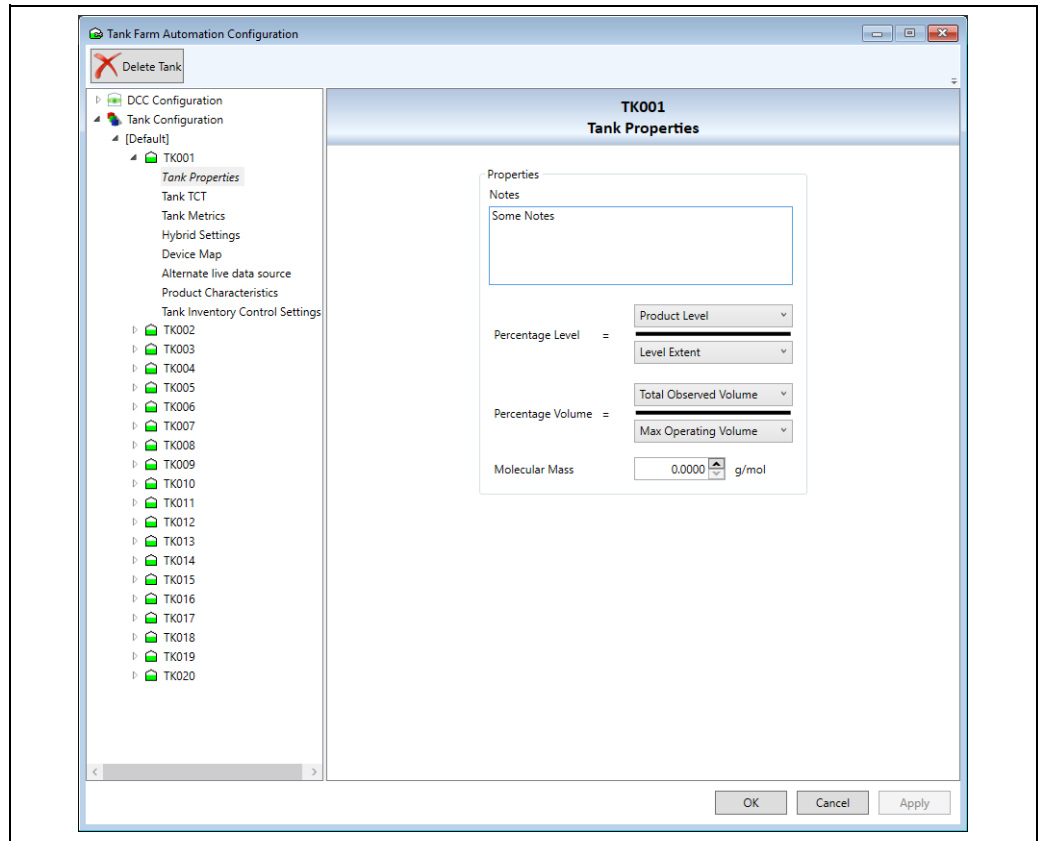
BA00390GEN_0286

Notes

Allows the user to record notes in relation to the tank. A time-stamp is recorded whenever the notes are edited.

Percentage Level

Determines which data parameters are used to produce the percentage level data value. For the settings shown in the screenshot above:
$PercentageLevel = (ProductLevel / LevelExtent) * 100$

Percentage Volume

Determines which data parameters are used to produce the percentage volume data value. For the settings shown in the screenshot above:
$PercentageVolume = (TotalObservedVolume / MaximumOperatingVolume) * 100$

Molecular Mass

The molecular mass of product in the tank.

Tank TCT

Configure properties related to tank capacity tables.
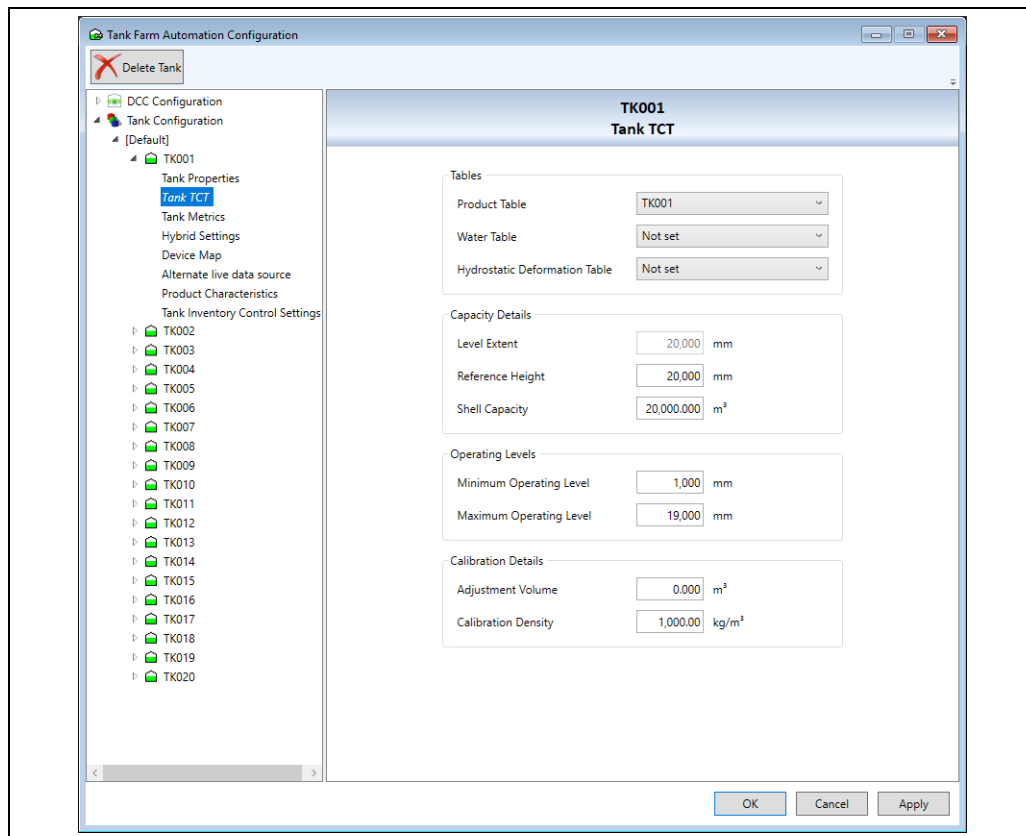
BA00390GEN_0287

Tables

- **Product Table**
  Selects the product tank capacity table to apply to this tank.
- **Water Table**
  Selects the water tank capacity table to apply to this tank.
- **Hydrostatic Deformation Table**
  Selects the hydrostatic deformation table to be used with this tank.

Capacity Details

- **Level Extent**
  This field is not editable. It displays the highest level value in the currently selected product tank capacity table for reference only.
- **Reference Height**
  The reference height for this tank.
- **Shell Capacity**
  The capacity of the entire tank shell.

Operating Levels

- **Minimum Operating Level**
  The defined minimum operating level of the tank. The accuracy of this value is important as it used to determine the minimum operating volume and consequently the amount of Usable Volume in the Tank.
- **Maximum Operating Level**
  The defined maximum operating level of the tank. The accuracy of this value is important as it used to determine the maximum operating volume and consequently the amount of Ullage Volume (Avail- able Room) in the Tank.

Calibration Details

- **Adjustment Volume**
  A fixed volumetric adjustment (either +ve or −ve) applied to the volume obtained from the Tank Capacity table. This accounts for any manifold or pipeline volume to be added or any deadwood to be removed.
- **Calibration Density**
  The density of the medium in a tank when that tank was calibrated. This setting is only relevant in JIS based calculations.

Tank Metrics

Configure settings regarding the physical properties of the tank itself.
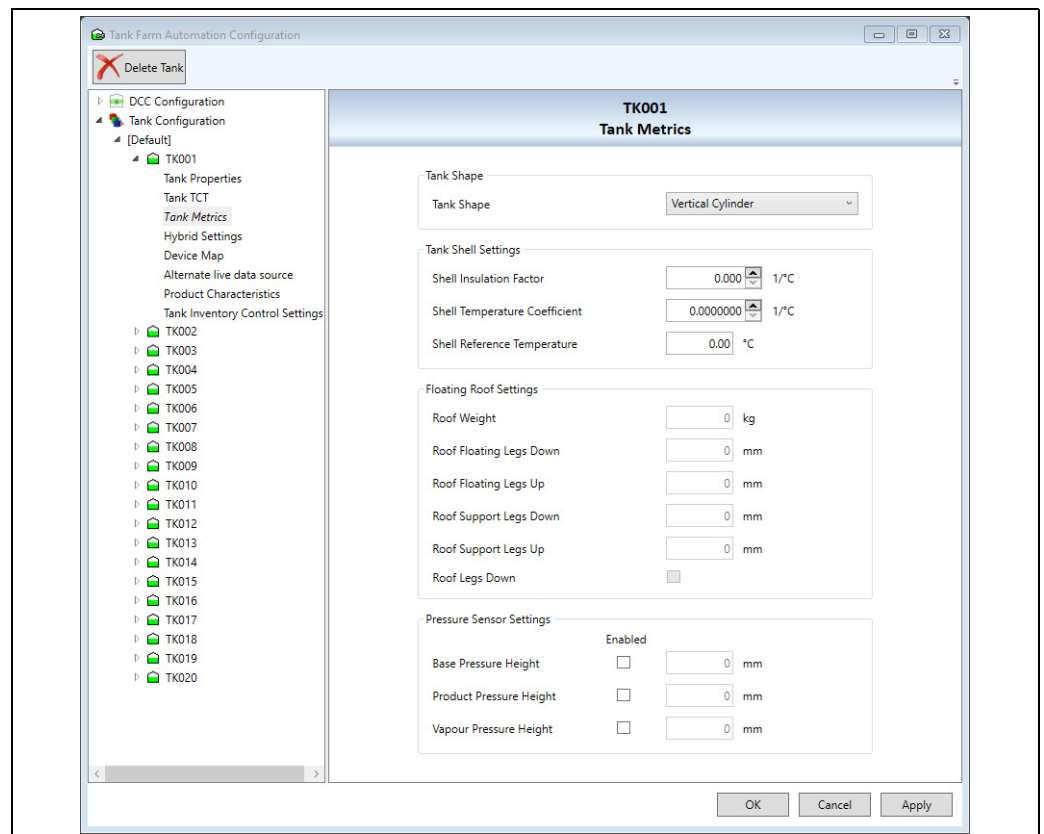
BA00390GEN_0288

Tank Shape

- **Tank Shape**
  The physical shape of the tank. Four principle tank shapes are supported:
  – Vertical Cylinder
  – Horizontal Cylinder
  – Vertical Cylinder (Floating Roof)
  – Sphere
  There are other similar tank shapes; however, most should fall into one of the above types. Vertical Cylinders that have internal floating blankets/decks should be configured as VCFR.
  It is essential that the tank shape is entered correctly as this affects the inventory calculation algorithms.

Tank Shell Settings

- **Shell Insulation Factor**
  For completely insulated storage. 0.875 is a typical value (0 for non-insulated storage)
- **Shell Temperature coefficient**

Expansion coefficient of the material the tank is constructed from. e.g. 0.0000112 for mild steel
- **Shell Reference Temperature**
Normally the same reference temperature used for your VCF calculations. (usually either 15 °C or 30 °C)

Floating Roof Settings

Some floating roofs have legs which may be set at two positions, thus altering the level at which the roof floats or is supported on the legs. Since the legs are usually attached to the floating roof, the "up" position of the legs allows the roof to descend to a lower level in the tank, and is the setting used in normal operation, whereas the "down" position causes the roof to become supported on its legs at a higher level and is the setting used for maintenance purposes. Where a tank has a floating roof with fixed or one - position legs, it is advisable to set the "Legs Up" and "Legs Down" levels to be the same, so that the Legs "Up/Down" selection becomes irrelevant.

- **Roof Weight**
The weight of the floating roof.
- **Roof Floating Legs Down**
The point at which the roof just ceases to be resting on its legs when the legs are in the "down" or maintenance position, such that the whole weight of the roof is being supported by its buoyancy in the product. Above this level, compensation is made for the displacement of the product by the full weight of the roof.
- **Roof Floating Legs Up**
The point at which the roof just ceases to be resting on its legs when the legs are in the "up" or operational position, such that the whole weight of the roof is being supported by its buoyancy in the product. Above this level, compensation is made for the displacement of the product by the full weight of the roof.
- **Roof Support Legs Down**
The point at which the roof legs are supporting the full weight of the roof when the legs are in the "down" or maintenance position. Below this level, no compensation is made for product displace- ment caused by roof weight.
- **Roof Support Legs Up**
The point at which the roof legs are supporting the full weight of the roof when the legs are in the "up" or operational position. Below this level, no compensation is made for product displacement caused by roof weight.
- **Roof Legs Down**
Indicates that the legs are in the up or down position.

The area between the Fully Supported and Fully Floating levels is generally referred to as the roof transition zone. Between these levels it is difficult to determine the proportion of the roof's weight which is being held by the legs and therefore difficult to calculate the displacement of product by the roof. For this reason this region of the tank is normally avoided during normal operation.

Pressure Sensor Settings

A pressure sensor must be enabled by selecting the check-box before it's configuration can be changed.
- **Base Pressure Height**
The level at which the Base Pressure sensor is physically mounted.
- **Product Pressure Height**
The level at which the Product Pressure sensor is physically mounted.
- **Vapour Pressure Height**
The level at which the Vapour Pressure sensor is physically mounted.

Tank Bottom Details

- **Tank Sump Volume**
  The volume of product in the bottom sump of the tank, below the measured range of the level gauge (typically below a product level of 0 mm (0 in)). The application of this value is dependant on the current tank mode. If the current tank mode includes the "Exclude Sump from Inventory" option, the value will be added to ullage volumes, otherwise it will be applied to the innage volumes.

  ℹ️ Any value entered in this field will always be applied in some way to volumes in the system. Customers whose sump volume is already included in their tank capacity tables should set this value to zero.

- **Empty Tank Threshold**
  The level used to check the tank mode state if the "Automatic Reversion to Default Tank Mode" flag is set for the current tank mode. When the product level moves above this threshold the tank mode will automatically revert back to the Default mode.

Hybrid Settings

Configure settings for hybrid (pressure derived) density calculations.
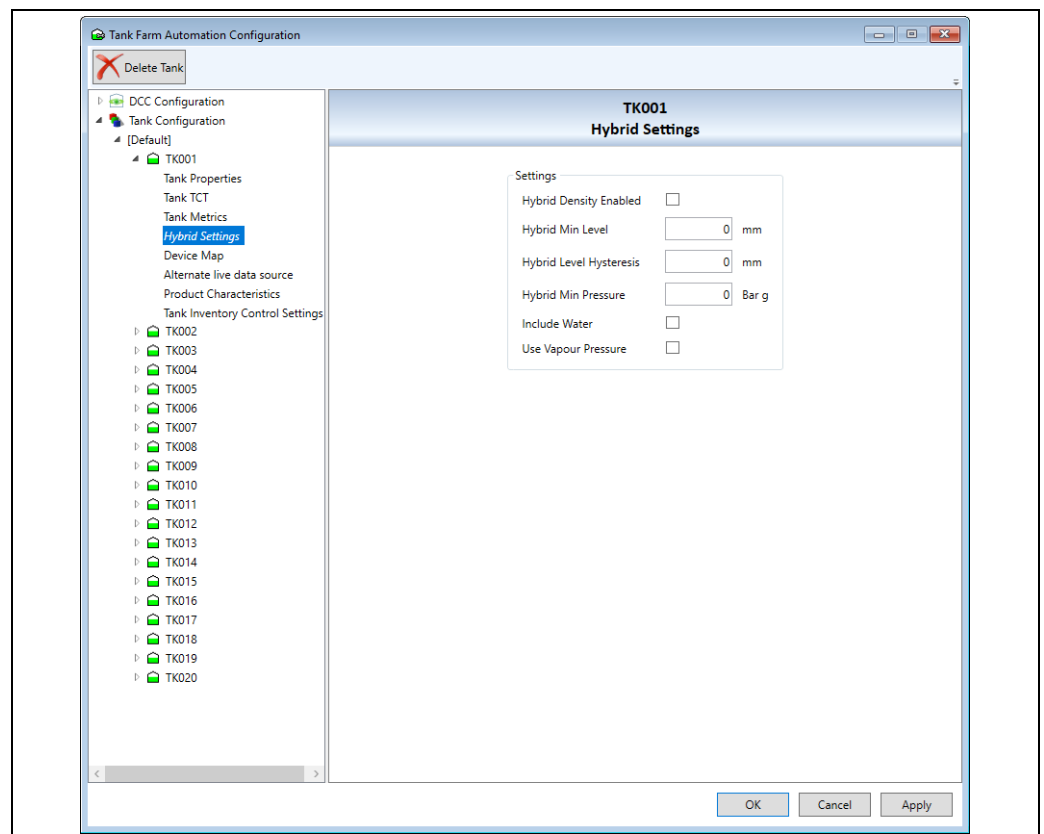
BA00390GEN_0289

- **Hybrid Density Enabled**
  Enables calculation of observed density from pressure data.
- **Hybrid Min Level**
  The minimum level above which the hybrid calculation will be carried out.
- **Hybrid Level Hysteresis**
  Hysteresis for the Hybrid Min Level value.
- **Hybrid Min Pressure**
  The minimum pressure above which the hybrid calculation will be carried out.
- **Include Water**
  Take account of water level in the hybrid calculation.
- **Use Vapour Pressure**

Include vapour pressure data in the hybrid calculation.

Device Mapping

The **Device Map** section allows the user to map previously configured devices to tanks.

BA00390GEN_0290
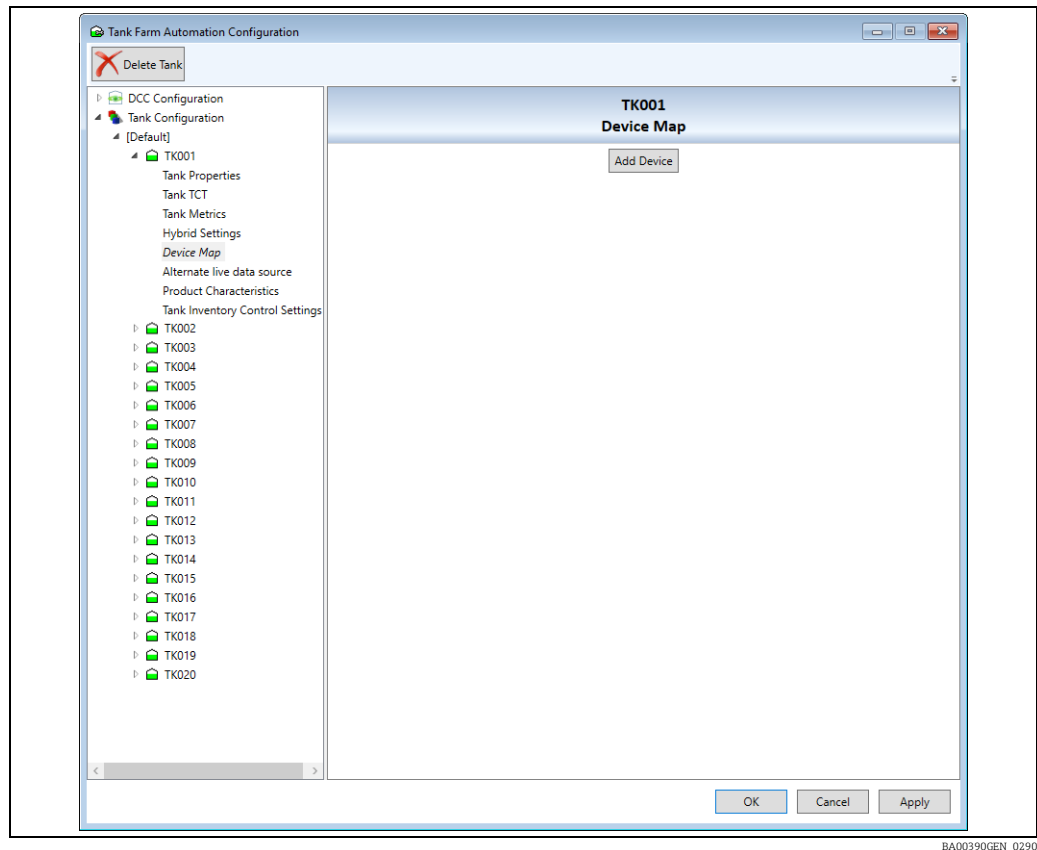
To map a device to the current tank:
- Click the **Add Device** button (see screenshot above). A device mapping entry will appear and the **Device** selection box will be populated with currently unassigned devices.
- Select the required device and select its **Duty** (see screenshot below).
- Continue adding devices as necessary.
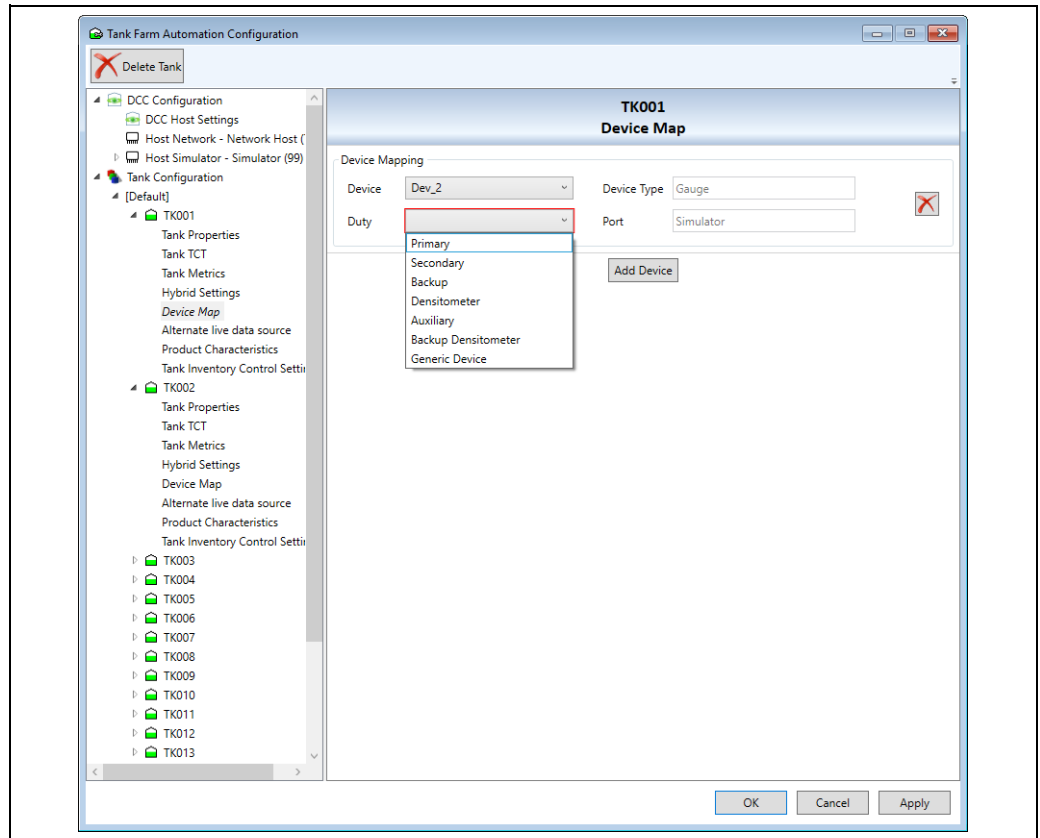
BA00390GEN_0291

Alternate Live Data Sources

These settings allow the data source for a specific data item to be changed to originate from a different device to that attached to the current tank.

Clicking one of the drop down selection boxes displays a list of available devices. Clicking **Reset to primary device** resets all the fields to their defaults.

For example, it is possible to direct the system to read Observed Temperature for tank **TK001** from the primary device on **TK007** by selecting the relevant device for **TK007** in the **Observed Temperature Data Source**. This will instruct the system to override any value read from **TK001** devices for this data value and instead use the value from the selected device on **TK007**.

The system will use the value from the alternate device even if the device does not support the data item or the data item is invalid.

BA00390GEN_0292
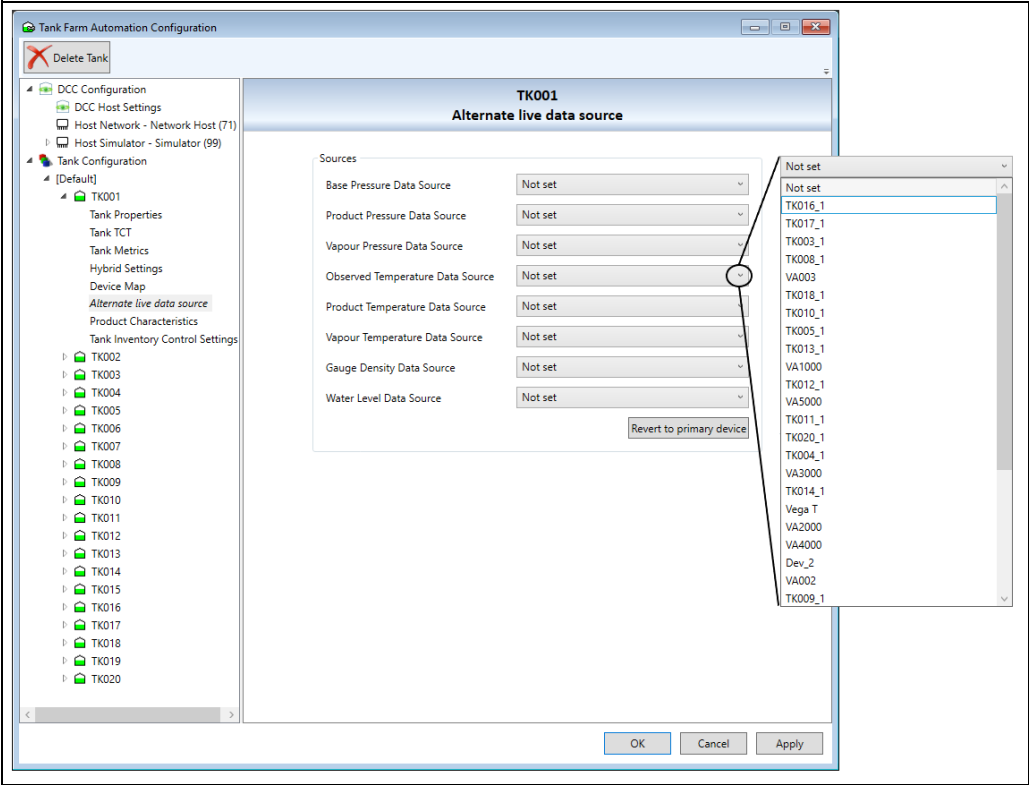
Product Characteristics

Configuration items relevant to the product contained in the tank.

BA00390GEN_0293
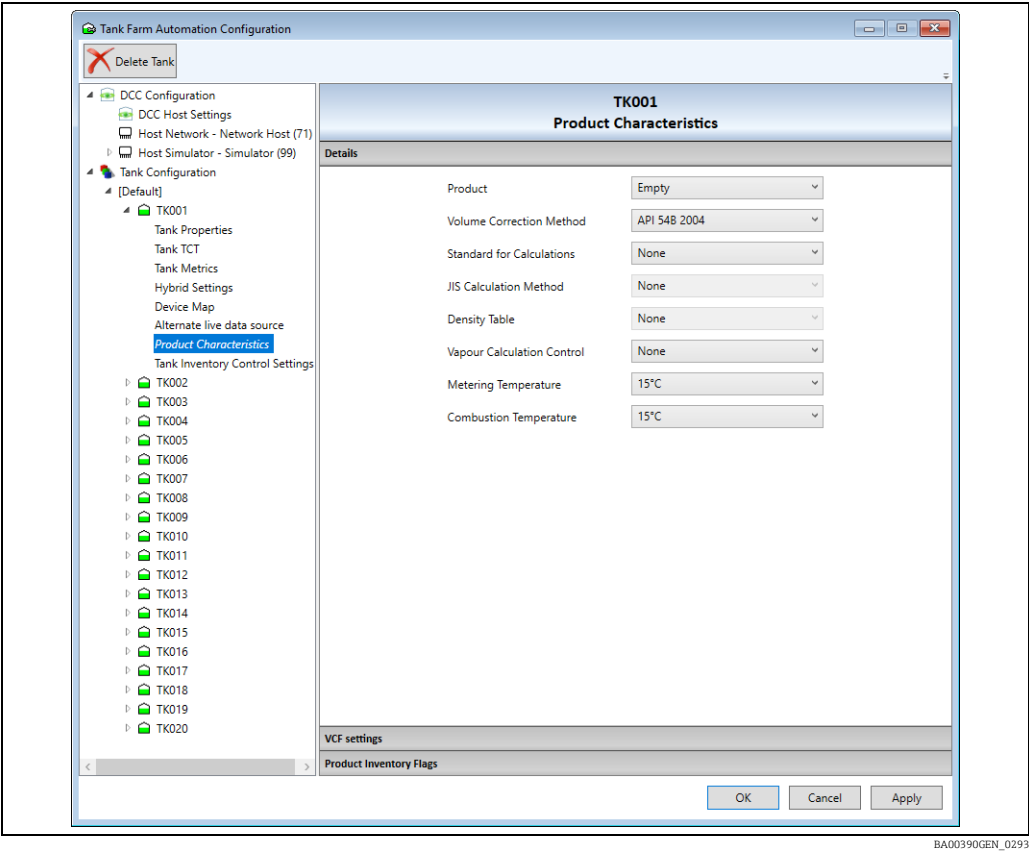
Details

- **Product**
  Specifies the pre-configured product to be stored in the selected tank. Products can be configured to have certain pre-selected characteristics attached to them. Products with characteristics are identified by being highlighted in yellow. Selecting a product with characteristics will override and disable certain settings within the configurator tool – an alert message is displayed in green at the top of the window to warn the user of this as shown below. The values that will be overridden are those configured as product characteristics in 'Product Configuration' (→ 🖹 82).
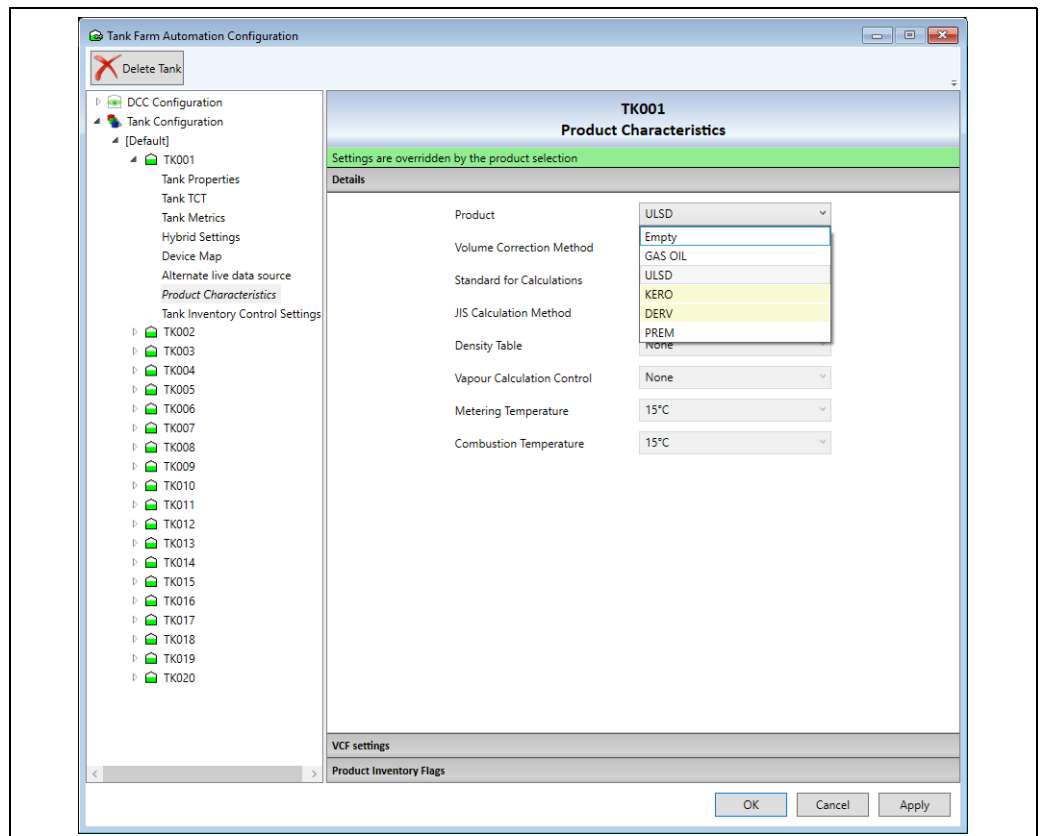
BA00390GEN_0294

- **Volume Correction Method**
  Here the method to use for volume calculations is chosen. It is essential that the volume correction method is selected correctly as this affects the inventory calculation algorithms.
- **Standard for Calculations**
  By selecting a suitable calculation method, the user can cause some of the calculation settings to be pre-set to values which are the accepted (or defined) default for the relevant standards body or type (→ 🖹 140). These settings are then locked. If the user wishes to change these locked values, the Standard for Calculations must be reset to 'None'. Certain calculation types rely on this setting. For example, Hydrostatic Deformation will only be included if the Method of Calculation has been set to GBT or GBT (Direct Weight).

  ℹ️   In the case of JIS MDP calculations, setting the control flag **VCF is restricted** forces the rounding of input data to use +/- 0.002 kg/l and +/- 0.25 °C for density and temperature respectively.

- **JIS Calculation Method**
  Specifies the handling of floating roof corrections within JIS calculations. This option is only available upon selection of a floating roof tank shape and a JIS volume correction method.
- **Density Table**

Specifies the density table to be assigned to this tank. This setting is only available if a Density Table volume correction method is chosen.

- **Vapour Calculation Control**
  Specifies the vapour correction calculations that will be performed as part of the inventory calculations. None means that no vapour correction will be performed.
- **Metering Temperature / Combustion Temperature**
  The specified temperature at which the amount of fuel to be burned is notionally determined for calorific calculations.

VCF Settings
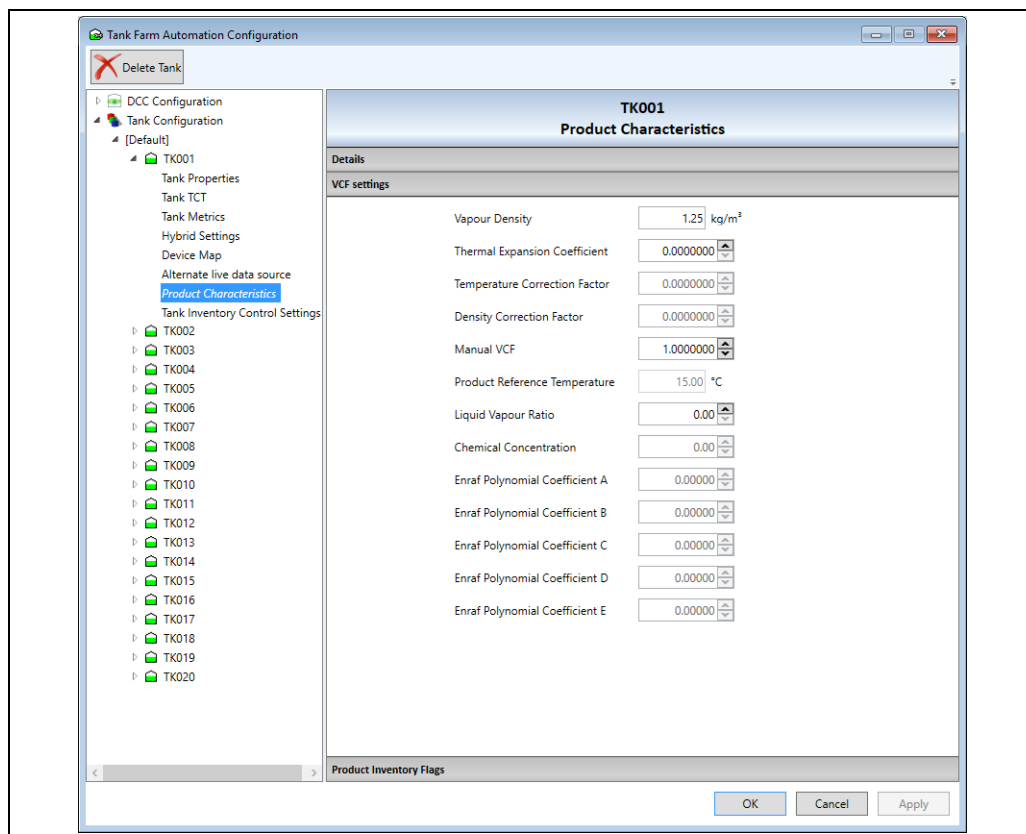
BA00390GEN_0295

- **Vapour Density**
  The Average density of vapour above product.
- **Thermal Expansion Coefficient**
  The volumetric expansion coefficient (or alpha) factor of the product in the tank.
- **Temperature Correction Factor**
  The temperature correction factor for the product.
- **Density Correction Factor**
  The density correction factor for the product.
- **Manual VCF**
  Volume Correction Factor that will be used if the **Manual** volume correction method is selected.
- **Product Reference Temperature**
  A custom reference temperature for the selected volume correction method. This may only be changed if the volume correction method chosen does not specify a product reference temperature.
- **Liquid Vapour Ratio**
  The ratio of liquid to vapour.
- **Chemical Concentration**

The 'strength' of the product. This may also be displayed as **Strength by Volume** or **Strength by Mass** depending on the choice of volume correction method (→ 🖹 23).
- **Enraf Polynomial Coefficients A-E**
Coefficients defining a curve fit of tank capacity table data.

Product Inventory Flags

BA00390GEN_0296

These settings control the way the inventory calculations are performed in relation to the product in the tank (→ 🖹 141).

Tank Inventory Flags
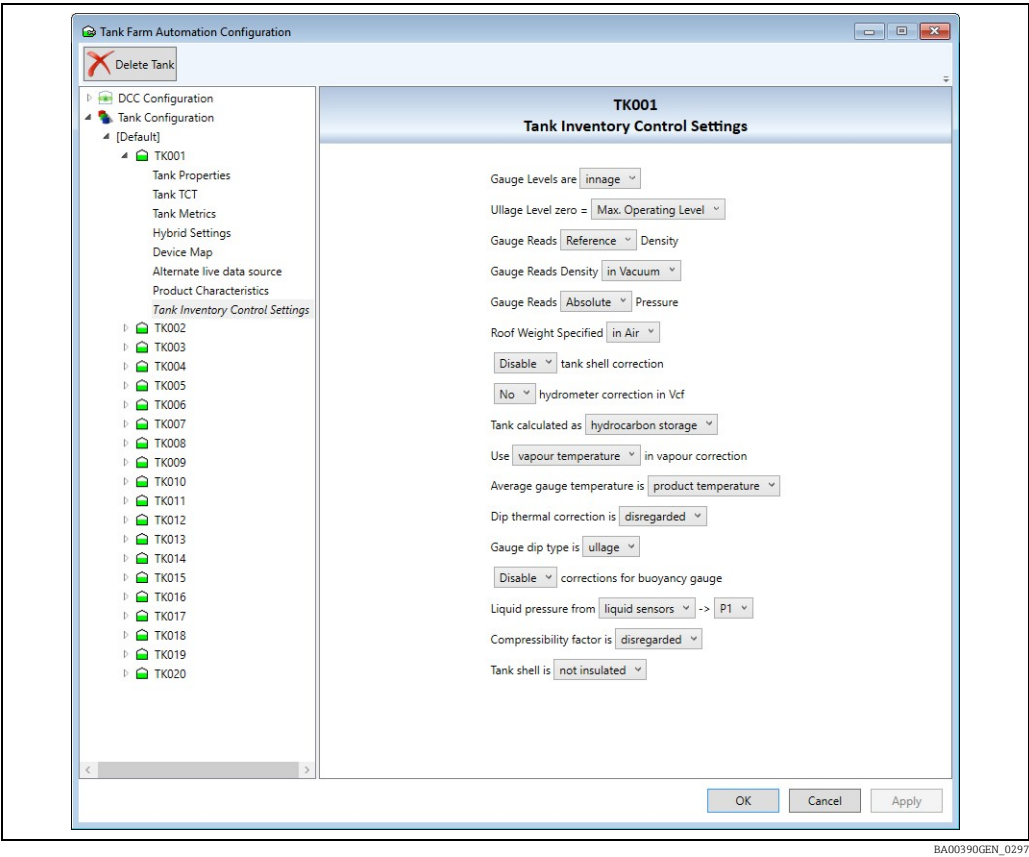
BA00390GEN_0297

These settings control the way the inventory calculations are performed in relation to the tank itself (→ ▤ 142).

8   Alarm Configuration

The alarm/event sub-system included with the system is highly configurable.
Access to the feature can be controlled by the security system.

