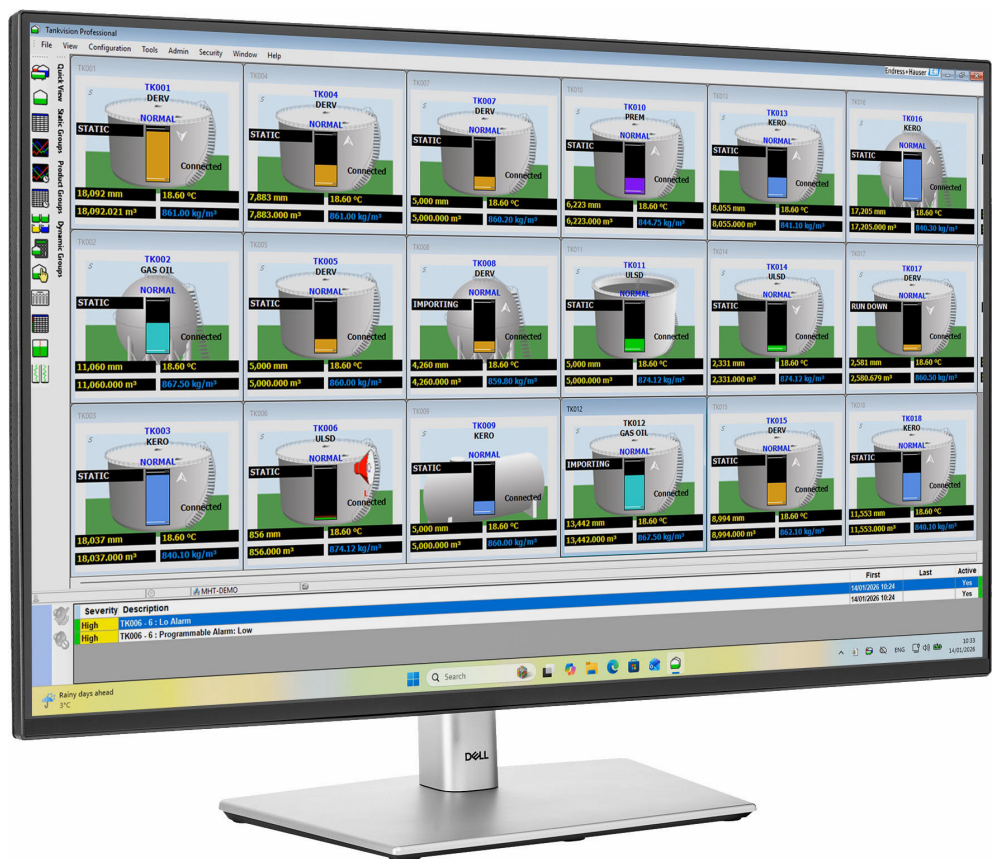


Operating Instructions

Tankvision Professional NXA85

Movements System Operation





A0023555

- Make sure the document is stored in a safe place such that it is always available when working on or with the device
- 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. The Endress+Hauser sales organization will supply you with current information and updates to these instructions.

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1 About this document

1.1 Document function

This manual should support during the operation of Tankvision Professional NXA85.

It deals with the usage of the movement system.

This manual is designed as an Operators aide to using the software.

1.2 Target audience

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

1.3 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 measures regulations and can therefore not be combined.

1.4 Symbols

1.4.1 Safety symbols

DANGER

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

WARNING

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

CAUTION

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

NOTICE

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

1.4.2 Symbols for certain types of information and graphics

Tip

Indicates additional information



Reference to documentation



Reference to graphic



Notice or individual step to be observed

1., 2., 3.

Series of steps



Result of a step

1, 2, 3, ...

Item numbers

A, B, C, ...

Views

1.5 Documentation



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

- *Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from the nameplate
- *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate.

The following document types are available in the Downloads area of the Endress+Hauser website (www.endress.com/downloads), depending on the device version:

Document type	Purpose and content of the document
Technical Information (TI)	Planning aid for your device The document contains all the technical data on the device and provides an overview of the accessories and other products that can be ordered for the device.
Brief Operating Instructions (KA)	Guide that takes you quickly to the 1st measured value The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning.
Operating Instructions (BA)	Your reference document The Operating Instructions contain all the information that is required in various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.
Description of Device Parameters (GP)	Reference for your parameters The document provides a detailed explanation of each individual parameter. The description is aimed at those who work with the device over the entire life cycle and perform specific configurations.
Safety instructions (XA)	Depending on the approval, safety instructions for electrical equipment in hazardous areas are also supplied with the device. These are an integral part of the Operating Instructions.  The nameplate indicates which Safety Instructions (XA) apply to the device.
Supplementary device-dependent documentation (SD/FY)	Always comply strictly with the instructions in the relevant supplementary documentation. The supplementary documentation is a constituent part of the device documentation.

1.6 Change history

BA00395G/13.10

- Valid for software version: 18.0.0
- Initial version

BA00395G/14.14

- Valid for software version: 18.0.2 and 18.0.3
- Changes to the previous version:
New layout; Enhanced Product, Tank and Movement functionality; Additional functions for Grid view

BA00395G/15.16

- Valid for software version: 18.0.2 and 18.0.3
- Changes to the previous version:
 - New features

BA00395G/16.17

- Valid for software version: 18.1.1
- Changes to the previous version:
 - Unification of the W&M and the non W&M software packages.

BA00395G/17.19

- Valid for software version: 18.2.5
- Changes to the previous version:
 - Optional software component Movements Ticketing added.

BA00395G/18.24

- Valid for software version: 18.3.3
- Changes to the previous version:
 - Compatibility with Windows 11 and Windows Server 2022. Minor changes to existing functionality.

BA00395G/19.26

- Valid for software version: 18.3.4
- Changes to the previous version:
 - Movement Activity Report added
 - Minor changes to document structure

1.7 Registered trademarks

Microsoft®, Windows® and Edge®

Microsoft®, Windows®, Edge® and the Microsoft logo are registered trademarks of the Microsoft Corporation.

1.7.1 Legal notice concerning trademarks

All company/product names and/or all company logos may be trade names, trademarks and/or registered trademarks of Endress+Hauser, its affiliates or of their respective owners with which they are associated.

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 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 Intended use of Tankvision Professional NXA85 software

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/remote) e.g. for administrative and accounting purposes.

2.3 IT security

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

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

3 Incoming acceptance and product identification

3.1 Incoming acceptance

On receipt of the delivery:

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

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

3.2 Product identification

The following options are available for identification of the software:

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

For an overview of the technical documentation provided, enter the serial number from the nameplate in the *Device Viewer* (www.endress.com/deviceviewer).

3.2.1 Nameplate

The information that is required by law and is relevant to the product is shown on the nameplate, e.g.:

- Manufacturer identification
- Product name
- Order code
- Extended order code
- Serial number
- Barcode

3.2.2 Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany
Place of manufacture: See nameplate.

3.2.3 Order code and product version

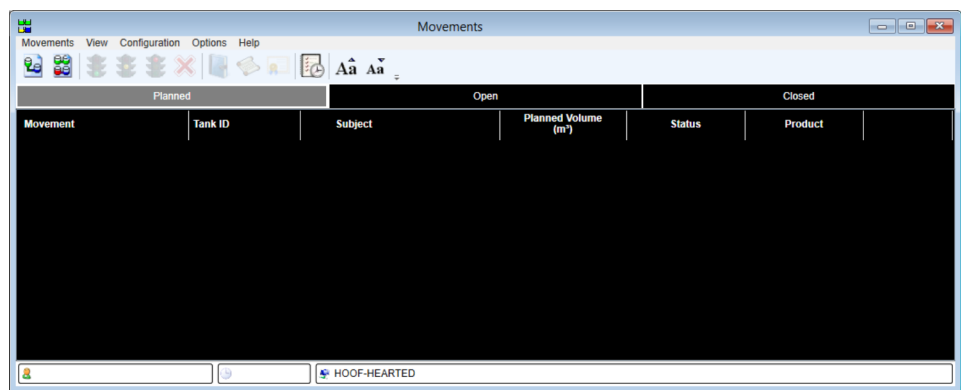
 To find out the version of your software, enter the order code indicated on the nameplate in the search screen at the following address:
www.products.endress.com/order-ident

4 Movements Operation Introduction

Movements are at the core of operations at a tank farm. If the tank farm is built to store bulk liquids, then movements are a necessary part of the operations there as the storage is only useful if you can move products in and out of the facility.

The movements system is a module in the tank gauging system designed to assist in the safe management of the transfer of products on and off and around the site being monitored. It can provide operators with notifications of the progress of movements, some enforcement of safe operating procedures and reporting of inventory changes.

This manual is a companion to the Movements Configuration manual. This manual describes the operational aspects of the full movements system and assumes that the reader is presented with a properly configured movement system to start with, many of the key features in movements are optional and are controlled by the configuration options. It is recommended that the person responsible for the implementation of policies regarding the movement operations at the site reads both manuals fully.



1 Main Summary screen

The main interface for using the movements is the movements client, the main window of which is shown above. There are 3 views of movements in the system, divided by the status of the operation: **Planned**, **Open** and **Closed**. Clicking the labels at the top of the black movement area selects the movements to be shown. This window is central to the use of the full movements package, and operators should become familiar with its operation.