8.1   Alarm Overview

The alarm/event sub-system is based on a Windows service.
The alarm system consists of an EventServer which distributes alarms and events as they occur to any connected AlarmEventViewer clients.
The EventServer may be configured to distribute only a sub-set of alarms to individual AlarmEventViewer clients and each client may be configured to display and annunciate alarms as required.
The AlarmEventViewer is the principle way of viewing alarms and only one instance runs per machine, although multiple client machines may connect to a single EventServer.
The following is a typical view of an Alarm Event Viewer:
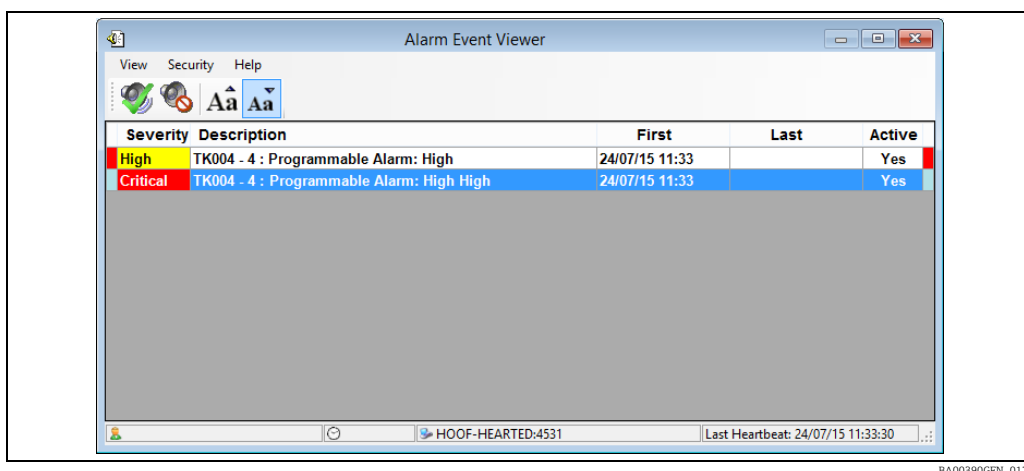
BA00390GEN_0171

8.2   Event Server Configuration

The Event Server's role is to send new alarm notifications to any Alarm Event Viewer clients connected to the system. These could be locally on the same PC or on networked client PCs.

The Event Server may be configured for a range of functions, including:
• Defining the severity of alarms.
• Defining what text to display for an alarm.
• Determining what alarms are sent to individual clients.

The Event Server also monitors the health of the alarm sub-system and if any of the following services fail, then an Event Subsystem Failed alarm will be sent to all client viewers:
• DCCHost
• RTDBAccessor

8.2.1   Configuring the Event Server

To configure the Event Server, proceed as follows:
1. Right click on the **Service Manager** icon in the Windows system tray and select the **Event Server Service → Event Server Config** option.
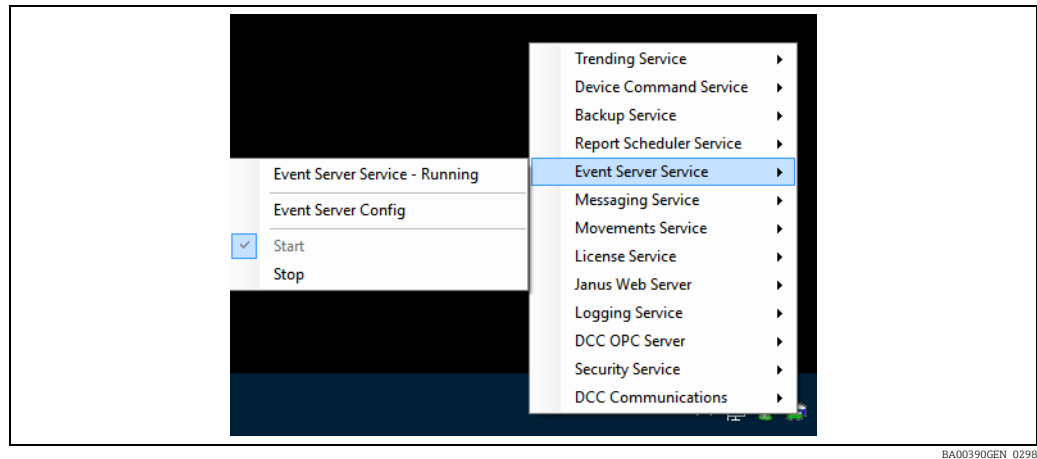
BA00390GEN_0298

2. Expand the left hand panel to select one of the areas to edit, or click on the underlined item in the right hand panel.
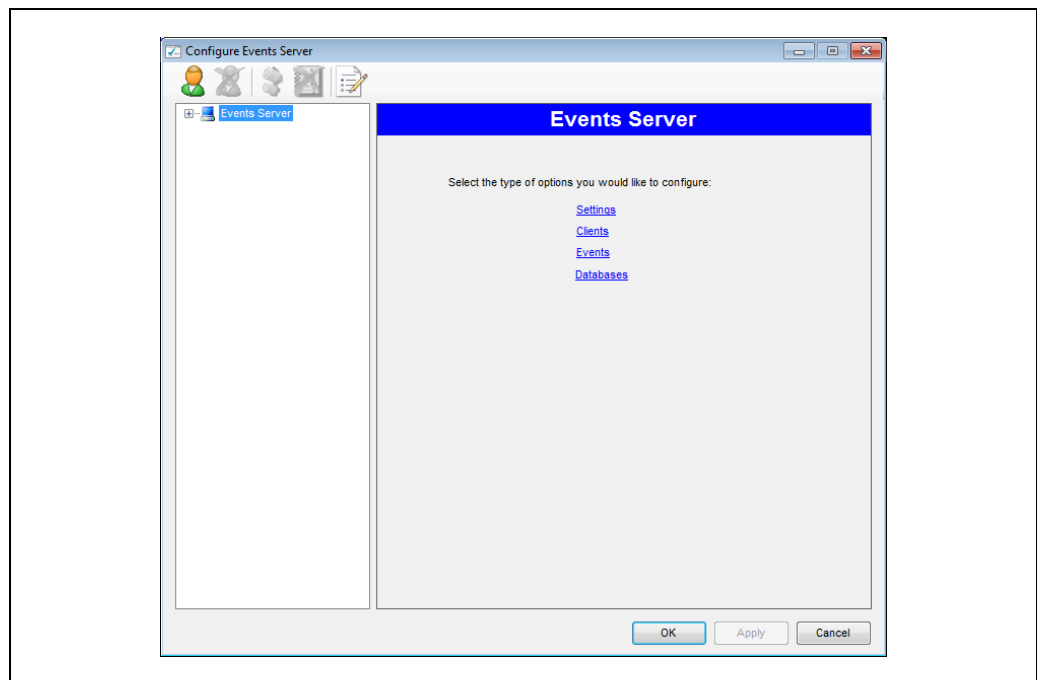
BA00390GEN_0036

The four selections are:
- **Settings**: Configure the internal settings for the Event Server
- **Clients**: Configure any unique client definitions
- **Events**: Configure the definition for each alarm/event type
- **Databases**: Configure the database maintenance parameters

There are toolbar icons to add/remove a client, override or remove over-ride for an alarm and to change event options.

8.2.2 Settings

This page allows various settings for the Event Server itself to be configured. Generally speaking, most of these should be left as their default values.

BA00390GEN_0265
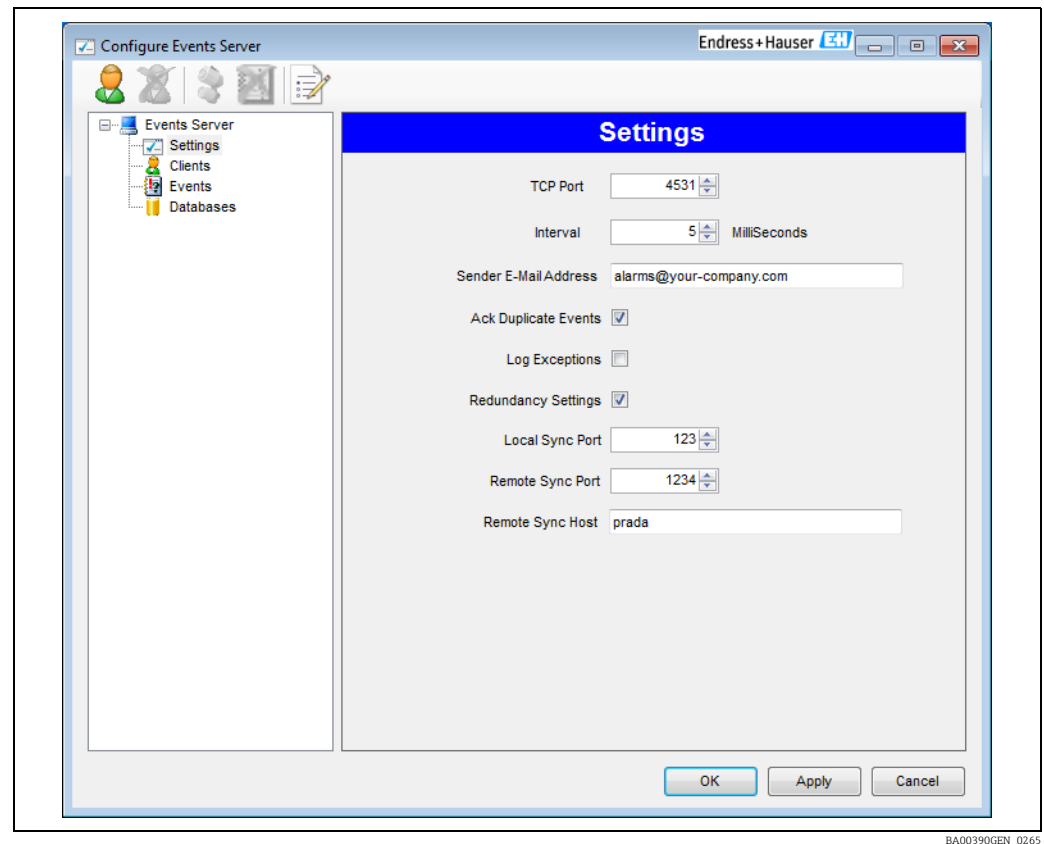
The following settings may be configured:

TCP Port

This is the network port used to listen for connections from Alarm Event Viewer clients. If this is changed then any Alarm event Viewer client should have their configuration changed to match it. This value should only be changed if there is a clash with some other software running on the PC.

Interval

This is the update time for the server, increasing it will slow down alarm updates. It should not be changed unless the PC is running at a very slow speed.

Sender E-Mail Address

This is the e-mail address displayed in the sender field of any e-mails that are sent containing alarm details.

Ack Duplicate Events

By default this item is ticked, in which case if there are multiple occurrences of the same alarm in the database then acknowledging one will acknowledge all of them. If this item is unticked then each alarm has to be individually acknowledged. This should only be unticked if clients are using the Legacy Mode for events.

Log Exceptions

If this is ticked then any problems that the server encounters will be logged to a file on the hard drive. The file will be called Event.Server.Exceptions.txt and will be located in the standard install directory for tank gauging.
It may be useful to log errors to assist in diagnosing network access problems.
For instance if a remote client on the network is not receiving automatic updates of events then it may be due to a number of problems such as the Windows firewall blocking on the client. This would show up in the log file on the server.

Redundancy Settings

This setting needs to be configured to create alarm synchronization among the redundant pairs. Alarm synchronization means that acknowledging alarms on one server automatically acknowledges the alarms on the second server. By default this option is unticked. Selecting this option enables the following options.

Local Sync Port

Port number used by the local Event Server to listen for connections from the remote Event Server on the redundant partner machine. This can be any number and that needs to be provided as the **Remote Synch Port** in another server.

Remote Sync Port

Remote port number used by the local event server to listen for connections from the local Event Server on the redundant partner machine. This number should be same as the **Local Sync Port** on the other server.

Remote Sync Host

Host Name of the redundancy partner.

The above settings must be completed on both servers of a redundant pair.

8.2.3   Client Definitions

This page allows the alarm/event sources for clients to be configured. For example, clients can be configured to only receive alarms for a sub-set of the tanks, or to receive nothing at all.
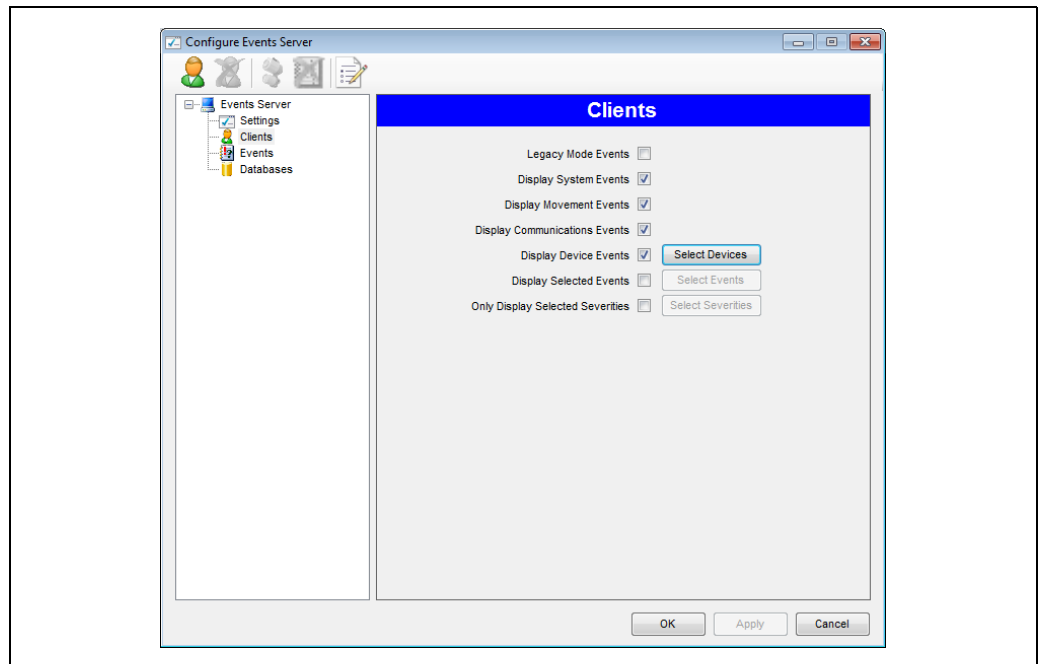
BA00390GEN_0039

The client name is either:
- The name of the client PC on the network (including the name of the PC that the server runs on, as the Alarm Event Viewer on that machine counts as a client), and must be unique.
- The telephone number of a mobile telephone which is to be used as an SMS client.
- The e-mail address which is to be used as a client for e-mailing alarms.
- The port name which is connected to an ASCII printer which is to be used to output alarms.
- The telephone number of a telephone which is to be used as a voice client.
- The name of a radio network (configured in the messaging service or remote radio module) which is to be used to broadcast alarms as radio messages.

Add Client

Clients may be added or deleted as required.
There is always a client called **default** which cannot be deleted and this is used as the definition for a connecting client if one does not exist. For most standalone systems no extra client definitions are required, as the default will be used.

To display a client definition:

1. Select it from the **Show settings for** list. All parameters on the screen will be set to the selected client.

To add a new client definition:

1. Click on the **Add Client** button which will open a dialog.
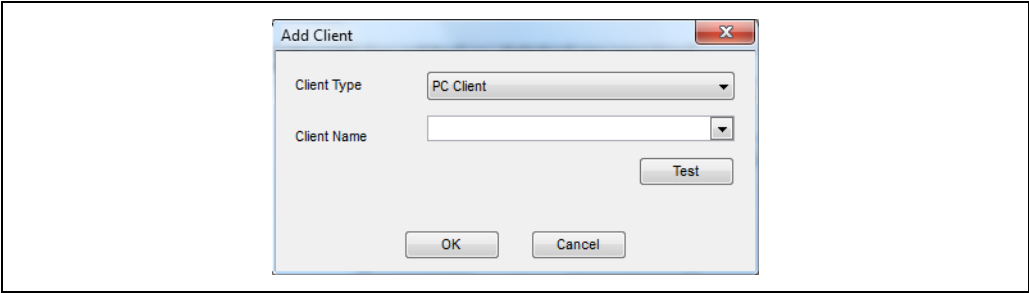
BA00390GEN_0040

2. Select the type of client required:

Client Type	Identity	Details
PC Client	Client Name	The name of the client PC on the network. This can either be typed in, or selected from the dropdown list of available PCs.
Mobile Phone (SMS)	Phone Number	Only available if the feature is licensed. The telephone number of the mobile phone which is to act as an SMS client.
E-Mail (Plain Text)	E-Mail Address	The e-mail address which is to act as a recipient of plain text e-mail messages containing alarm details.
E-Mail (HTML)	E-Mail Address	The e-mail address which is to act as a recipient of HTML e-mail messages containing alarm details.
ASCII Printer	Port Name	The name of the COM port the ASCII printer is connected to.
Radio	Radio	Only available if the feature is licensed. Selected from a dropdown list of the radio networks configured in the messaging configuration.
Remote Radio	Radio	See **Remote Radio Client Configuration** for details.
Telephone	Phone Number	Only available if the feature is licensed. The telephone number of a phone which is to act as a voice client. There is an additional field (Use Outside Line) which indicates if an outside line is to be used as configured in the messaging service configuration.

3. Click **OK** and the new client will be displayed in the list and the parameters will be cleared.

Delete Client

To delete a client definition:

1. Select the client in the list and click on the **Delete Client** button.

ℹ️ Deleting a PC client definition will not stop the client from receiving alarms. It will simply use the default definition.

For each client the following parameters may be configured:

Remote Radio Client Configuration

The remote radio client is a special case and requires additional configuration when being added. The client is a standalone Radio Module which connects to the site radio and is available separately from your supplier. When the **Remote Radio** option is selected, a button is available which gives access to the configuration parameters:
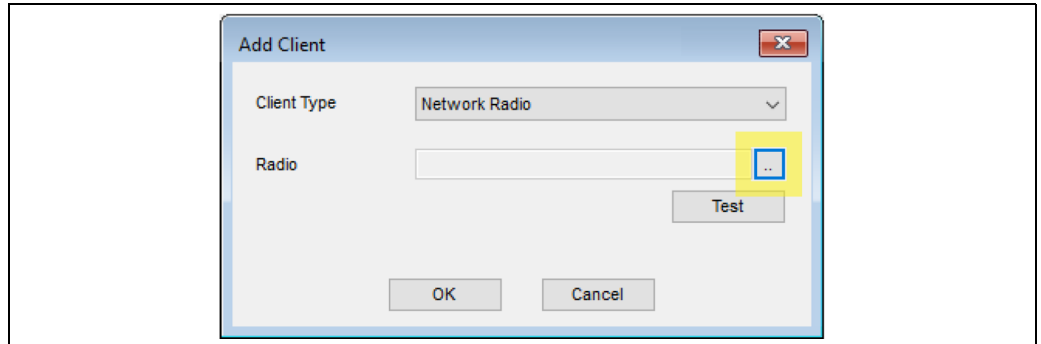
A0043773

Clicking this button will display the network radio settings screen.

The configuration fields are:
- **Radio**
  The name of the radio to be used to broadcast the alarm. This must match the name of the radio configured in the Radio Module at the given address
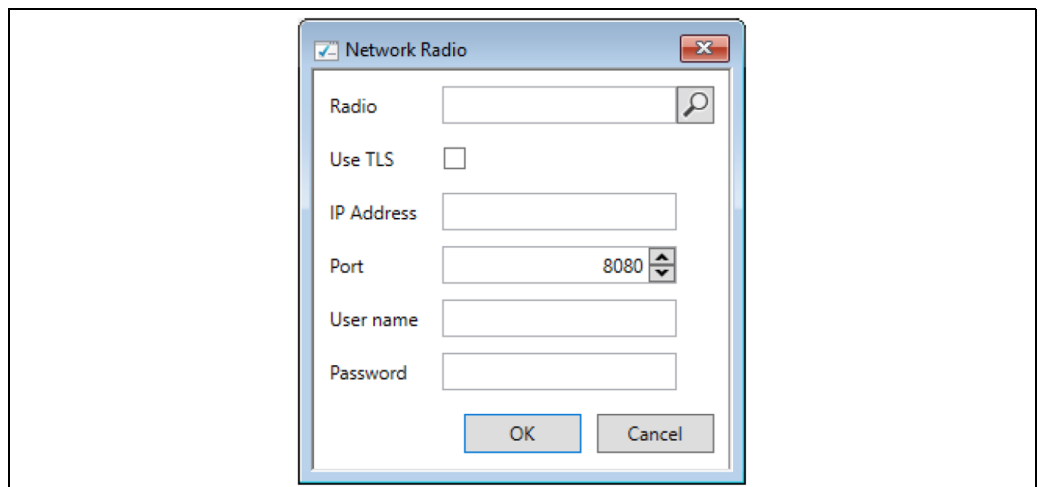
A0043774

- **Use TLS**
  Indicates whether transport layer security is to be used to connect to the Radio Module
- **IP Address**
  The network address of the Radio Module
- **Port**
  The port used to connect to the Radio Module. This must match the number of the port configured in the Radio Module at the given address
- **User Name**
  The user name required for operations if the Radio Module has been configured to use operation security
- **Password**
  The password required for operations if the Radio Module has been configured to use operation security

It is also possible to search for Radio Modules that are connected to the network. To do this, click the **Search** button 🔍. This will display the **Find Network Radios** screen:
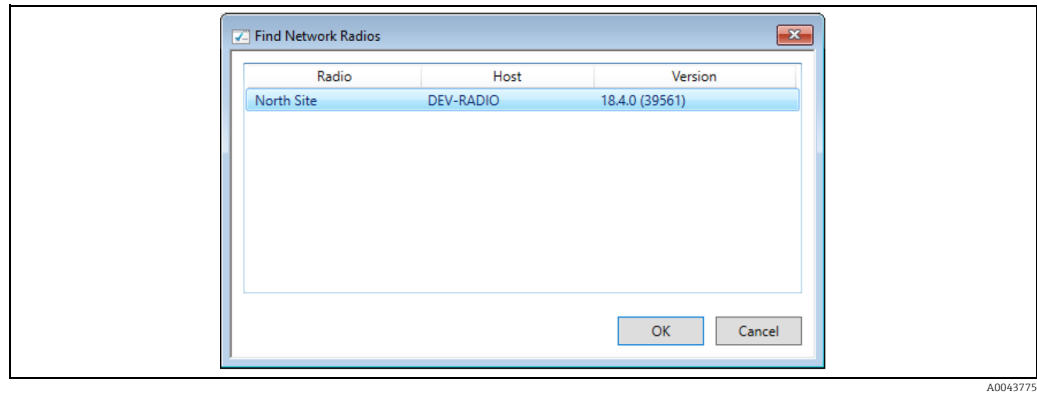
A0043775

Selecting the required radio and then clicking the **OK** button will close the screen and populate the configuration screen with the radio details. NB. This does not include the user name and password. If these are required they must still be entered manually.

Legacy Mode Events

This sets the client in the same mode as used on older versions of the tank gauging system, where multiple occurrences of the same alarm will each have their own entry displayed and will have to be acknowledged individually.

Display System Events

Certain alarms or events are defined as system events, such as system failure events etc. The annunciation of these can be prevented on a client by unticking this box.

Display Movement Events

Events generated by the Movement Server service can be stopped from being annunciated on a client by unticking this box.

Display Communications Events

The DCC Host service generates a range of communication events, such as Communication Failure events, or Failed to Connect events etc. These can be stopped from being annunciated on a client by unticking this box.

Display Device Events

Device events are the main set of alarms generated for tanks, such as Level Alarms, Temperature alarms etc. These can be stopped from being annunciated on a client by unticking this box. These represent the main events in the tank gauging system and generally should not be disabled.

Display Selected Events

This allows the filtering of events so that only specified events are sent to the client.

Only Display Selected Severities

This allows the filtering of events so that only events of specified severities are sent to the client.

Select Devices

It is possible to configure a client to only receive events from specific devices/gauges. These can be specified by clicking on the **Select Devices** button.

This will launch the **Select Devices** screen:
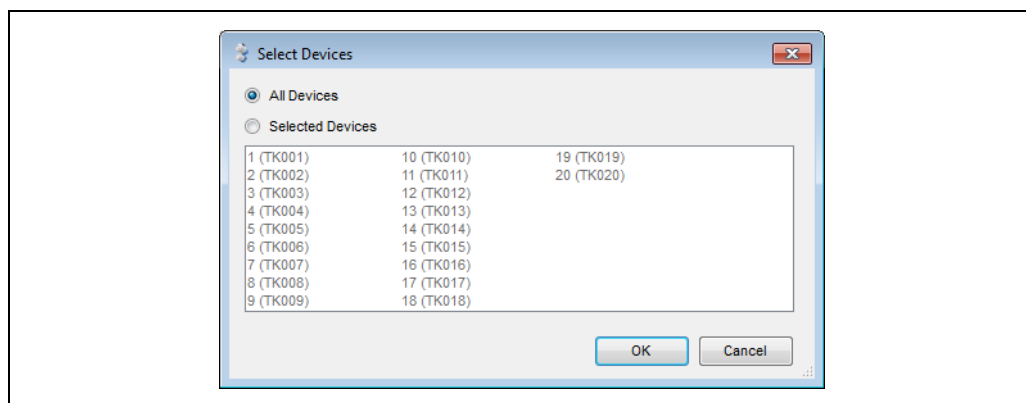
BA00390GEN_0041

To add a device, choose the **Selected Devices** button, highlight it on the list and click the **OK** button. To delete a device, deselect it in the list and click the **OK** button.

Select Events

It is possible to configure a client to only receive specified events. These can be specified by clicking on the **Select Events** button (only available when the **Display Selected Events** field has been ticked).
This will launch the **Select Events** screen:
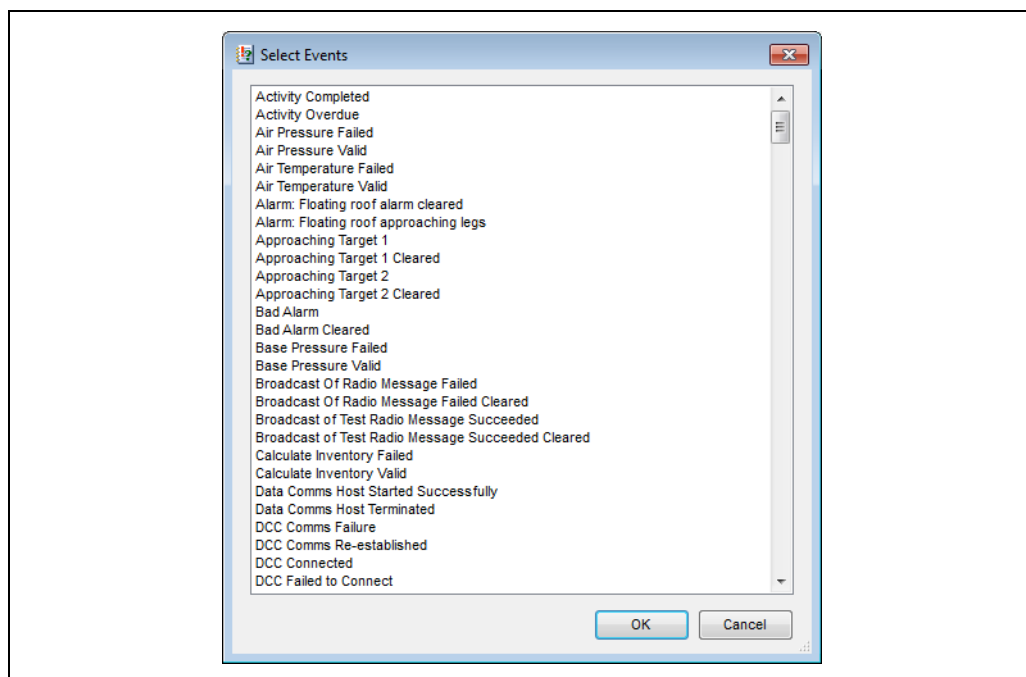
BA00390GEN_0042

To add an event, select it from the list and click **OK** button. To delete an event, deselect it in the list and click the **OK** button.

Select Severities

It is possible to configure a client to only receive events of specified severities. These can be specified by clicking on the **Select Severities** button (only available when the **Only Display Selected Severities** field has been ticked).
This will launch the **Select Severities** screen:
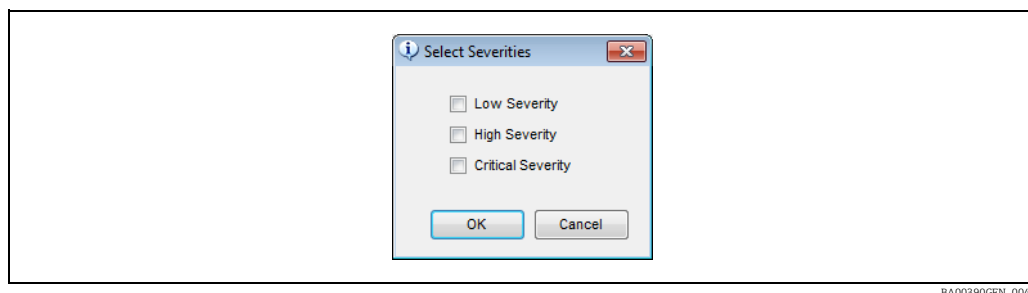
BA00390GEN_0043

To add a severity, tick the relevant item in the list and click the **OK** button. To delete a severity, untick the relevant item in the list and click the **OK** button.

8.2.4   Event Definitions

This page allows the definition for each event (an alarm is just a type of event) to be configured. This includes the event/alarm text to be displayed on screen and its severity.
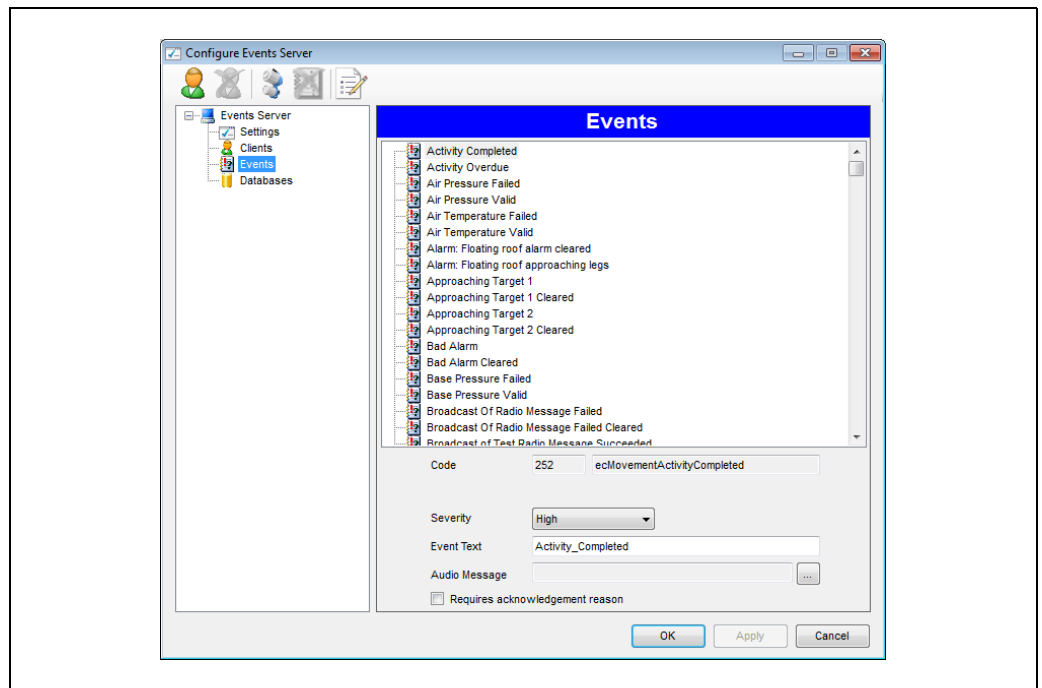
BA00390GEN_0044

All the possible events that the system can generate are displayed in the list.
Selecting an event will show its settings in the fields at the bottom of the window.
For each event the following may be configured:

Event Text

This is the text that will be logged to the events database and displayed on the **EventViewer** screen.

Audio Message

This is the message which will be annunciated for radio and telephone voice clients. If no message is set up, the event will not be annunciated.
To edit the message click on the [...] button next to the field. This will bring up an audio messaging edit screen:
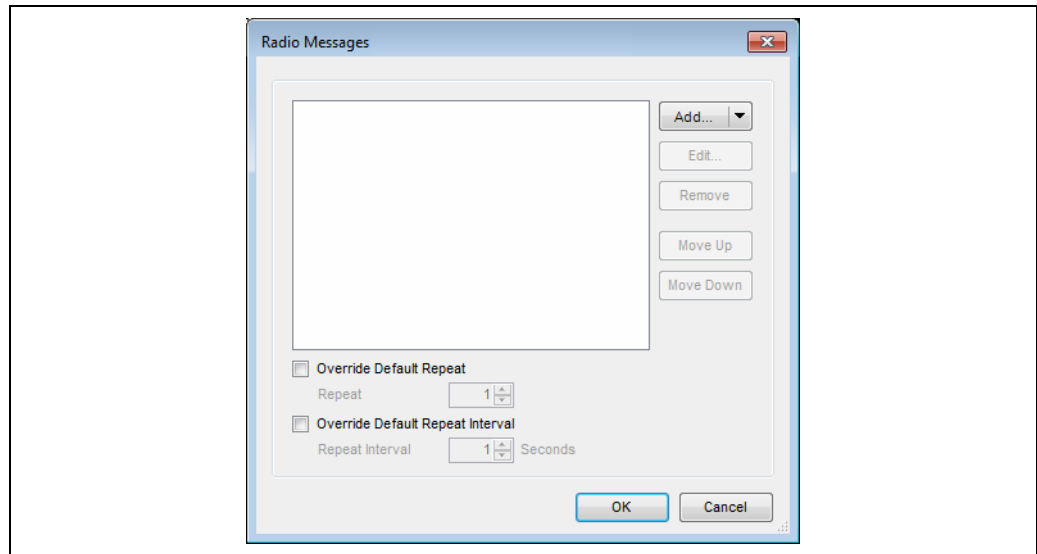
BA00390GEN_0299

For more details on configuring audio messages, → 🖹 137. The number of times that the message is repeated and the interval at which the message is repeated can be overridden (only relevant for radio messaging, not telephone messaging).
To override the number of times the message is repeated, tick the **Override Default Repeat** field and then select the number of times the message is to be repeated. Similarly to override the repeat interval for the message, tick the **Override Default Repeat Interval** and select the interval at which the message is to be repeated. Telephone messages will only ever be annunciated once regardless of these settings.

Severity

There are four options:
- Critical
- High
- Low
- Log Only

These refer to the priority given to the alarm.
LogOnly alarms will never be displayed in any **Alarm Event Viewer** clients, but will be saved in the events database and may be viewed in the **Event Search** screen. They are automatically acknowledged by the system.

Requires acknowledgement reason

If this box is ticked, the user will be required to enter an acknowledgement reason when they acknowledge this type of alarm.

8.2.5   Database Maintenance

This page allows parameters to be specified to prevent the events database growing to an unmanageable size.
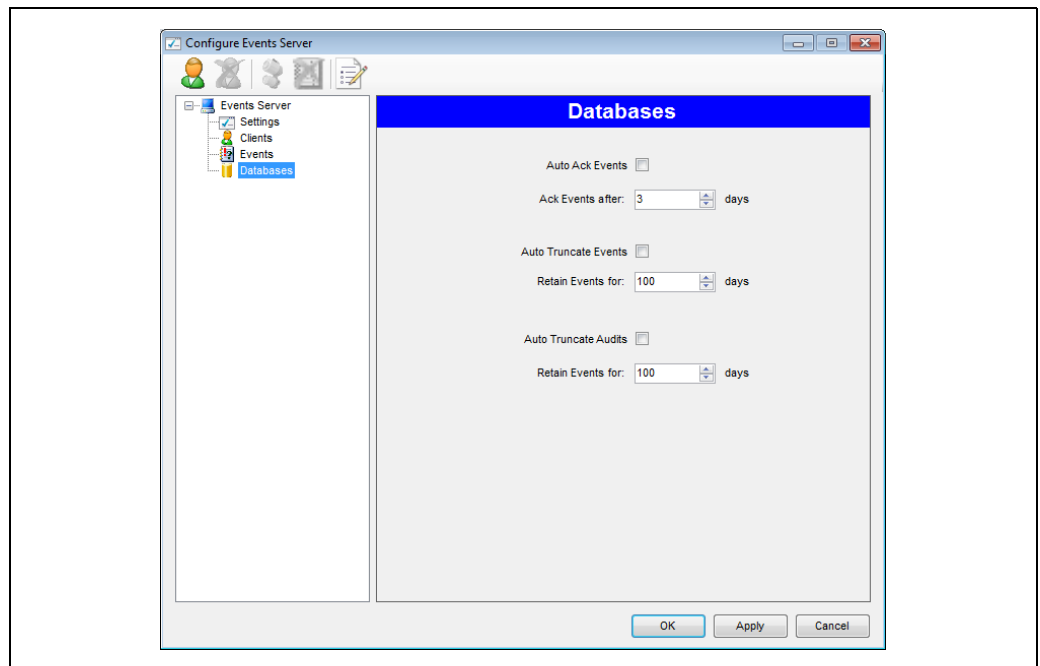
BA00390GEN_0046

Auto Ack Events

This field is to be ticked if events are to be automatically acknowledged after a given time period. This should only really be used on redundant systems where it is possible that no client machines are connected to a particular server and hence the events will never be acknowledged, or the user may be swamped with events when a server changeover occurs.

Ack Events after

This field is used to specify the number of days after which events should be acknowledged.

Auto Truncate Events

This field is to be ticked if events are to be deleted from the events database after a given period.

Retain Events for

This field is used to specify the number of days after which events should be deleted from the events database.

Auto Truncate Audits

This field is to be ticked if audit events are to be deleted from the events database after a given period.

Retain Events for

This field is used to specify the number of days after which audit events should be deleted from the events database.

8.3   Alarm Event Viewer Configuration

To configure the Alarm Event Viewer, proceed as follows:

1. Choose **View → Options** from the menu.

BA00390GEN_0047
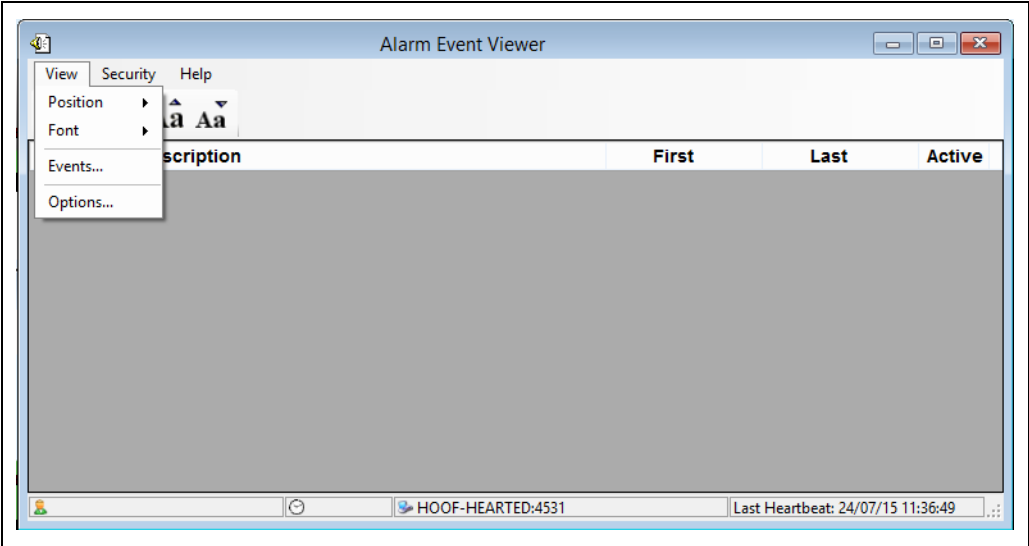
The following screen will be displayed:
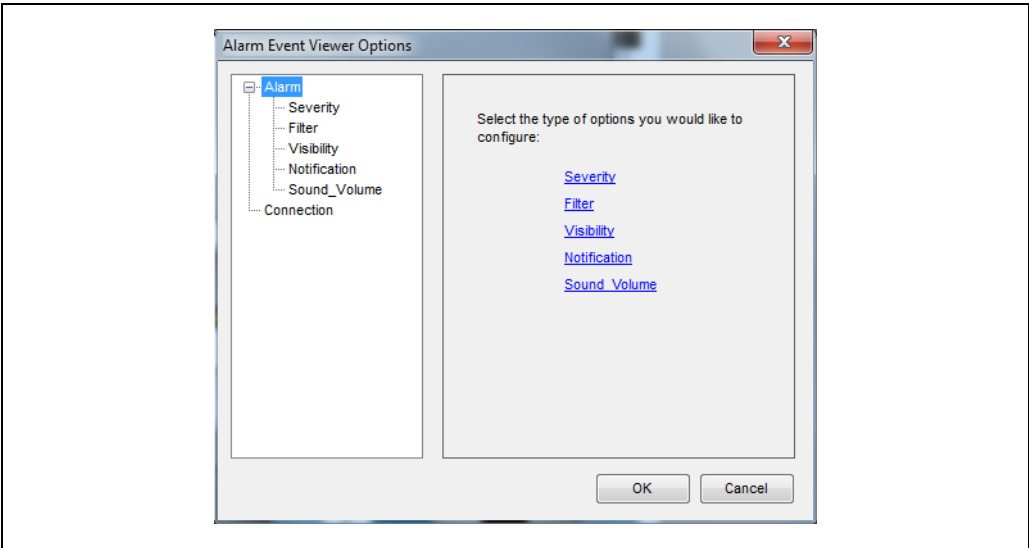
BA00390GEN_0048

2. To choose the type of options to configure, either select them from the list on the left or click on the relevant text on the right.