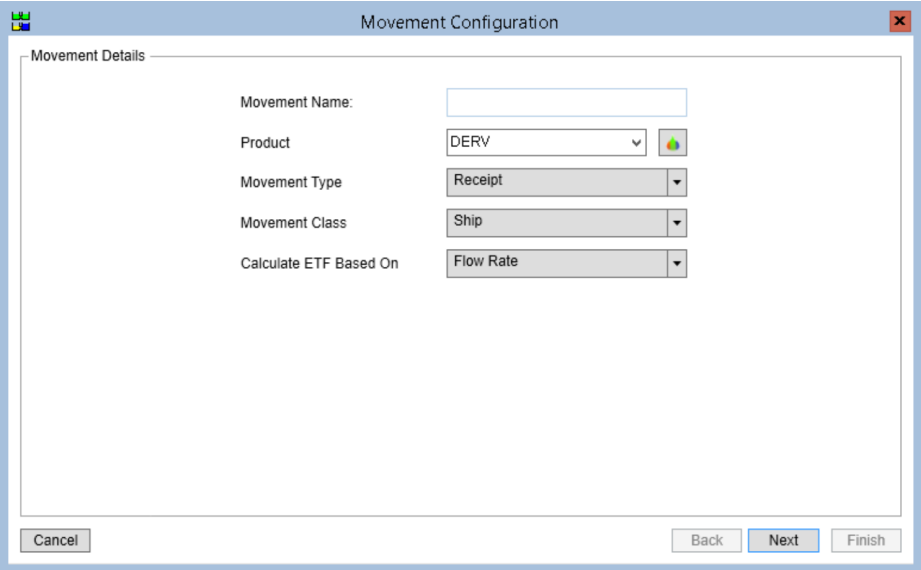
5 Quick Start Guide

This section shows how to plan movements for a number of common scenarios.

 The scenarios will not necessarily be applicable to every installation.

5.1 Receipt from a Ship

1. From the **Main Summary** screen click the **Create new movement** button 
↳ The first page of the **New Movement** wizard will be displayed:



 2 *First page*

2. Enter a **Movement Name**. If no name is entered, the ID of the movement will be used as the name. The **Movement Name** for a movement is displayed in the first column on the **Summary** screen.
3. Select a **Product**. This is for information purposes only and may be displayed on the **Summary** screen.
4. Select a **Movement Type** of **Receipt**.
5. Select a **Movement Class** of **Ship**.

6. Click the **Next** button.
 ↳ The **Subject** page is now displayed:

Movement Configuration

Subject

Subject: King George VI

Movement Control: Specified

Target Type: G.S.V

Planned Quantity: 30,000.000 m³

Reference Density: 800.00 kg/m³

Buttons: Cancel, Back, Next, Finish

3 Subject page

7. Enter the name of the **Subject** of the movement. Typically this would be the name of the ship. This value will be displayed in the **Subject** column on the **Summary** screen.

For the purposes of this exercise, it is assumed that the ship cargo is 30 000 m³ of DERV. The volume and density of the cargo are generally provided at standard conditions, in Europe and the US standard conditions are typically atmospheric pressure and 15 °C or 60 °F respectively. If your receipt documentation provides a cargo weight, as might be the case for a road delivery for instance, select the appropriate target type.

8. Enter the **Planned Quantity**, as defined by the choice of **Target Type**.
9. Enter the **Reference Density**, this will be used by the system to convert between the different quantities.
10. Click the **Next** button.
 ↳ The **Tank Movements** page will be displayed:

Movement Configuration

Tank Movements

Target Type: G.S.V

Tank ID	Movement Control	Start Level (m)	Start Temperature (°C)	Planned Quantity (m³)	Standard Planned Quantity (m³)
TK001	Fill	4.332	20.00	15,668.000	15,668.000
TK004	Fill	5.965	18.60	14,000.836	14,000.836
TK009	No Control	6.050	-10.55	331.164	331.164

Add

Total Volume (m³): 30,000.000
 Planned Volume (m³): 30,000.000
 Discrepancy (m³): 0.000

Buttons: Cancel, Back, Next, Finish

4 Tank Movements page

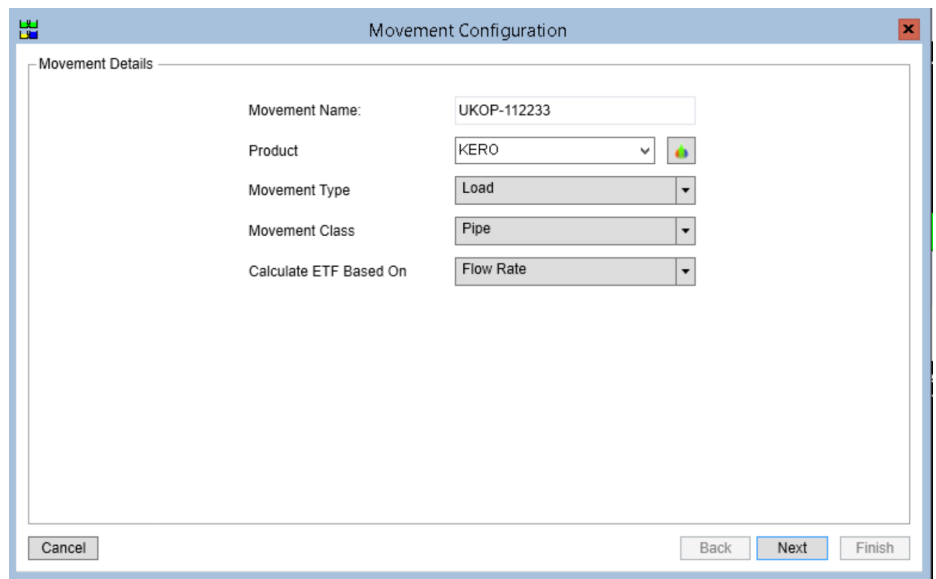
11. When you open the page the first time a line will be displayed showing the first tank in your system selected. Select the first tank to be filled and then select **Fill** in the **Movement Control** column.
 - ↳ The **Planned Volume** will be automatically calculated and will be grayed out so that it cannot be amended.
-  If your tank does not currently have a valid level, as is frequently the case with radar gauges on empty tanks, or your tank is not yet ready to receive a cargo you can enter your own level and temperature for the purposes of planning. When you come to open the movement the current live level will be taken at that point and the validity of your planned quantity will be checked to prevent you from attempting to over fill the tank.
12. Click **Add** to create a second entry. Select the **Tank ID** of the second tank to be filled and then select **Fill** in the **Movement Control** column. Continue until enough capacity for the cargo has been allocated. Usually the allocated cargo will not fill all the tanks you select, so the final tank will be set as **No Control**.
-  **No Control** does not mean that the movement will not be subject to any controls when you come to run it. The usual procedure when receiving a large shipment that won't fit in a single tank is for a number of tanks to be lined up for the receipt and to change the tank while the ship is pumping as they become full, before finally depositing the balance in the last tank. When you select a tank to be filled the target level is determined to be the maximum operating level for the tank, the final **No Control** tank has its target level calculated by estimating the product level to accommodate the remaining volume of the movement at the time the final tank is opened.

You can remove a tank from the list by clicking the  button at the left of each tank row.

13. Click on the **Next** button. If the **Timed Activities** page is displayed click the **Next** button again.
 - ↳ The **Summary** page is now displayed.
14. Check that the details for the receipt are correct and then click the **Finish** button.
 - ↳ The movement planning is now complete.

5.2 Load to a Pipeline

1. On the **Summary** screen click the **Create new movement** button .
 - ↳ The first page of the **New Movement** wizard will be displayed:



 5 Load to a Pipeline

2. Enter a **Movement Name**. If no name is entered, the ID of the movement will be used as the name. The **Movement Name** for a movement is displayed in the first column on the **Summary** screen.
3. Select a **Product**. This is for information purposes only and may be displayed on the **Summary** screen.
4. Select a **Movement Type** of **Load**.
5. Select a **Movement Class** of **Pipeline**.

 The setting for **Calculate ETF Based On** determines how the Estimated Time to Finish (ETF - Estimated Time to Finish) is calculated. The options are several different flow rates calculated within the tank gauging system's communications layer. Which you choose has little bearing on the way you run the movement, it is really a personal choice as to whether you would like a slow responding steady flow rate or a quick responding but potentially erratic one.

- 6. Click the **Next** button.
↳ The **Subject** page is now displayed:

Movement Configuration

Subject

Subject: Overland Pipeline

Movement Control: Specified

Target Type: G.S.V

Planned Quantity: 5,000.000 m³

Buttons: Cancel, Back, Next, Finish

6 Subject page

- 7. Enter the name of the **Subject** of the movement. Typically this would be the name of the pipeline. This value will be displayed in the **Subject** column on the **Summary** screen.
- 8. Leave the **Movement Control** field as **Specified** and the **Target Type** field as **Volume**.
- i** It is possible to choose the different volume and mass types to define your movement quantity, which you select will largely depend on the information you are provided with and the limitations of your instrumentation. If you need to ignore the effects of free water from your movement, choose **Total Observed Volume**.
- 9. Enter the **Planned Quantity**.
- 10. Click the **Next** button.
↳ The **Tank Movements** page will be displayed:

Movement Configuration

Tank Movements

Target Type: G.S.V

Tank ID	Movement Control	Start Level (m)	Start Temperature (°C)	Planned Quantity (m³)	Standard Planned Quantity (m³)
TK010	Empty	5.000	18.60	4,987.900	4,987.900
TK011	No Control	5.000	18.60	12.100	12.100

Add

Summary:

- Total Volume (m³): 5,000.000
- Planned Volume (m³): 5,000.000
- Discrepancy (m³): 0.000

Buttons: Cancel, Back, Next, Finish

7 Tank Movements page

The first row will be populated with the first tank in your database.

11. Select the **Tank ID** of the first tank in the movement and then enter the quantity that is to be taken out of it.
12. Click **Add** to include additional tanks in the movement. If the tank you select currently has an invalid level, or you expect it to be different when you open the movement you can edit the start level, which defaults to the current tank level.

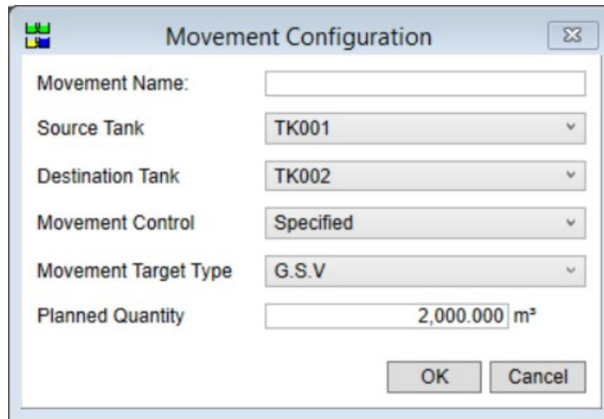
 The same tank can be added multiple times; if you expect that the tank will be refilled during the course of the discharge to the pipeline.