8.3.1   Severity Options
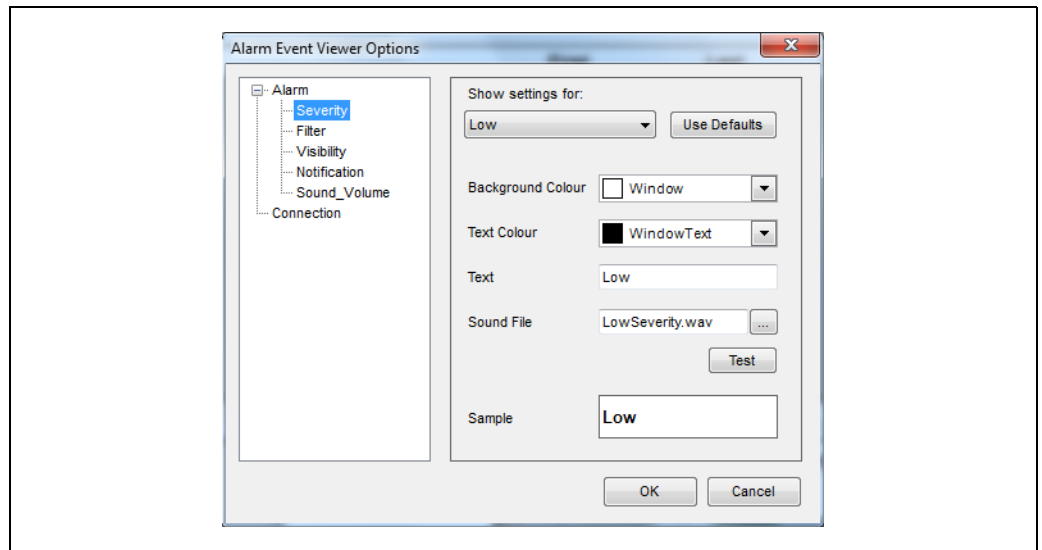
BA00390GEN_0049

Show settings for

The drop down list at the top of the page is used to select the severity of the alarm for which the options are to be set. Changing the options will only affect the alarms of that severity.

Use Defaults

Reverts all the options for the severity back to their default values.

Background Colour

The background colour to be used to display the severity of an alarm.

Text Colour

The text colour to be used to display the severity of an alarm.

Text

The text to be displayed to indicate the severity of an alarm.

Sound File

The sound file to be played when an alarm of this severity is the highest priority and sound is enabled (see Notification Options). If no directory is supplied the file must exist in the Media directory contained in the application directory.
• To browse for a new sound file click on the button to the right of the sound file field.

Test

To play the currently selected sound file click on the **Test** button.

Sample

Indicates how the severity of the alarm will be displayed in the list of alarms.

8.3.2   Filter Options
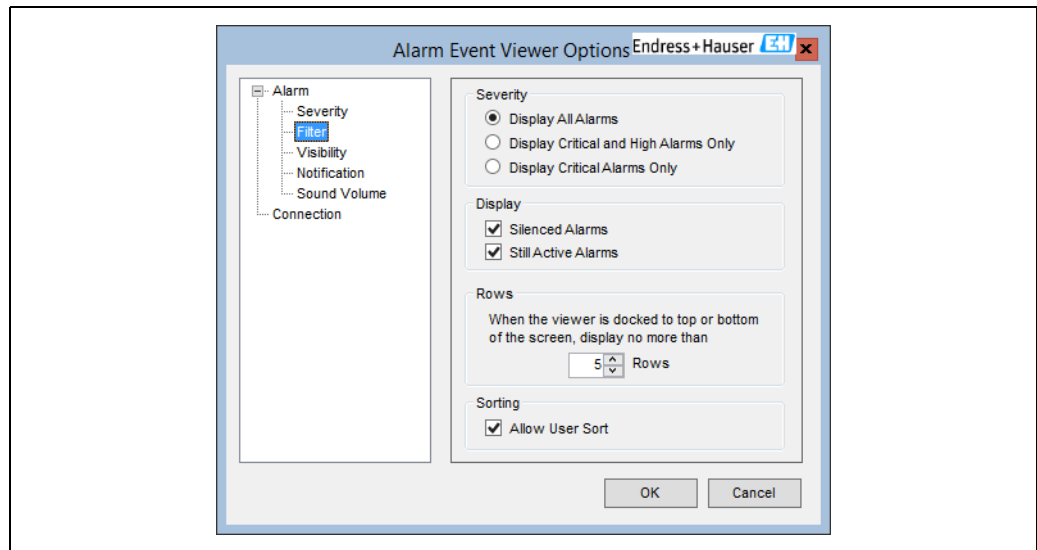
BA00390GEN_0174

These options specify how the alarms will be filtered within the alarm event viewer.

Severity

This section allows the filtering of alarms based on their severity.

Display → Silenced Alarms

If this option is ticked, alarms that have been silenced but not acknowledged will be displayed in the list. Otherwise the alarm will be removed from the list when it has been silenced even if it has not been acknowledged.

Display → Still Active Alarms

If this option is ticked, alarms that have been acknowledged but are still active will be displayed in the list. Otherwise the alarm will be removed from the list when it has been acknowledged even if it is still active.

Rows

Allows the user to specify the maximum number of rows to be visible in the list when the alarm event viewer is docked at the top or bottom of the screen. All alarms will still be present in the list and if the number of alarms is more than the value entered a scroll bar will be displayed to allow the user to view details of all the alarms.

Sorting

Allows the user to sort the alarms by Severity, Description, First, Last and Active.

8.3.3   Visibility Options

BA00390GEN_0258
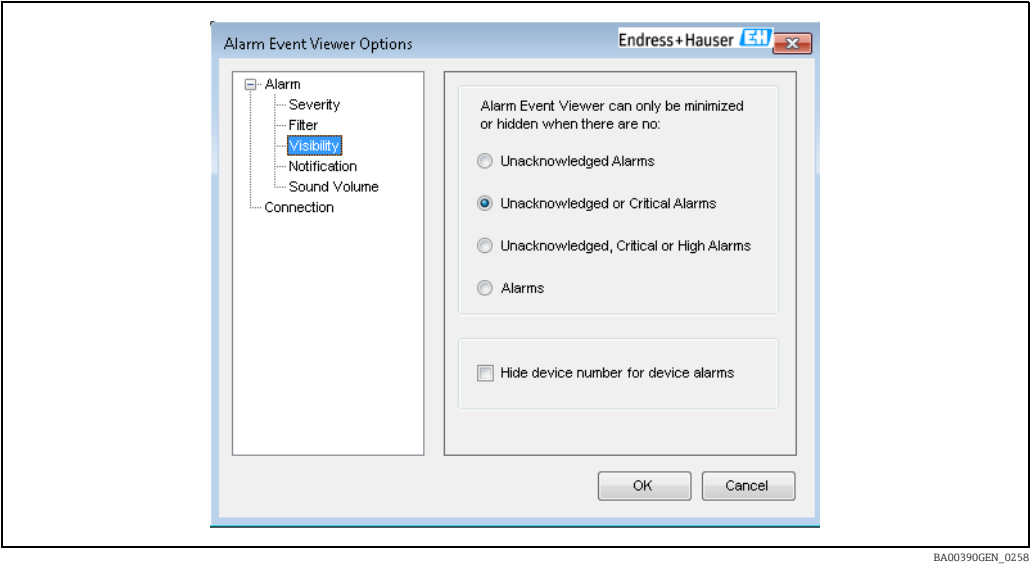
The first panel on this page allows the user to specify the conditions under which the **Alarm Event Viewer** can be minimized or hidden. This also works in reverse, in that if a new alarm is raised which does not meet these conditions the **Alarm Event Viewer** is redisplayed on the screen if it is hidden or minimized.

Hide device number for device alarms alters the description displayed on the main **Alarm Event Viewer** window to either show or hide the Device ID. See screenshots below. If your site has only one level gauge per tank, then showing the Device ID may be unnecessary.

BA00390GEN_0259

Alarm Event Viewer with Device ID hidden

xxxxx

Alarm Event Viewer with Device ID shown

8.3.4   Notification Options
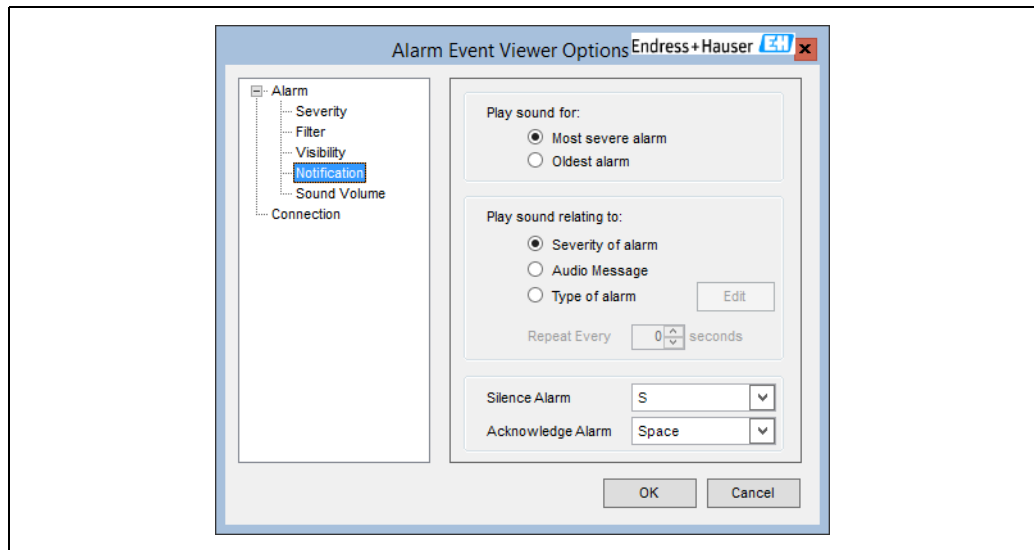
BA00390GEN_0175

Play sound for → Most severe alarm

The 'active' alarm is considered to be the oldest unacknowledged alarm of the highest severity, i.e. there may be older unacknowledged alarms but these are of a lower severity than the 'active' one.

Play sound for → Oldest alarm

The 'active' alarm is considered to be the oldest unacknowledged alarm irrespective of severity.

Play sound relating to → Severity of alarm

The sound relating to the severity of the 'active' alarm (→ 🖹 55) is continuously played until the alarm is acknowledged.

Play sound relating to → Audio message

The audio message configured for the alarm (see events configuration) is played once.

Play sound relating to → Type of alarm

The sound relating to the type of the 'active' alarm is played once. This is typically an annunciation of the alarm type. These sounds can be edited by pressing the **Edit** button (which is only available when this option is selected). Pressing the **Edit** button causes the following screen to be displayed:
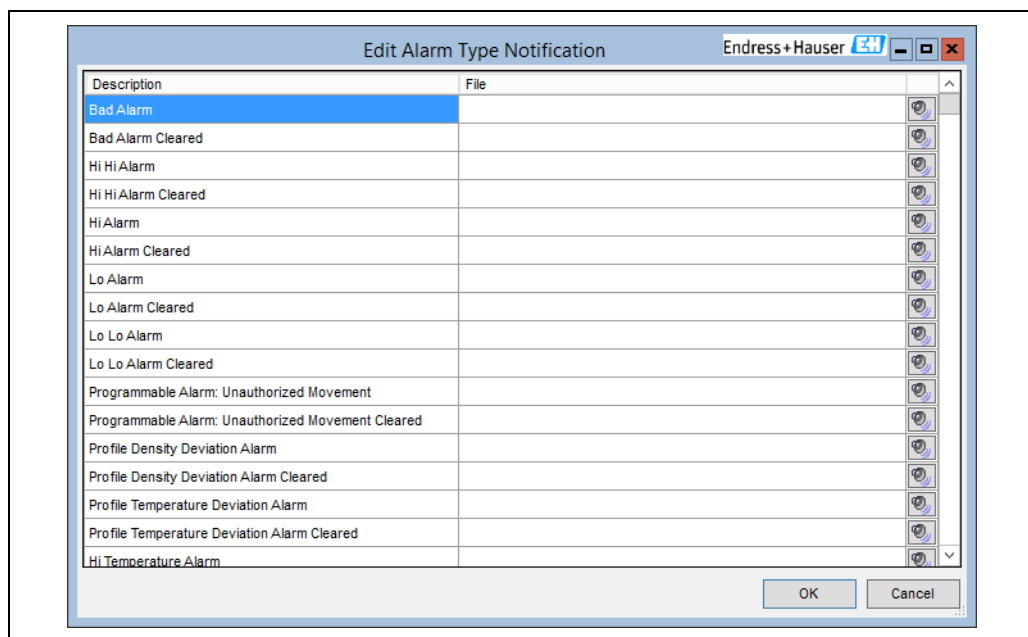
BA00390GEN_0176

This list indicates the sound file that will be used for each type of alarm. The file can be changed by typing the new file name into the relevant field. Alternatively a new file can be selected by clicking on the [...] button which is available when a file name is being edited. If no file is entered for an alarm type, the text for the alarm type will be annunciated using the Windows Speech Engine. To test the sound that will be played for an alarm type click on the button in the row for that alarm.

Silence Alarm

Allows the user to change the combination of keys that can be used to silence the currently selected alarm.

Acknowledge Alarm

Allows the user to change the combination of keys that can be used to acknowledge the currently selected alarm.

8.3.5   Sound Volume Options

The alarm volumes can be altered or muted using the **Sound Volumes** screen.
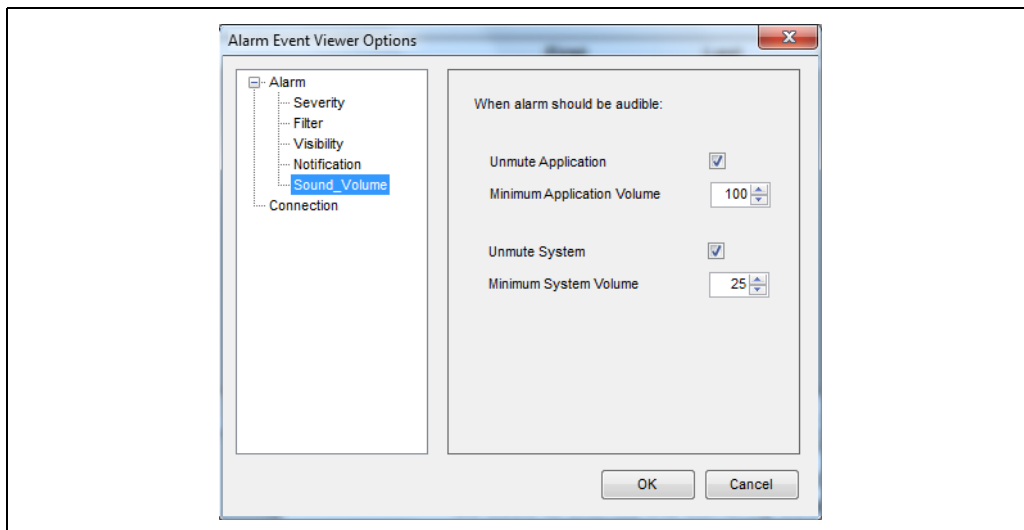
BA00390GEN_0054

8.3.6   Connection Options
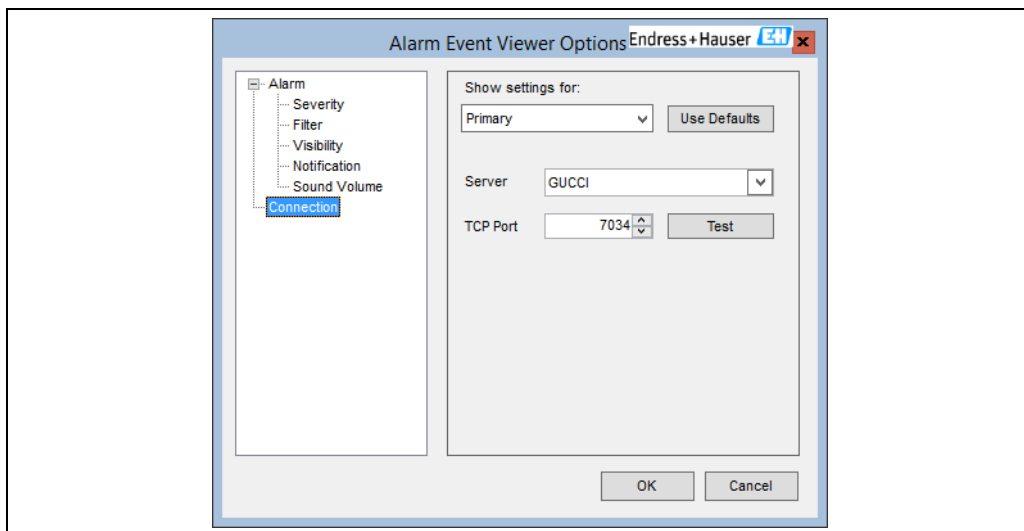
BA00390GEN_0177

Show settings for

The drop down list at the top of the page is used to select the server type for which the options are to be set. Changing the options on the page will only affect the settings for that server type.

Use Defaults

Reverts all the options for the server type back to their default values.

Server

The name of the server to be used for this server type. This can either be typed in directly, or selected from the drop down list. Depending on the speed and configuration of the network this list can take some time to be fully populated.

TCP Port

The TCP port on which the events service is running on the specified server.

Test

Tests that the events service can be found on the given combination of server and tcp port.

8.4 Programmable Alarm Configuration

An integrated part of the system is the Alarm Configuration module.
A wide range of programmable alarms are provided allowing the operator/user to have control over product movement.

8.4.1 Launching Alarm Configuration

To launch the Alarm Configuration module, proceed as follows:

1. Select the **Alarm Configuration** option from the **Configuration** menu.
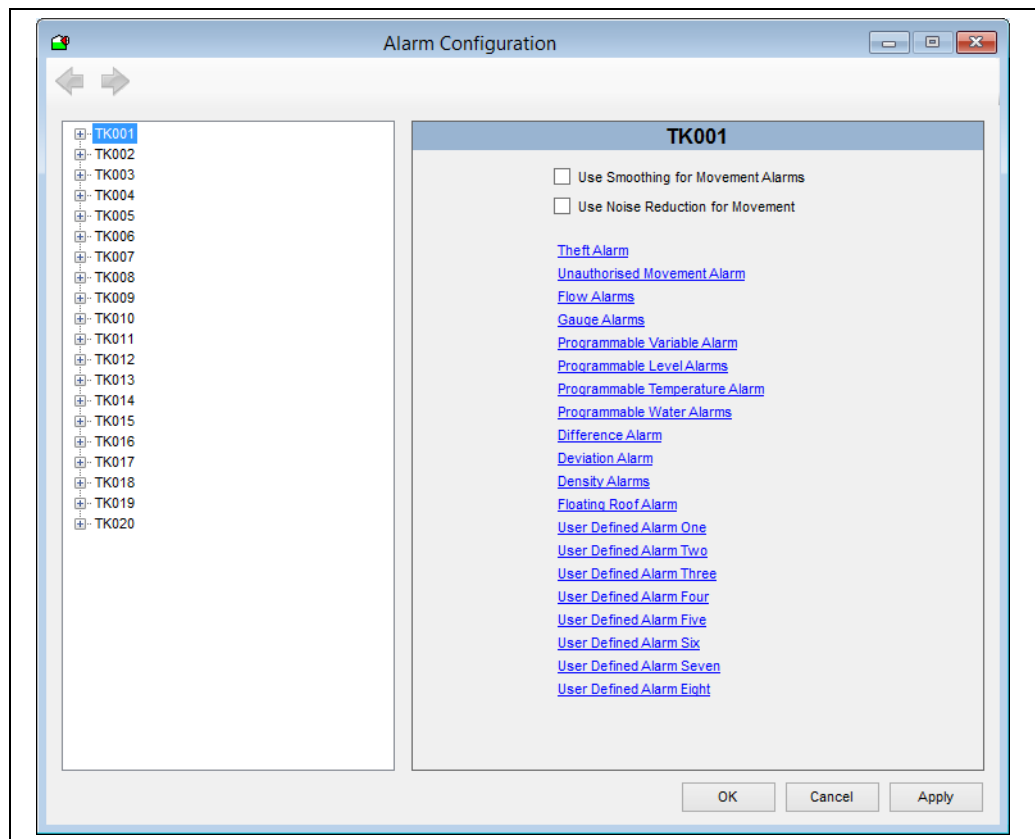
BA00390GEN_0178

2. Expand the Tank to show the different types of alarms that can be configured.

3. Select one of the alarm groups.

Unauthorised Movement Alarm
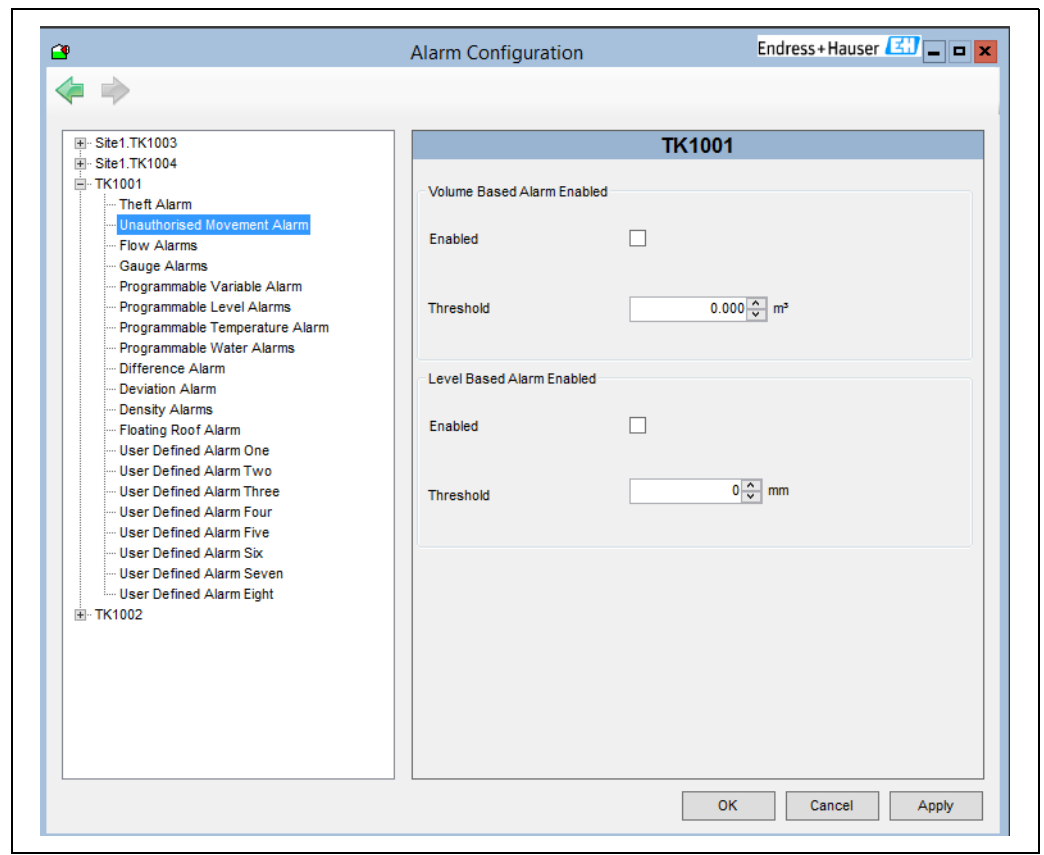
BA00390GEN_0183

The unauthorised movement alarm protects against inadvertent movement of product in static tanks. This alarm should be enabled when the tank is to remain static, this has the action of internally storing the current GSV for the tank, should the GSV in the tank change beyond the predefined threshold limit, then the alarm will be triggered. The alarm should be disabled when movement of product into or out of the tank is being done.

The monitoring supports two different methods of detecting unauthorised movements, by standard volume and by level. If your tanks are equipped with temperature measurement, it is recommended that you use the volume based alarm, as temperature correction is incorporated into the calculations and should therefore result in fewer false-positive detections. The level based alarm is driven solely by changes in product level, which removes a number of other factors from the detection; it could be viewed a crude alternative or a much simplified implementation of the volume based alarm depending on your perspective.

Both can be used at the same time, but it will result in twice the number of alarms.

Automatic Control of Unauthorised Movement Alarms

Manual control of the unauthorised movement alarms involves operators deciding when a tank's levels should or should not change and remembering to enable and disable the alarm accordingly. This is prone to error unless rigorously administered. The tank gauging system has a number of mechanisms which allow for automatic control.

Full and Simple Movements

Set the Automatically Generate Unauthorised Movements flag in the system settings (→ 🗎 97) and the action of starting and stopping a movement on a tank will deactivate and activate the unauthorised movement detection on the system. Typically sites adopting this approach mandate that all site activities that involve moving product in or out of a tank must be run through the tank gauging movements packages. When the Automatic Generate

Unauthorised Movement flag is set, enabling the unauthorised movement alarm on a particular tank just makes it possible that a tank will be monitored, if the alarm is unset no monitoring of the specific tank takes place. This feature is used by sites that have "day" tanks that are permanently open to road loading bays, where it is not possible to determine when the product level in the tank should or should not be moving.

TAD Tank Modes

Tank modes can be defined that suppress the unauthorised movement monitoring (see System Operation manual BA00396G). Modes that have the "Alarms Suppressed" flag set will cause tanks assigned that mode to not be monitored for unauthorised movements. Changing the mode from an "Alarms Suppressed" mode to one that isn't causes the start level or volume to be recorded as the starting point for the monitoring.

> ℹ️ This alarm is often referred to as a "Leak Alarm" although it equally refers to a gain of product as well as a leak.

There is only one configuration item for each of the unauthorised movement alarms. The major consideration when selecting a threshold for the alarm is to balance the utility in warning operators of possible leaks on site and the number of false-positives created by the alarms. Allowances need to be made for "swing" in windy weather, temperature fluctuations and the size of the tank: there is no substitute for experience in determining these values.

Theft Alarm
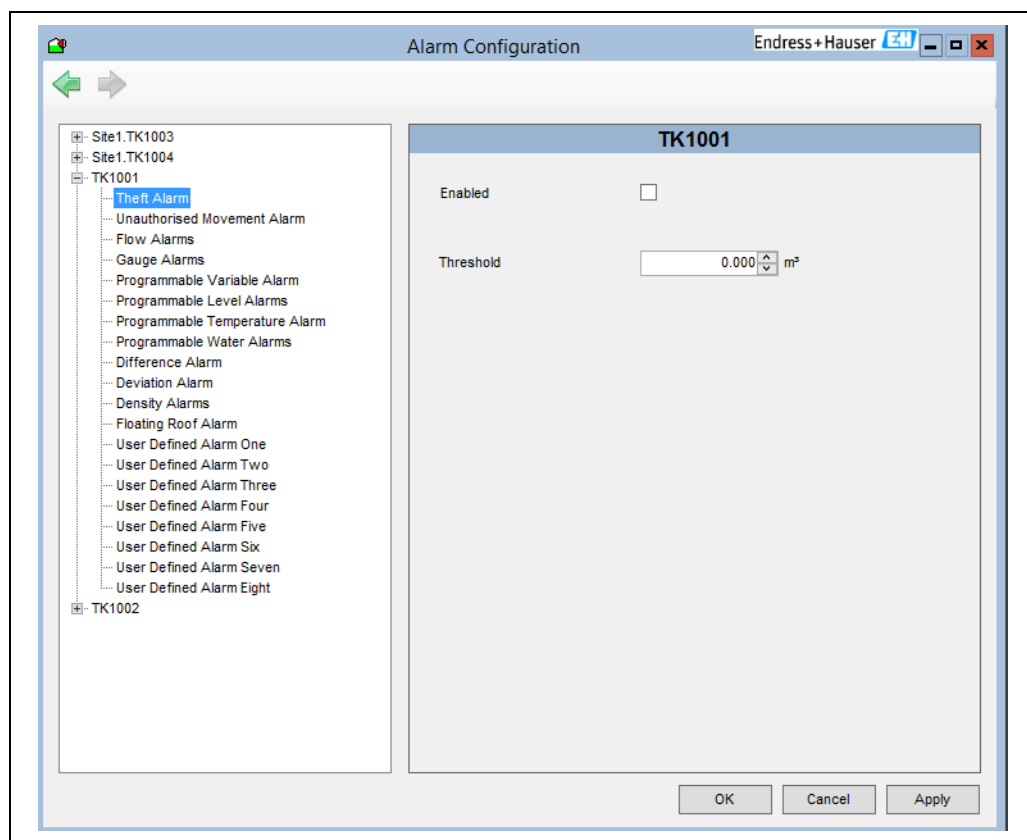
BA00390GEN_0179

The **Theft Alarm** is similar to the **Unauthorised Movement Alarm** except that it only detects a loss of product and ignores gains. It also has a number of extra features, specific to theft monitoring. When the alarm is enabled the current GSV is stored as a starting value and any reduction in the volume greater than the threshold figure will then trigger the alarm. If the GSV increases then the starting value will be set to the new GSV value, thus it will automatically take account of any receipts of product. Once a Theft Alarm has been

triggered it will reset itself after a user defined period and re-arm with the current GSV as a starting value.

There is just one tank configuration item for the theft alarm, **Threshold**, which dictates the amount of loss that must occur in order to activate the alarm. The amount is defined as a volume at standard temperature and conditions. The major consideration to make when choosing a threshold is finding a balance between too many false detections caused by thermal contractions as the product cools overnight and the timeliness of alerts to theft. Larger tanks without temperature measurement and inaccurate gauges will require larger thresholds.

Theft Alarm Schedule and Reset Time

The **Theft Alarm** will only be monitored during user defined periods (i.e. during nights and weekends); outside of these periods no alarm will be generated even if the theft alarm is enabled. To configure the monitoring periods and the alarm reset period, the software tool **Theft Monitor Config** is used. This tool is only installed on tank gauging servers not clients, and can be accessed from the Home Page configuration menu. See figure below.
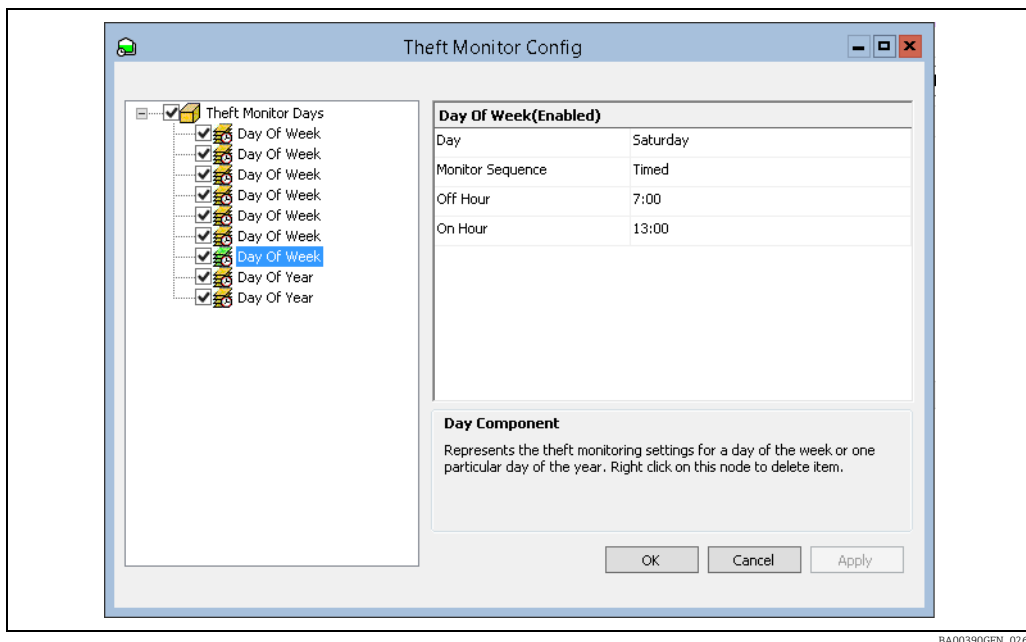
BA00390GEN_0266

ℹ️ After using this tool it is necessary to start and stop services using the service manager utility to set up the alarm.

Alarm Reset

The time in minutes and seconds before alarm is reset. Shown in figure below.

BA00390GEN_0267

When a theft is detected the alarm will remain active for the reset period (assuming that the alarm is not reset before then by an operator) after which alarm is cleared, thus re-arming the system to monitor for further losses. Should the thieves return a second time to take further fuel the system will then sound a second time. A reset time of 15 to 30 minutes is a typical value for this setting. This setting is accessed by selecting the **Theft Monitor Days** node on the left hand panel.

Day of week

Defines a schedule for the alarm on a particular day of the week as shown in figure below.

BA00390GEN_0268

The alarm can be configured to be off for the whole day, be on for the whole day or conform to a particular timed schedule. Normally the alarm is deactivated during working hours, for example if the site working hours are between 7am and 5pm the **Off Hour** will be set at 7:00 and the **On Hour** at 17:00.

It is not possible to define more than one schedule for a particular day of the week and that the **Off Hour** must be earlier than the **On Hour**.

Day of year

This defines the schedule for a particular day of the year, and overrides the schedule for the day of the week. It is similar to the day of week settings in that the hours are defined in an identical fashion. The difference is that the date defines a specific day of the year, e.g. Christmas day; 25th December. The same caveats apply as for Day of Week: only the first schedule for a particular day is considered, if multiples are defined, and the Off time must be before the On time.

ℹ️ After using this tool it is necessary to start and stop services using the service manager tool to set up the alarm.

Movement Alarms

In some circumstances it is necessary to reduce the sensitivity of the Unauthorized Movement and Theft Alarms.
Typical reasons are that radar gauges on empty tanks can give spurious jumps in level that would be detected as an Unauthorized Movement or that high winds acting on a floating roof tank cause the levels to "swing". In such situations the Unauthorized Movement and Theft Alarms can become a nuisance, distracting the operators from the real dangers on their site.
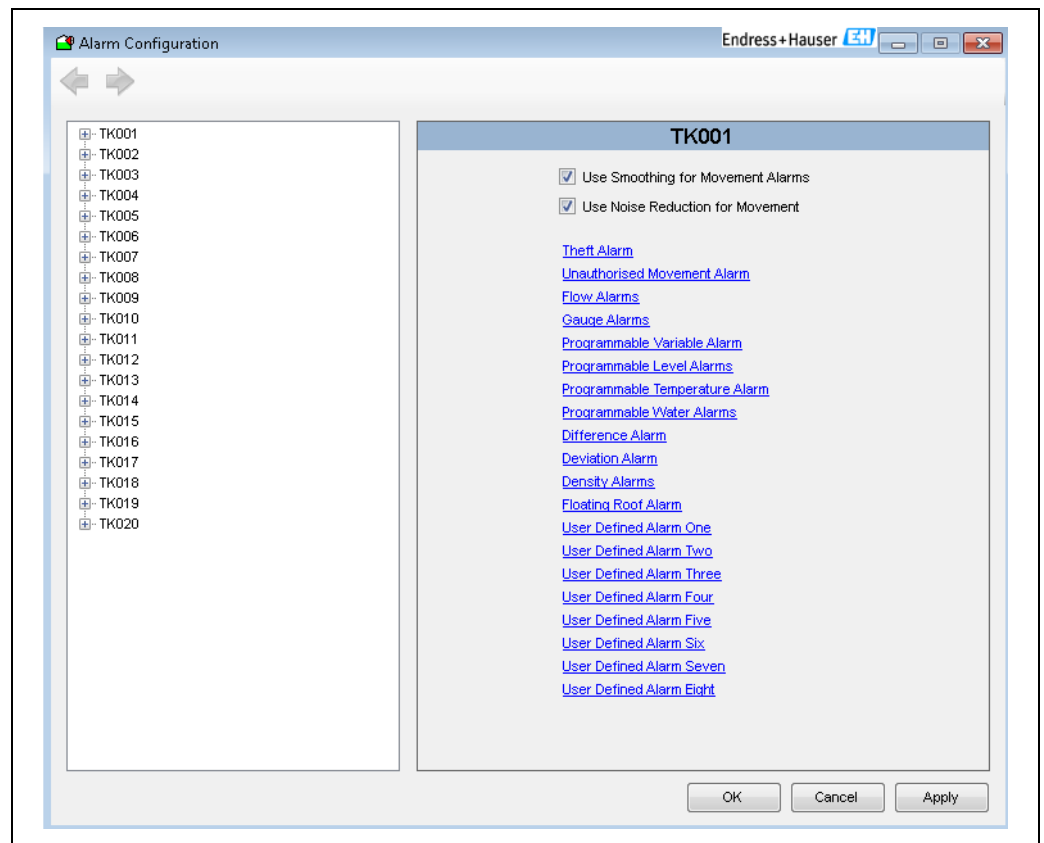
BA00390GEN_0261

Use Smoothing for Movement Alarms – apply smoothing to the volume and level used to test for the **Unauthorised Movement Alarm** and the **Theft Alarm**. The smoothing uses the same parameters entered for the flow calculations, i.e. Flow Rate Damping and Flow Rate Integration. These are entered in the **Device Configuration** screens.
Use Noise Reduction for Movement – is similar to the above, but employs a two out of three voting mechanism to discard "jumps" in level which can be caused by radar gauges. Each successive level reading from the gauge is compared with the previous two readings, the most extreme reading is discarded and the level in the tank is considered to be the average of the two remaining. In this way outlier readings (i.e. jumps in gauged level) are discarded.

ℹ️ These settings have no effect on the product level and dependent inventory volumes and masses, it is only the levels and volumes used by the Unauthorised Movement and the Theft Alarm detection mechanism that are altered.

Flow Alarms
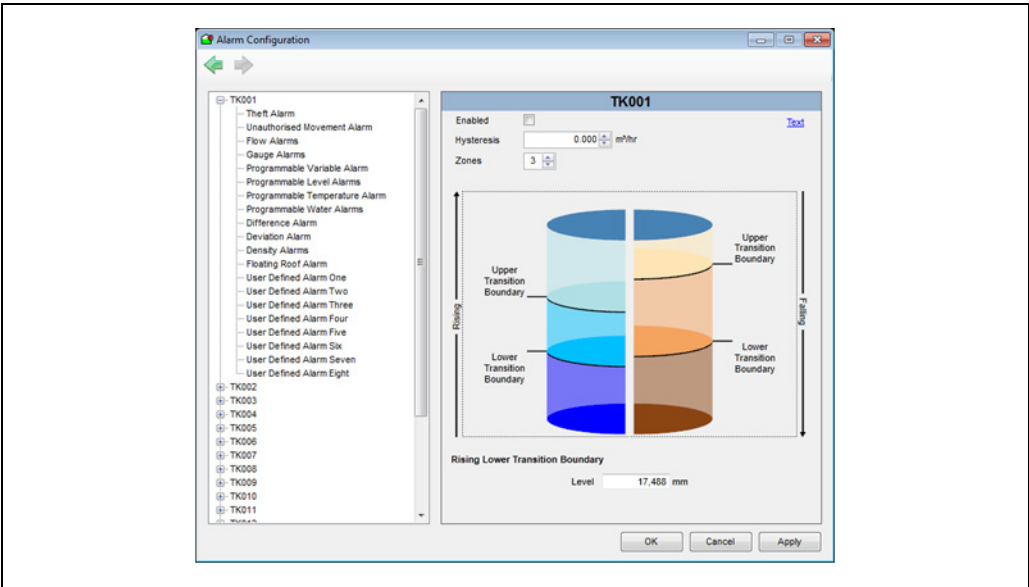
BA00390GEN_0063

The flow alarms are intended for use when tanks are moving. They are useful to detect that flow has exceeded a tank or pipeline design limit or that flow has reduced or stopped perhaps due to some fault.

The alarms are configurable for up to 3 zones. The zone transition boundaries for Rising level alarms and Falling level alarms can be independently configured.

Transition boundaries may be dragged to the required level or selected and the required level typed into the **Level** entry field.

Flow rates for each zone may be entered by selecting the required zone and typing the **Min Flow Rate** and **Max Flow Rate** into the appropriate entry field.

Alternatively, clicking the **Text** link in the top right of the window switches from Graphical to Text entry.
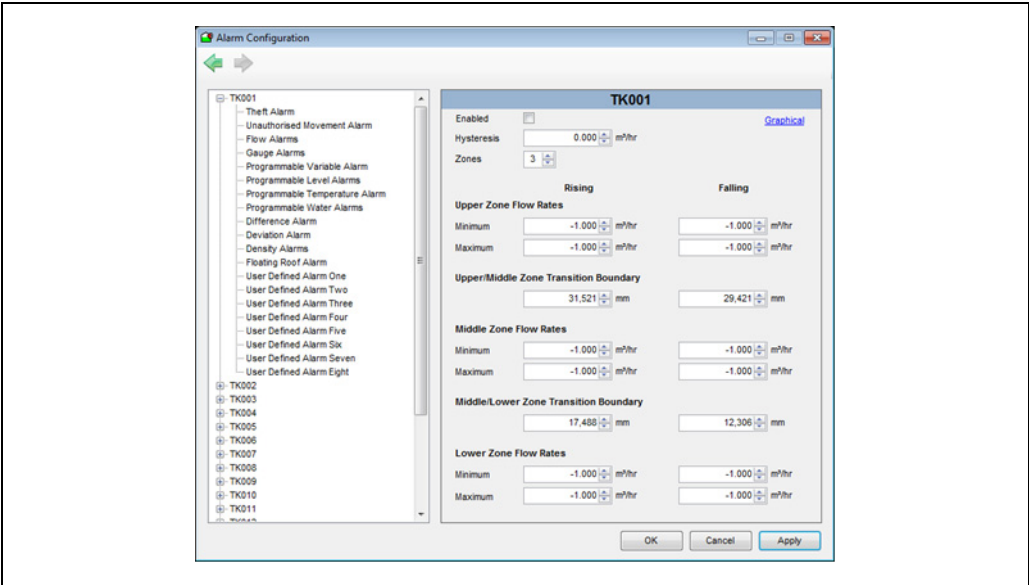
BA00390GEN_0064

ℹ️   Entering a negative flow rate value disables an alarm.

> **NOTICE**
>
> **Set the boundaries correctly!**
> Failure to do so may result in alarms not being triggered.
> ▶ If only two zones are in use then both the lower transition boundaries must be set to zero.
> ▶ If only one zone is in use then all transition boundaries must be set to zero.

Gauge Alarms

BA00390GEN_0180
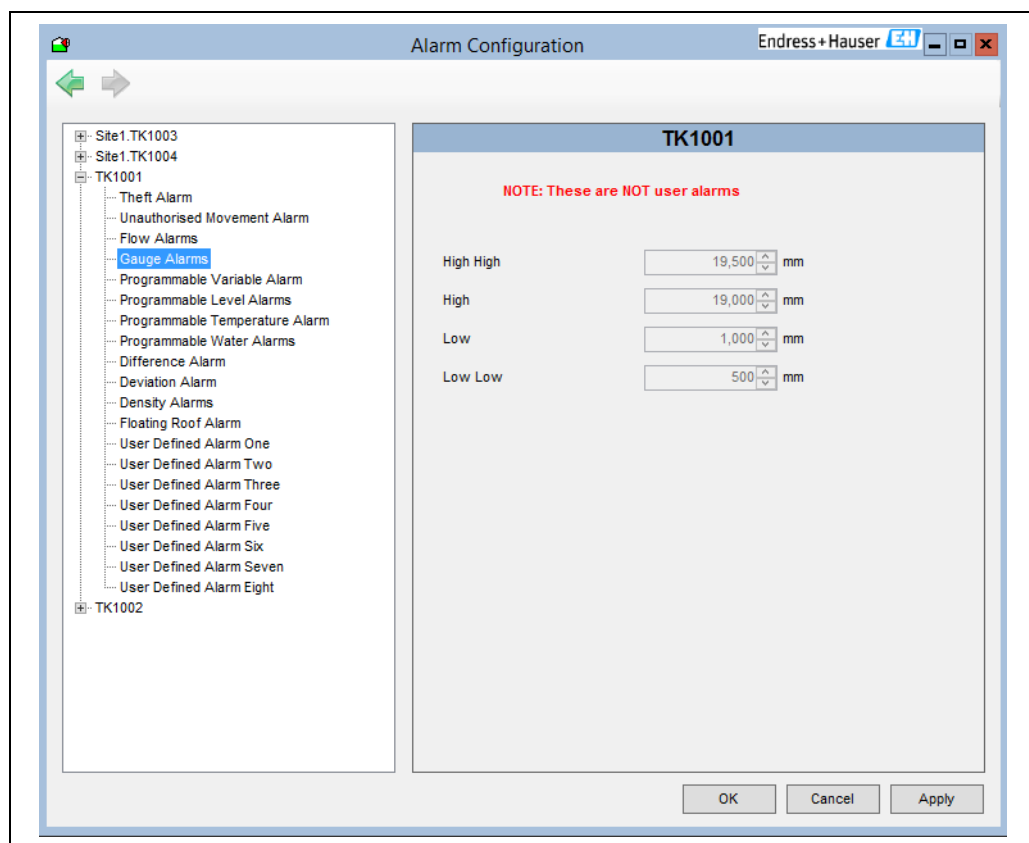
Gauge alarms are those alarms that are generated by the gauging instrument itself. The alarm levels displayed here are normally only there for reference purposes.
On some modern technology gauges it is possible to read the gauge alarm settings from the gauge automatically.
On older gauges this is not possible and provision is made to enter these manually within through this module.

ℹ️ Detection of gauge alarms is done by the gauging instrument and not by the Tankvision Professional/LMS software. Tankvision Professional/LMS merely reads the status of the alarm bits transmitted to it by the gauge.

Gauge alarm settings are normally set by the gauge commissioning engineer.

- **Gauge Alarm High High** - The gauge high high level alarm setting.
- **Gauge Alarm High** - The gauge high level alarm setting.
- **Gauge Alarm Low** - The gauge low level alarm setting.
- **Gauge Alarm Low Low** - The gauge low low level alarm setting.
- **Gauge Alarm Enable** - An operator configurable enable flag.

Difference Alarms
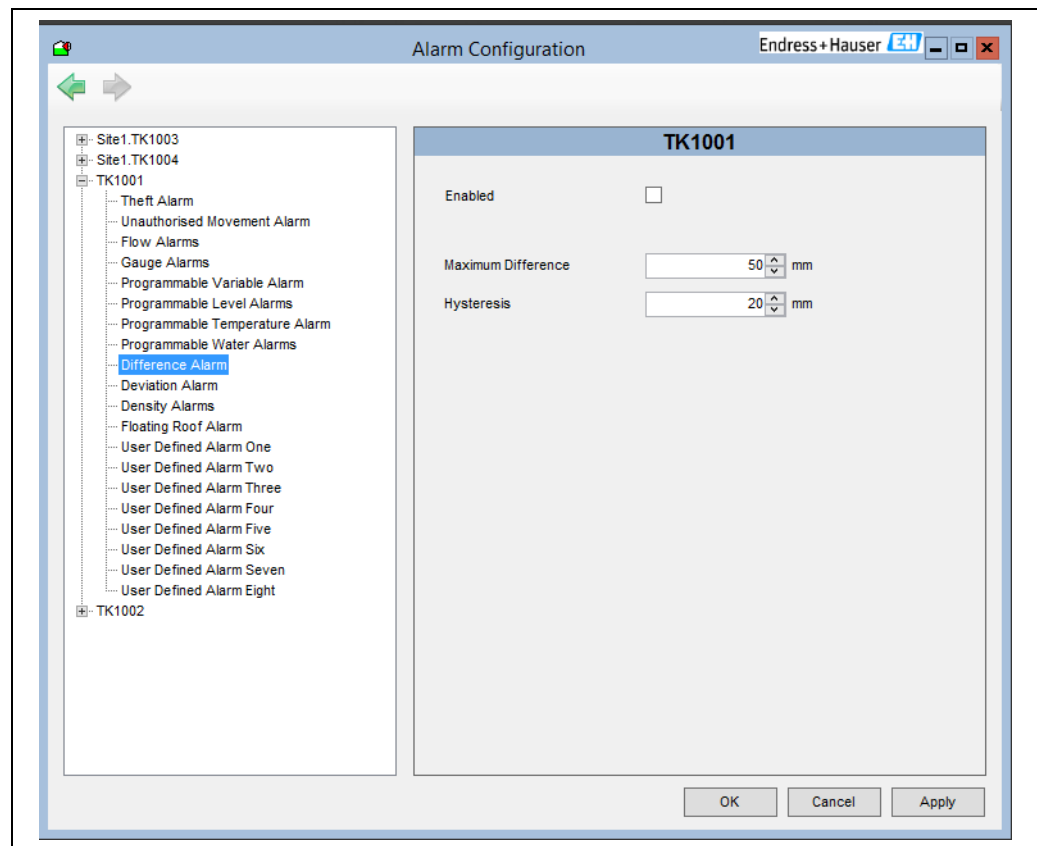
BA00390GEN_0181

For example a tank fitted with two gauges will have one nominated as the primary gauge and the second as a secondary gauge. The system can then monitor the difference between the two gauge levels, and compare the difference to the allowable tolerance set by the user. If the difference exceeds the tolerance a difference alarm will be generated.

- **Difference Alarm Enable** - an operator settable signal to determine if the alarm is enabled or not.
- **Difference Alarm** - an operator configurable difference alarm.
- **Difference Alarm Hysteresis** - operator configurable hysteresis for difference alarm.
  If a hysteresis value above the Allowable Tolerance is entered then the following warning message is displayed:
  Hysteresis is above the Allowable Tolerance!

1. Click the **OK** button to clear the warning.
   A hysteresis value below the Allowable Tolerance must be entered.

Deviation Alarms
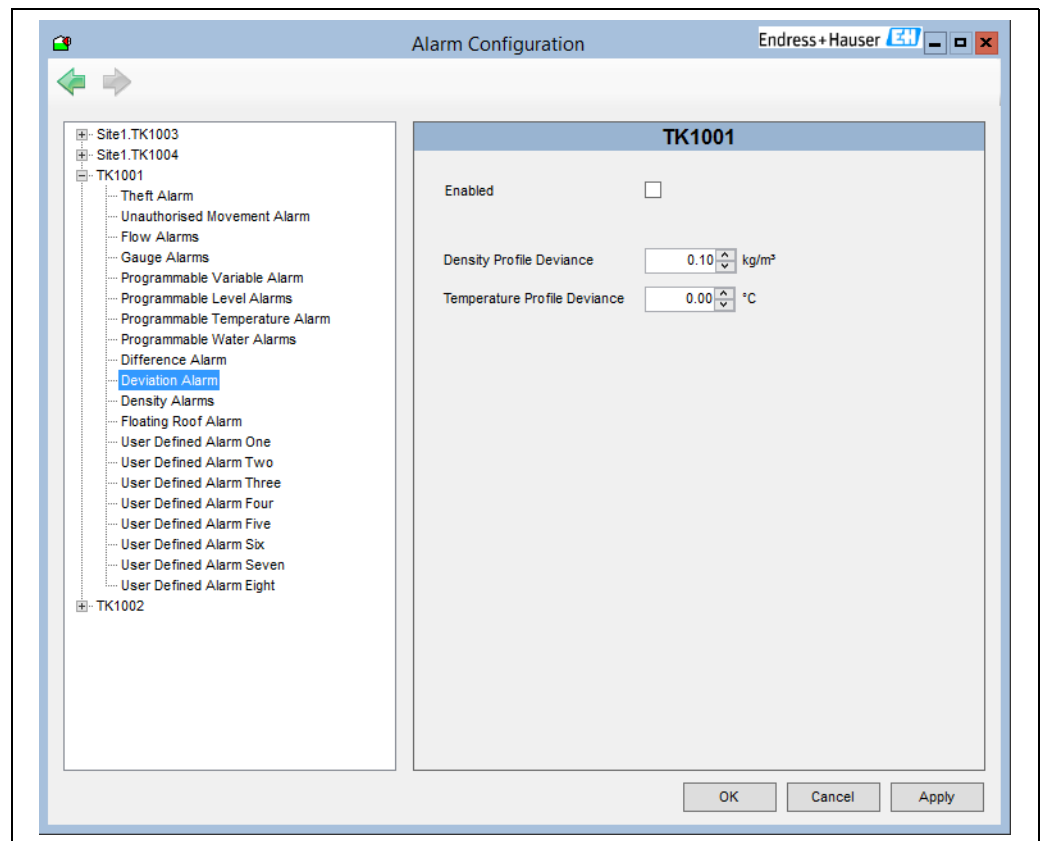
BA00390GEN_0182

The deviation alarm is used to alert operators to layering occurring in the tank. When two consecutive profile points deviate by the specified amount, either in their density readings or temperature, an alarm will be generated. This alarm requires the use of gauges capable of returning density profiles.

- **Deviation Alarm Enable** - Enables and disables the alarm.
- **Density Profile Deviation** - Deviation amount, for density points.
- **Temperature Profile Deviation** - Deviation amount, for temperature points.

Programmable Level Alarms
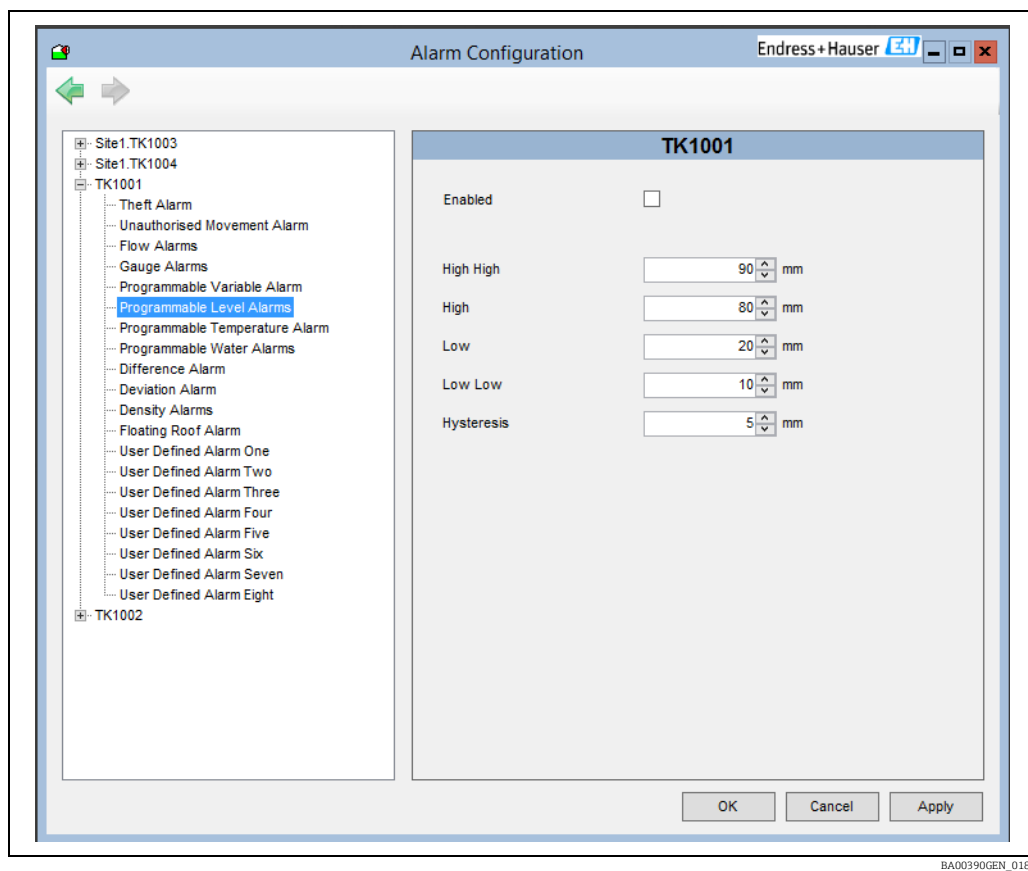
BA00390GEN_0185

Programmable level alarms are triggered according to the gauged level, they can be used on gauges where hardware alarms are not available or used in addition to the gauge hardware alarms.

- **Level Alarm High High** - an operator configurable level alarm denoted High High.
- **Level Alarm High** - an operator configurable level alarm denoted High.
- **Level Alarm Low** - an operator configurable level alarm denoted Low.
- **Level Alarm Low Low** - an operator configurable level alarm denoted Low Low.
- **Level Alarm Hysteresis** - an operator configurable hysteresis value.
- **Level Alarm Enable** - an operator configurable enable flag.

The term **High High** is normally associated with the extreme upper limit to which a tank would be filled. Under normal operating conditions it would be unusual to trigger this alarm.
Consequently the term High is not as extreme as **High High** and is normally set a small distance below the **High High** limit.
The term **Low Low** is normally associated with the extreme lower limit to which a tank would be emptied. Under normal operating conditions it would be unusual to trigger this alarm.
Consequently the term Low is not as extreme as **Low Low** and is normally set a small distance above the **Low Low** limit.
Clearly it is essential that all the alarms being used are configured correctly.

The programmable level alarms have equivalent gauge alarms. The programmable alarms would normally be set slightly below and slightly above there respective gauge alarm values. The programmable alarms would normally be used as early warnings to the gauge alarms. However the user can choose to use them as required although it is recommended that they are used within the context of the definition of the alarm to avoid confusion.

Programmable Water Alarms
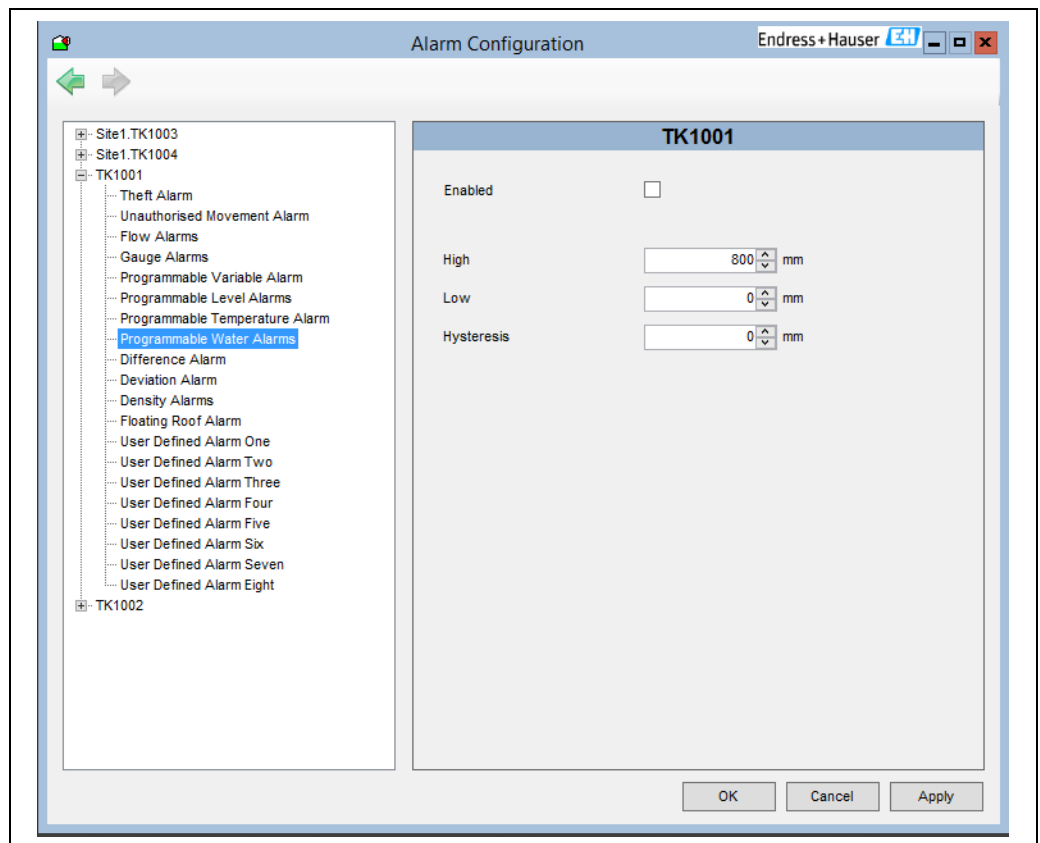
BA00390GEN_0186

Water alarms are triggered when tank water levels exceed the limits specified. If you do not require a low water alarm, set the low level to a negative value.

- **High Water Level** - an operator configurable free water level, above which the alarm will be triggered.
- **Low Water Level** - an operator configurable free water level, below which the alarm will be triggered - If a low water warning is not required set this to a negative value, to prevent it occurring.

Floating Roof Alarm
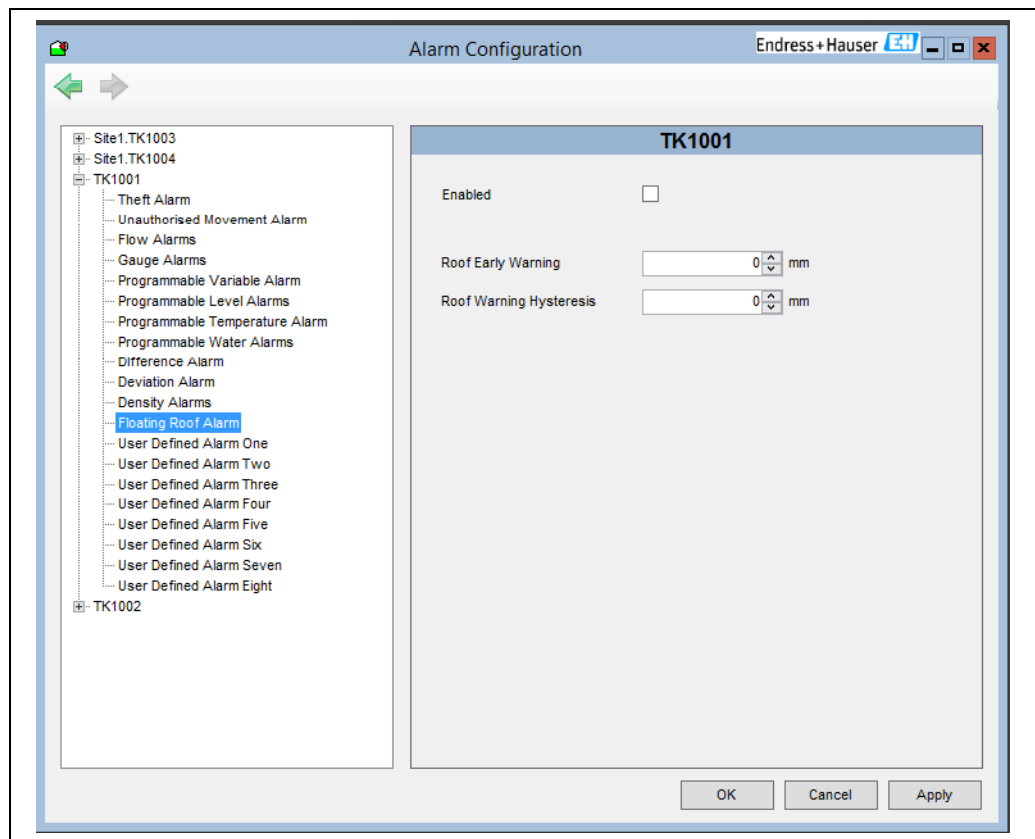
BA00390GEN_0187

The purpose of the Floating Roof alarm is to provide the operator with the option of generating a warning when the product level starts to approach the point where the roof starts to rest on its legs. Under normal operating conditions this is generally undesirable; therefore the alarm has been provided for that purpose.

- **Enabled** - when selected, the Floating Roof Alarm will be activated when the product level falls below the Roof Early Warning Level. The alarm will be cleared when the product level rises above the Roof Early Warning Level by more than the Roof Warning Hysteresis.
- **Roof Early Warning** - an operator configurable set point determining at what level the alarm will be generated. The level would normally be programmed above the Roof Fully Floating level set in the configuration tool.
- **Roof Warning Hysteresis** - the operator configurable distance by which the product level must return above the Roof Early Warning Level in order to clear the Roof Early Warning Alarm.

Programmable Temperature Alarms
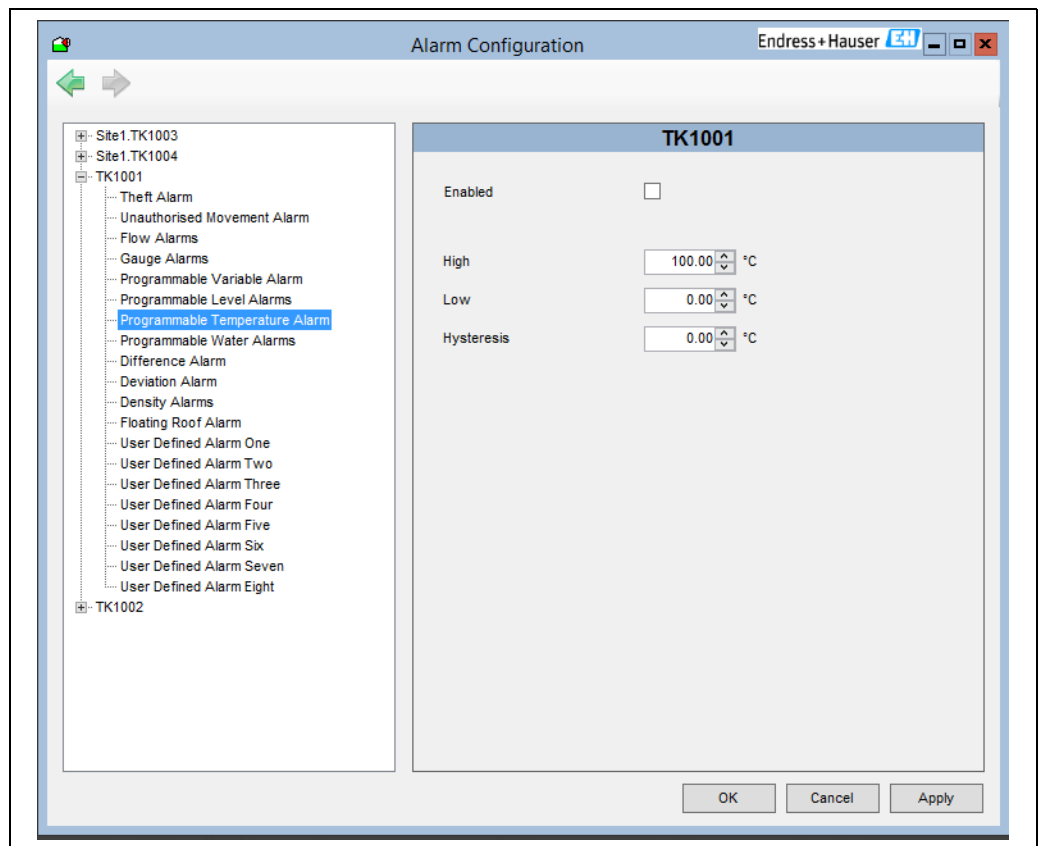
BA00390GEN_0188

These are operator programmable temperature alarms.

- **High** - an operator configurable high temperature alarm.
- **Low** - an operator configurable low temperature alarm.
- **Hysteresis** - an operator configurable temperature hysteresis.
- **Enabled** - an operator configurable temperature alarm enable.

Density Alarms

BA00390GEN_0189

These are operator programmable density alarms.

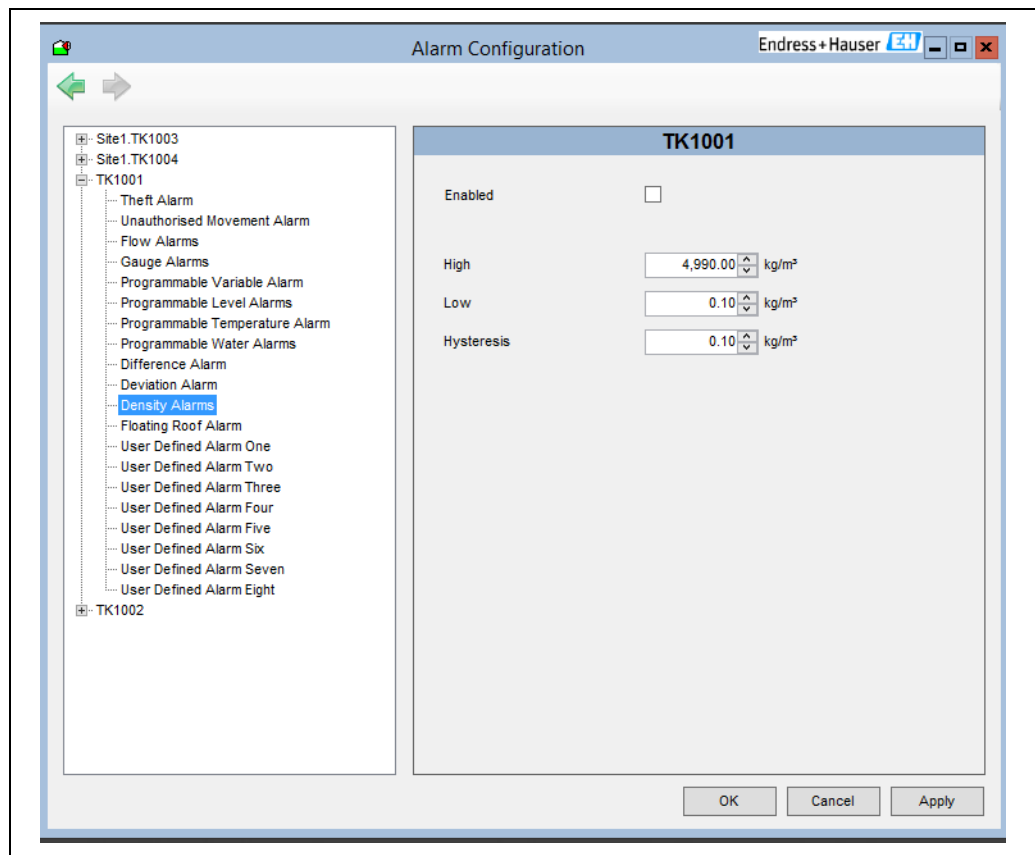- **High** - an operator configurable high density alarm.
- **Low** - an operator configurable low density alarm.
- **Hysteresis** - an operator configurable density hysteresis.
- **Enabled** - enables and disables the alarm

8.4.2   Modifying Data within Alarm Configuration

To modify data within the Alarm Configuration module, proceed as follows:

1. Select the tank to be modified from the list and the type of alarm to be modified.
   The current details for the alarm for that tank will be displayed.

ℹ️ Take note that if this is the first time Alarm Configuration has been loaded after installing the system it will be displaying default values. It is essential that default values are replaced with the correct operating values.

2. Select the field to be edited and type in the new data values.

ℹ️ Each field is validated both during data entry and just before the data is saved to the database.
You can use the **TAB** key to move to the next entry field.

3. If the changes made are correct and you want to save them, press the **Apply** button to save the changes to the database.

To edit further tanks follow the same procedure.

4. If you want to abandon any changes made since the last time the **Apply** button was pressed, press the **Cancel** button.
   This will also exit the application.

5. To exit the application, either close the Window or press the **Cancel** or **OK** buttons.

8.4.3   Generation of Alarms

Normally in a standalone configuration the alarms are detected and generated by the Data Communications Control module. It is this module that sees the changes in gauge data first. In a client-server system it is the same module that detects and reports the alarms although it is important to note that this module will only be running on the server.
Any client connected to the server will therefore see the same alarms.
Some events may be generated locally by each client. These are normally events in response to abnormal operating data or transient or irrecoverable data access errors.

8.4.4   Enabling and Disabling Alarms

Enabling an alarm means that the variable associated with the alarm will be monitored against its set limits and when it deviates outside of those set limits an alarm will occur. Disabling an alarm means that no alarm processing will take place for the disabled alarm and therefore no event, audible signal or otherwise will be generated if the variable goes outside of its set limits.

Alarms can generally be enabled or disabled in one of two ways:
• The alarm configuration display provides a check box within each tab for enabling or disabling the alarm.
• Alternatively, the pop-up menu allows the user to enable and disable the alarms.

The enabling and disabling of alarms is logged to the audit trail file.

8.5   User Defined Alarms

User Defined Alarms (Programmable) are a set of alarms which the user may configure based on a set point and hysteresis. There are eight alarms **User Defined Alarm One** to **User Defined Alarm Eight**.

BA00390GEN_0190
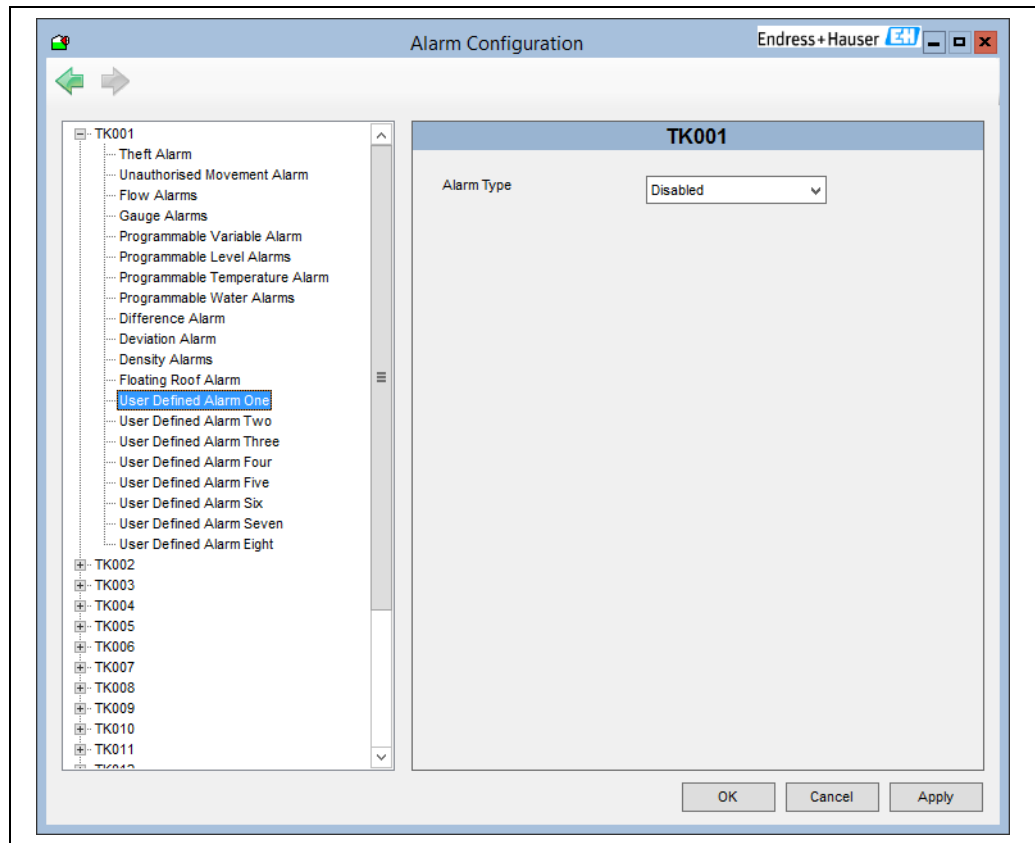
There is a drop down box to select the alarm type and a text box to enter the alarm description.

BA00390GEN_0191
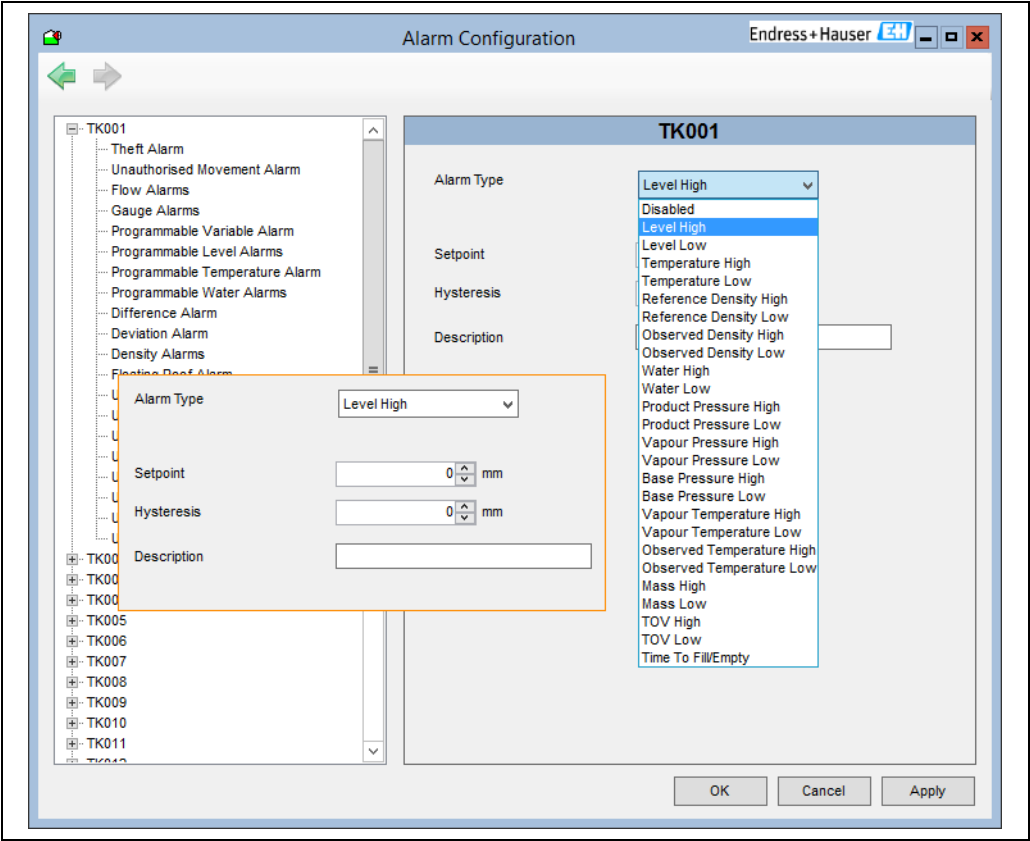
The text that is displayed when the alarm is activated or cleared and the severity is set in Event Server Configuration.