When the details of the first entry are amended, a second entry is automatically created.

13. Select the **Tank ID** of the second tank in the movement and then enter the quantity that is to be taken out of it. Continue until all of the tanks in the movement have been included.
14. Check that the **Total Volume** for the tanks matches the **Planned Volume** for the pipeline (i.e. the **Discrepancy** is zero).
15. Click on the **Next** button. If the **Timed Activities** page is displayed click the **Next** button again.
 - ↳ The **Summary** page is now displayed.
16. Check that the details for the movement are correct and then click the **Finish** button.
 - ↳ The movement planning is now complete.

5.3 Tank to Tank Transfer

1. On the **Summary** screen click the **Create transfer** button .
 - ↳ The **Simple Tank Transfer** page will be displayed:



 8 Simple Tank Transfer

2. Enter a **Movement Name**. If no name is entered, the ID of the movement will be used as the name. The **Movement Name** for a movement is displayed in the first column on the **Summary** screen.
3. Select a **Source Tank** and a **Destination Tank** for the movement.
4. Leave the **Movement Control** as **Specified** and the **Movement Target Type** as **GSV**.
5. Enter the planned volume.

6. Click the **OK** button.

↳ The movement planning is now complete.



The Simple Tank Transfer screen is limited to creating one to one movements of product between 2 tanks. The movements system is capable of managing more complex one to many and many to one transfers, however these need to be configured using the movements wizard.

The simple tank transfer is provided as a convenient way to create the many "housekeeping" movements which occur on many sites.

6 Alarms

In addition to the alarms that are generated by Tankvision Professional, the movements system has some unique alarms. Default settings for the alarms are configured from the **Default Alarm Configuration** screen ( see Movements Configuration Manual BA00394G for more details). Alarm settings for individual movement components can be modified (see "Tank Alarms" and "Timed Activity Alarms" for more details).



For more details about alarm annunciation and acknowledgement see the appropriate section of the System Operation manual BA00396G.

6.1 Movement Alarms

6.1.1 Net Flow Alarm

For movements which are tank to tank transfers, a net flow alarm can be enabled. If the total net flow of the open tanks in the movement exceeds the pre-defined threshold an alarm is raised. By default the severity of the alarm is **High**.

The description of the alarm will be

movement: Net movement flow is greater than *amount*

where *movement* is the name of the movement and *amount* is the pre-defined threshold.

6.2 Tank Alarms

The following alarms may be raised for a tank in a movement when the status of the corresponding movement component is either **Open** or **Reopened**.

6.2.1 Time to Target Alarms

There are 2 **Time to Target** alarms for each tank in a movement (including the subject tank if the movement is a transfer). These are raised when the ETF for the movement component drops below a pre-defined threshold. By default the severity of the first of these alarms is **Low** and the severity of the second of these alarms is **High**.

Both alarms will have a description of

movement - tank ID: Target level will be reached in *n* minutes

where *movement* is the name of the movement, *tank ID* is the ID of the tank which is approaching the completion time and *n* is the time remaining (in minutes).

6.2.2 Approaching Target Level Alarms

There are 2 **Approaching Target Level** alarms for each tank in a movement (including the subject tank if the movement is a transfer). These are raised when the product level in the tank reaches a pre-defined distance from the target level for the tank. By default the severity of the first of these alarms is **Low** and the severity of the second of these alarms is **High**.

Both alarms will have a description of

movement - tank ID: Product level is within *distance* of target level

where *movement* is the name of the movement, *tank ID* is the ID of the tank which is approaching the target level and *distance* is the distance remaining to the target level.

6.2.3 Target Level Achieved Alarm

The **Target Level Achieved** alarm is raised when the target level is reached for a tank in a movement (including the subject tank if the movement is a transfer). By default the severity of this alarm is **High**.

The description of the alarm will be

movement - tank ID: Target level achieved

where *movement* is the name of the movement and *tank ID* is the ID of the tank which has achieved its target level.

6.2.4 Target Level Exceeded Alarm

The **Target Level Exceeded** alarm is raised when the target level for a tank is passed by more than a pre-defined distance. By default the severity of this alarm is **Critical**.

The description of the alarm will be

movement - tank ID: Target level exceeded

where *movement* is the name of the movement and *tank ID* is the ID of the tank which has exceeded the target level.

6.2.5 Low Flow Alarm

The **Low Flow** alarm is raised when the flow rate for a tank is lower than a pre-defined threshold. By default the severity of this alarm is **High**.

The description of the alarm will be

movement - tank ID: Flow rate is less than *amount*

where *movement* is the name of the movement, *tank ID* is the ID of the tank which has the low flow rate and *amount* is the pre-defined threshold.

6.2.6 Reverse Flow Alarm

The **Reverse Flow** alarm is raised when the flow for a tank is in the opposite direction to that expected by the movement. By default the severity of this alarm is **High**.

The description of the alarm will be

movement - tank ID: Flow is not in expected direction

where *movement* is the name of the movement and *tank ID* is the ID of the tank which has a flow in the wrong direction.

6.3 Timed Activity Alarms

The following alarms may be raised for a timed activity in a movement when the status of the corresponding movement component is either **Open** or **Reopened**.

6.3.1 Time to Finish Alarms

There are 2 **Time to Finish** alarms for each timed activity in a movement. These are raised when the time remaining for the activity drops below a pre-defined threshold. By default the severity of the first of these alarms is **Low** and the severity of the second of these alarms is **High**.

Both alarms will have a description of

movement - tank ID (activity): Activity will be completed in *n* minutes

where *movement* is the name of the movement, *tank ID* is the ID of the tank, *activity* is the description for the activity and *n* is the time remaining (in minutes).

6.3.2 Activity Finished Alarm

The **Activity Finished** alarm is raised when the length of time a timed activity has been open matches the planned time for the activity. By default the severity of this alarm is **High**.

The description of the alarm will be

movement - tank ID (activity): Activity completed

where *movement* is the name of the movement, *tank ID* is the ID of the tank and *activity* is the description for the activity.

6.3.3 Activity Overdue Alarm

The **Activity Overdue** alarm is raised when the length of time a timed activity has been open exceeds the planned time for the activity by a pre-defined amount. By default the severity of this alarm is **Critical**.

The description of the alarm will be

movement - tank ID (activity): Activity completed n minutes ago

where *movement* is the name of the movement, *tank ID* is the ID of the tank, *activity* is the description for the activity and n is the time by which the completion time has been exceeded (in minutes).

7 Summary Screen

The **Movements Summary** screen can be accessed from the Tankvision Professional Home Page in the following ways:

- By selecting the **Movements** entry from the **View** menu.
- By clicking the **Movements** button  on the shortcut bar.
- By selecting the **Movements** entry from the **Movements** menu on the movements bar.

The **Movements Summary** screen displays details of all planned and open movements. In addition, movements that have been closed within the last 24 hours are displayed. The **Summary** screen starts with the planned movements displayed (see "Main Summary screen").

Viewing open and closed movements

Open movements can be viewed by clicking on the **Open** tab. Similarly movements that have been closed in the last 24 hours can be viewed by clicking on the **Closed** tab.

Adjusting the text size

The size of the text in the **Summary** screen can be increased by clicking the **Make text larger** button  on the toolbar or selecting **View → Text Size → Make Larger** from the menu. Similarly it can be decreased by clicking the **Make text smaller** button  on the toolbar or selecting **View → Text Size → Make Smaller** from the menu.

Adjusting the width of columns

The width of the columns in the **Summary** screen can be changed by holding the left-mouse button down over the dividing line between 2 headers and then dragging it left or right.

Movement components

The movement details that are displayed on each of the views (**Planned/Open/Closed**) can also be amended.



See the Movements Configuration Manual BA00394G for more details.



Movement components can be selected by clicking on them with the mouse. If more than one component needs to be selected, the Ctrl-key should be held down whilst clicking on the additional components to be selected.

7.1 Toolbar Icons

	Create transfer (see "Simple Tank Transfer")
	Create new movement (see "New Movement Wizard")
	Open/Reopen movement (see "Opening Movements")
	Suspend movement (see "Suspending Movements")
	Close movement (see "Closing Movements")
	Cancel movement (see "Cancelling Movements")
	Movement Log (see "Movement Log")

	Movement History (see "Movement History")
	Movement Certificate (see "Movement Certificate")
	Historical Movements (see "Historical Movements")
	Make text larger
	Make text smaller

8 Movement Life Cycle

8.1 Planning Movements

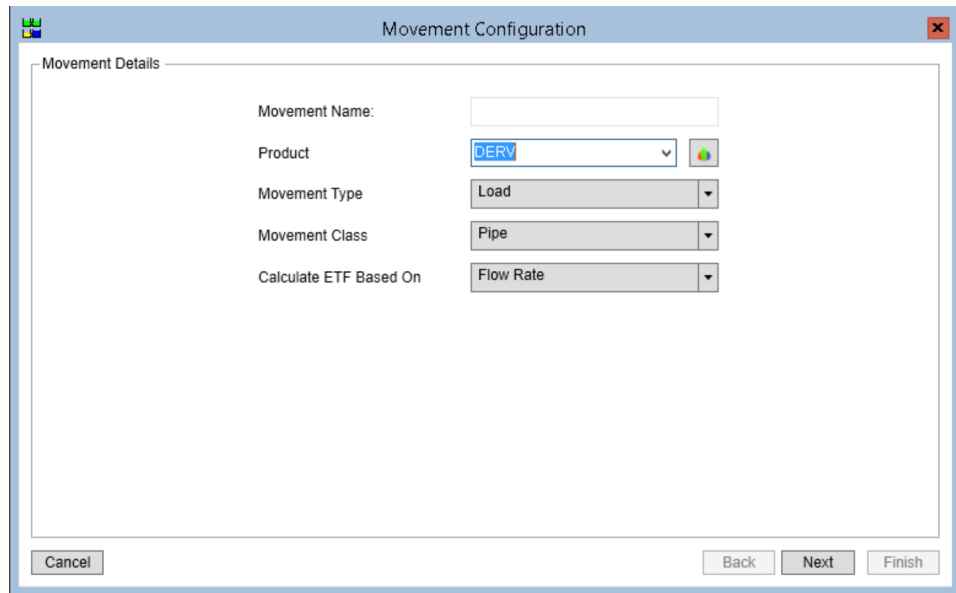
New movements can be created using the New Movement wizard or the Simple Tank Transfer screen.

8.1.1 New Movement Wizard

The **New Movement** wizard is run by clicking the **Create new movement** button  on the toolbar, or selecting **New** from the **Movements** menu.

Movement Details Page

The first page in the **New Movement** wizard is the **Movement Details** page:



 9 Movement Details Page

This page contains the following fields:

Movement Name

The name used to identify the movement. If no name is entered, this will be set to the movement ID.

Product

The product involved in the movement. This is for information only and does not have to relate to the product in the receipt or load tank(s). It defaults to the product selected in the Movement System Settings screen ( see Movement Configuration Manual BA00394G for more details).



Toggles **Product** between product name and product ID.

Movement Type

The type of the movement. This must be one of the 4 pre-defined types which are selectable from the drop-down list.

Movement Class

The class of the movement. This drop-down list will only contain the movement classes which have been associated with the selected **Movement Type** ( see Movement Configuration Manual BA00394G for more details).

Calculate ETF Based On

This field allows the selection of the type of volume flow rate which is to be used to calculate the ETF of the movement when it is open.

Custom Data Fields

There are up to 5 custom data fields below the **Calculate ETF Based On** field. These are dependent on the selected **Movement Class** (see Movement Configuration Manual BA00394G for more details).

Subject Page

The **Subject** page is used to enter details of the subject of the movement. In the case of a Receipt or a one-to-many Transfer, this is the source. In the case of a Load or a many-to-one Transfer, this is the destination.

10 Subject Page

This page contains the following fields:

Subject

This field is only displayed for **Load** and **Receipt** movement types. It is used to enter information about the subject of the movement, for example the name of a ship, or the registration plate of a lorry.

Source/Destination Tank ID

This field is displayed instead of the **Subject** field for transfer movement types. The source or destination tank is selected from a drop-down list of all the tanks in the system.

Movement Control

Determines the planned quantity for the subject of the movement.

	Receipt	Load	Transfer (one to many)	Transfer (many to one)	
Fill	x	x	x	✓	The Planned Quantity is the quantity required to fill the subject (destination) tank to the maximum operating level.
Empty	x	x	✓	x	The Planned Quantity is the available volume in the (source) tank. (i.e. Target the minimum operating level).
Strip	x	x	✓	x	The target is to leave the source tank with a Total Observed Volume of 0. Note the implied use of TOV as Target type .

	Receipt	Load	Transfer (one to many)	Transfer (many to one)	
No Control	✓	✓	✓	✓	The Planned Quantity is determined by the quantities specified on the tanks page of the wizard.
Specified	✓	✓	✓	✓	The Planned Quantity for the subject must be entered.

Target Type

This field is only visible if the planned quantity for the subject is to be specified. The dropdown list allows the selection of whether the planned quantity will be entered as **GOV**, **TOV**, **GSV**, **Weight** or **Mass**. Where the **Movement Type** is one of the transfer options it is then possible to specify the quantity as an absolute quantity or a level.

Planned Volume/Planned Weight/Stop Gauge By

This field is only visible if the planned quantity for the subject is to be specified. It is used to enter the planned quantity for the subject.

Reference Density

This field is only visible for receipts. It allows the reference density of the product being received to be entered. Other types of movement use the density of the source tank in their calculations.

Tanks Page

The **Tanks** page is used to enter details of the tanks to be used in the movement.

Movement Configuration

Tank Movements

Target Type: G.S.V

Tank ID	Movement Control	Start Level (m)	Start Temperature (°C)	Planned Quantity (m³)	Standard Planned Quantity (m³)
TK001	Specified	10.215	20.00	0.000	0.000

Add

Total Volume (m³): 0.000
Planned Volume (m³): 9,215.000
Discrepancy (m³): 9,215.000

Cancel Back Next Finish

11 Tanks Page

The **Target Type** field is used to indicate whether planned quantities are to be entered as a volume, weight or level. The selection includes several variations of volume and weight as well as absolute versions. Absolute GOV for instance would allow a tank to be filled until it contains a quantity of product sufficient to meet the absolute volume entered. The totals at the bottom of the page will be displayed as volumes unless stop gauge by weight is selected, when they are displayed as weights.

The **Total Volume/Weight** field displays the total planned quantity for all the selected tanks.

The **Planned Volume/Weight** field displays the total planned quantity for the subject of the movement.

The **Discrepancy** field indicates the difference between the total planned quantity for the selected tanks and the total planned quantity for the subject of the movement. If this value is positive, it indicates that the planned volume for the subject is greater than the planned volume for the tanks. If this value is negative, it indicates that the planned volume for the tanks is greater than the planned volume for the subject.

Adding a tank to the movement

- To add a tank to the movement, click the **Add** button.
 - ↳ A new tank will be added to the movement:

Movement Configuration

Tank Movements

Target Type: G.S.V

Tank ID	Movement Control	Start Level (m)	Start Temperature (°C)	Planned Quantity (m³)	Standard Planned Quantity (m³)
TK004	Specified	7.164	18.60	5,000.000	5,000.000
TK001	Specified	11.400	20.00	0.000	0.000

Add

Total Volume (m³) 5,000.000
Planned Volume (m³) 9,215.000
Discrepancy (m³) 4,215.000

Cancel Back Next Finish

12 Add Tank

By default, the **Tank ID** will be set to the Tank ID of the first tank in the list, the **Movement Control** will be set to **Specified** and the **Planned Quantity** to **0**. The **Start Level** and **Temperature** are defaulted to the current tank level and temperature; these may be overridden to permit planning to occur in advance of the movement being started.

Tanks are selected by the **Tank ID** from the drop-down list. The movement control for the tank can then be specified:

	Receipt	Load	Transfer (one to many)	Transfer (many to one)	
Fill	✓	✗	✓	✗	The Planned Quantity is the quantity required to fill the tank to the maximum operating level.
Empty	✗	✓	✗	✓	The Planned Quantity is the quantity required to empty the tank to the minimum operating level.
Strip ¹⁾	✗	✓	✗	✓	The tank's entire current TOV is to be taken, this may imply a target level beneath the minimum operating level and any water or sediment in the bottom of the tank.
No Control	✓	✓	✓	✓	The Planned Quantity is determined by the planned quantity for the subject.
Specified	✓	✓	✓	✓	The Planned Quantity must be entered.

1) Present as a movement control option when the target type is either TOV or Absolute TOV.

If a movement control of **Fill**, **Empty**, **Strip** or **No Control** is selected, the planned quantity is calculated and cannot be entered. If **No Control** has been selected for the subject movement type then it is not available for the tanks.

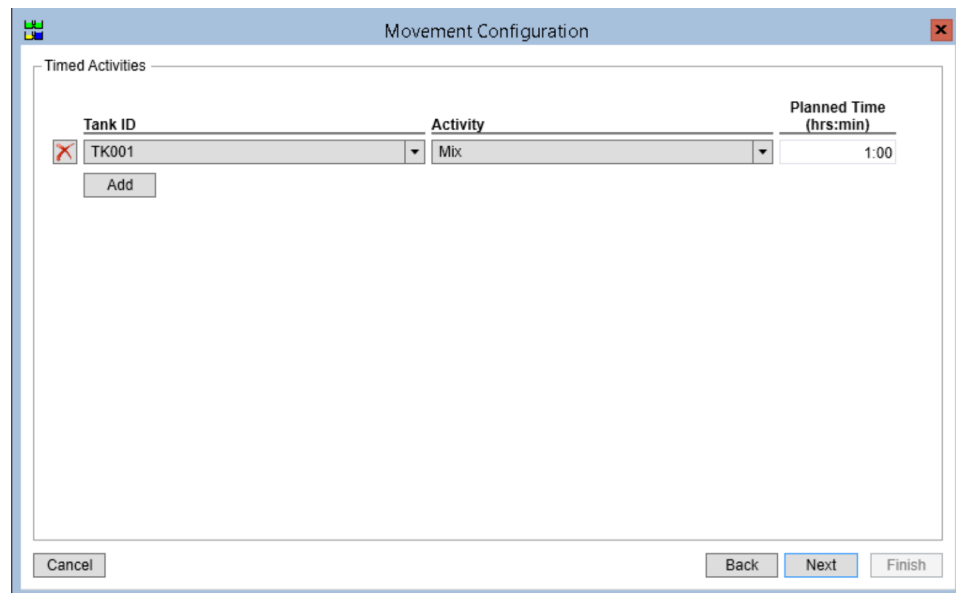
i Note that if **No Control** is selected then a receipt tank will be filled until either all the planned subject quantity has been used, or the maximum operating level has been reached. Similarly, for a load tank, it will be emptied until either all of the planned subject quantity has been accounted for, or the minimum operating level has been reached. If more than one tank has **No Control** selected, they will be filled/emptied in order until all the planned quantity for the subject has been accounted for.

Deleting a tank from the movement

- To delete a tank, click the **Delete** button  to the left of the row to be removed.

Timed Activities Page

This page will only be displayed if **Include timed activities page** is ticked in the Movements System Settings and at least one timed activity has been set up.