BA00390GEN_0072
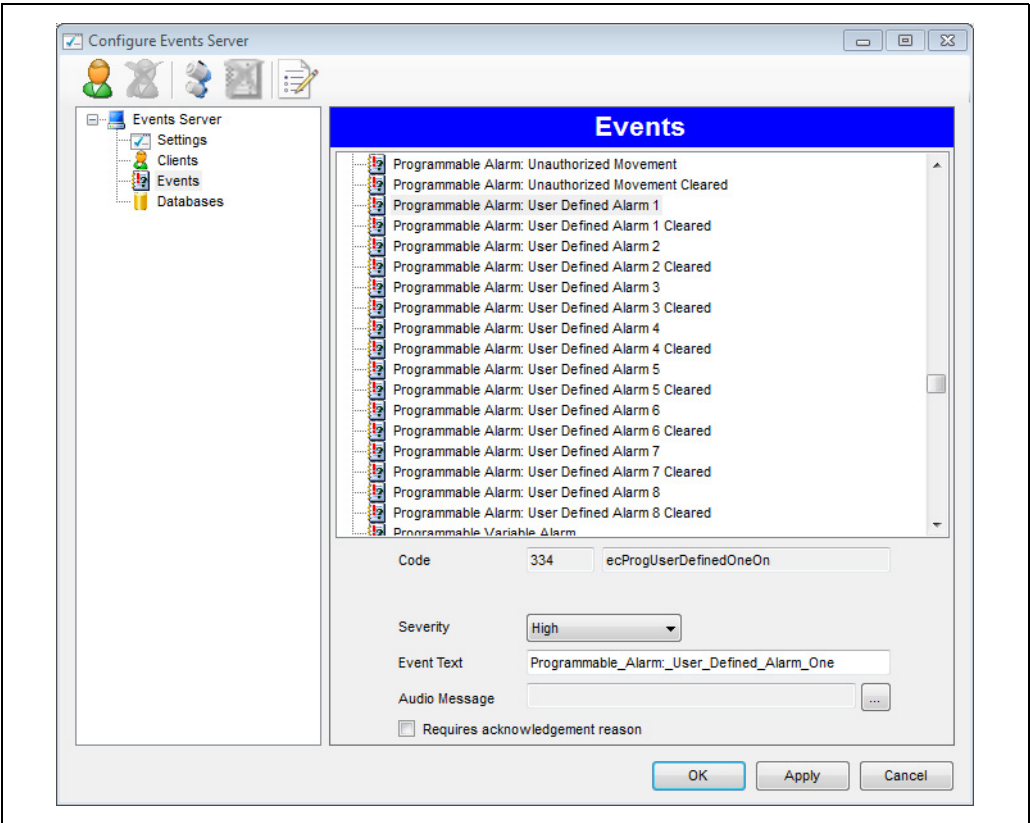
8.6 User Defined Alarms (Gauge)

User Defined Alarms (Gauge) are a set of alarms generated by certain gauge types, Bit pattern data is received by the application from a Modbus or OPC host which must be configured in DCC (see DCC config document). The user may configure the text to be displayed when the alarm is activated and cleared. There are 32 such alarms per gauge:

- User Defined Alarm 1
- User Defined Alarm 2
- User Defined Alarm 3
- Etc. etc. up to;
- User Defined Alarm 32

The alarms are available in the database for all gauge types which support Modbus or OPC. To configure the text and severity, display the **Events** page of the **Event Server Configuration** utility.
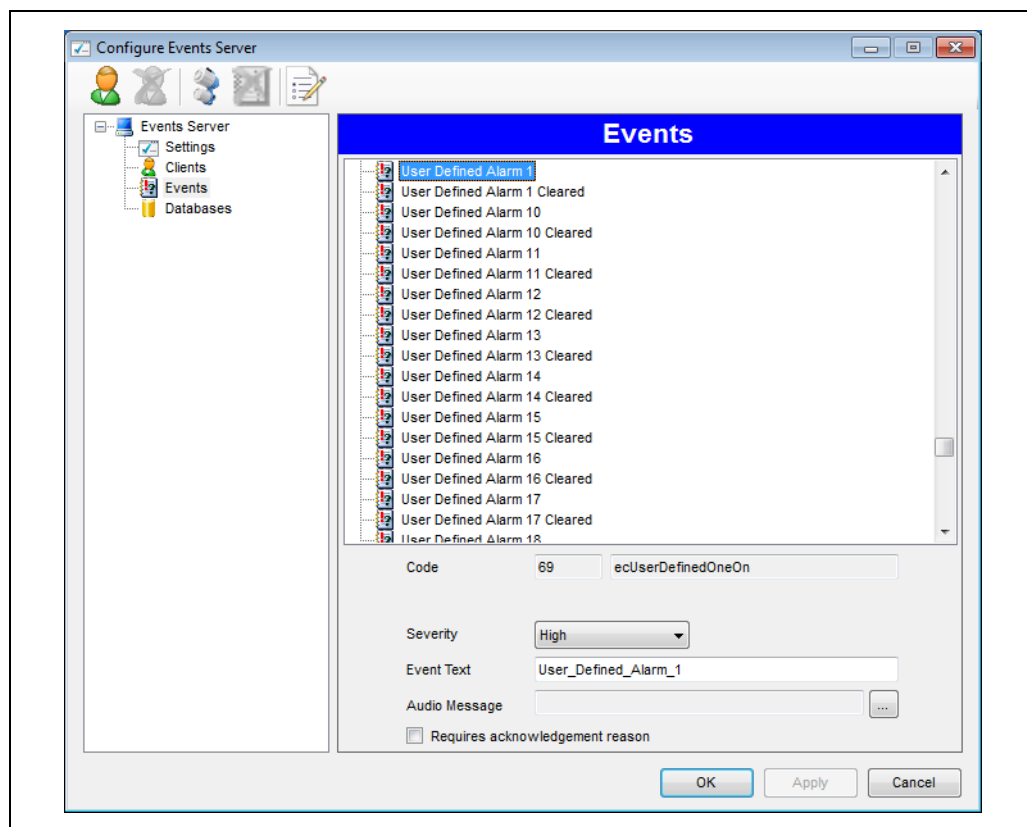
BA00390GEN_0073

From this page the settings for each alarm in the system can be defined.

1. To show the settings select the alarm from the list.

The user defined alarms are:
- User Defined Alarm 1
- User Defined Alarm 1 Cleared
- User Defined Alarm 2
- User Defined Alarm 2 Cleared
- User Defined Alarm 3
- User Defined Alarm 3 Cleared
- Etc. etc. up to;
- User Defined Alarm 32
- User Defined Alarm 32 Cleared

The On and Cleared parameters define what text is displayed when the alarm is activated and cleared. These should be modified by the user to the required text.

Endress+Hauser

The severity may be set by the user as required.
The Event Server should be re-started to load any new alarm definitions. Use the service manager utility to do this.

9   Product Configuration

When first installed, the system has no product information.
This function is used to enter the names of the products stored on-site.
Product Configuration can be launched at any time in order to edit and modify existing products as well as add new products or delete existing products.
Each product needs to be allocated to a product type. By default, a **GENERAL** product type exists. Other product types can be created using this function.

The use of this feature can be controlled by the security system.

9.1   Product Types

Product Types allow the user to group products that have similar characteristics.

For example, general product types might be configured as:
- DISTILLATES
- SPIRITS
- CRUDE
- HEAVY OILS
- FUEL OIL

The following products may for example be members of the DISTILLATES product type:
- DERV
- KERO
- GAS
- OIL
- JET A1

Similarly, the following products may be members of the SPIRITS product type:
- ULMS
- LRP
- UL 95
- UL 98

And so on.

The system provides features that allow the user to view tanks by product type.

9.2   Launching Product Configuration

To launch the Product Configuration module, proceed as follows:

1. Select the **Product Configuration** option from the **Configuration** menu.

BA00390GEN_0300
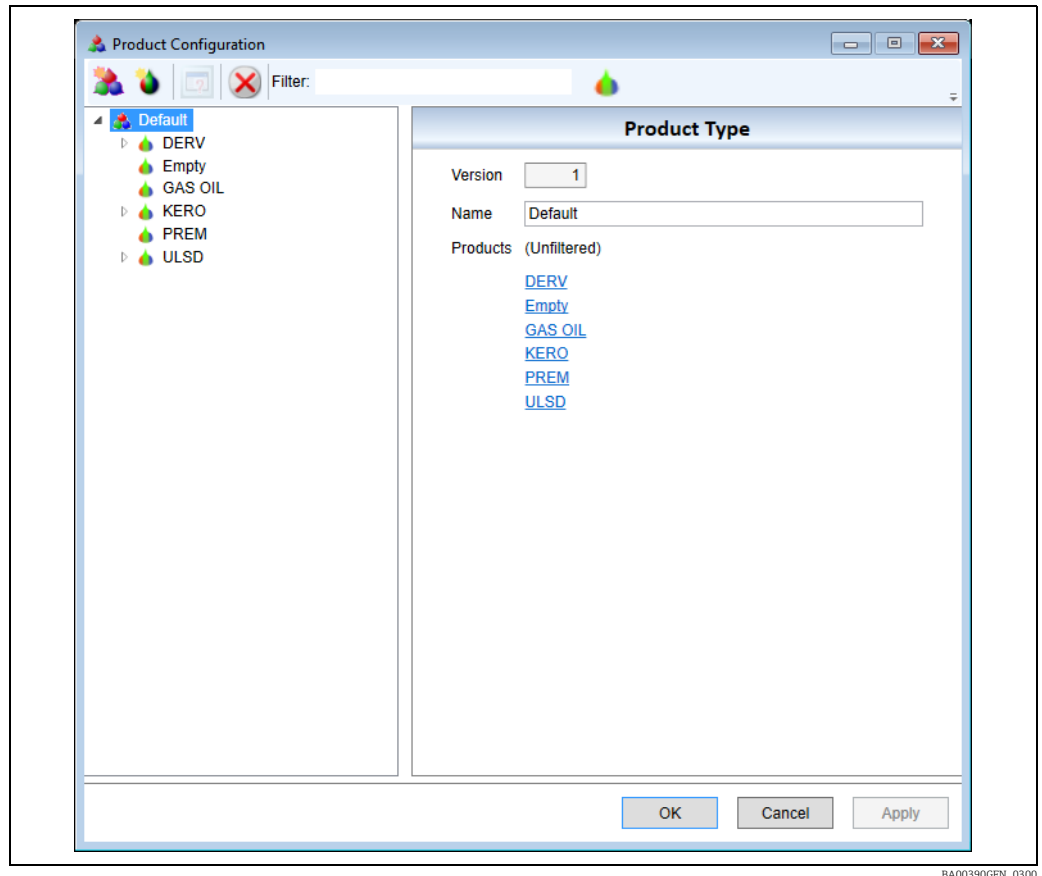
The details of the product or product type selected from the list are displayed in the right-hand pane.
A filter has been provided, as shown in the figure below. This can be useful for locating a particular product when a large number of products have been configured. To filter the products, type the filter criteria into the text box in the tool bar. Any products whose name contains the filter text will be displayed. There is an indication of the number of products included in the filter shown in the product/product type list and also on the product type details pane.
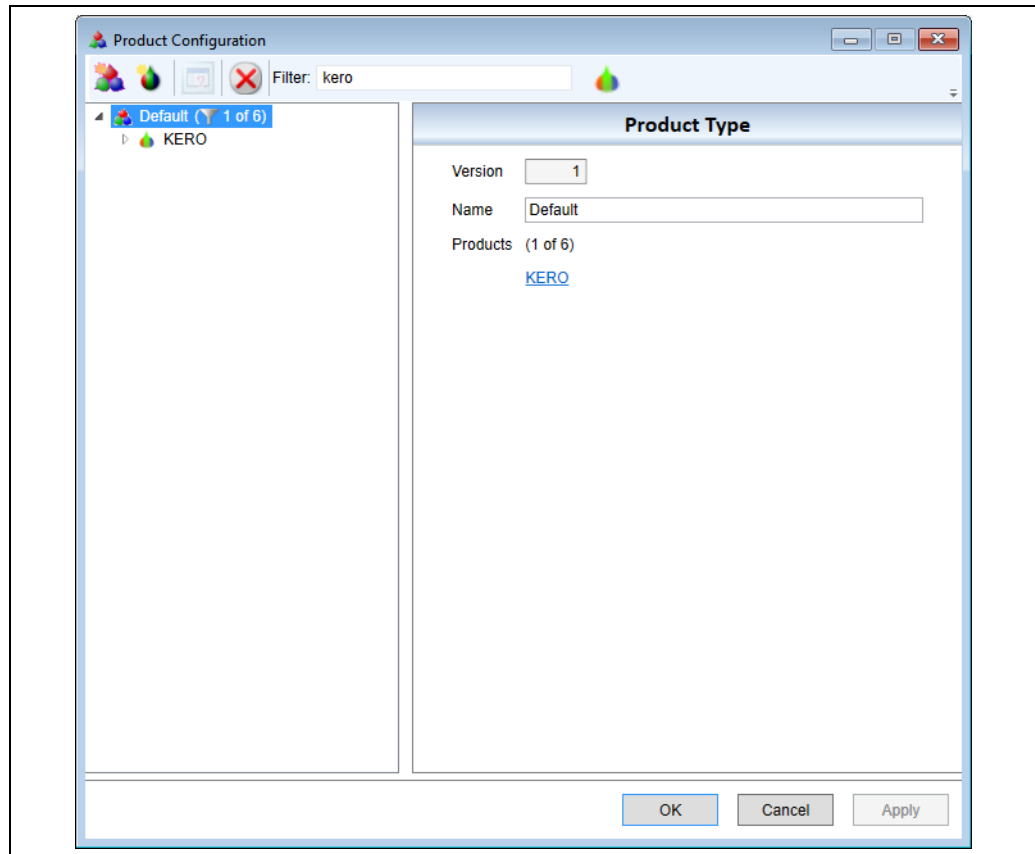
BA00390GEN_0301

9.2.1 Creating a Product Type

To create a product type, proceed as follows:

1. Click on the **New Product Type** ![icon] tool bar button.

2. Enter a name for the product type.

3. Click **Apply** or **OK** to save the new configuration.
   Alternatively click on any entry in the product/product type list with the right mouse button and select **New Product Type** from the menu
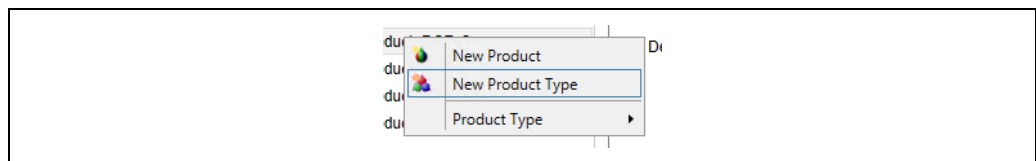
BA00390GEN_0195

The new product type will be created and inserted into the list.

9.2.2 Modifying a Product Type

The only item that can be modified for a product type is the name. To modify the name, proceed as follows:

1. Select the product type from the list of product types.
   The existing details will be displayed in the right hand pane.

2. Edit the name as required and click **Apply** or **OK** to save the new name.
   The version number will automatically increment.

9.2.3 Delete Product Type

Product types that contain products cannot be deleted. Attempting to delete a product type which contains products will result in the following error message.

BA00390GEN_0196

ℹ️ In order to delete a product type, all products within the product type must first be deleted or moved to a different location.

To delete a product type, proceed as follows:

1. Select it from the list of product types and click the **Delete** ❌ tool bar button.

2. Confirm that the product type is to be deleted in the pop up.

BA00390GEN_0198

ℹ️ The **GENERAL** product type cannot be deleted.
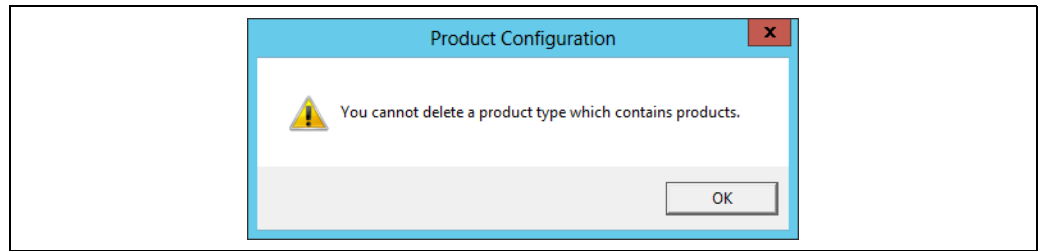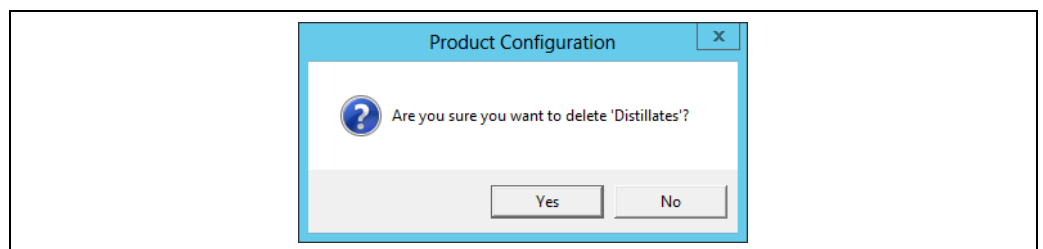
9.2.4 Creating a New Product

To create a new product, proceed as follows:

1. Select the product type that will contain the product and click on the **New Product** 🌑 tool bar button.

2. Enter a name for the product, select a colour to represent the product and, optionally, add a product code (up to 8 characters) and a description.

3. Click **Apply** or **OK** to save the configuration.
    The new product will be created and inserted into the list under the currently selected product type.

ℹ️ The use of colour is determined by options configured in the System Settings module. Please refer to this section for a description of these settings (→ 🖺 96).

Alternatively click on any product type, or entry within the product type, with the right mouse button and select **New Product** from the menu to create a new product in the selected product type.
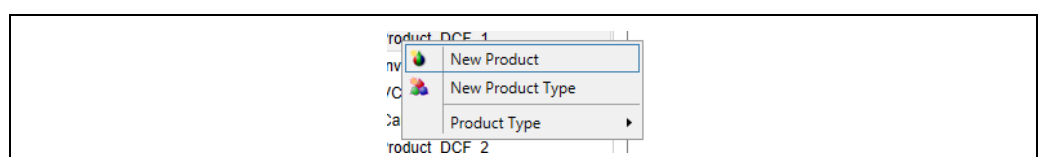
BA00390GEN_0200

9.2.5 Modifying a Product

To modify a product, proceed as follows:

1. Select the product from the list. The existing details for the product will be displayed in the right hand pane. The name, colour and description for the product can then be modified.

A product can also have a set of characteristics configured which will override the corresponding settings in the configuration tool which will then appear grayed out and will be fixed for use with the selected product. This is not an exhaustive set of characteristics and should not be considered an alternative to configuring characteristics for individual tanks. It is, however, useful for fixing a set of characteristics for a particular product.

2. To add characteristics select the product and then click the **Add Characteristics** [icon] tool bar button. If a product already has characteristics, then the toolbar button is displayed differently [icon] and can be used to remove the characteristics.

> [info icon] If characteristics are removed they will then need to be set on each tank containing the product.

A product which has characteristics set can be expanded to show additional entries:

BA00390GEN_0203
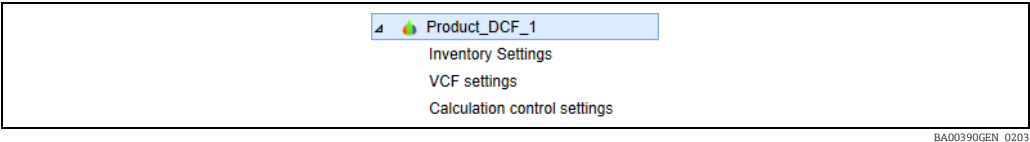
3. Select the entry to show the settings available for each heading:

BA00390GEN_0302
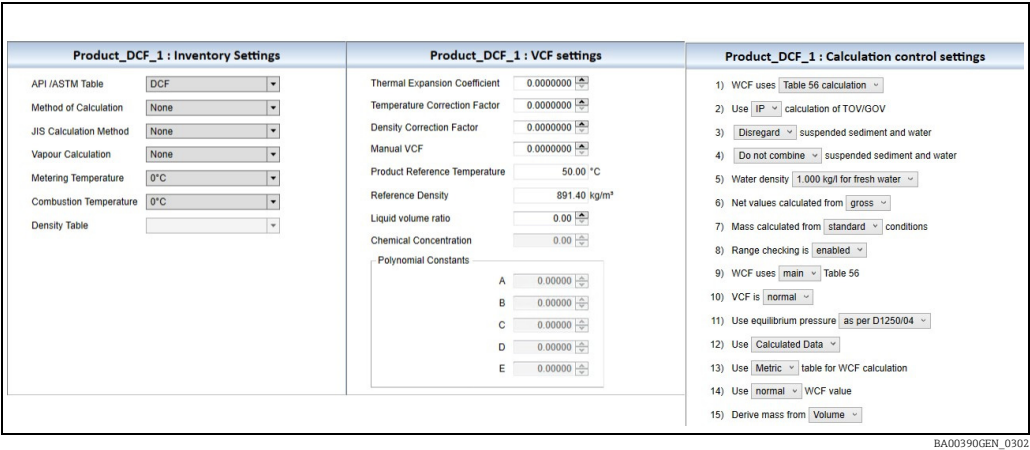
Refer to the section on the configuration tool (→ 🗎 23) for more details on these settings.

4. Click the **Apply** or **OK** button to save the settings.

9.2.6 Deleting a Product

To delete a product, proceed as follows:

1. Select the product from the list and click the **Delete** [X icon] tool bar button.

2. Confirm the product is to be deleted in the pop up.

BA00390GEN_0207
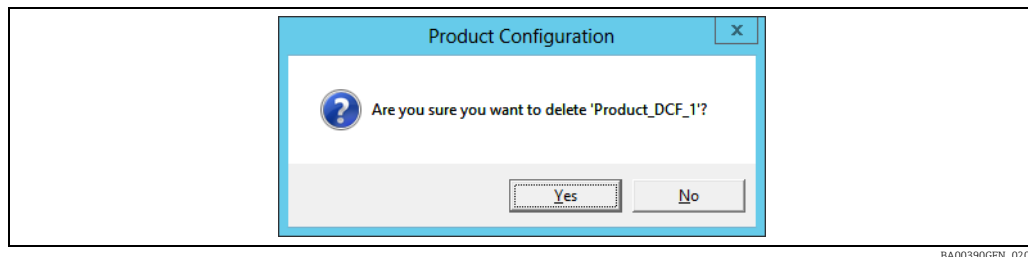
ℹ️ The **Empty** product is required as the default when creating new tanks so cannot be deleted, also products which are currently allocated to a tank cannot be deleted.

9.2.7   Relocating a Product

To relocate a product, proceed as follows:

1. To move a product from one product type to another it can either be dragged with the mouse from its current product type to the new product type, or it can be clicked with the right mouse button and the new product type selected from the menu.

BA00390GEN_0208
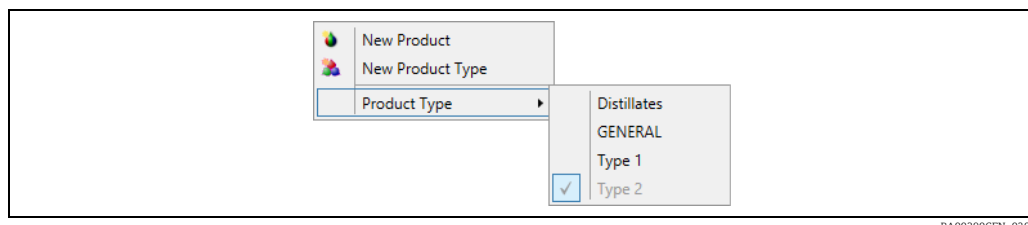
9.2.8   Displaying Product Codes

Products may be selected using either Product Names or Product Codes.
To change between names and codes, proceed as follows:

1. Click on the toggle (🌢 / 🌢) button in the **Product Configuration** menu bar. This will affect product selection in the configuration tool, on the Home page and in the SCADA screens.

9.2.9   Saving Changes

To save changes made to products and/or product types, proceed as follows:

1. Click either the **Apply** or **OK** button.

Clicking **Apply** will save the changes and keep the product configuration screen open allowing for further editing.
Clicking **OK** will save the changes and then close the product configuration screen.

ℹ️ If a product with characteristics has been modified, then any characteristics of the product will be applied to all the tanks that have that product allocated when the product changes are saved.

9.2.10   Discarding Changes

To discard any changes made, proceed as follows:

1. Click the **Cancel** button.
The following message will be displayed if there are any unsaved changes.

BA00390GEN_0209
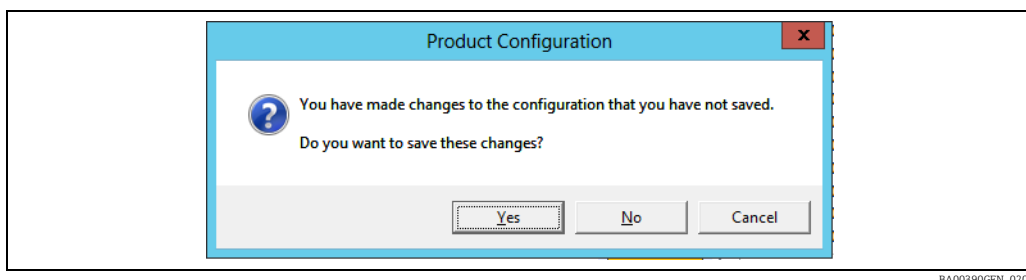
9.3   Allocating Products to Tanks

Once all the product information has been entered the products can then be allocated to their operational tanks.
The Configurator tool module is used to allocate a product to a tank.
See the section detailing the Configurator tool module for a full and complete description (→ 🖹 23).
Alternatively, the product allocated to a tank can be changed from the Home Page, Single Tank Overview and SCADA screens. See the relevant sections in the Operations Manual for more details.

10 Security

The application is provided with its own security and user administration functions. It is not dependent on Windows system security for access to its features.

The tank gauging applications check that the current user has access privileges for the features in the module by communicating with the Security Manager running in their Windows session. This in turn communicates with the Security Service on the Tank Gauging server, if the system is a standalone one, then the service will be running in the background on the same machine, otherwise it may be running on a remote server over the local area network. This service stores the security information in a database called "TGSecurity" on the server. The figure below represents this architecture.

BA00390GEN_0269

When troubleshooting security problems it is important to consider all the pieces in the security system, the problem might lie in the communications between the Security Manager on the client and the Security Service on the server, or with the connection between the Security Service and the database.
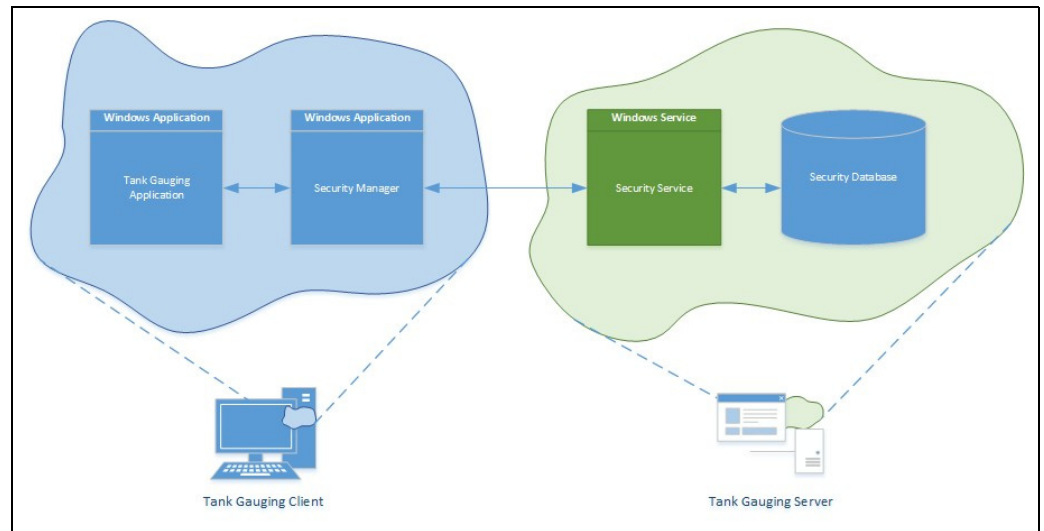
Redundant Systems

If your system is a redundant one there are instances of the Security Service running on both servers, each system also has a copy of the TGSecurity database. In normal operation when both servers are available Security Manager will communicate with one of the servers: there is no way to determine which server the Security Manager is using, nor is there a way to command the Security Manager to connect to a particular server.

In the event that one of the servers fails, the Security Manager will connect to whichever of the servers it can. While in the failed state users can continue to log in and out of the system and features such as automatic log out are maintained. However, in such a state, the security system will prevent security settings from changing, the alteration of users and groups and users changing their passwords. This is in order to preserve the synchronisation of the TGSecurity databases on the two systems.

Initial Set up

During initial installation an Administrative account is created as part of the Set-up procedure. Thereafter additional user accounts can be created by a user with administrative privileges.

The security maintenance features are accessed via the **Security** menu.

The security features should be used carefully to ensure users have the correct access rights for their day to day tasks yet prevent unauthorised access to the other features.

10.1   Security Settings

In order to adjust the security settings, proceed as follows:

1. Log on to system as an administrator.

2. Select the **Security Settings** option from the **Security** menu.
   The following screen appears:
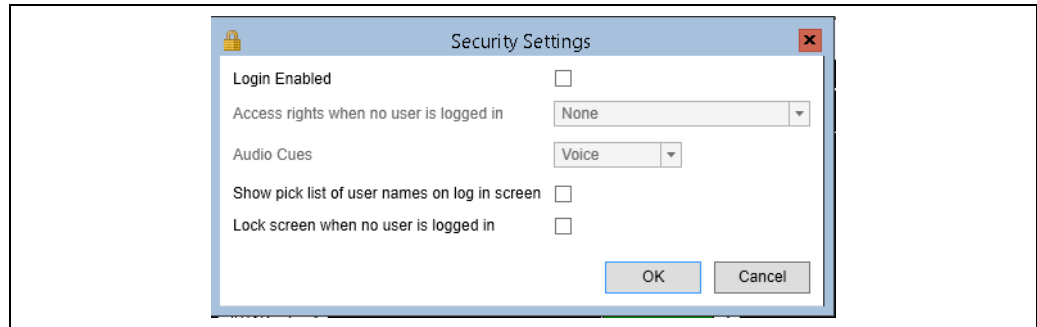
ℹ️   User Access rights (from User group) are only applied if **Login Enabled**.

3. Adjust the settings according to the explanations below.

Login Enabled

Determines whether the use of logins should be disabled throughout the whole application.
If this option is checked, the system will prompt for a User name and Password before
providing access.
If this option is not enabled, no login prompt will appear.
Clearly this option needs to be treated with care.

Access rights when no user logged in

If Login is enabled, there is obviously a state when the user logs out or when the system
starts up. You can assign a user group for this state and then define what actions the system
will accept without a user being logged on. For instance you may allow users to change the
arrangement of tanks on the screen without logging on, but require that users log in to
acknowledge an alarm.

Audio Cues

Changes the way that users are informed of a need to log in.
• **Voice**: A spoken announcement is made, currently the only language spoken is English.
• **Sound** A simple beep noise is given.
• None: There is no audible indication of a need to log on.

Show pick list of user names on log in screen

Determines whether a pick list of user names is displayed on the log in screen instead of the
user name text field. Use of this setting is not recommended since it reduces security.

**Lock screen when no user is logged in**

Determines whether the screen is locked when no user is logged in. If this option is ticked
the screen is locked when the user logs out. Before anything can be accessed on the
computer, a user must log in.

10.2   User Maintenance

In order to launch the User Maintenance module, proceed as follows:

1. Log on to system as an administrator.

2. Select the **Maintain Users** option from the **Security** menu.
The following dialog opens:
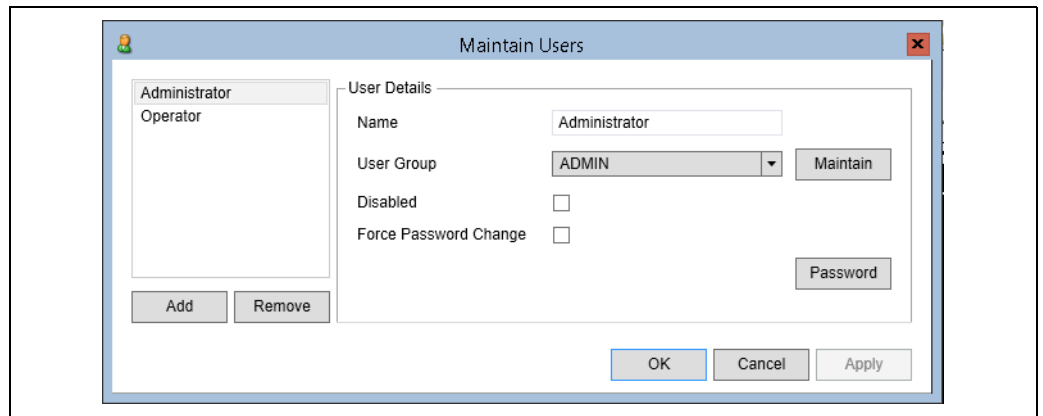
BA00390GEN_0077

10.2.1   View/Edit Details of an Existing User

To view/edit details of an existing user, select the user in the list. Details of the user will be displayed in the **User Details** area.
If you have access rights to edit users, the following details can be edited.

Name

The name of the user.

User Group

The user group that the user belongs to. It is the user group that determines the areas that the user has access to. To edit user groups click the **Maintain** button.

Disabled

Determines whether the log in for the user is disabled. This can be set explicitly on this screen, or automatically by the system depending on the user group when the user incorrectly enters their password. To re-enable this user, untick the box.

Force Password Change

Forces the user to change their password the next time that they log in. This can be used in conjunction with the **Password** button to reset their password, but force them to change it the next time they log in, so that the administrator doesn't know their password.

Password

Click this button to reset the password for the user:
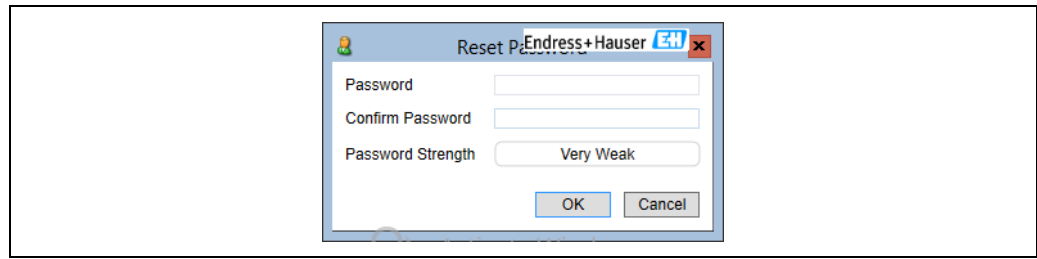
BA00390GEN_0211

10.2.2   Adding a New User

To add a new user, click the **Add** button. A new user will be added to the list and selected ready for editing.

10.2.3   Deleting a User

To delete a user, select them in the list and click the **Remove** button. If the user is currently logged in you will be unable to delete them.

10.2.4   Saving Changes

To save the changes to the users click the **Apply** button. To save the changes and close the screen click the **OK** button.

10.2.5   Discarding Changes

To discard the changes to the users click the **Cancel** button. This will discard the changes and close the screen.
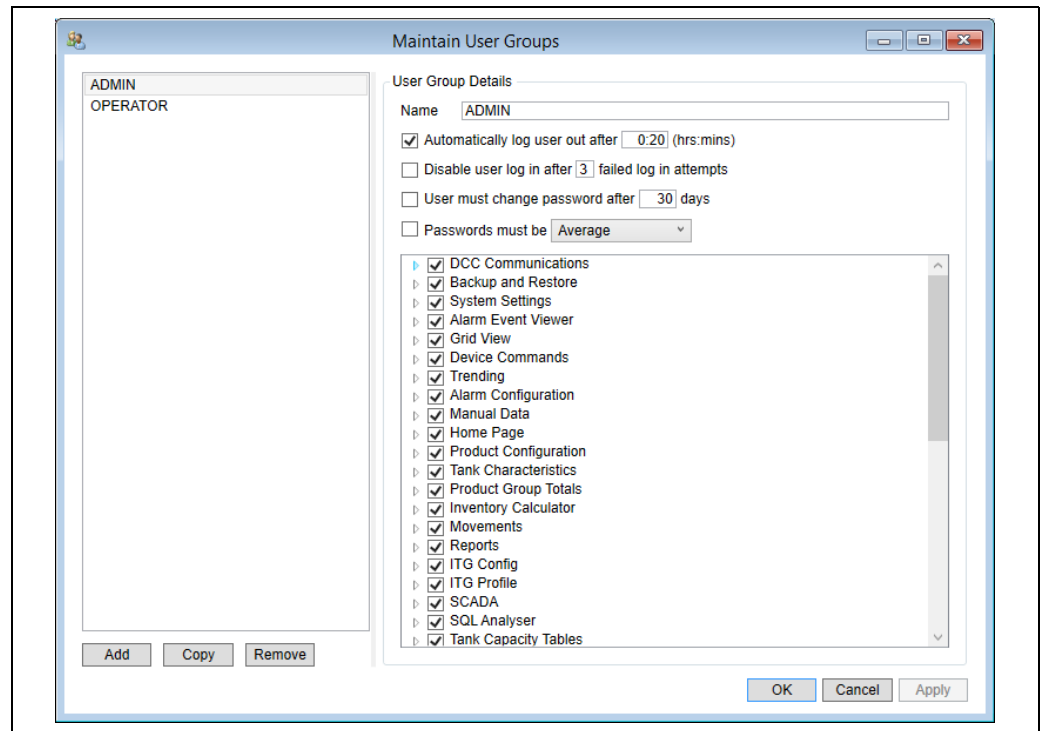
10.3 User Group Maintenance

To launch the User Group Maintenance module, proceed as follows:

1. Log on to system as an administrator.

2. Select the **Maintain Users Groups** option from the **Security** menu.
The following dialog opens:

BA00390GEN_0212

10.3.1 View/Edit Details of an Existing User Group

To view/edit details of an existing user group, select the user group in the list. Details of the user group will be displayed in the **User Group Details** area.
If you have access rights to edit user groups, the details can be edited.

Name

The name of the user group.

Automatically Log Out

Determines whether users belonging to the user group will automatically be logged out after a given period of inactivity.

Disable User Log In

Determines whether users belonging to the user group will have their accounts disabled if they incorrectly enter their password the specified number of times.

Force Password Change

Determines whether users belonging to the user group will be forced to change their password after the given number of days.
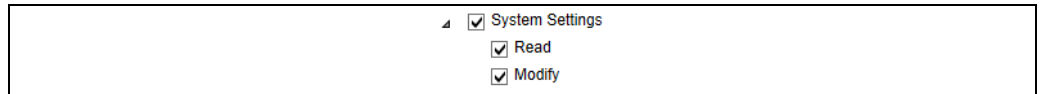
Password Strength

Determines whether users belonging to the user group will be forced to use passwords of the given strength.

ℹ️ If this option is used, passwords are case sensitive, otherwise passwords are case insensitive.
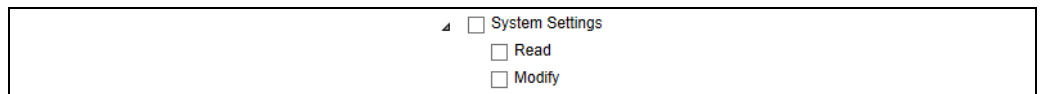
Access rights

To view details of a specific access right click on the ▷ button to the left of it. This will show further details:
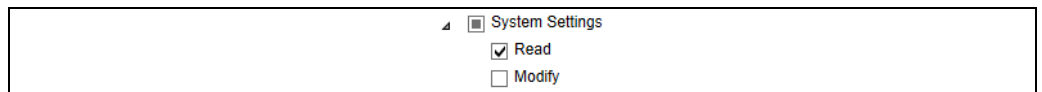

BA00390GEN_0213

Access rights granted for a user group are indicated by a tick. To remove or grant an access right click on the box next to it. This will toggle whether it is granted to the user group. Clicking on a 'parent' access right (for example **System Settings** above) will remove or grant access to all the options underneath it. So, for example, to prevent a user accessing the **System Settings** area, you could untick the box next to **System Settings** and this would remove the ticks from the **Read** and **Modify** boxes underneath it.

BA00390GEN_0214

If the access rights under a 'parent' access right are in a mixed state (some ticked and some unticked), the box for the 'parent' access right will be filled in:

BA00390GEN_0215

ℹ️ User Access rights (from User group) are only applied if **Login Enabled**.

10.3.2   Adding a New User Group

To add a new user group, click the **Add** button. A new user group will be added to the list and selected ready for editing.

10.3.3   Copying a New User Group

A new user group can be copied from an existing one, to make setting up access rights easier. Select an existing user group and then click the **Copy** button. A new user group will be added to the list, with the same details as the existing user group, and selected ready for editing.

10.3.4   Deleting a User Group

To delete a user group, select it in the list and click the **Remove** button. If any users are a member of the user group you will be unable to delete it.

10.3.5   Saving Changes

To save the changes to the user groups click the **Apply** button. To save the changes and close the screen click the **OK** button.

10.3.6 Discarding Changes

To discard the changes to the user groups click the **Cancel** button. This will discard the changes and close the screen.

11   System Settings

System Settings affect the operation of the entire system. The System Settings option is available under the **Admin** menu.

ℹ️   The use of this feature can be controlled by the security system.

11.1   Using System Settings

To launch the System settings module, proceed as follows:

1. Select the **Admin** → **System Settings** option from the main menu bar.

BA00390GEN_0303

To change system settings, proceed as follows:

1. Enter the required data or change the current settings. For the meaning of the individual items refer to the explanations below.

2. Press the **OK** button.
    The window will close and the changes will be saved to the database.

11.2   Default Tank Manual Data

Determines which data items will be set to manual status by default.
Selecting a data item in this section will force the corresponding item to be set to manual status by default when a new device is added to the system.

11.3   Ambient Conditions

These settings influence the hybrid-hydrostatic and hydrostatic calculations, and permit adjustment of the constants in these calculations to match the local conditions.

11.3.1   Local Gravitational Acceleration

The acceleration due to gravity expressed in m/s². Default: 9.8126 m/s².

11.3.2   Ambient Air density

The density of air at the site's location expressed in the density units prevalent to the local system. Default: 1.23 kg/m³.

11.3.3 Water Density

The density of water typically found suspended in the products in the tank, expressed in the density units prevalent to the local system. Default: 999.02 kg/m³.

11.4 Security Settings

11.4.1 Use User Profile

Determines whether a user profile should be used. The user profile is limited to determining which tanks can be viewed by a user.

- When checked the user will be asked to logon at start-up on the assumption that the user only has access to a limited number of tanks programmed into the system. If the user has not been previously configured with a group of tanks no tanks will be in view at start up.
- When not checked the system will be started with the default profile which is show all tanks programmed into the system.

See the **Tanks By User** feature on how to configure a user profile.

11.4.2 Automatically Generate Unauthorised Movements

Determines whether the movements subsystem should enable and disable the unauthorised movement alarm.
If this option is checked the movements subsystem will disable the unauthorised movement alarm when a movement is opened for a tank. Similarly the movements subsystem will re-enable the unauthorized movement alarm when a movement is closed and there are no more open movements for a tank.