Tank ID	Activity	Planned Time (hrs:min)
 TK001	Mix	1:00

Add

Cancel Back Next Finish

 13 Timed Activities Page

This page works in a similar way to the tanks page. There is always one dummy activity with a **Tank ID** of the first tank in the list, an **Activity** of the first activity in the list and a **Planned Time** of 0:00.

Adding activities

- To add activities, select the **Tank ID** for the activity, select the **Activity** and enter a **Planned Time**.
 - ↳ A new dummy row will automatically be created.

Deleting activities

- To delete an activity, click the **Delete** button  to the left of the row to be removed.

Summary Page

The final page of the wizard is a **Summary** page to allow for verification of the entered details:

14 Summary Page

- To create the movement, click the **Finish** button.
 - ↳ The new movement will then appear in the list of planned movements on the Summary screen and a new entry will be created in the audit trail detailing the new movement.

8.1.2 Simple Tank Transfer

The **Simple Tank Transfer** screen is started by clicking the **Create transfer** button  on the toolbar.

15 Simple Transfer screen

This screen contains the following fields:

Movement Name

The name used to identify the movement. If no name is entered, this will be set to the **Movement ID**.

Source Tank

The **Tank ID** of the tank to be used as the source of the movement.

Destination Tank

The **Tank ID** of the tank to be used as the destination of the movement.

Movement Control

Determines how the planned quantity for the movement is to be calculated:

Movement Control	Source Tank	Destination Tank
Empty	Empty	No Control
Strip	Empty + Dead stock + Free water	TOV
Fill	No Control	Fill
Specified	Specified	Specified

For further details see "Appendix: Transfer Volume Calculations".

Stop Gauge By

Determines how the planned quantity is to be entered if movement control is set to specified.

Planned Volume/Weight

The planned quantity for both the source and destination tanks.

- Click the **OK** button to create the new movement.
 - ↳ This will create a movement of movement type **Transfer (one to many)**. The new movement will appear in the list of planned movements on the **Summary** screen and a new entry will be created in the audit trail detailing the new movement.

8.2 Amend Planned Figures

Planned figures for a movement component can be amended up to the point where the movement component is closed. They can be amended either from the **Summary** screen or from the details screen for the movement.

1. On either the **Summary** screen or **Movement Details** screen select the movement components to be amended and then select the **Amend Planned Figures** item from the **Movements** menu. Alternatively, click on the movement component with the right mouse button and select **Amend Planned Figures** from the menu that is displayed.
 - ↳ A screen will be displayed to allow the entry of the amended figures:

Tank ID	Movement Control	Planned Quantity (m³)	Standard Planned Quantity (m³)
TK010	Empty	4,987.900	4,987.900
Total Volume (m³)		5,000.000	
Planned Volume (m³)		5,000.000	
Discrepancy (m³)		0.000	

16 Amend Planned Figures

2. Click **OK** to save the changes to the planned figures. Click **Cancel** to close the screen without saving the changes.
 - ↳ When the changes are saved a new entry is created in the audit trail showing the changes.

8.3 Add Tank

Tanks can be added to a movement up to the point where the movement is complete (i.e. all movement components have been closed or cancelled). They can be added either from the **Summary** screen or from the details screen for the movement.

1. On either the **Summary** screen or **Movement Details** screen select a component belonging to the movement to which a tank is to be added and select **Add → Tank** from the **Movements** menu. Alternatively, click on the component with the right mouse button and select **Add → Tank** from the menu that is displayed.
 - ↳ A screen will be displayed to allow the entry of details of the tank to be added to the movement:

Tank ID	Movement Control	Planned Quantity (m³)	Standard Planned Quantity (m³)
TK001	Fill	15,668.000	15,668.000
TK004	Fill	14,000.836	14,000.836
TK009	No Control	331.164	331.164
TK001	Specified	0.000	0.000
Total Volume (m³)			30,000.000
Planned Volume (m³)			30,000.000
Discrepancy (m³)			0.000

17 Add Tank

- i** Details of the tanks already on the movement are displayed along with the discrepancy from the planned volume for the subject.
 - i** Details for the tank are entered in the same way as creating a new movement.
2. Click **OK** to add the new tank to the movement, or **Cancel** to close the screen without adding the tank.
 - ↳ When a new tank is added to a movement, a new entry is written to the audit trail with the details of the new tank.

8.4 Add Timed Activity

Timed activities can be added to a movement up to the point where the movement is complete (i.e. all movement components have been closed or cancelled). They can be added either from the **Summary** screen or from the details screen for the movement.

1. On either the **Summary** screen or **Movement Details** screen select a component belonging to the movement to which a timed activity is to be added and the select **Add → Timed Activity** from the **Movements** menu. Alternatively, click on the component with the right mouse button and select **Add → Timed Activity** from the menu that is displayed.
 - ↳ A screen will be displayed to allow the entry of details of the timed activity to be added to the movement:

Tank ID	Activity	Planned Time
TK001	Mix	1:00

New Activity Details

Tank ID: TK001

Activity: Recirc

Planned Time: 3:00

OK Cancel

18 Add Timed Activity

This screen contains details of the timed activities that already exist for the movement and allows details of the new timed activity to be entered.

2. Click **OK** to add the new timed activity to the movement, or **Cancel** to close the screen without adding the timed activity.
 - ↳ When a new timed activity is added to a movement, a new entry is written to the audit trail with the details of the new timed activity.

8.5 Edit Alarm Configuration

A default set of alarms is created for each movement and for each component on the movement. The alarm settings for a component can be amended by selecting a single component on the **Summary** screen or **Movement Details** screen and then selecting **Edit Alarm Configuration** from the **Movements** menu. Alternatively click on the movement component with the right mouse button and select **Edit Alarm Configuration** from the menu that is displayed.

8.5.1 Tank Alarm Configuration

Configure Tank Movement Alarms

Movement Kero Delivery 23432
Tank ID TK018

☐ Raise first alarm 20 minutes before target level is due to be reached
☐ Raise second alarm 10 minutes before target level is due to be reached
Hysteresis for time to target alarms 45 Minutes

☒ Raise first alarm when product level is within 300 mm of target level
☒ Raise second alarm when product level is within 100 mm of target level
☒ Raise alarm when target level is achieved
☒ Raise alarm when product level exceeds target level by 50 mm
Hysteresis for target level alarms 10 mm

☒ Raise alarm when flow rate falls below 5.000 m³/hr, unless the movement has been open for less than 5 minutes
☒ Raise alarm when flow is more than 0.000 m³/hr in the wrong direction unless the movement has been open for less than 5 minutes
☐ Disable alarm until flow exceeds 100.000 m³/hr in the correct direction.

OK Cancel

19 Tank Alarm Configuration

- Click **OK** to save the changes to the alarm configuration, or **Cancel** to close the screen without saving the changes.
 - ↳ When the alarm configuration is changed, a new entry is written to the audit trail with the details of the changes.

8.5.2 Timed Activity Alarm Configuration

Timed Activities

Timed Activity

Description

Default Duration 0:00

☐ Raise first alarm minutes before activity is due to be closed.
☐ Raise second alarm minutes before activity is due to be closed.
☐ Raise alarm when activity should be closed.
☐ Raise alarm when activity should have been closed minutes earlier.

Add Remove

OK Cancel

20 Timed Activity Alarm Configuration

- Click **OK** to save the changes to the alarm configuration, or **Cancel** to close the screen without saving the changes.
 - ↳ When the alarm configuration is changed, a new entry is written to the audit trail with the details of the changes.

8.6 Opening Movements

Movement components can be opened either from the **Summary** screen or from the details screen for the movement.

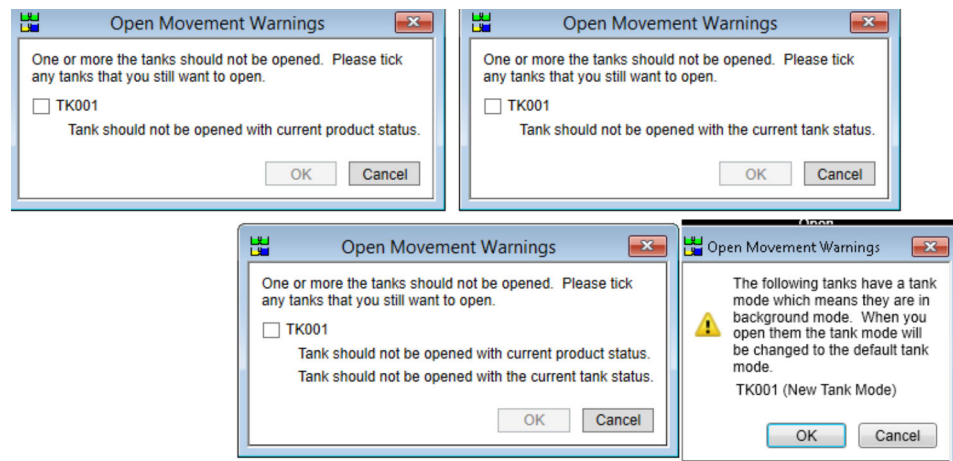
- On either the **Summary** screen or **Movement Details** screen select the movement components to be opened and then either click the **Open/Reopen movement** button  on the toolbar or select the **Open/Reopen** item from the **Movements** menu.

 These options will only be available if all of the selected movement components belong to the same movement and have a status of **Planned** or **Suspended**.

Alternatively, click on the movement component with the right mouse button and select **Open/Reopen** from the menu that is displayed.

8.6.1 Tank movements

If any of the movement components has been blocked by product status and/or tank status the following override box will be displayed:



 21 Override Boxes

- Tick the required tank(s) and click **OK** to override the block and open the movement or click **Cancel** to abandon the movement.
- ↳ If the relevant enter manual data option has been ticked in the movement system settings, the screen will be displayed to allow the manual data for the tank to be updated:

The screenshot shows a dialog box titled "Open/Reopen Movement". Inside, there is a table titled "Tank Movements" with the following data:

Tank ID	Product Level (mm)	Product Temperature (°C)	Reference Density (kg/m³)	Water Level (mm)
TK001	3,865	18.60	1,000.00	0
TK006	8,451	15.40	1,000.00	0

At the bottom right of the dialog box are "OK" and "Cancel" buttons.

22 Amend Manual Data

Similarly if the relevant amend quantity option has been ticked in the movement system settings, the screen will be displayed to allow the planned quantity to be amended before the movement is opened:

The screenshot shows a dialog box titled "Open/Reopen Movement". Inside, there is a table titled "Tank Movements" with the following data:

Tank ID	Movement Control	Planned Volume (m³)
TK001	Specified	3,000.000
TK006	Specified	2,000.000
Total Volume (m³)		5,000.000
Planned Volume (m³)		5,000.000
Discrepancy (m³)		0.000

At the bottom right of the dialog box are "OK" and "Cancel" buttons.

23 Amend Planned Figures

If both of the relevant options have been ticked in the movement system settings, the screen will be displayed to allow both the manual data and planned quantity to be amended:

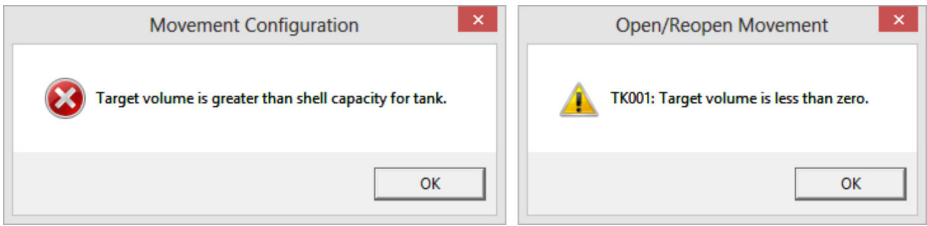
The screenshot shows a dialog box titled "Open/Reopen Movement". Inside, there is a table titled "Tank Movements" with the following data:

Tank ID	Product Level (mm)	Product Temperature (°C)	Reference Density (kg/m³)	Water Level (mm)	Movement Control	Planned Volume (m³)
TK001	3,163	18.60	1,000.00	0	Specified	3,000.000
TK006	7,021	15.48	1,000.00	0	Specified	2,000.000
Total Volume (m³)						5,000.000
Planned Volume (m³)						5,000.000
Discrepancy (m³)						0.000

At the bottom right of the dialog box are "OK" and "Cancel" buttons.

24 Amend Manual Data and Planned Figures

If the planned quantity would take the contents of the tank outside the maximum or minimum operating levels then the screens below are displayed.

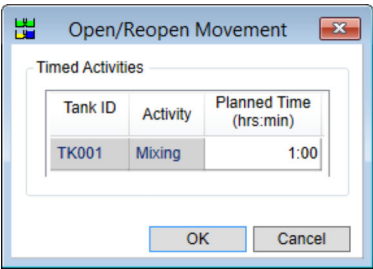


25 Target Warning

- i** Movement components which would cause the shell capacity of the tank to be exceeded, or the volume remaining in the tank to drop below zero cannot be opened until the planned quantity has been edited to rectify the problem.
- i** Movement components which would cause the maximum or minimum operating levels to be exceeded can be opened (depending on the current user’s access rights), but an entry will be written to the audit trail as well.
- i** When the movement components are opened they move from the **Planned** to the **Open** view on the **Summary** screen. Details of any changes made will be written to the audit trail. In addition an entry will be added to the audit trail indicating that the movement was opened.

8.6.2 Timed Activities

If the relevant amend planned time option has been ticked in the movement system settings, the screen will be displayed to allow the planned time to be updated before the timed activity is opened:



26 Amend Planned Time

When the timed activity is opened it moves from the **Planned** to the **Open** view on the **Summary** screen. Details of any changes made will be written to the audit trail. In addition an entry will be added to the audit trail indicating that the timed activity was opened.

The timed activity icon on the Home page will change from **Planned**  to **Open** .

8.7 Suspending Movements

Movement components can be opened either from the **Summary** screen or from the details screen for the movement.

- ▶ On either the **Summary** screen or **Movement Details** screen select the movement components to be suspended and then either click the **Suspend movement** button  on the toolbar or select the **Suspend** item from the **Movements** menu.

- i** These options will only be available if all of the selected movement components belong to the same movement and have a status of **Open** or **Reopened**.
Alternatively, click on the movement component with the right mouse button and select **Suspend** from the menu that is displayed.

8.7.1 Tank Movements

If the relevant enter manual data option has been ticked in the movement system settings, the screen will be displayed to allow the manual data for the tank to be updated:

Tank ID	Product Level (mm)	Product Temperature (°C)	Reference Density (kg/m³)	Water Level (mm)
TK006	5,000	18.60	1,000.00	0

27 Update Manual Data

- When the movement components are suspended they move from the **Open** to the **Planned** view on the **Summary** screen.
- Note that reopening a suspended movement component will cause it to 'split'. The original movement component will be closed and a new movement component will be created and opened for the remaining planned quantity.
- Details of any changes made will be written to the audit trail. In addition an entry will be added to the audit trail indicating that the movement was suspended.

8.7.2 Timed Activities

When timed activity components are suspended they move from the **Open** to the **Planned** view on the **Summary** screen.

The timed activity icon on the Home page will change from **Open** to **Suspended** .

- Note that reopening a suspended timed activity component will cause it to 'split'. The original timed activity component will be closed and a new timed activity component will be created and opened for the remaining planned time.
- Details of any changes made will be written to the audit trail. In addition an entry will be added to the audit trail indicating that the movement was suspended.

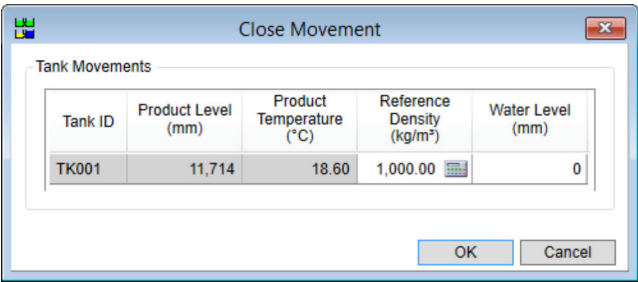
8.8 Closing Movements

Movement components can be opened either from the **Summary** screen or from the details screen for the movement.

- On either the **Summary** screen or **Movement Details** screen select the movement components to be suspended and then either click the **Close movement** button on the toolbar or select the **Close** item from the **Movements** menu.
- These options will only be available if all of the selected movement components belong to the same movement and have a status of **Open** or **Reopened**. Alternatively, click on the movement component with the right mouse button and select **Close** from the menu that is displayed.

8.8.1 Tank Movements

If the relevant enter manual data option has been ticked in the movement system settings, the screen will be displayed to allow the manual data for the tank to be updated:



Tank ID	Product Level (mm)	Product Temperature (°C)	Reference Density (kg/m³)	Water Level (mm)
TK001	11,714	18.60	1,000.00	0

OK Cancel

28 Update Manual Data

-  When movement components are closed they move from the **Open** to the **Closed** view on the **Summary** screen.
-  Details of any changes made will be written to the audit trail. In addition an entry will be added to the audit trail indicating that the movement was closed.

8.8.2 Timed Activity

When timed activity components are closed they move from the **Open** to the **Closed** view on the **Summary** screen. An entry will be added to the audit trail indicating that the timed activity was closed.

If there are no more timed activities planned for the tank the **Timed Activity** icon will be removed from the Home Page otherwise it will change to **Planned** .

8.9 Cancelling Movements

Movement components can be cancelled either from the **Summary** screen or from the details screen for the movement.

- ▶ On either the **Summary** screen or **Movement Details** screen select the movement components to be suspended and then either click the **Cancel movement** button  on the toolbar or select the **Cancel** item from the **Movements** menu.
-  These options will only be available if all of the selected movement components belong to the same movement and have a status of **Planned**.

Alternatively, click on the movement component with the right mouse button and select **Cancel** from the menu that is displayed.

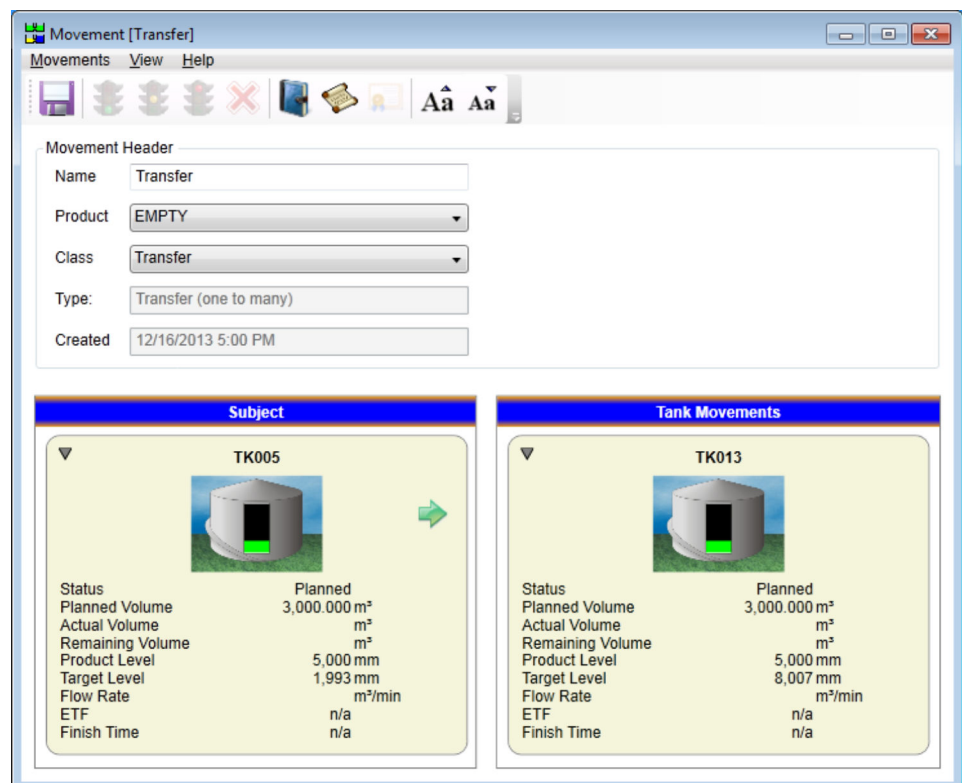
If there are no other Timed Activity components for the tank the **Planned** icons () will be removed from the Home Page otherwise the highest priority icon will be displayed (, , ).