11.5 Calculations

11.5.1 Flow Rate

The flow rate calculation can be made to mimic an MDP system.

11.6 Tank Settings

11.6.1 Use Product Colour

Determines the strategy for use of colour in the tank windows.
When selected the colour representing the product level in the tank will be that which was selected for the product in the tank. See the **Configuration → Product Configuration** options which allows the user to configure the colour a product will be displayed in.
When not selected the colour of the tanks is represented by the tank status. For example, if the tank is filling the colour of the product is displayed in blue, if the tank is emptying the colour of the product is displayed in brown, and if the tank is static the colour is displayed in green.

11.6.2 Movement Threshold

Determines the minimum level flow rate that is deemed significant enough to mark a tank as moving.
A flow rate of 5 mm/min is correct for most installations, but if your particular site has a lot of large crude tanks, for instance, you might want to use a smaller value. The threshold level is used to drive the up and down arrows on the tank mimic screens on the main page.

11.6.3   Display Target Levels

Determines if a target level is displayed in the homepage when using simple movements.

11.7   Manual Level Entry

11.7.1   Warn Against Manual Level Entry

Determines whether the user should be warned if they attempt to enter a manual level entry that would fall outside the normal operating range of the tank.
For example above the High High level or below the Low Low level.

12   Auto Startup Configuration

12.1   Description

The Auto Startup configuration allows the user to start any application within the system when the PC is rebooted or restarted. This is useful after a power trip for example. Any other program on the PC can also be added via the browse option. There is an overall delay (to allow for the database and services to start) and each application can be further delayed separately. Parameters or arguments may be passed to any application on startup.

12.2   Launching

The **Auto Startup Configuration** is launched from the windows start menu.
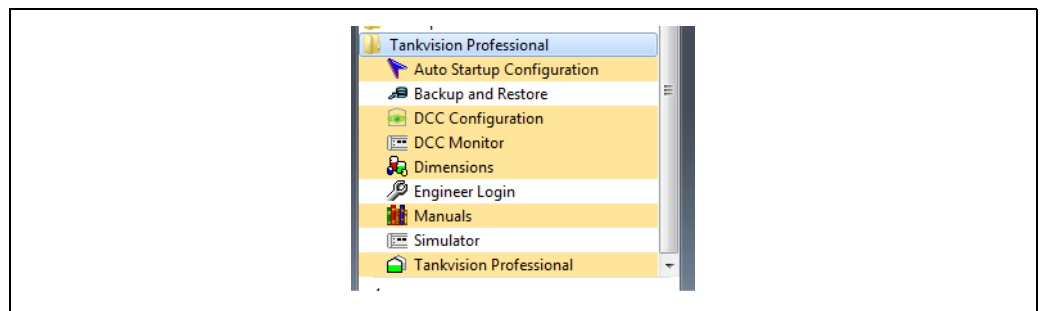
Windows start menu for Tankvision Professional
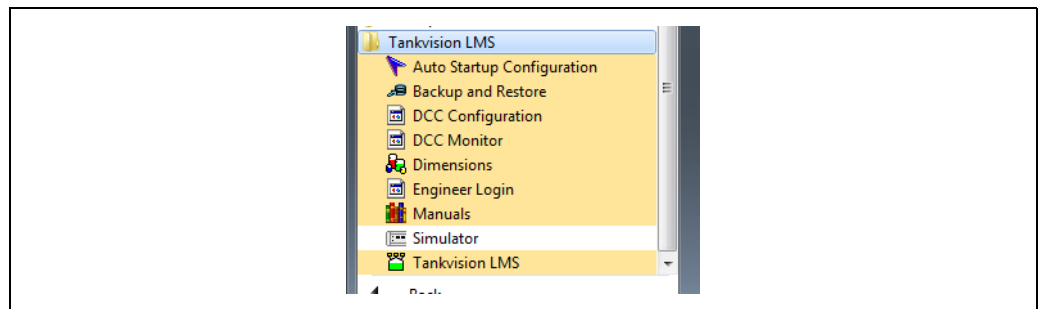
Windows start menu for Tankvision LMS

The configuration window below is opened:
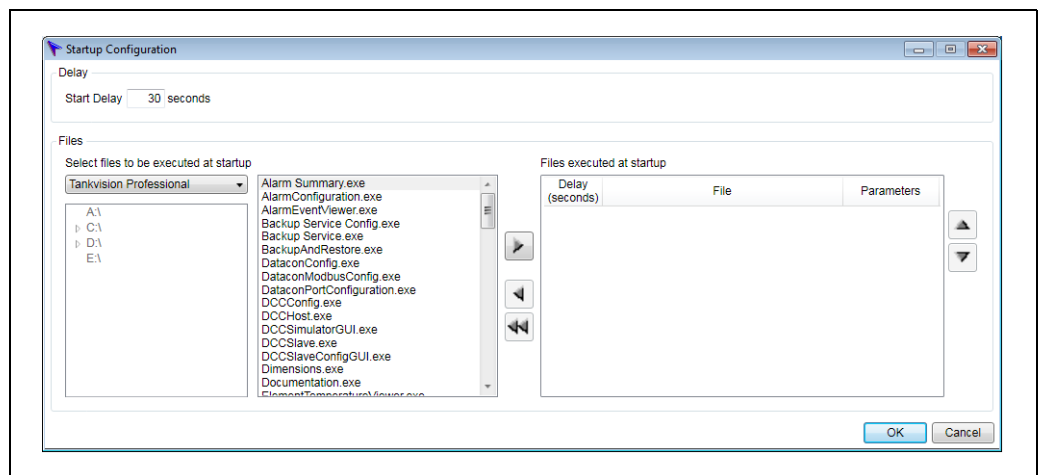
Configuration window for Tankvision Professional

BA0xxxxGEN_Configuration_0002
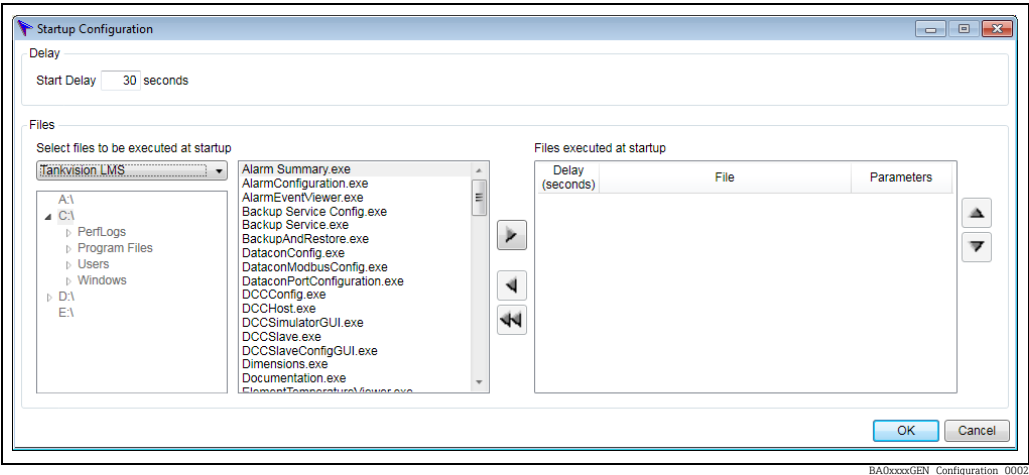
Configuration window for Tankvision LMS

12.3   Configuring

Any application from the tank gauging system can be selected.

BA00390GEN_0085

Applications for Tankvision Professional

BA0xxxxGEN_Configuration_0003
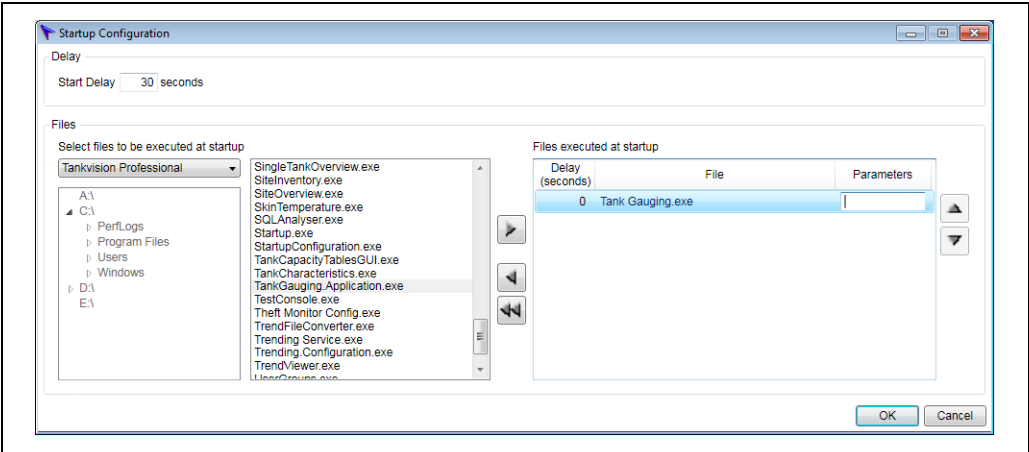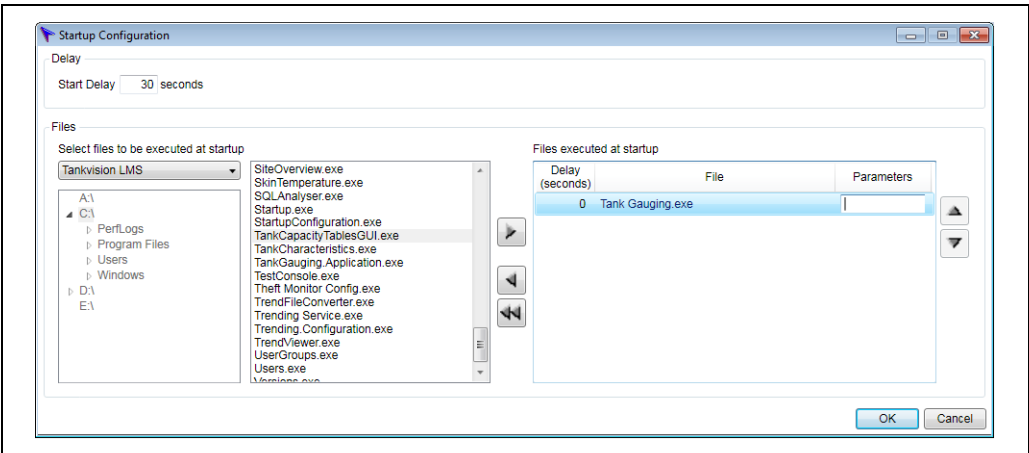
Applications for Tankvision LMS

In the example shown above the main screen with multi tank view has been selected. The default delay is 30 seconds and no further delay has been added. The dialog for adding arguments or parameters is shown opened.
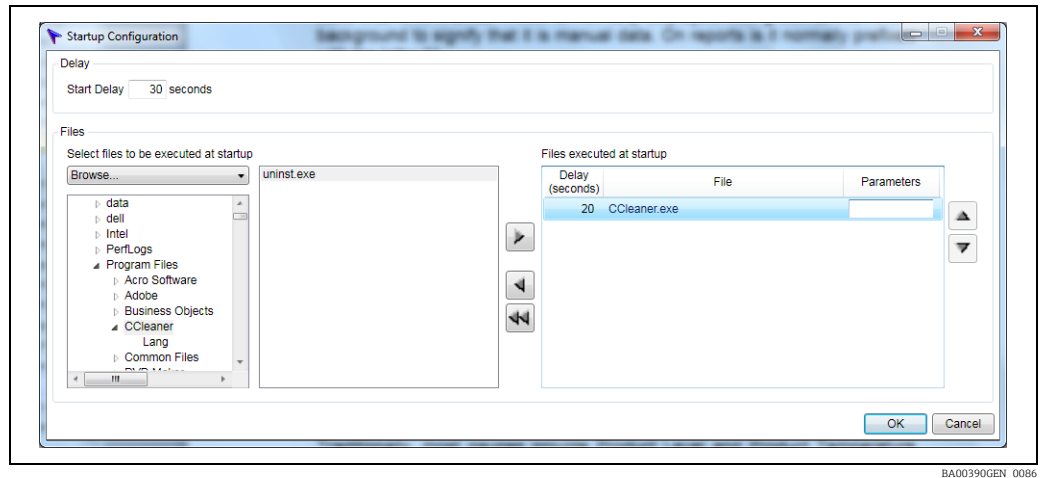
BA00390GEN_0086

In the example shown above a custom application has been added.
The default delay is 30 seconds and a further delay off 20 seconds has been added. The dialog for adding arguments or parameters is shown opened.
During start-up a count-down window is displayed.
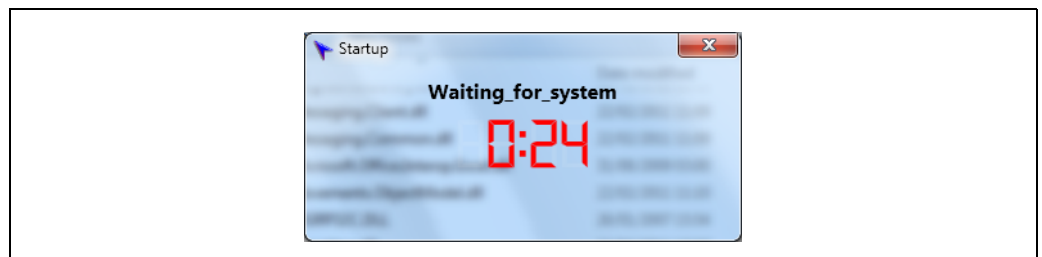
BA00390GEN_0087

13   Manual Data

Normally tank data is collected from the field instruments automatically.
Where primary data values are not available or no longer available due to a gauge fault, data
values can be switched from automatic mode to manual mode.
When in manual mode the data values have to be provided by the operator.
Data that is in manual mode is normally displayed with green text on black background to
signify that it is manual data. On reports is it normally prefixed with the letter **M**.
Where tanks are not fitted with gauges but they are still required on the system, the tank
may be operated with all of its primary data values in manual mode. In this way at least the
tank inventory is still calculated.

> **i** Gauges that have both level and temperature in manual mode will not be polled by the
> communications layer.

Primary data values are those measurements made by the tank gauging instrument such as:
- Product Level
- Water Level
- Product Temperature
- Product Density
- Pressure

Traditionally, most gauges provide Product Level and Product Temperature measurement
capability. It is quite common to find that the rest are entered as manual data.
More modern gauging instruments have the capability to measure water level, density and
pressure automatically. In this case the values would be collected automatically.

The use of this feature can be controlled by the security system.

> **i** By default a manual value will not trigger a programmable alarm, **DCC Host** → **Options**
> → **Configure** ticking the option for alarms on manual data will reverse this
> functionality.

13.1   Launching the Manual Data Entry Module

To launch the Manual Data Entry Module, proceed as follows:

1. Select from the main application window menu **Configuration** → **Manual Data**.
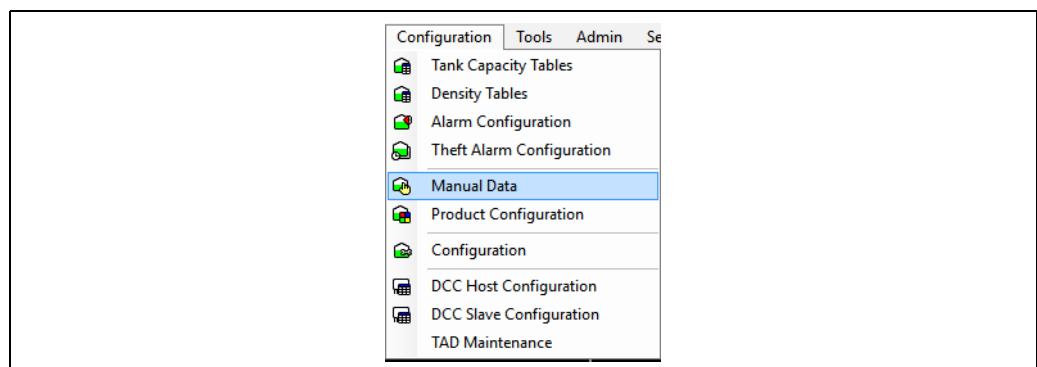
BA00390GEN_0304

The following display is typical.
A list of all tanks will be displayed on the left, together with the manual data entry fields for
the selected tank.
By default a reduced set of the most common fields will be displayed.

BA00390GEN_0305
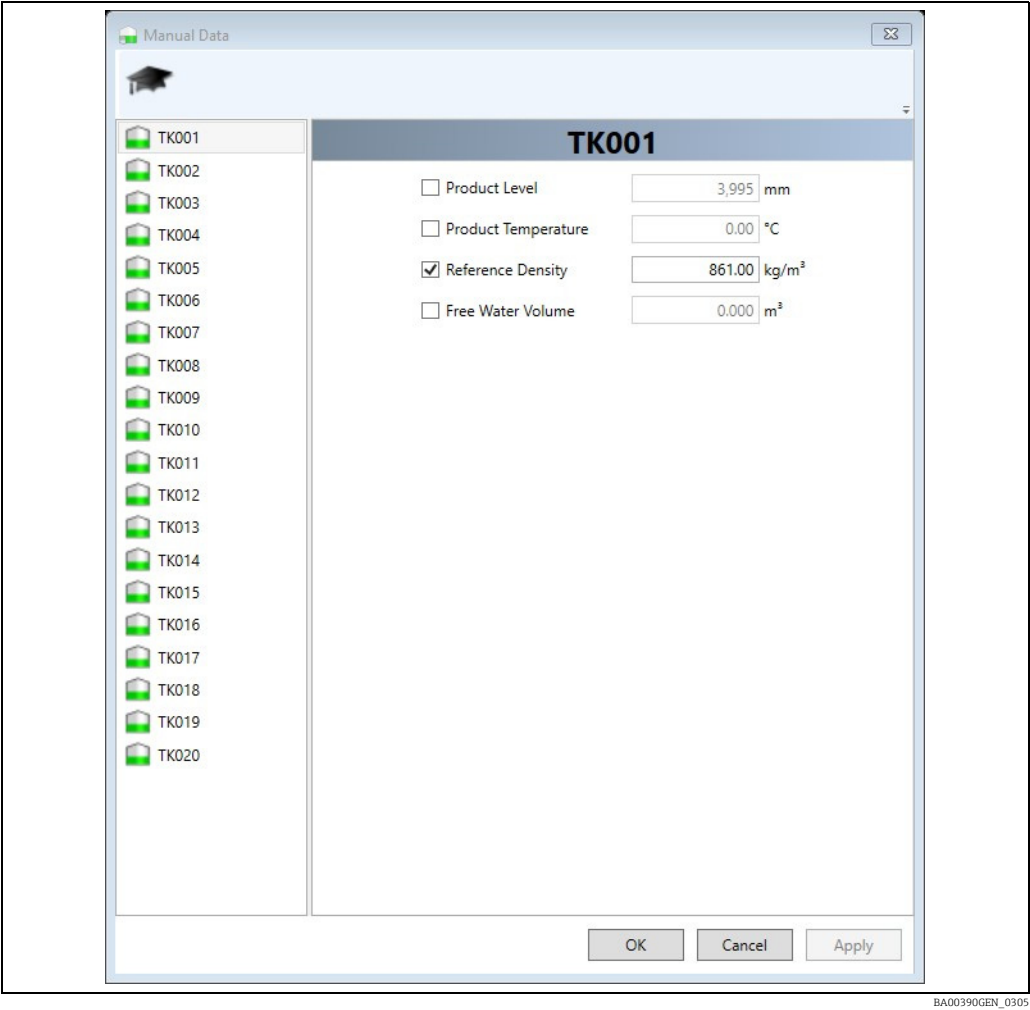
To view the additional fields for a tank click on the advanced [icon] button which will extend the display to show additional values as shown below.

By default any changes to the manual data for a tank will apply to ALL gauges on that tank.

BA00390GEN_0306

13.2   Entering Manual Data

To enter manual data, proceed as follows:

1. Select the required tank/gauge from the list.

2. Edit the value.

3. If the variable is not already in manual mode tick the **Enabled** tick box. When saved this will switch the value to manual mode.

4. After all required data has been entered, press the **Apply** button to save the changes to the database.

ℹ️ Any problems in writing the data to the database will be reported to the user via the Status bar of the display.

5. Press the **Cancel** button to discard any changes and exit the application.

13.3   Putting a Variable into Manual Mode

Manual data can be modified regardless of whether the value being modified is in manual mode or not.
When a parameter is switched to manual mode, the current data stored in the manual value will be utilised. The inventory data will also be calculated using values that are in manual mode.

There are essentially two techniques to putting a parameter into manual mode:
• Checking the tick box adjacent to the parameter in the manual data entry module, or
• Selecting the **Manual Data** option from the pop-up menu on the tank graphic view (see below).
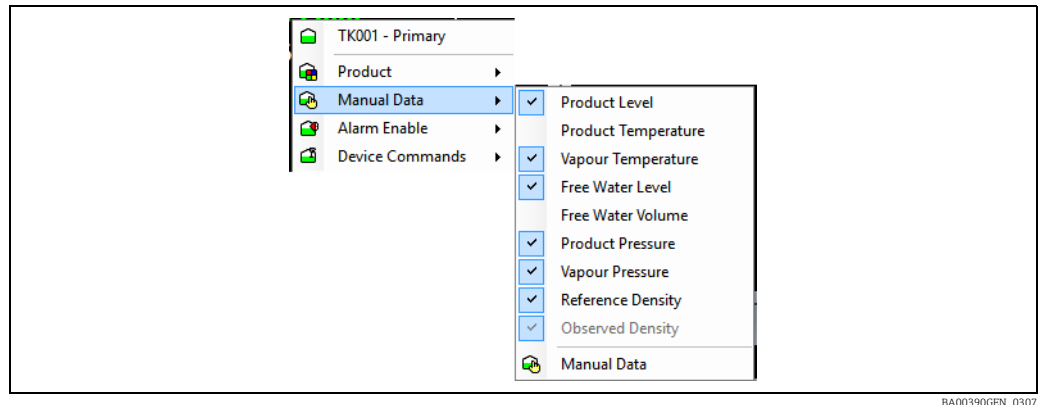
BA00390GEN_0307

Either method has the same effect.

ℹ️ If the pop-up menu is used, the current manual data will replace the automatic value. If the current manual values are incorrect you would need to use the **Configuration** → **Manual Data** module or select **Manual Data** → **Manual Data** from the pop up menu to update them.

13.4   Shortcut to Manual Data

When a parameter is set to manual mode, its data is displayed with blue text and black background colour.

1. Double click the parameter in manual mode.
   This will launch the manual data entry module for the selected tank.

14   Tanks by User

This function provides an administrator with the ability to configure which tanks a user login can view.

This is quite useful on larger multi-user systems where tank operations are split between different users, and a user may be responsible for looking after a specific set of tanks.

1. Select the **Tanks By User** option from the **Admin** menu.
   The **Tanks By User** display will be loaded.
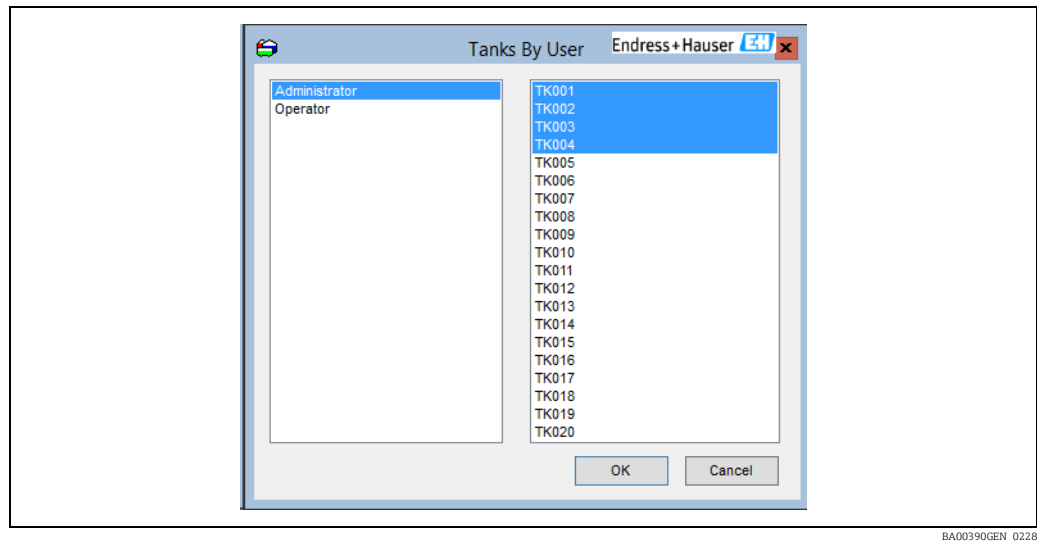
BA00390GEN_0228

This display comprises two list boxes. One list containing the currently configured users and the other the full list of tanks with the tanks currently assigned to the selected user highlighted.

14.1   Setting Tanks a User Can View

To set the tanks a user can view, proceed as follows:

1. Select the user from the list.
   Any tanks currently allocated to that user will be highlighted. Highlight the tanks in the tanks list that the selected user is able to view.

2. Click the **OK** button to save the changes. Repeat this for each user.

3. To exit the screen without saving the changes click the **Cancel** button.

ℹ️   For Tanks by User to work **Login Enabled** must be selected in **Security Settings**.

15 Trending Configuration

Trending configuration is done on a server or standalone station. It is accessed via the Service Manager in the Windows system tray. The display is a multi-tabbed dialog as shown below.

15.1 General Tab

This contains configuration options relating to the trending service and housekeeping of the trend files.
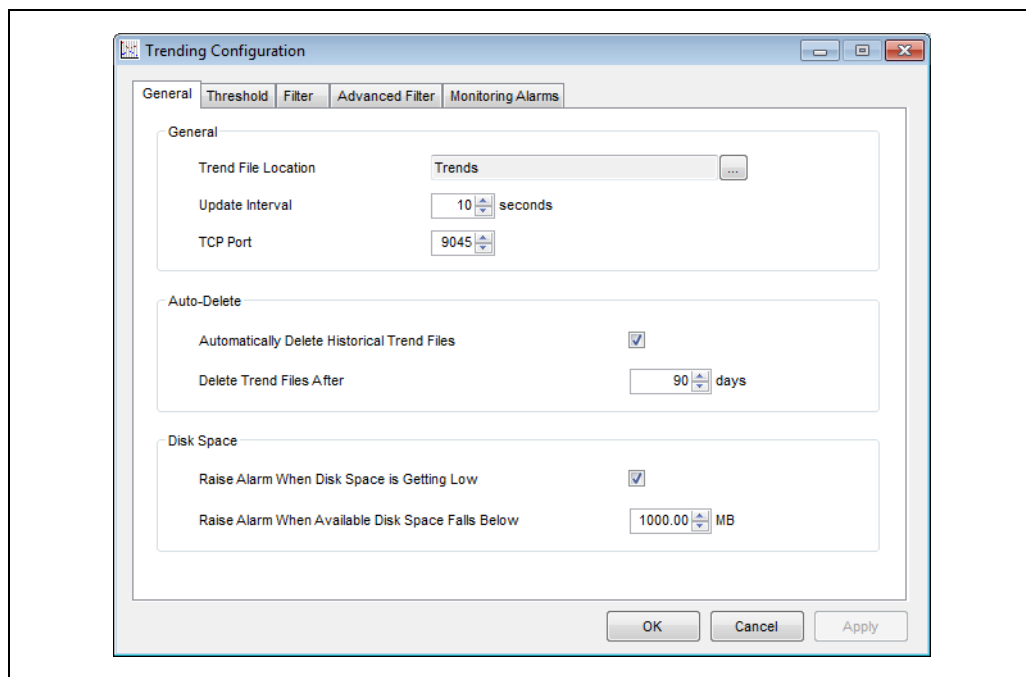
BA00390GEN_0114

Trend File Location

A directory where the trend files will be stored. This location is relative to the Application directory.

Update Interval

The interval at which the tank data is checked to see if it has changed.
The trend server analyses the live tank gauging data by polling the RTDB on a timer based trigger. This value is the number of seconds between successive poll triggers.

TCP Port

The TCP port to be used by clients to communicate with the trending service.

Automatically Delete Historical Trend Files

If this option is checked historical trend files will be deleted after the time specified below.

Delete Trend Files After

The age the files need to be before they are deleted, if this feature is enabled.

Raise Alarm When Disk Space is Getting Low

If this option is checked an alarm will be raised through the events subsystem when the available disk space falls below the defined threshold.

Raise Alarm When Available Disk Space Falls Below

The available disk space below which an alarm is to be raised.

15.2 Threshold Tab

The **Threshold** tab allows the sensitivity of the trending to be modified. In order to reduce the volume of data written to disk and therefore the size of the dataset the service only writes data items when they have changed significantly from their previous value. The threshold of each type of field is defined in the service configuration individually and it is this threshold that determines when a value is written.

If we take level as an example, a threshold of 0 millimetres will result in every level reading from the gauges being written to disk, doing so means there are more data point records in the trend files and a commensurate increase in time spent writing the data and reading it again to display in the trending client. It is therefore recommended that thresholds of zero are not used. When deciding on a threshold setting; approach it from the aspect of selecting what accuracy you need for your historical data on the graphical displays, not from trying to determine exact inventory conditions on the site at any given time. The trending data from the tank gauging system is not intended to provide verifiable custody transfer information.

15.2.1 Quantised data

Conceptually the domain of values for a given tank parameter are divided into discrete quanta. Each value in the domain maps to a single quantum. When a tank parameter's value changes so that the quantum the value maps to is different from the previous tank parameter's quantum, then the trending service records a value in the trend file. The quanta are calculated as follows:

Q = value / ((treshhold * $\sqrt{2}$) + ε)

ℹ️ Observe the factor of $\sqrt{2}$, this included so as to render the volume of data collected compatible with earlier versions of the software before quanta.
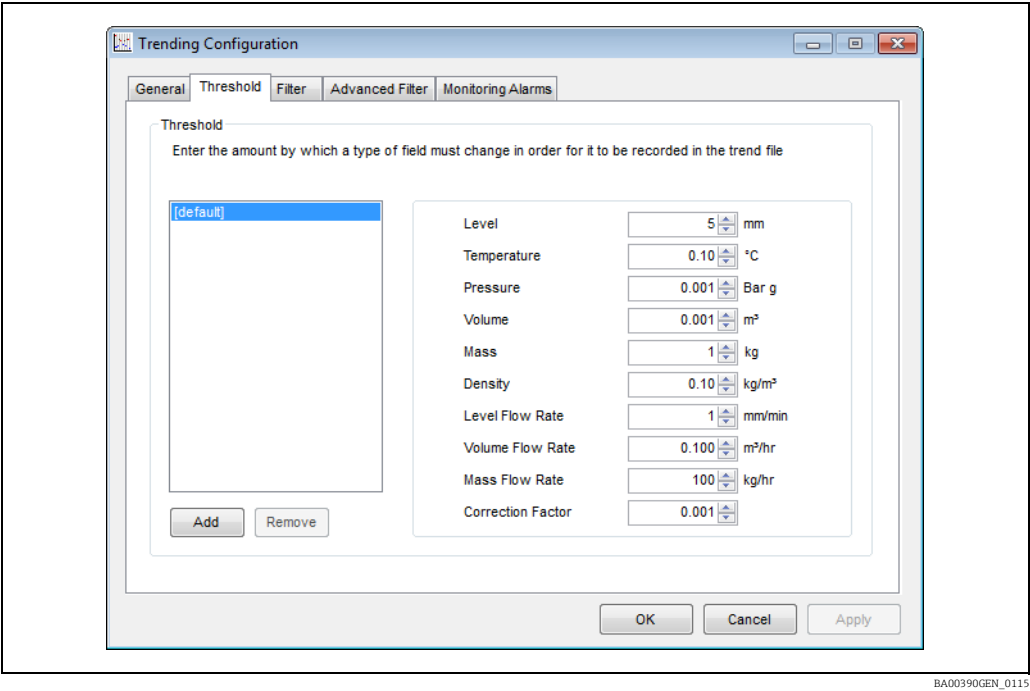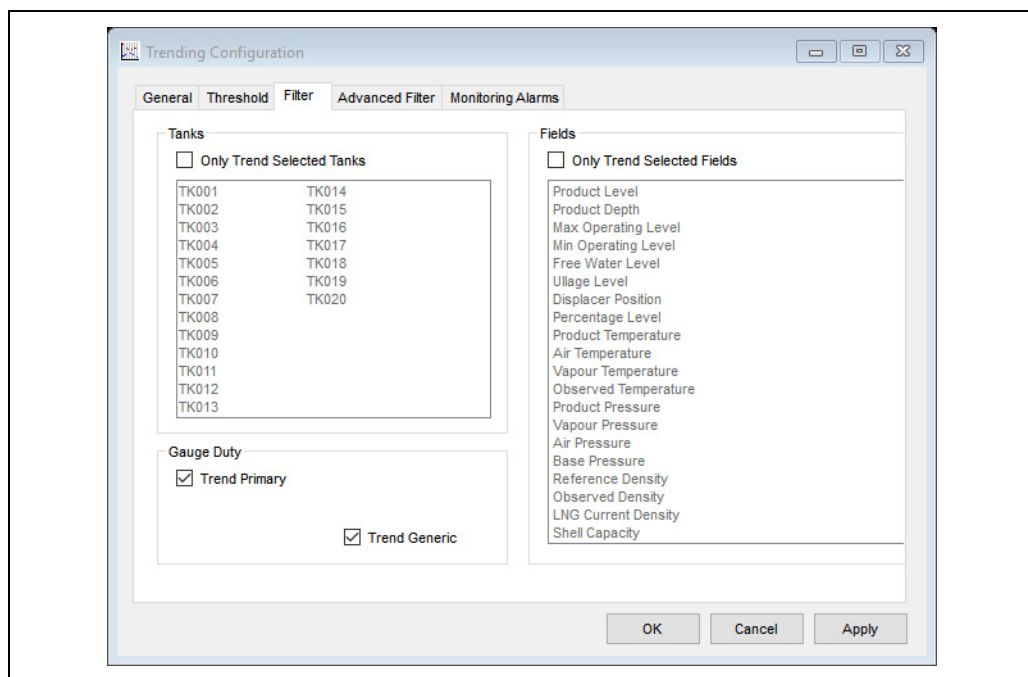

BA00390GEN_0115

The threshold values can be overridden for individual tanks to allow for the different behavior of different products and/or tank shapes. To override the threshold values for a

tank click on the **Add** button and select the tank from the list of tanks displayed. The tank will then appear in the list of tanks. Ensure that the tank is highlighted and then amend the threshold values.

Similarly to remove the override for the tank ensure that it is highlighted in the list and then click on the **Remove** button.

15.3   Filter Tab

The **Filter** tab allows the data to be trended for each tank/gauge to be unique. By default all tanks, gauge duties and fields are trended.

BA00390GEN_0308

Only Trend Selected Tanks

If this option is checked, only the data for the tanks highlighted in the list of tanks will be trended. Otherwise the data for all of the tanks will be trended.

Trend Primary

If this option is checked, the data for the primary gauges will be trended.

Trend Secondary

This option will only be visible if one or more tanks in the system has a secondary gauge configured. If this option is checked, the data for the secondary gauges will be trended.

Trend Backup

This option will only be visible if one or more tanks in the system has a backup gauge configured. If this option is checked, the data for the backup gauges will be trended.

Trend Densitometer

This option will only be visible if one or more tanks in the system has a densitometer configured. If this option is checked, the data for the densitometers will be trended.

Only Trend Selected Fields

If this option is checked, only the data for the fields highlighted in the list of fields will be trended. Otherwise all the fields in the list will be trended.

15.4   Advanced Filter

The **Advanced Filter** tab of the trending configuration screen allows trending options to be set for element temperatures and skin temperatures (if appropriate). By default, element temperatures and skin temperatures are not trended.
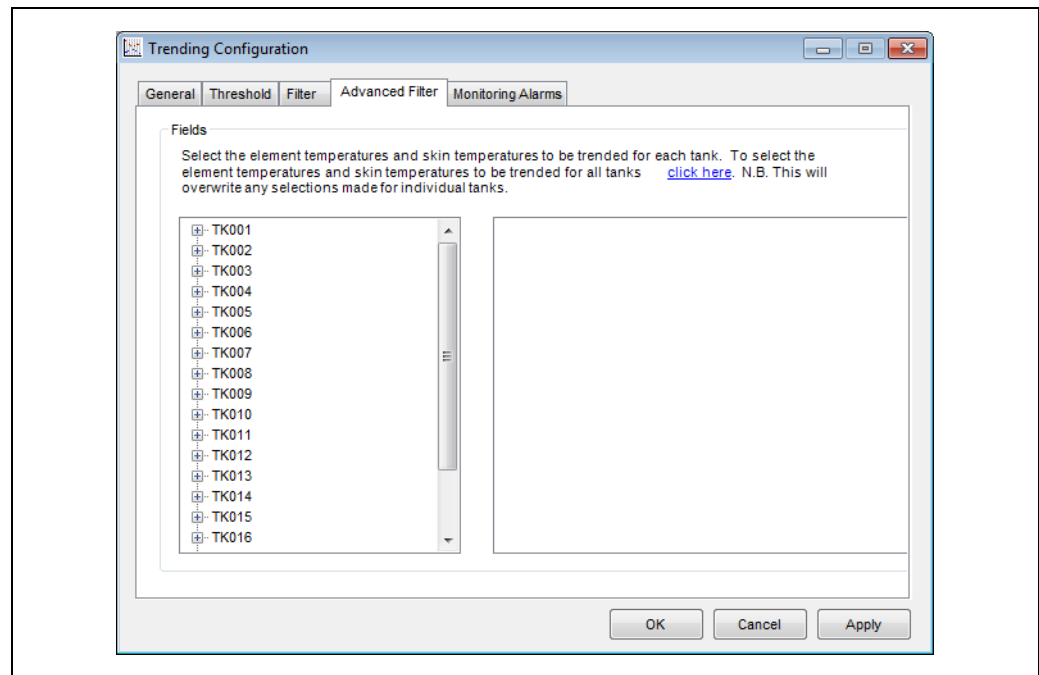
BA00390GEN_0117

To set the element temperatures and/or skin temperatures to be trended on all gauges click on the **click here** hyperlink in the description. This will display the following screen:
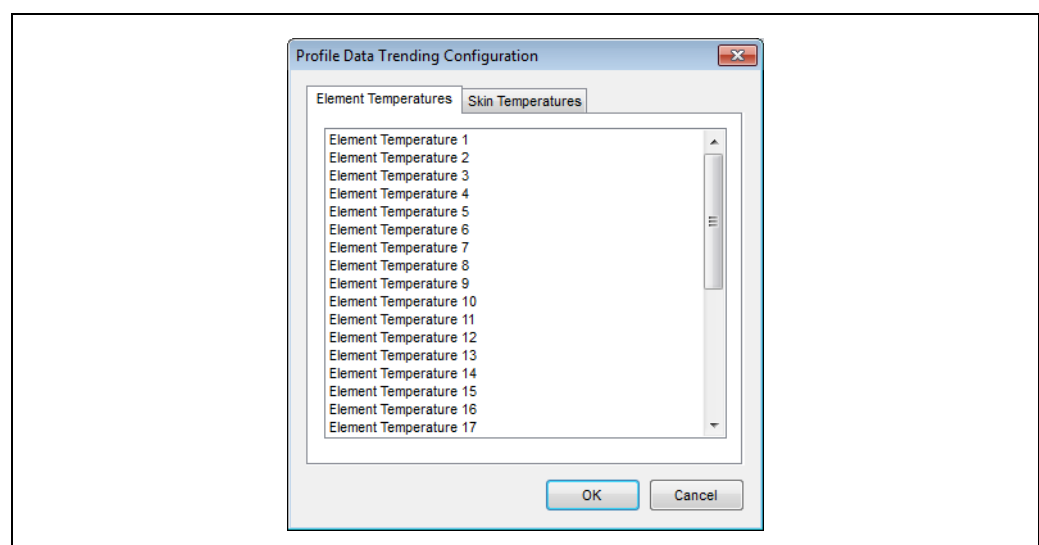
BA00390GEN_0118

Highlight the element temperatures and skin temperatures to be trended and click the **OK** button. Note that this will overwrite the existing selected element temperatures and skin temperatures for all gauges.

To set the element temperatures and skin temperatures to be trended for an individual tank, double-click the tank in the tanks list. If the tank has multiple gauges, double-click the gauge for which the element temperature and skin temperatures are to be trended. If the element temperatures can be trended for a gauge, the entry **Element Temperatures** will appear under the gauge. Similarly if the skin temperatures can be trended for a gauge, the entry **Skin Temperatures** will appear under the gauge. Select either **Element Temperatures** or **Skin Temperatures** and the list on the right hand side of the screen will be populated with the element temperatures or skin temperatures respectively. The temperatures to be trended will be highlighted. To modify the temperatures to be trended, highlight the temperatures to be trended.