9 Movement Details Screen

The **Movement Details** screen is accessed from the **Summary** screen or the Tankvision Professional Home Page:

- On the **Summary** screen select one or more movement components belonging to the movement to be displayed and then select the **Show Details** from the **Movements** menu. Alternatively double-click on a movement component to show details of the movement it belongs to, or click on it with the right mouse button and select the movement name from the menu that is displayed.
- From the **Tankvision Professional Home Page**, click on a movement status in the movement bar and then click the name of the movement in the menu that is displayed.

The **Movement Details** screen displays details of a single movement:



29 Movement Details screen

9.1 Toolbar Icons

	Save Changes
	Open/Reopen movement (see "Opening Movements")
	Suspend movement (see "Suspending Movements")
	Close movement (see "Closing Movements")

	Cancel movement (see "Cancelling Movements")
	Movement Log (see "Movement Log")
	Movement History (see "Movement History")
	Movement Certificate (see "Movement Certificate")
	Historical Movements (see "Historical Movements")
	Make text larger
	Make text smaller

9.2 Movement Header

The **Movement Header** details are displayed at the top of the **Movement Details** screen.

- 1. They can be hidden or shown by selecting the **Movement Header** item from the **View** menu.
- 2. The **Name**, **Product** and **Class** of the movement can be amended (dependent on the access rights for the current user), along with the custom data (which is dependent on the movement class).
- 3. To save the changes click on the **Save Changes** button  on the toolbar.

 When the changes are saved an entry will be added to the audit trail detailing the changes that were made.

9.3 Subject

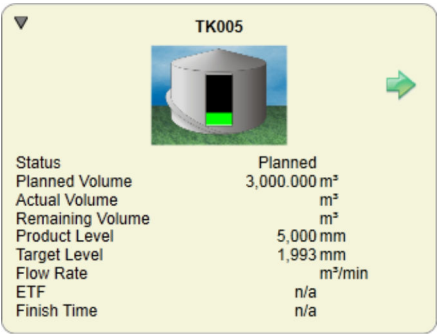
The movement **Subject** details are displayed on the left-hand side of the middle of the **Movement Details** screen.

For movements which are a **Load** or a **Receipt**, this contains the name of the subject, an image taken from the movement class for the movement, the current status of the subject and the planned quantity for the subject:



 30 Subject details (Load/Receipt)

For movements which are a **Transfer**, this contains details of the source tank (for one to many transfers) or the destination tank (for many to one transfers):

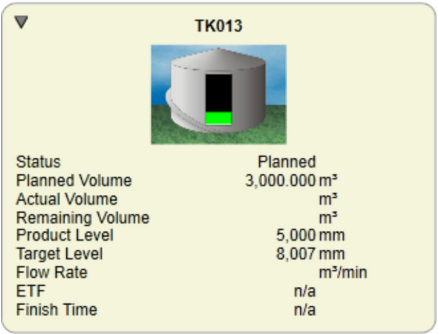


31 Subject details (Transfer)

9.4 Tank Movements

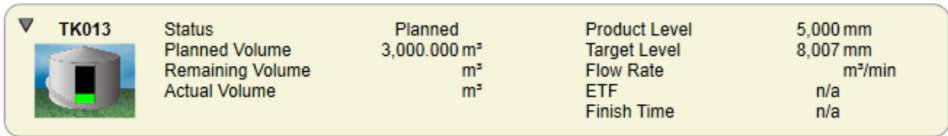
The details of the tanks involved in the movement (other than the subject tank if applicable) are displayed in a list on the right-hand side of the middle of the **Movement Details** screen.

If there is only one tank in the list, the details are displayed in a similar form to a subject tank:



32 Tank details

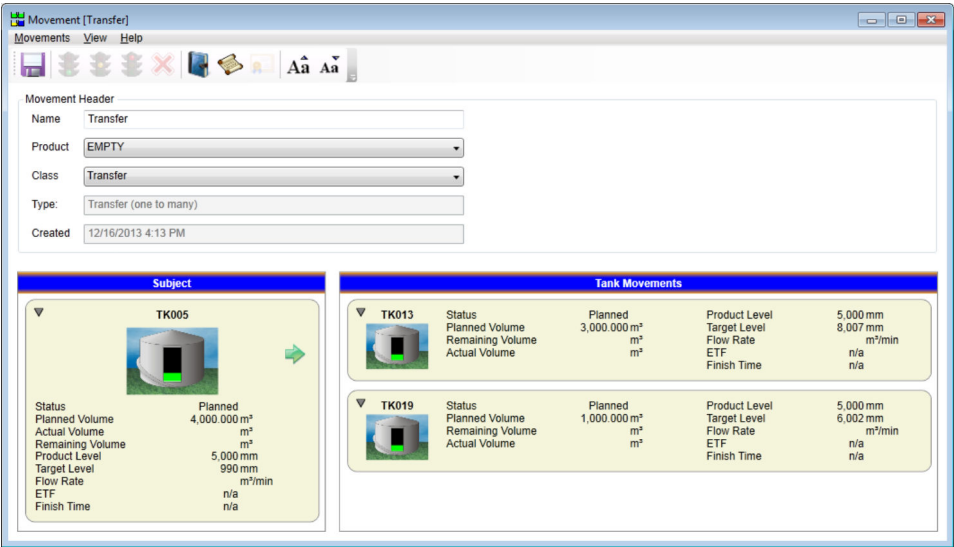
However, if there is more than one tank in the list the details are displayed alongside the tank graphic instead of underneath it:



33 Multiple tanks

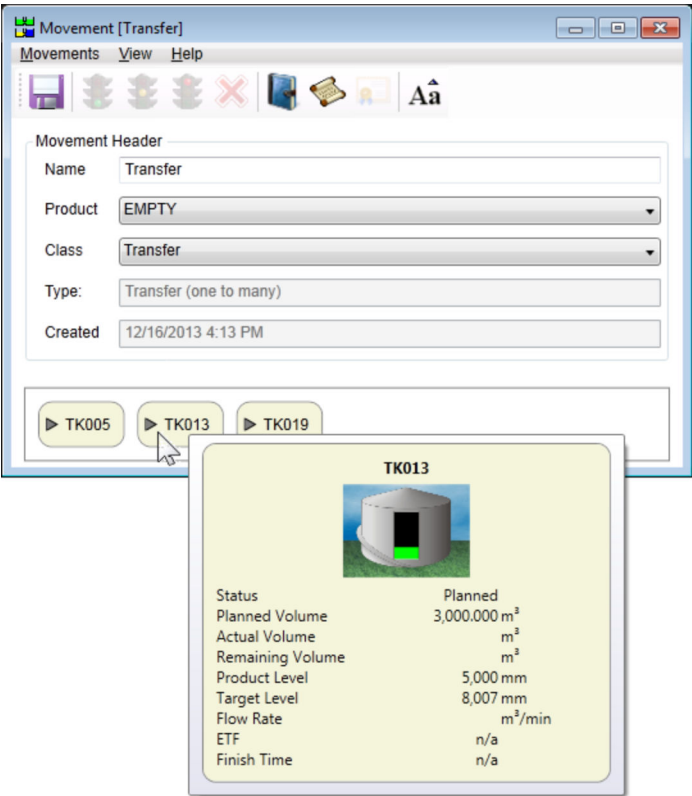
9.5 Minimising Components

To help manage the movement or to save space on the screen any (or all) of the individual components may be minimised by clicking on the  arrow in the top left of the component.



34 Movement screen

Components can be reopened clicking the  arrow . The status of a minimised component can be checked by hovering the mouse cursor over the component.



35 Minimised component status

9.6 Timed Activities

The details of the timed activities for the movement are displayed in a horizontal list at the bottom of the **Movement Details** screen:



TK001

Drain-off

Status

Planned

Time

1:30

ETF

n/a

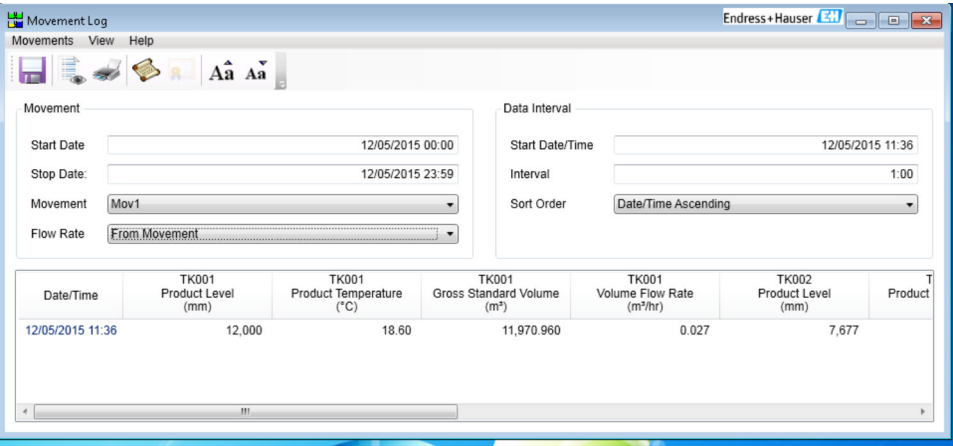
 36 *Timed Activities*

If there are no timed activities for a movement this list is hidden.

10 Movement Log

The **Movement Log** screen is accessed from the **Summary** screen, **Movement Details** screen or **Historical Movements** screen. On any of these screens select one or more movement components belonging to the movement for which the log is required and select **Movement Log** from the **Movements** menu, or click on the **Movement Log** button  on the toolbar.