15.5   Monitoring Alarms

The **Monitoring Alarms** tab of the trending configuration screen is used to configure and Enable/Disable the various trending alarms.
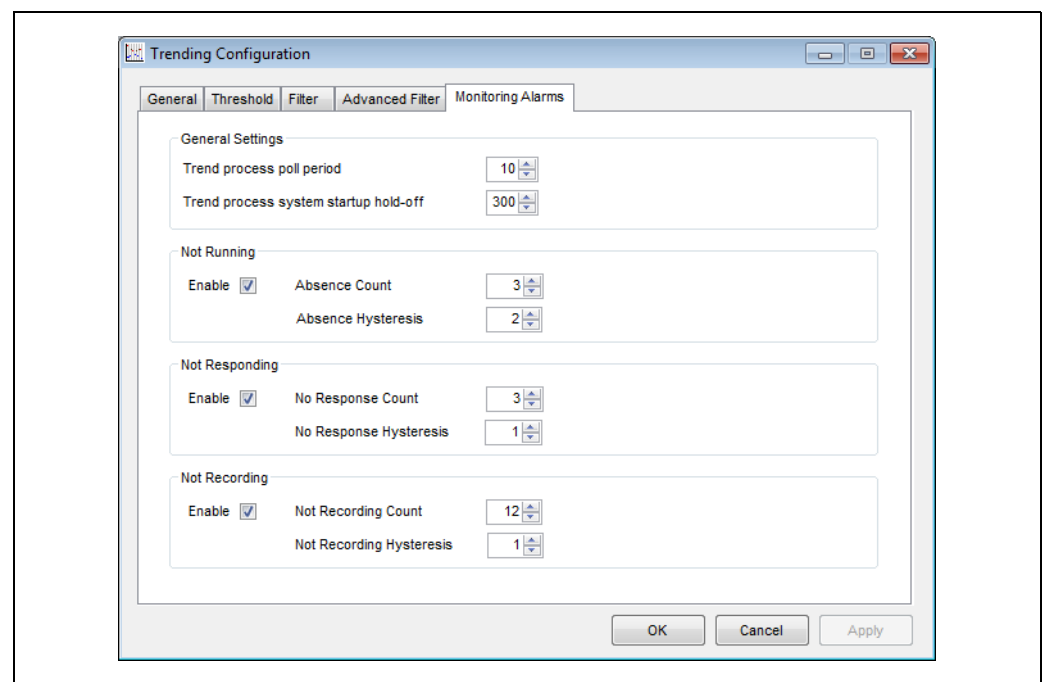
BA00390GEN_0119

General Settings

- **Trend process poll period** - The frequency, in seconds, that the trend service is polled to check the status of the alarm conditions.
- **Trend process system startup hold-off** - The delay, in seconds, after the system starts to allow the Trend service to stabilize. No alarms are raised during this time.

Not Running

If the Trending Service is not running no trend data will be generated. If enabled a "Trending Service not running" alarm will be raised in the Alarm Event Viewer. The following items are configurable:

- **Enable** - If this option is checked an alarm will be raised through the events subsystem if the Trending service stops running for the specified time (Poll period × Absence Count). If this option is not checked none of the alarms will be enabled and it will not be possible to configure any "count" or "hysteresis" values.
- **Absence Count** – Use this option to set the number of successive polls that must not detect that the trending service is running before an alarm is raised.
- **Absence Hysteresis** - Use this option to set the number of successive polls that must detect a running trending service before an alarm is cleared.

Not Responding

If the Trending Service stops responding to requests there will be a loss of "Real Time" trending data, "Historic" trend data may still be generated. If enabled a "Trending Service not responding" alarm will be raised in the Alarm Event Viewer. The following items are configurable:

- **Enable** - If this option is checked an alarm will be raised through the events subsystem if the Trending service stops running for the specified time
  (Poll period × No Response Count).
- **No Response Count** - Use this option to set the number of successive polls that must not detect a response from the trending service before an alarm is raised.
- **No Response Hysteresis** - Use this option to set the number of successive polls that must detect a response from the trending service before an alarm is cleared.

Not Recording

If the Trending Service stops recording there will be a loss of "Historic" trend data, "Real Time" trending data may still be available. If enabled a "Trending Service not recording" alarm will be raised in the Alarm Event Viewer. The following items are configurable:

- **Enable** - If this option is checked an alarm will be raised through the events subsystem if the Trending service stops recording for the specified time
  (Poll period × Not Recording Count).
- **Not Recording Count** - Use this option to set the number of successive polls that must not detect the trending service is recording before an alarm is raised.
- **Not Recording Hysteresis** - Use this option to set the number of successive polls that must detect that the trending service is recording before an alarm is cleared.

16 Device Command Scheduler

The Device Command Scheduler is a Windows service that can be configured to send device commands at a specific time of day on a recurring basis.
The Device Commands can be sent to a Single Tank, all Tanks, or a group of tanks generally specified by Gauge Type or Tank Group.
Care should be exercised when scheduling device commands, particularly those that affect a gauges primary measuring capability, as the tank may be involved in some sort of critical operation such as receiving product from a ship or similar.

## 16.1 Launching the Device Command Scheduler

The Windows service part of the scheduler, which sends the commands at the scheduled time, automatically starts up when Windows boots. The service can be monitored, as with all Windows services via the control panel, or using the application Service Manager, which is present as an icon in the system tray.

16.2 Configuring Scheduled Commands

The schedule by which the commands are executed is configured from the Command Scheduler GUI.
To configure scheduled commands, proceed as follows:

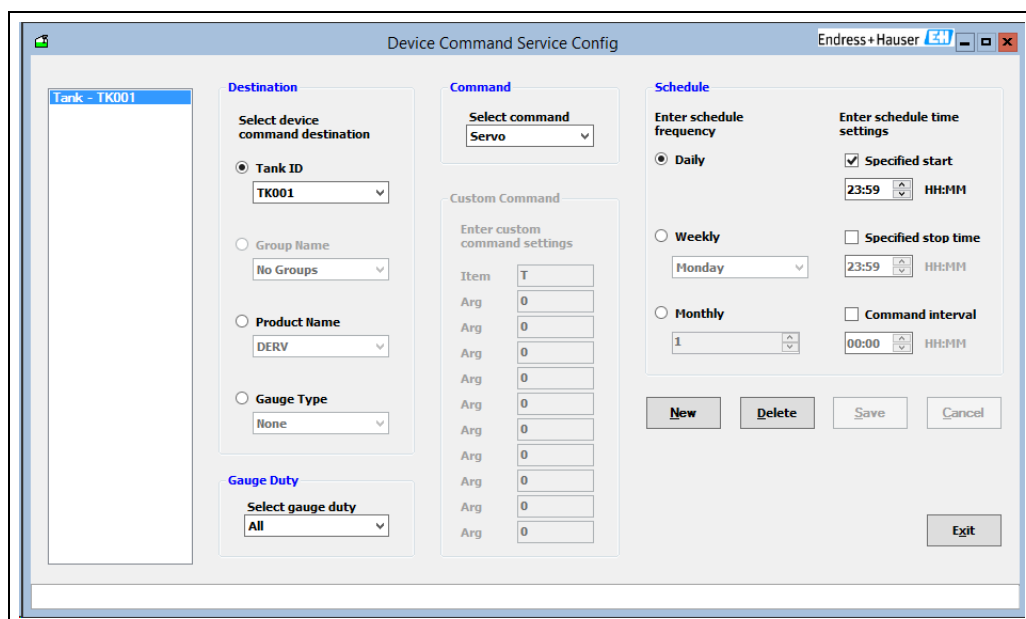1. Right click on the Service Manager icon in the Windows system tray:
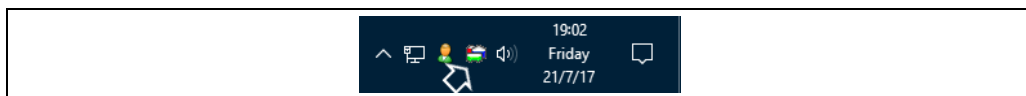
BA00390GEN_0309

2. Select **Device Command Service** → **Device Command Config**.
This will bring up the configuration application, which you can use to view and edit the scheduled commands.

BA00390GEN_0241

3. Select a scheduled entry from the list on the left of the window or create a new entry by clicking the **New** button.

> You can also delete an entry from the database by selecting it from the list and clicking the **Delete** button.

4. Adjust the parameters according to the explanations below (→ 🗎 114).

5. Click **Save** to commit the changes to the database, or **Cancel** to discard them.

Scheduled entries are listed on the left of the window, selecting one of these entries will display the details of the entry in the controls on the right.

16.2.1   Scheduled Commands Parameters

Destination

Denotes the way the gauges can be selected for scheduling, either by a specific Tank ID, or collectively by Product Group Name, or by Product or by Gauge Type.

Gauge Duty

Where tanks are fitted with more than one gauge, you can specify which gauge on the tank is to perform the command.

Command

Sets the command to be executed by the gauge or gauges.

Custom Command

Enables you to configure a custom command.

Schedule

A scheduled command can be configured to send a series of commands between two specified times and a specified frequency. For example to send a command every hour between the hours of 01:00 and 04:00 you would set the start time as 01:00, the stop time 04:00 and the interval as 01:00.

> When you make changes to the schedule's detail, click **Save** to commit the changes to the database, or **Cancel** to discard them.
> Clicking **New** will clear the currently selected entry's details, allowing you configure a new one. Clicking **Save** commits the entry to the database.
> **Delete** will remove the currently selected entry from the database.

17   Report Scheduler

The report scheduler facilitates the printing and exporting of reports and report documents in various formats at defined moments in time.

The report scheduler consists of 2 independent components:
- A background Report Scheduler Windows Service which executes the reports at the appropriate time(s).
- The Report Scheduler Configuration tool, used for configuring the reports.

The report configuration data is held in the file ReportSchedulerConfig.xml located in the same directory as the ReportSchedulerService.exe service executable.
This file is used by both of the above components. The configuration tool is used to edit the contents of the file for the desired user configuration. The service then loads this file to determine its actions.

17.1   Report Scheduler Service

The Report Scheduler service runs automatically as a Windows service, executing all scheduled reports at the appropriate times. It will run in the background and has no user interface.
The service will start automatically whenever the computer is rebooted and should therefore always be running.
The status of the service can be viewed by right clicking on the Tank Gauging Service Manager icon in the system tray and selecting the Report Scheduler Service item from the pop-up menu.

BA00390GEN_0310
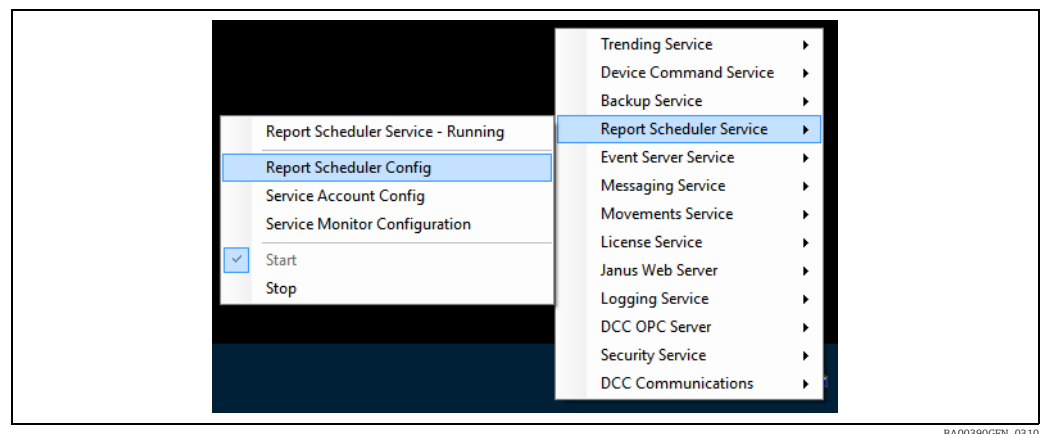
The service may also be started or stopped using this menu.

17.2   Spooling of Scheduled Reports

Reports that are printed by the service are spooled to a directory where they are stored for a period of seven days before being deleted. This enables an administrator to obtain any time critical reports that have failed to print for any reason.
The location of the spool directory can be specified by the user by using the configuration tool to change the **Spool Directory** settings of the Area component.
Spooling does not occur if the reports are printed directly from the configuration tool.

17.3   Report Scheduler Configuration

The Report Scheduler Configuration tool allows the user to configure the reports and report documents for a system.
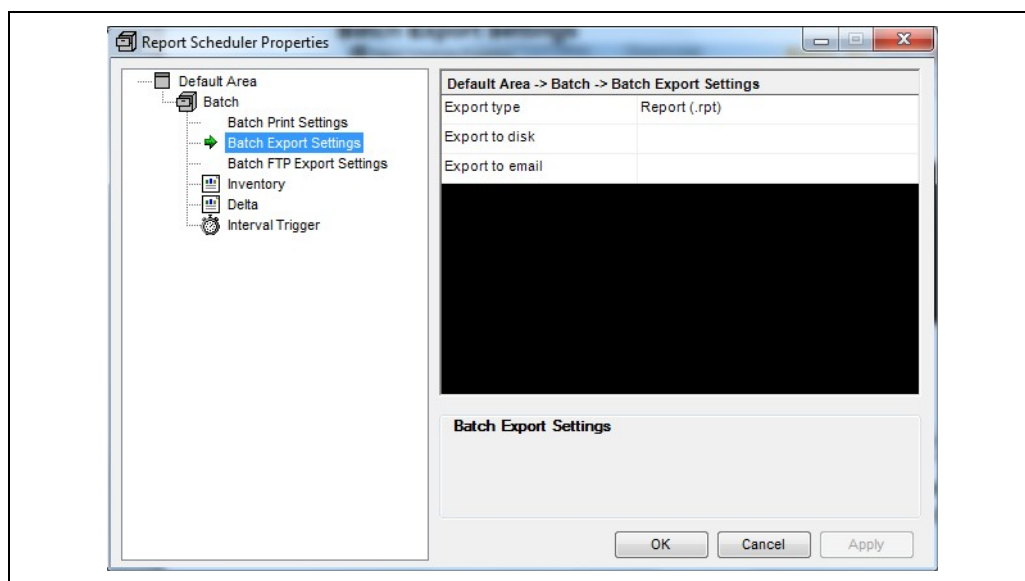To configure the report scheduler, proceed as follows:

1. Right click on the **Tank Gauging Service Manager** icon in the system tray.

2. Select the **Report Scheduler Config** item from the **Report Scheduler Service** menu:
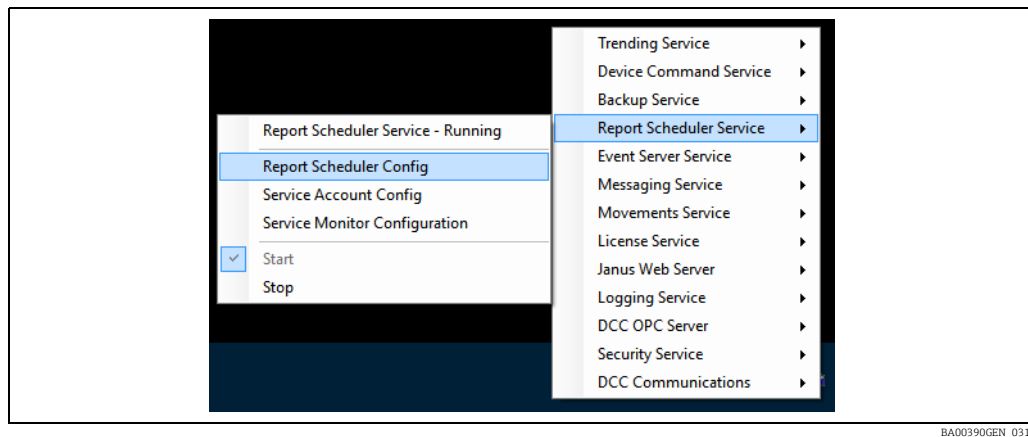
BA00390GEN_0310

The following window opens:

BA00390GEN_0271

From the tree on the left select the component you are going to edit.
The tree view control on the left hand side of the configuration tool represents the components which exist on the system.

The following types of components can appear in the tree view:
- Areas
- Batches
- Reports
- Report Documents
- Triggers

The grid view adjacent to the tree view represents the settings for each of these components. For a description of these types of components refer to the sections below.

3. Enter the required values into the grid view on the right.

4. Click **Apply** to confirm your changes or **Cancel** to discard them.

5. If all the necessary changes have been made, click **OK** to close the window.

 ℹ Any changes which are made to the report scheduler configuration will only be written to the ReportSchedulerConfig.xml when the user hits **OK** or **Apply**. If the user hits **Cancel** all changes to the configuration will be lost.

17.3.1 Area Component

Icon_Area_Component
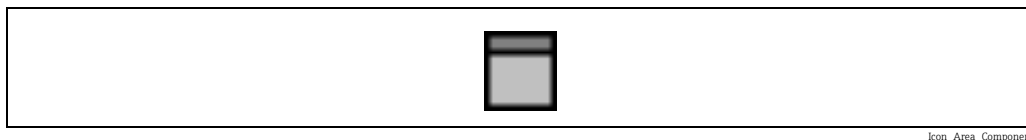
The reporting system is represented by the root component of the tree, called an Area.

Renaming an Area component

The Area component can be renamed to reflect the name of the site and/or system. To do so, right click on the Area component and select **Rename**.

The Transaction log

The Area component also defines settings which determine the location of the transaction log. The transaction log stores information about the execution of the reports that the system processes and any consequent abnormal operating conditions. Right click on the Area component and select **Transaction Log** to view the log using Wordpad.

The System Reports directory

Also defined by the Area component is the System Reports directory. This is the directory which contains the predefined reports associated with the tank automation system. Both the Transaction Log directory and the System Report directory are set to sensible defaults upon installation, but can be easily changed if necessary.

17.3.2   Batch Component

Icon_Batch_Component

Report, Report Document and Trigger components are contained within Batches. An Area can contain one or more Batches.

A Batch defines various settings which describe the printing/export behaviour of the Report and Report Document components that it contains.

Adding Batches

In order to add a Report or Trigger to the system, we must first add a Batch. Right click on the Area node and select **Add Batch** from the menu. This adds a Batch to the Area.

Renaming/deleting Batches

The Batch can be renamed if required by right clicking on the Batch and selecting **Rename Batch** from the menu. A batch can be deleted from the Area in a similar way.

Locking and Unlocking Batches

Batches can be locked to prevent unauthorized users from deleting or modifying them. In order for a user to be able to lock or unlock a batch that user must be granted 'Full' Report Scheduler privileges. Users with 'Modify' privileges will be able to create, delete and maintain unlocked batches, but they won't be able to remove or place a lock on a batch.

In order to lock a batch, right-click on an unlocked batch and choose **Lock Batch** from the context menu, the unlocking process is similar except you choose **Unlock Batch** instead. A locked batch can't be altered - it must be unlocked in order to be amended.
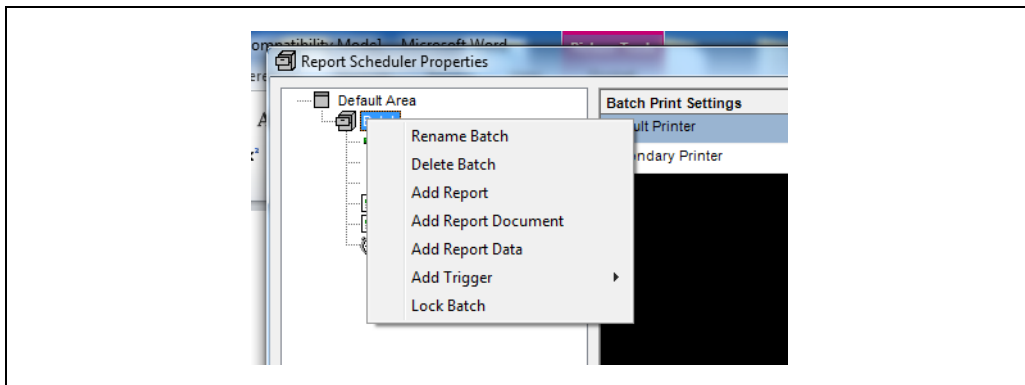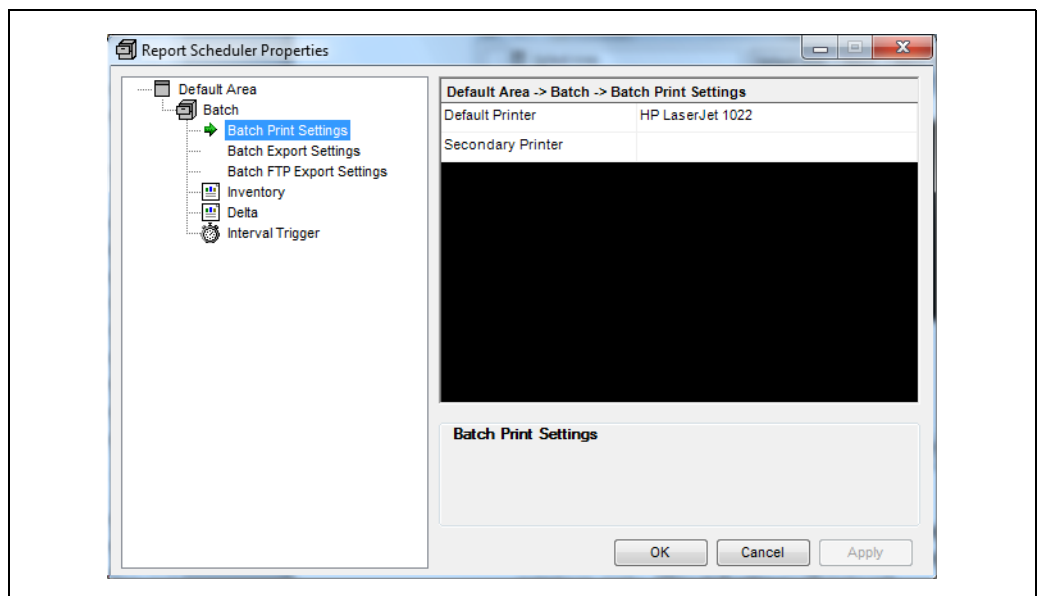

BA00390GEN_0138

Locked batches can be identified by the lock icon superimposed over the top of the filing cabinet icon.
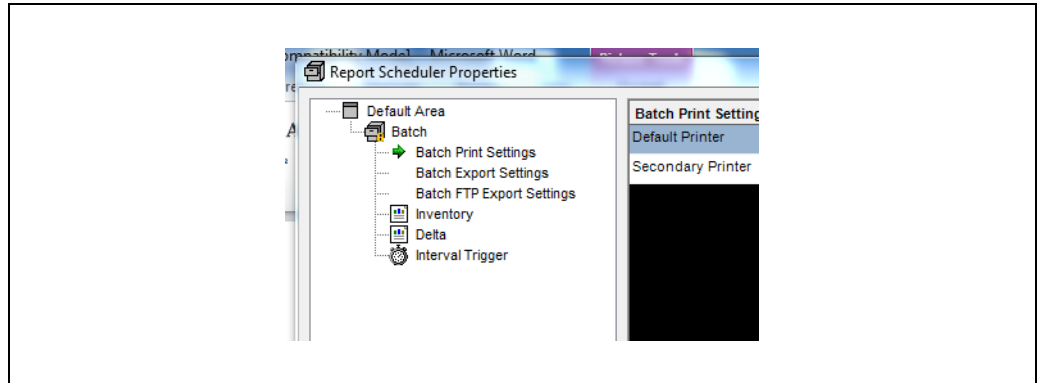
BA00390GEN_0139

17.3.3   Batch Print Settings

1. Click on **Batch Print Settings** to change the following parameters:
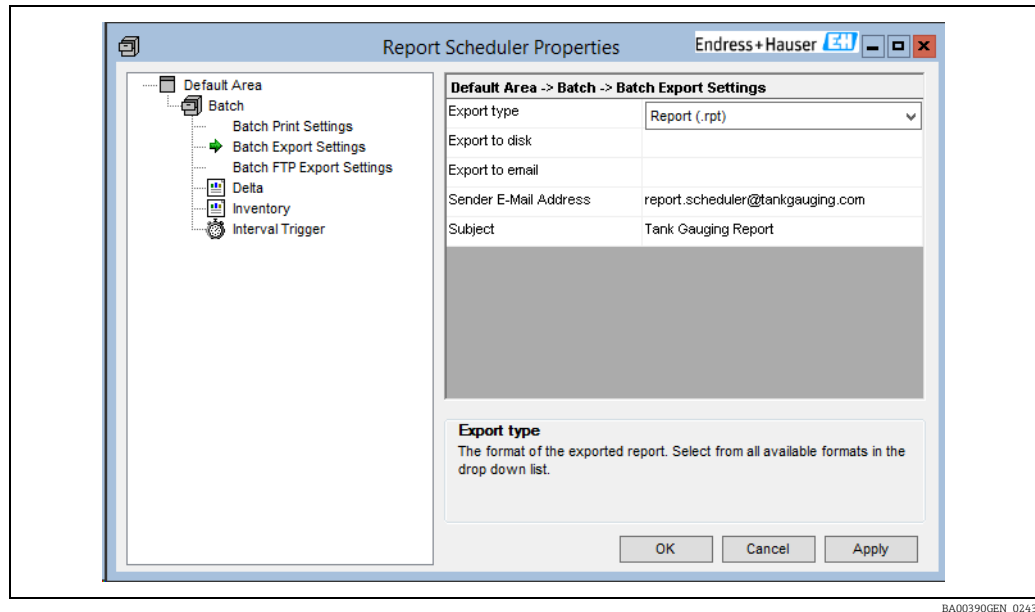

BA00390GEN_0140

- **Default Printer** - The default printer for report printing. Select from all installed printers in the drop down list. The list reflects the users installed printers only.
  [see: **Start → Settings → Printers**]]
- **Secondary Printer** - The secondary printer is used for printing if the default printer is unavailable.

In both cases the printer must be a real printer, not a print to file device as the service does not interact with the console.

17.3.4 Batch Export Settings

1. Click on **Batch Export Settings** to change the following parameters:

BA00390GEN_0243

- **Export Type** – The format of the exported report. Select from all available formats in the drop down list including .rpt, .xls, .pdf, .rtf and .doc.
- **Export to disk** – Path to folder which will contain the exported report. Blank entry disables disk export.
- **Export to email** – Semicolon separated list of email addresses to which the report will be sent. Blank entry disables email export. (Users require an SMTP mail server to use this feature; the server itself is specified as an Area setting.)
- **Sender E-Mail Address** – The address that will appear in the 'From' field of received E-mails.
- **Subject** – Enter the text that will appear in the 'Subject' field of received E-mails.

17.3.5   Batch FTP Export Settings

1. Click on **Batch FTP Export Settings** to change the following parameters:

BA00390GEN_0244
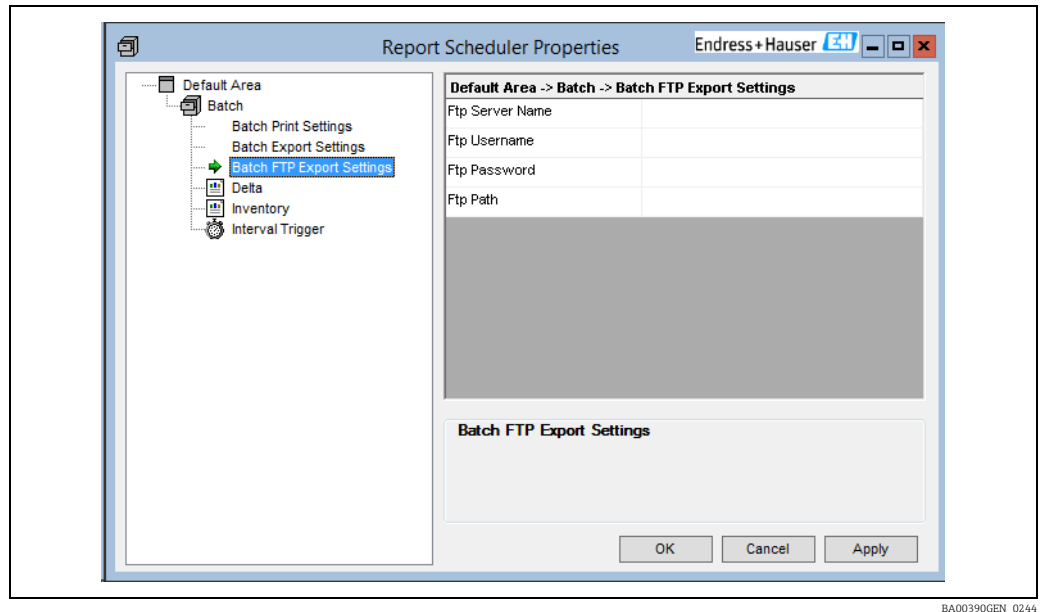
- **Ftp Server Name** – The full name used to identify the ftp server. Blank entry disables ftp export.
- **Ftp Username** – User-name used to log-on to the ftp server.
- **Ftp Password** – Password associated with ftp user-name.
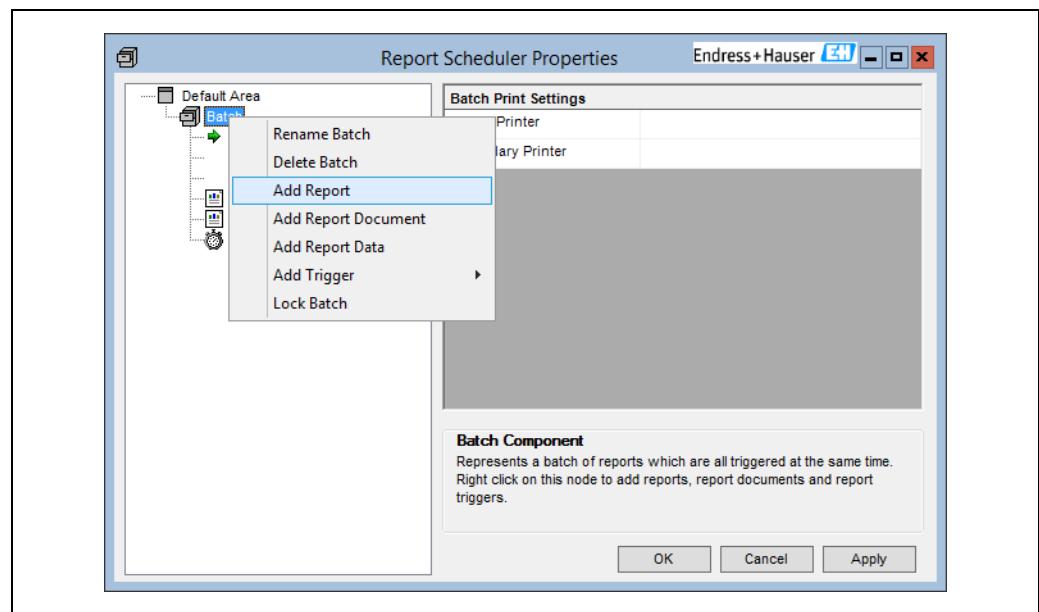- **Ftp Path** – The path to the drop directory on the Ftp server.

17.3.6   Report Component

A Batch can contain one or more Report components each of which represents a Crystal Reports format report file.
To add a Report to a Batch, right click the Batch, select **Add Report** and select a .rpt file using the 'Open File' dialog box displayed.

To remove a Report from a Batch, right click on it and select **Delete Report**.

A Report defines the following settings which describes the Reports individual behaviour independent of it's parent Batch settings:

General Settings

- **Print Enabled**
  Printing enabled for this report.
- **Export Enabled**
  Export enabled for this report.
- **Date Stamp Export**
  If True, add the date to the file-name for the exported file.
- **Time Stamp Export**
  If True, add the time to the file-name for the exported report.

Database Settings

- **Data Source Name**
  Specify the ODBC data source name.
- **Database Name**
  The name of the database used to generate the report.
- **User ID**
  The user name used to log-on to the database. The default is 'sa'.
- **Password**

The password associated with the User ID. The default is blank.

Parameter Settings

This section is auto-generated from the report itself. If the report gives the user the option of specifying parameters they can be entered here. The default values for each field are shown in a combo box if any are specified.

17.3.7   Report Document Component


Icon_Word

Icon_Excel
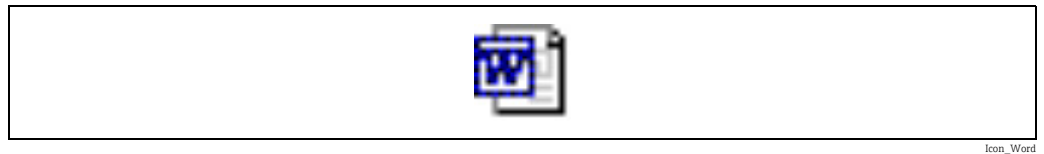
A Batch can contain one or more Report Document components. Each Report Document component represents a Word document or an Excel Workbook which conveys report data. Report and Report Document components can happily co-exist within the same Batch. To add a Report Document to a Batch, right click on the Batch, select **Add Report Document** and select a .doc or .xls file using the **Open File** dialog box displayed. To remove a Report Document from a Batch, right click on it and select **Delete Report**.

In order to use Report Document components within the Report Scheduler, Microsoft Office 2003 or later must be installed.

17.3.8   Trigger Component
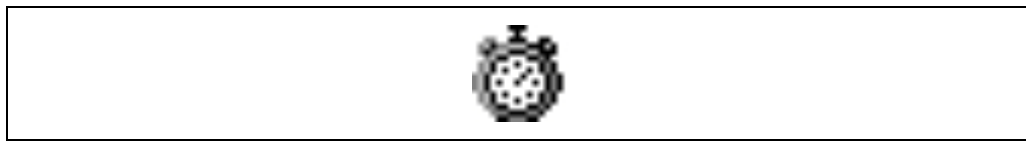
Icon_Trigger

A batch can also contain one or more Triggers. A Trigger is a component which specifies when a Batch will run, and hence when all of its Report modules will run. Right mouse click on the Batch component to see the trigger options as shown below.
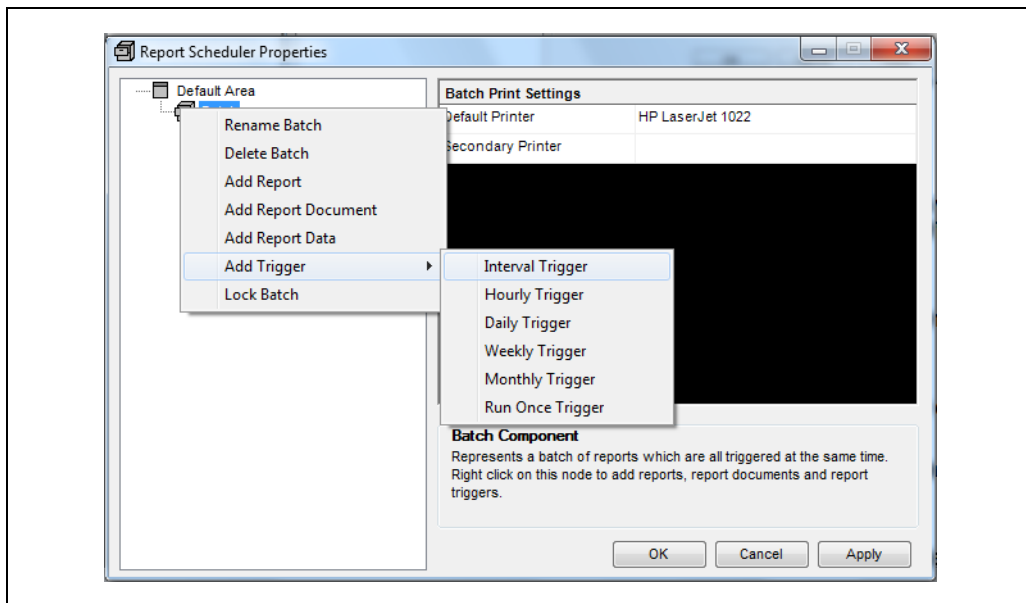
BA00390GEN_0144

There are 6 types of Triggers:

1. **Interval Trigger**
    A trigger which is fired every time interval, defined in hours and minutes. A synchronization time may also be defined, from which all interval timings will be based.

2. **Hourly Trigger**
    A trigger which is fired at a specified number of minutes past every hour.

3. **Daily Trigger**
    A trigger which is fired at a specified hour every day.

4. **Weekly Trigger**
    A trigger which is fired on a specified day of the week, at a specified hour.

5. **Monthly Trigger**
    A trigger which is fired on a specified day of the month, at a specified hour.

6. **Run Once Trigger**
    A trigger which is fired once only at a specified time.

By adding Triggers to Batches it is easy to build up complex scheduling. For example, if it is required that a Batch is run three times a week, add 3 Weekly Triggers to a Batch, specifying a different firing day for each.

To add a Trigger to a Batch, right click on the Batch, select **Add Trigger** and select the trigger type from the sub-menu.
To remove a Trigger from a Batch, right click on it and select **Delete Trigger**.
You can also specify a period of time over which a trigger will be active on the Trigger Period Settings page.

17.3.9   View, Print and Export Reports

It is possible to print, export or view a Report or Report Document directly from the GUI rather than relying upon Triggers and the service component.

1.   Right click on the relevant component and select **Print**, **Export** or **View** from the menu. The configuration is automatically saved should any of these commands be used.
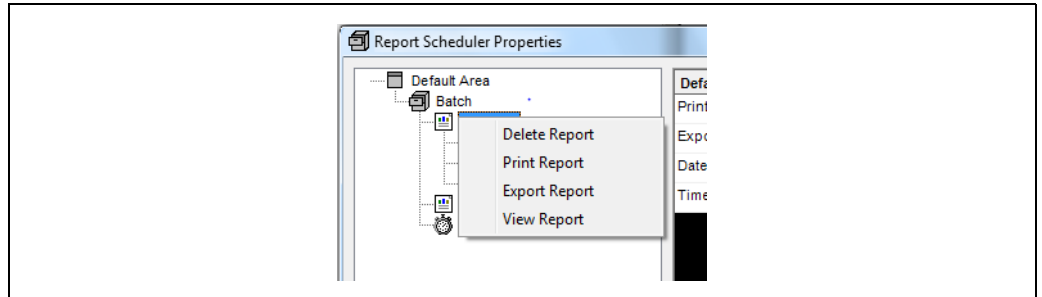
BA00390GEN_0145

Any changes which are made to the report scheduler configuration will only be written to the ReportSchedulerConfig.xml when the user selects **OK** or **Apply**. If the user selects **Cancel** all changes to the configuration will be lost.

18 Messaging

18.1 Message Service

The messaging service is used to queue and distribute messages asynchronously. Messages can be sent to:

- E-mail clients (SMTP mail server required).
- Mobile telephones in the form of SMS messages (GSM modem required).
- Telephones (voice modem required).
- Site Radios (specialist hardware required).

The messaging service configuration is accessed from the application Service Manager icon in the Windows system tray.

BA00390GEN_0309

1. Click right on this icon.

2. Select **Messaging Service** → **Messaging Service Config**.

This will bring up the configuration application, which you can use to view and edit the messaging configuration.
This application contains the following pages:
- General
- E-Mail
- SMS (if the SMS Messaging option has been licensed)
- Telephone (if the Telephone Messaging option has been licensed)
- Radio (if the Radio Messaging option has been licensed)

18.1.1   General

The general page allows configuration of settings relating to the messaging service as a whole:
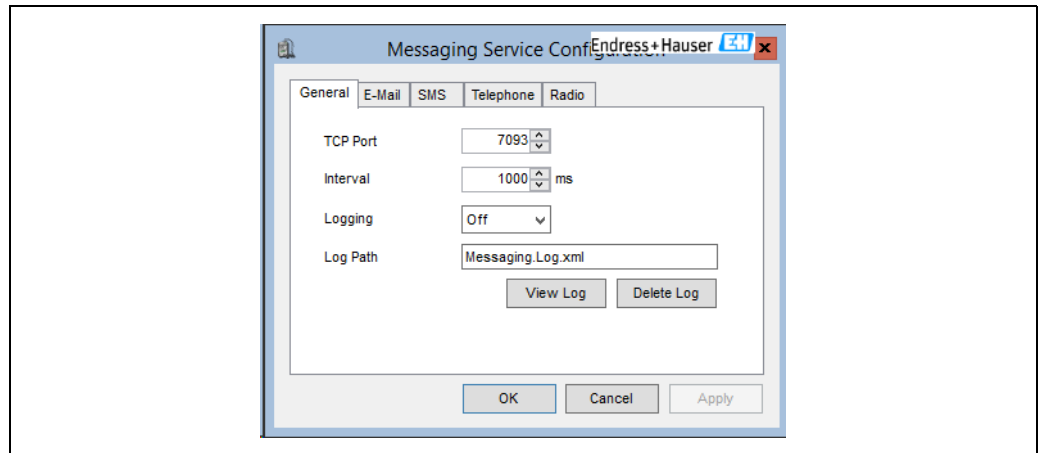
BA00390GEN_0246

TCP Port

The TCP port which is used to accept messages from client applications. This must match the TCP port configured in the messaging client configuration file.

Interval

The interval in milliseconds at which the service will check for incoming messages.

Logging

The level of logging required. This is used for diagnostic purposes if there are problems with the messaging service. Generally it should be set to **Off**.
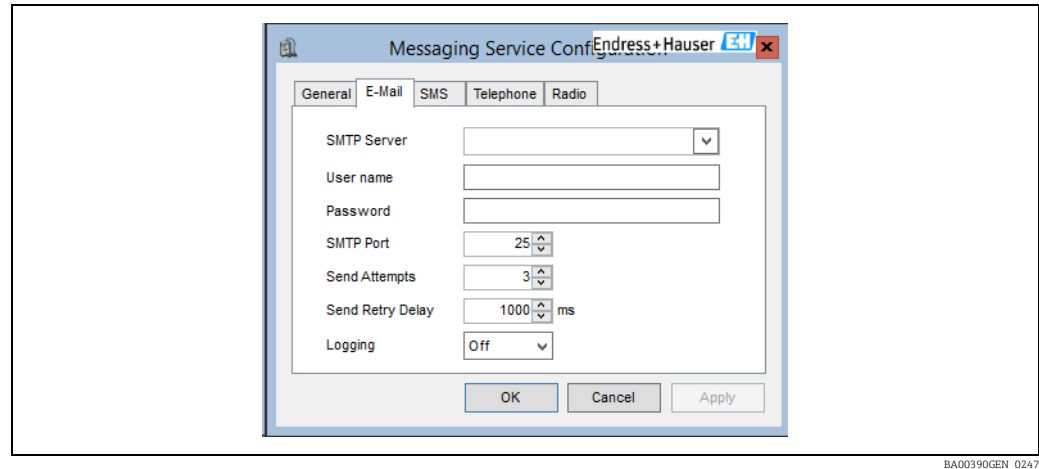
Log Path

The path to the log file.
The current log file can be viewed by clicking on the **View Log** button, or deleted by clicking on the **Delete Log** button.

18.1.2   E-Mail Configuration

The E-Mail page allows configuration of settings relating to sending e-mails:

BA00390GEN_0247

SMTP Server

The SMTP server to be used to send e-mails from the messaging service. (**User name** and **Password** valid for the domain are required for external emails.)

SMTP Port

The port used by the messaging service to connect to the SMTP server.

Send Attempts

The maximum number of times a message should be sent to the SMTP server if it fails for any reason on a preceding attempt.

Send Retry Delay

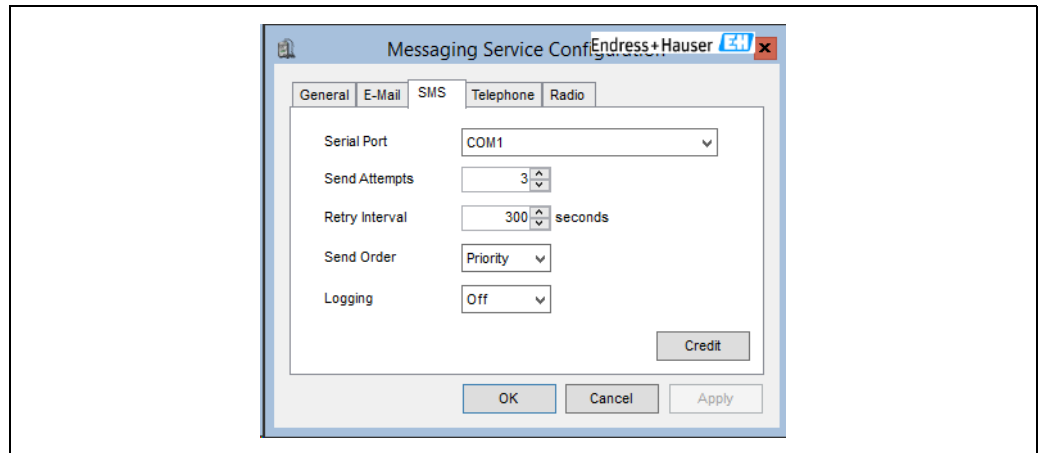The interval to wait before attempting to resend a message to the SMTP server following a failure.

Logging

The level of logging required. This is used for diagnostic purposes if there are problems with the e-mail part of the messaging service. Generally it should be set to **Off**.

18.1.3   SMS Configuration

The SMS page allows configuration of settings relating to sending SMS messages. It will only be present if the **SMS Messaging** option has been licensed:

BA00390GEN_0248

Serial Port

The serial port to which the GSM modem to be used to send SMS messages is attached.

Send Attempts

The maximum number of times to attempt to send a message via SMS.

Retry Interval

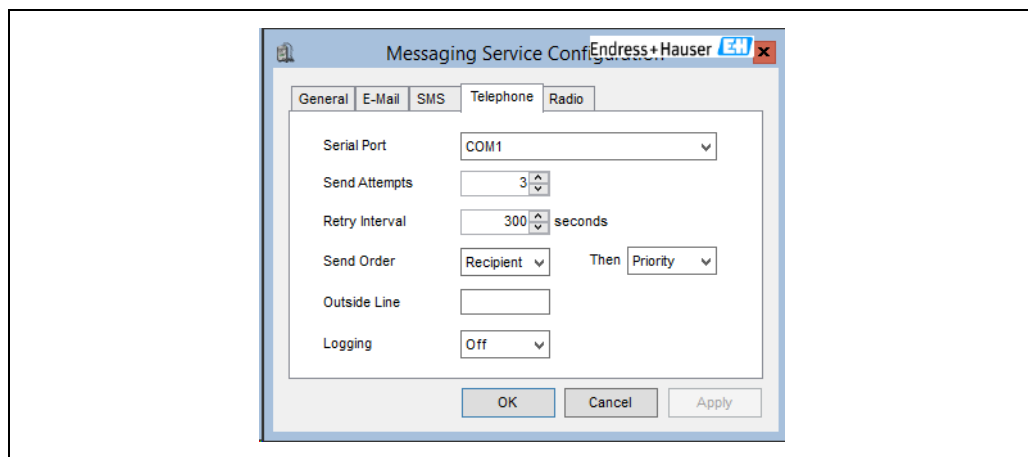The interval to wait before attempting to resend a message following a failure.

Send Order

Indicates whether messages are to be sent in priority order, or in the order in which they were received from clients.

Logging

The level of logging required. This is used for diagnostic purposes if there are problems with the SMS part of the messaging service. Generally it should be set to **Off**.

18.1.4   Telephone Configuration

The Telephone page allows configuration of settings relating to sending voice messages to a telephone. It will be present only if the **Telephone Messaging** option has been licensed.

BA00390GEN_0249

Serial Port

The serial port to which the modem used to send voice messages is attached. The modem must be a voice modem. To check if the modem is compatible with the messaging service, open HyperTerminal and connect to the modem as a serial device. Then type AT+FCLASS=?. The response should be in the form 0,1,8,80 (followed by OK). This list of supported classes must contain 8 for the modem to be used to transmit voice messages.

Send Attempts

The maximum number of times to attempt to send a message to a telephone.

Retry Interval

The interval to wait before attempting to resend a message following a failure.

Send Order

The order in which messages are to be transmitted.

Outside Line

Some locations require a number to be dialed to access an outside line. If this is the case, enter the number in this field.

Logging

The level of logging required. This is used for diagnostic purposes if there are problems with the telephone part of the messaging service. Generally it should be set to **Off**.

18.1.5   Radio Configuration

The Radio page allows configuration of settings relating to broadcasting messages over a radio network. It will be present only if the **Radio Messaging** option has been licensed.
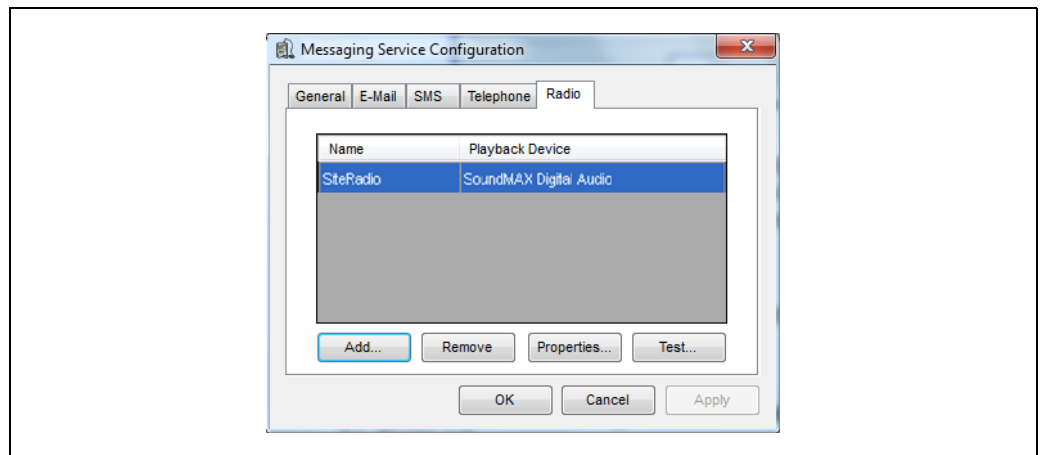
BA00390GEN_0150

Adding a radio network

To add a new radio network click the **Add** button. The settings screen is displayed (→ 🖹 133).

Removing a radio network

To delete an existing radio network select it from the list and the click the **Remove** button.

Editing a radio network

To edit an existing radio network select it from the list and then click the **Properties** button. The settings screen is displayed (→ 🖹 133).

Testing a radio network

To broadcast a test message, proceed as follows:

1. Click the **Test** button.
   The following screen will be displayed:
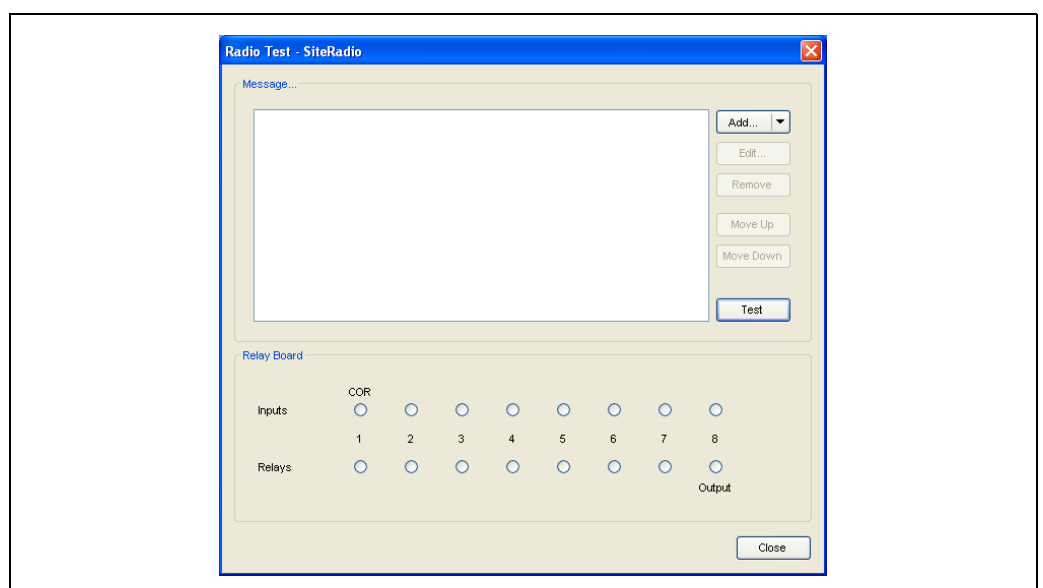
BA00390GEN_0151

2. Configure the test message to be broadcast (for more details → 🖹 137).

3. Click the **Test** button.
   If the radio network has been configured correctly the message should be broadcast over the site radio. The status of the relay board inputs and outputs should be indicated correctly during the broadcast. The status of the inputs and outputs can be used to determine the configuration issues if the message fails to broadcast.

18.1.6   Radio Settings

Radio Settings - Radio

The **Radio** page allows the basic configuration details for a site radio to be set up.
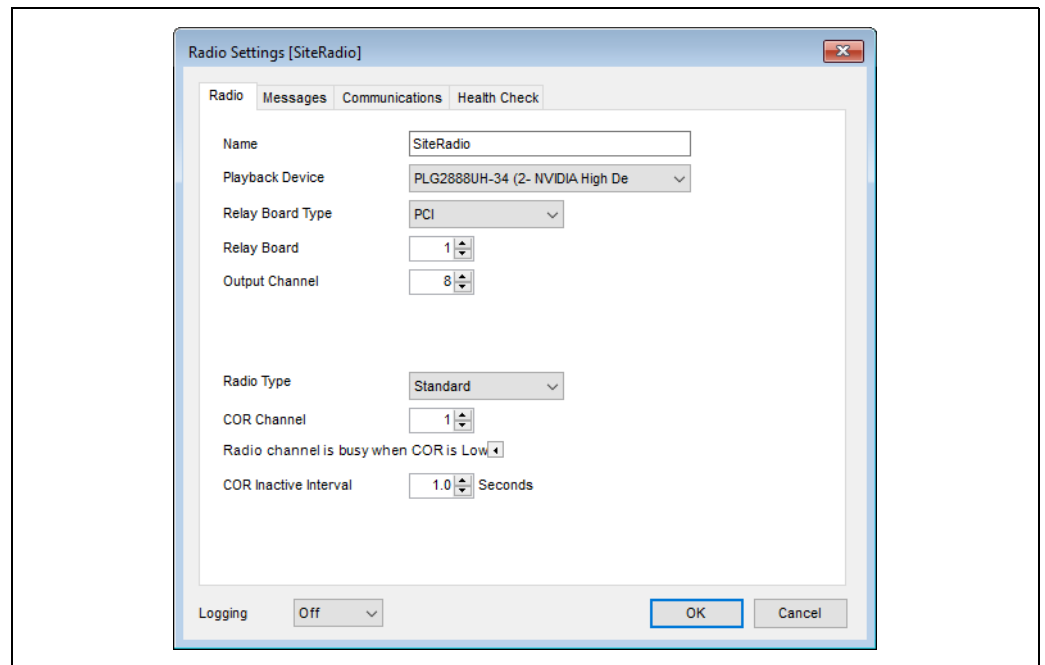
BA00390GEN_0311

- **Name** – The name used to identify this radio configuration.
- **Playback Device** – The playback device on the PC which will be used to generated the audio to be broadcast over the radio. It is strongly recommended that this is not the default playback device for the PC, since that might lead to other audio output from the PC being inadvertently broadcast over the radio.
- **Radio Type** – There are three possible types of radio configuration – simple, standard or trunking. The difference lies in the way that the COR (Carrier On Relay) input is handled. For simple radio systems the COR input is ignored and the message is broadcast immediately, ignoring any other transmissions in progress.
- **Relay Board** – The index of the relay board which is connected to the ROB (Radio Output Board) and optionally an alarm panel and/or manual reset switch.
- **Output Channel** – The index of the relay on the Arcom relay board which is connected to the PTT terminal of the radio output board.
- **COR Channel** – Not applicable for simple radios. The index of the input on the relay board which is connected to the COR terminal of the radio output board.
- **Radio channel is busy when COR is High/Low** – Not applicable for simple radios. Indicates whether the radio channel is busy when the COR input is high or low. This may vary from base station to base station.
- **COR Inactive Interval** – Not applicable for simple radios. The number of seconds the COR input needs to be inactive before an attempt is made to broadcast a message.
- **Wait Interval** – Trunking radios only. The number of seconds to wait for the COR input to become inactive after PTT.
- **Wait Retry Interval** – Trunking radios only. The number of seconds to wait before setting the PTT following the COR input failing to become inactive during a transmission attempt.

Radio Settings - Messages

The **Messages** page allows message configuration details to be set up.
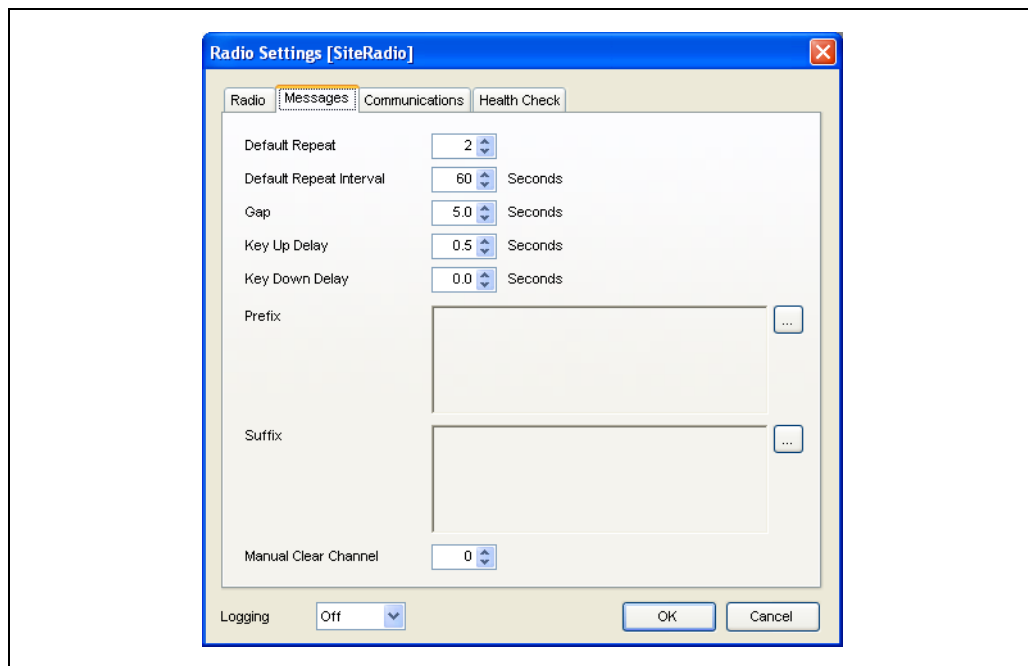
BA00390GEN_0153

- **Default Repeat** – The number of times a message is to be repeated by default unless it is specifically overridden.
- **Default Repeat Interval** – The length of time before a message is to be repeated.
- **Gap** – The length of time to be left before broadcasting the next message.
- **Key Up Delay** – The length of time between setting PTT and beginning to output the audio
- **Key Down Delay** – The length of time between completing the audio output and unsetting PTT.
- **Prefix** – A standard message to be prefixed to all broadcast messages. This can be used to add a standard call sign for example. To edit this message click the ... button to the right of the field. See section on Configuring Audio Messages for more details (→ 🖹 137).
- **Suffix** – A standard message to be suffixed to all broadcast messages. This can be used to add a standard sign-off for example. To edit this message click the ... button to the right of the field. See section on Configuring Audio Messages for more details (→ 🖹 137).
- **Manual Clear Channel** – The index of the input on the ArcCom relay board to which the manual reset switch is connected. If no manual reset switch is in use, this should be set to 0.

Radio Settings - Communications

The **Communications** page allows configuration of the communications failure functionality.
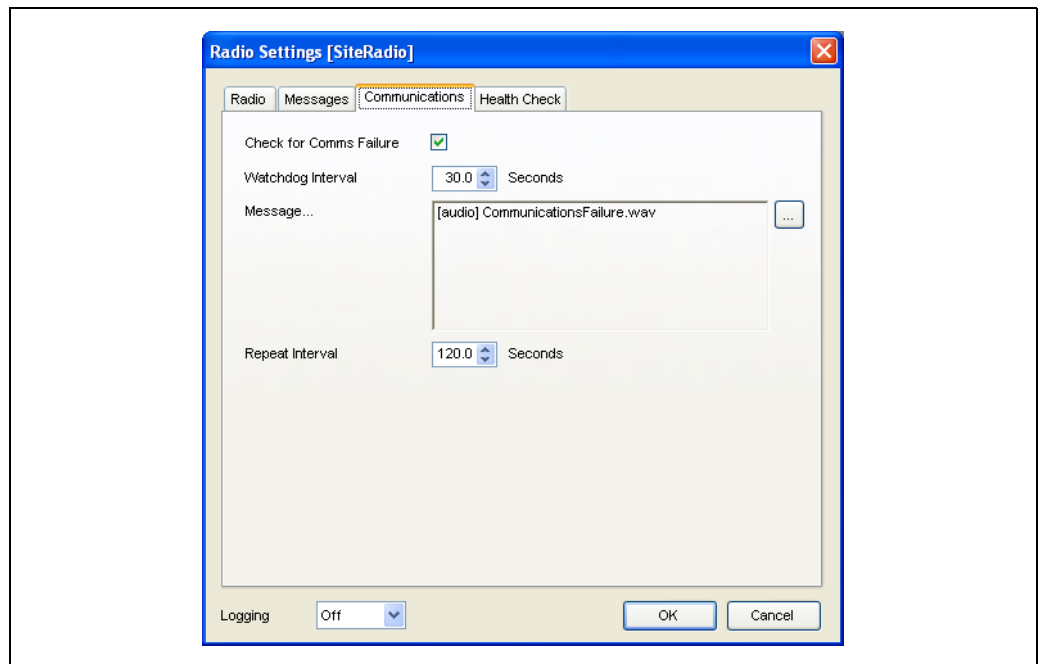
BA00390GEN_0154

- **Check for Comms Failure** – Indicates whether the messaging service is to check whether communications with calling applications is interrupted.
- **Watchdog Interval** – The interval defining what constitutes a communications failure.
- **Message** – The message to be broadcast when a communications failure is identified. To edit this message click the ⬚ button on the right side of the field. See section on Configuring Audio Messages for more details (→ 🗎 137).
- **Repeat Interval** – The interval at which the communications failure message is to be broadcast until communications with client applications is restored.

Radio Settings - Health Check

The **Health Check** page allows configuration of the health check functionality.
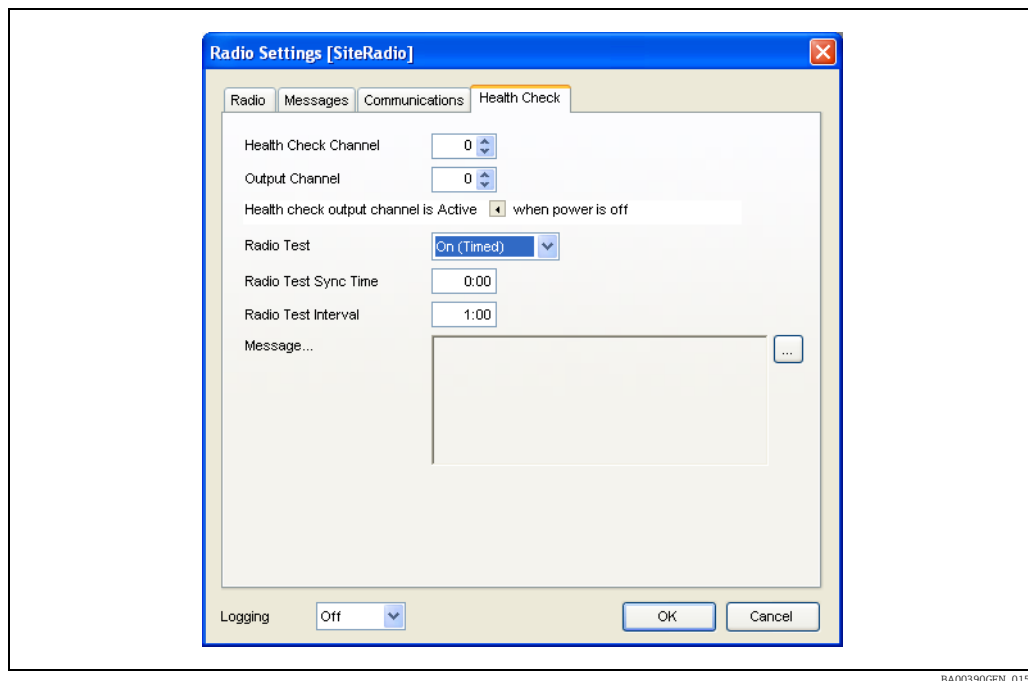
BA00390GEN_0155

Health Check Channel – The index of the relay on the relay board which is connected to the health check terminal on the radio output board. If no health checking is to be performed, this should be set to 0.

Output Channel – The index of the relay on the relay board which is connected to an alarm indicator (such as an alarm panel). If no external alarm is being used, this should be set to 0.

Health check output channel is Active/Inactive when power is off – This field allows configuration of the default state of the external alarm indicator. This means that the system can be configured to display an external alarm if the PC is shut down.

Radio Test – This field allows a periodic test to be carried out to ensure that the audio output from the PC is reaching the radio output board. This can be one of the following values:

• **Off** - No test performed.
• **On** - The test message is broadcast over the radio if no message has been broadcast in the time defined in the **Radio Test Interval** field.
• **On (Timed)** - The test message is broadcast over the radio at intervals defined by the **Radio Test Sync Time** and **Radio Test Interval** fields irrespective of when the last message was broadcast over the radio.
• **Silent** - The audio message is to be transmitted to the radio output board if no message has been broadcast in the time defined in the **Radio Test Interval** field.However, PTT is not set so the message is not actually broadcast over the radio.
• **Silent (Timed)** - The audio message is to be transmitted to the radio output board at intervals defined by the **Radio Test Sync Time** and **Radio Test Interval** fields irrespective of when the last message was broadcast over the radio. However, PTT is not set so the message is not actually broadcast over the radio.

Message – The message to be broadcast. To edit this message click the [...] button on the right side of the field. See section on Configuring Audio Messages for more details (→ 🖹 137).

18.2 Configuring Audio Messages

Configuring Audio Messages is a relatively simple process. However, in the interests of integrity and flexibility fields containing audio messages cannot be edited directly. Throughout the system where a message field is used, it is read-only and has a ⬚... button next to it.

1. To edit the message click on the ⬚... button.
   This will bring up a separate screen allowing editing of the message. Although these screens may differ in detail they will always contain the following fields:
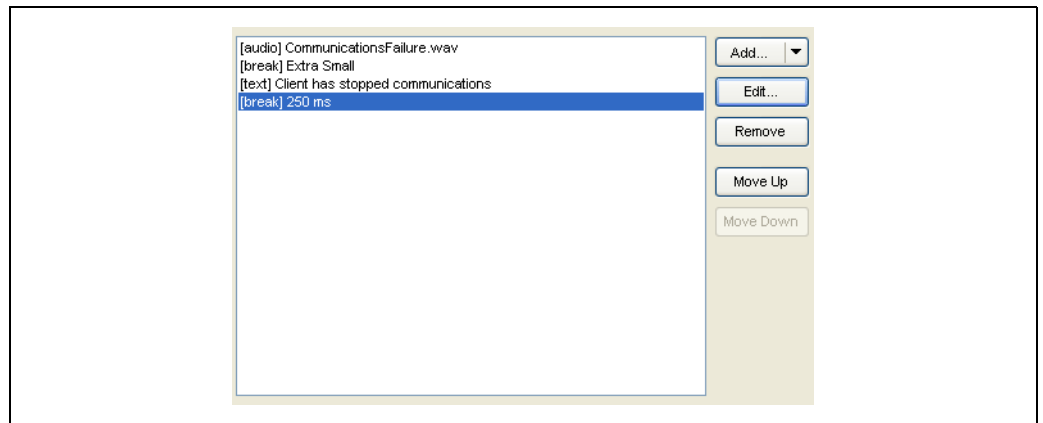
BA00390GEN_0156

Adding a message element

1. To add a new message element click the **Add** button.

- Clicking on the arrow on the button will display a drop-down menu allowing selection of the element type:
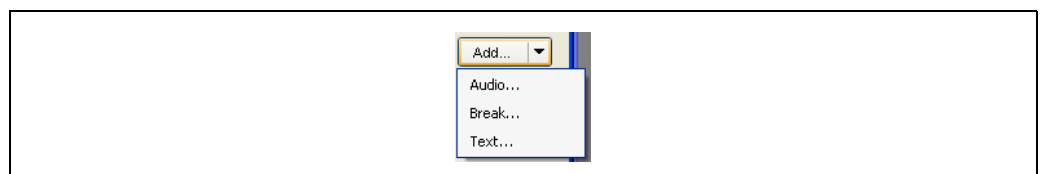
BA00390GEN_0157

- Clicking on the main part of the button automatically selects the previous message element type (defaulting to **Audio** if no previous selection has been made).

A configuration screen for the message element will be displayed (→ 🖹 138, → 🖹 139).

2. Click the **OK** button on the configuration screen.
   The message element is added to the message.

Editing a message element

To edit a message element, proceed as follows:

1. Select the message element in the list.

2. Click the **Edit** button.
   The relevant configuration screen for the message element will be displayed (→ 🖹 138, → 🖹 139).

3. Click the **OK** button on the configuration screen.
   The message element is updated.

Removing a message element

To remove a message element, proceed as follows:

1. Select the message element in the list.

2. Click the **Remove** button.

Moving a message element up or down

To move a message element to earlier in the message, proceed as follows:

1. Select the message element in the list.

2. Click the **Move Up** button until the required position is reached.

To move a message element to later in the message, proceed as follows:

1. Select the message element in the list.

2. Click the **Move Down** button until the required position is reached.

18.2.1   Audio Element

The audio element simply plays an audio file as part of the message.

1. Select the audio file on the audio configuration screen.
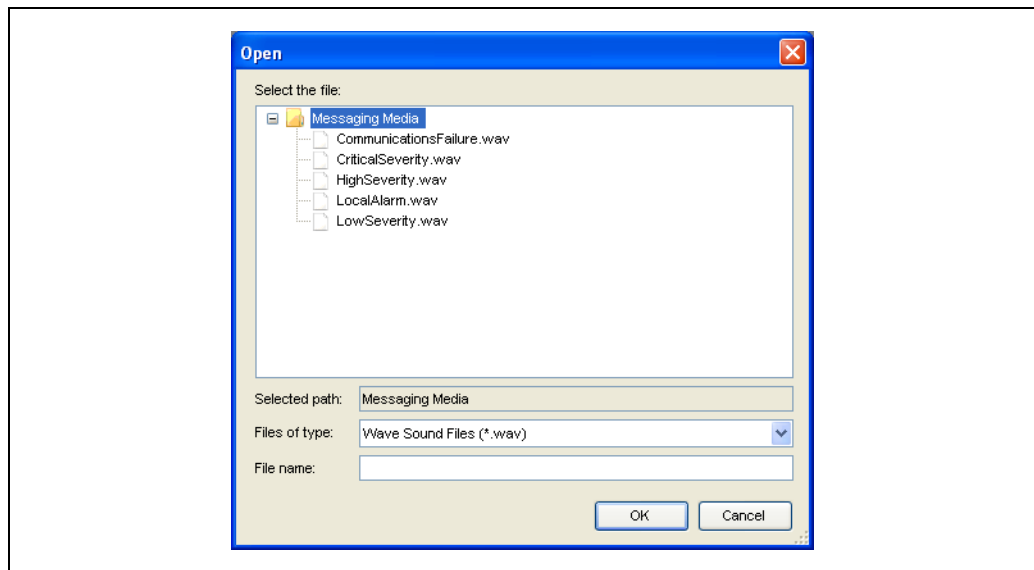
BA00390GEN_0158

The audio files available to the messaging service are stored in a directory called **Messaging Media** which can be found under the directory that the messaging service is installed in.

2. Click the **OK** button.

18.2.2   Break Element

The Break element allows the insertion of a break between other message elements. The break can either be a pre-defined length, or explicitly specified.
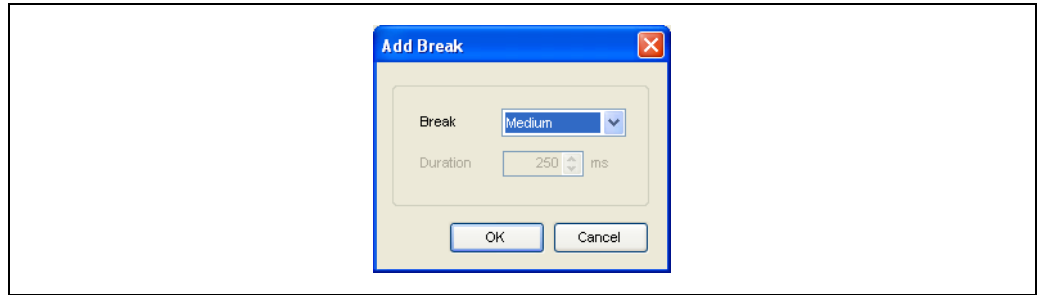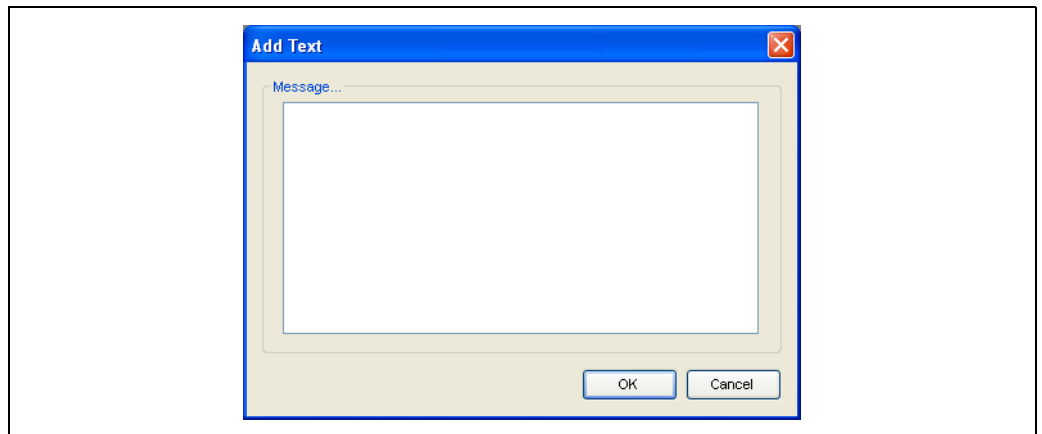
BA00390GEN_0159

To explicitly specify the length of a break, proceed as follows:

1. Select **Timed** from the drop-down list of break types.

2. Enter the duration of the break in milliseconds in the **Duration** field.

18.2.3   Text Element

The Text element allows the use of free format text which will be synthesized using the text to speech functionality of Windows.

ℹ️ The standard synthesized voice in Windows may seem rather robotic and it would usually be better to record messages and use the Audio element instead.

BA00390GEN_0160

Appendix

Appendix A – Standard for Calculation default flags

Industry standard	Flag
IP	• Roof weight specified in air • Enable tank shell correction • Use IP calculation of TOV/GOV • Include suspended sediment & water • Do not combine suspended sediment & water • VCF is normal
API	• Roof weight specified in air • Enable tank shell correction • WCF uses Table 56 calculation • Use API calculation of TOV/GOV • Include suspended sediment & water • Combine suspended sediment & water • Net values calculated from gross • VCF is normal
GB/T	• Roof weight specified in air • Enable tank shell correction • WCF uses fixed 0.0011 kg/l • Use API calculation of TOV/GOV • Include suspended sediment & water • Combine suspended sediment & water • Net values calculated from gross • VCF is normal
GB/T direct weight	• Roof weight specified in air • Enable tank shell correction • WCF uses fixed 0.0011 kg/l • Use API calculation of TOV/GOV • Include suspended sediment & water • Combine suspended sediment & water • Net values calculated from gross • WCF uses short Table 56 • VCF is normal
GOST	• Roof weight specified in Vacuum (mass) • Use IP calculation of TOV/GOV • Net values calculated from gross • WCF uses short Table 56
JIS	• Gauge reads reference density • Roof weight specified in Vacuum (mass) • WCF uses Table 56 calculation • Use API calculation of TOV/GOV • Disregard suspended sediment & water • Water density 1.0 kg/l for fresh water • Net values calculated from gross • Tank shell is not insulated • VCF is normal
JIS-MDP	• Gauge reads reference density • Roof weight specified in Vacuum (mass) • WCF uses Table 56 calculation • Use API calculation of TOV/GOV • Disregard suspended sediment & water • Water density 1.0 kg/l for fresh water • Net values calculated from gross • Tank shell is not insulated • VCF is restricted

Appendix B – Product Inventory Flags

Setting 1 (unset)	Setting 2 (Set)	Explanation
WCF uses Table 56 correction	WCF uses fixed 0.0011 kg/l	Select this to use a calculated WCF, which gives better accuracy when calculating WCF.
Use IP calculation of TOV/GOV	Use API calculation of TOV/GOV	Set if you wish to use American (US) style calculations, which perform the floating roof and free water corrections at a different stage to the British calculations.
Disregard suspended sediment and water	Include suspended sediment & water	Set if you want include sediment and water correction in your inventory calculations
Combined sediment & water calculation	Separate sediment & water calculation	Set if you want sediment and water correction calculated separately
Water density 1.0 kg/l for fresh water	Water density 1.020 kg/l for sea water	Set according to whether the water you have in your tanks is fresh or sea water
Net values calculated from gross	Net values calculated from NOV-NSV chain	If set, net values are calculated from gross, otherwise from prior calculated NOV and NSV values. Only applicable to IP calculation methods
Mass calculated from standard conditions	Mass calculated from observed conditions	–
Range checking is enabled	Range checking is disabled	If set, checks to ensure input values are within acceptable range are turned off
WCF uses main Table 56	WCF uses short Table 56	Weight correction factor calculations use 'Table 56'. This exists in a 'short' or 'main' version. If set, the short version will be used
VCF is normal	VCF is restricted	When set, VCF output is restricted to 4 decimal places
Use equilibrium pressure as per D1250/04	Use equilibrium pressure as per D1250/04 addendum 1	When set, the 2007 addendum to MPMS 11.1 D1250/04 regarding equilibrium pressure is applied
Use Calculated Data	Use Tabular Data	When set, the data for WCF is obtained from a lookup table rather than being calculated
Use Metric table for WCF calculation	Use Imperial table for WCF calculation	Only valid if the 'Use Tabular Data' option is set. When set, the WCF is derived from Table 57 (imperial). Otherwise Table 56 (Metric) is used
Use normal WCF value	Use reciprocal WCF value	Only valid if the 'Use Tabular Data' and the 'Use Metric table for WCF calculation' options are selected. When set, the WCF value will be obtained from the 'litres/Metric Ton' column of Table 56. Otherwise the 'Metric Ton/litre' column is used
Volume	Pressure	Determines whether mass values are derived from volumetric data or from pressure inputs
Volume	Mass	The calculated Barrel Conversion Factor is to be used to convert volume or mass values

Appendix C – Tank Inventory Flags

Setting 1 (unset)	Setting 2 (Set)	Explanation
Gauge levels are innage	Gauge levels are ullage	The levels returned by the gauge are innage (referenced from the bottom) or ullage (referenced from the top)
Ullage level zero = Max. Operating Level	Ullage level zero = Reference Height	Zero ullage is taken as the highest safe working level or the maximum height of the tank
Gauge reads reference density	Gauge reads observed density	Note! Use this setting with care! When set the inventory calculator derives the reference density from the observed density information, if you enter manual densities be aware of whether you enter a reference density or an observed density
Gauge reads density in vacuum	Gauge reads density in air	When set an allowance for the density of air will be made during inventory calculations
Gauge reads relative pressure	Gauge reads absolute pressure	Internally pressures are stored in Bar absolute, checking this option will cause the pressure stored to be calculated from the gauged value
Roof weight specified in air	Roof weight specified in vacuum	If you know the mass of your floating roof, set to Roof Weight Specified in vacuum
Disable tank shell correction	Enable tank shell correction	When checked the tank shell correction calculation will be performed, enter shell correction information on the relevant tab in this module
Do not apply hydrometer correction in VCF	Apply hydrometer correction to VCF	Set according to whether hydrometer correction is required or not
Tank calculated as hydrocarbon storage	Tank calculated for ballast/slops storage	When set movements in and out of the tank are assumed to leave a constant oil depth and vary the amount of water in the tank
Use product temperature in vapour correction	Use vapour temperature in vapour corrections	Sets which temperature is used by vapour corrections
Average gauge temperature is product temperature	Average gauge temperature is vapour temperature	Selecting vapour temperature as the source of average temperature disables product temperature
Dip thermal correction is disregarded	Dip thermal correction is enabled	Set if correction for temperature is applied to dip
Gauge dip type is Ullage	Gauge dip type is Innage	If Dip thermal correction is enabled, selects which type of gauge to apply correction to
Disable correction for Buoyancy gauges	Enable correction for Buoyancy gauges	When set, correction is applied for buoyancy type gauges
Liquid pressure is from P1	Liquid pressure is from P2	Determines where liquid pressure is read from. Can also be set to read Liquid Pressure from P3
Compressibility factor is disregarded	Compressibility factor is applied	If set, the compressibility factor will be applied to calculations
Tank shell is not insulated	Tank shell is insulated	If set, tank shell insulation will be included in calculations

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