The **Movement Log** screen shows inventory details for the tanks involved in a movement:



 37 Movement Log screen

10.1 Toolbar Icons

	Export (see "Export")
	Print Preview (see "Print Preview")
	Print (see "Print")
	Movement History (see "Movement History")
	Movement Certificate (see "Movement Certificate")
	Make text larger
	Make text smaller

10.2 Movement Filter

The movement filter is used to specify the movement for which the log is required. When the **Movement Log** screen is first opened the **Start Date** and **Stop Date** fields are set to span the current day. The movements in the drop down list are those which have been created later than the **Start Date** and have at least one component which is still not closed by the **Stop Date**.

- To amend the list of available movements, edit the **Start Date** or **Stop Date** and then click away from the field.

- To view the log details for a movement, select it in the drop down list.

10.3 Data Interval

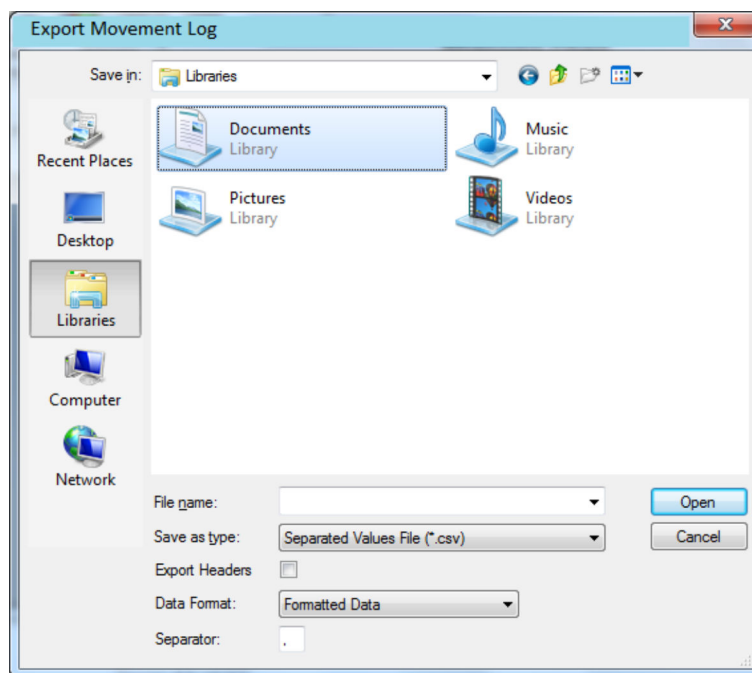
The **Data Interval** determines the data to be displayed in the log. When a movement is selected, the **Start Date/Time** is set to the date and time that the first component in the movement was opened. If no components have been opened yet, it is set to the current date and time.

- To amend the **Start Date/Time**, click on the field and then type in the new date and time the log is to start. Then click away from the field.
- Similarly, to amend the **Interval**, click on the field and then type in the new interval. This can either be in minutes or in hours and minutes separated by a colon. Then click away from the field.

10.4 Export

The current contents of the movement log can be exported by selecting **Export** from the **Movements** menu, or clicking on the **Export** button  on the toolbar.

The screen is displayed to allow selection of the file to which the log data is to be exported:



 38 Export Movement Log

10.5 Print Preview

A report on the current contents of the movement log can be previewed by selecting **Print Preview** from the **Movements** menu, or by clicking on the **Print Preview** button  on the toolbar.

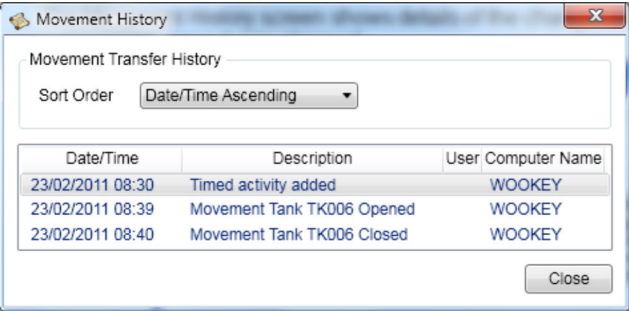
10.6 Print

A report on the current contents of the movement log can be printed by selecting **Print** from the **Movements** menu, or by clicking on the **Print** button  on the toolbar. Using the **Print** button on the toolbar will send the report straight to the default printer. To choose a printer, or modify printer settings print the report from the menu.

11 Movement History

The **Movement History** is accessed from the **Summary** screen, **Movement Details** screen or **Historical Movements** screen. On any of these screens select one or more movement components belonging to the movement for which the history is required and select **Movement History** from the **Movements** menu, or click on the **Movement History** button  on the toolbar.

The **Movement History** screen shows details of the changes that have been applied to a movement since it was planned:



 39 Movement History screen

11.1 Filter and Sort

For redundant systems an additional field is displayed in the top part of the screen to allow selection of the computer on which the history is stored. The drop down list contains **Current database server** and the name of each of the servers on which the history could be stored.

 The full history may not be available on each server as it is dependent on whether the server could be reached when the update was made.

The **Sort Order** field makes it possible to sort the history in either ascending or descending order of the date and time the change was made.

11.2 Fields

The following fields are included in the movement history:

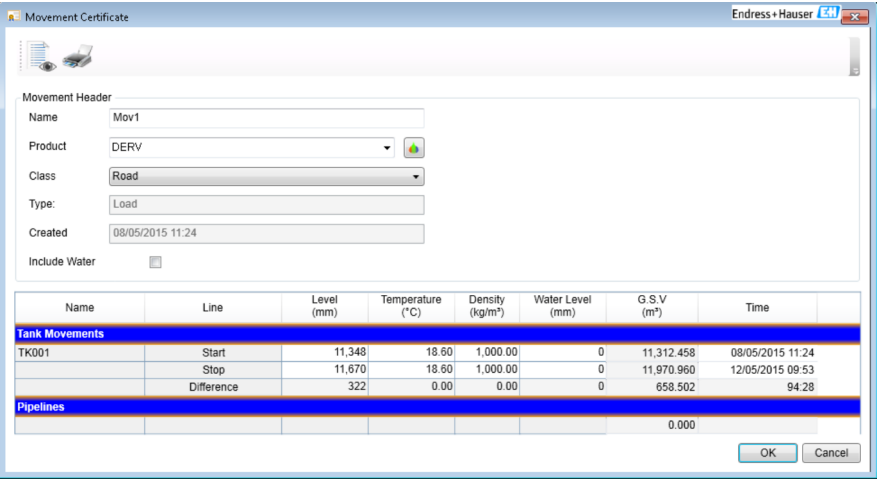
- **Date/Time**
The date and time the change was made.
- **Description**
A description of the change that was made.
- **User**
The name of the user logged in at the time the change was made (if any).
- **Computer Name**
The name of the computer that was being used when the change was made.

12 Movement Certificate

The **Movement Certificate** is accessed from the **Summary** screen, **Movement Details** screen or **Historical Movements** screen. On any of these screens select one or more closed movement components belonging to the movement for which the certificate is required and select **Movement Certificate** from the **Movements** menu, or click on the **Movement Certificate** button  on the toolbar.

 This option is only available for closed movement components.

The **Movement Certificate** screen shows the inventory details for all closed movement components for a movement:

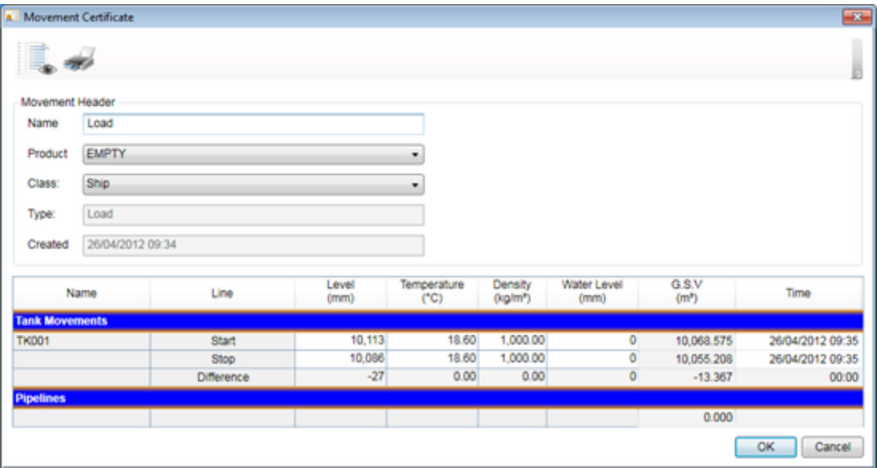


The screenshot shows the 'Movement Certificate' window for movement 'Mov1'. The header includes fields for Name, Product (DERV), Class (Road), Type (Load), and Created date (08/05/2015 11:24). Below the header is a table with columns: Name, Line, Level (mm), Temperature (°C), Density (kg/m³), Water Level (mm), G.S.V (m³), and Time. The table is divided into sections: 'Tank Movements' and 'Pipelines'. The 'Tank Movements' section shows data for TK001, including Start, Stop, and Difference values. The 'Pipelines' section shows a total G.S.V of 0.000.

Name	Line	Level (mm)	Temperature (°C)	Density (kg/m³)	Water Level (mm)	G.S.V (m³)	Time
Tank Movements							
TK001	Start	11,348	18.60	1,000.00	0	11,312.458	08/05/2015 11:24
	Stop	11,670	18.60	1,000.00	0	11,970.960	12/05/2015 09:53
	Difference	322	0.00	0.00	0	658.502	94.28
Pipelines							
						0.000	

 40 Movement Certificate screen

If any pipelines have been configured, a pipeline section will appear below the inventory details:



The screenshot shows the 'Movement Certificate' window for movement 'Load'. The header includes fields for Name, Product (EMPTY), Class (Ship), Type (Load), and Created date (26/04/2012 09:34). Below the header is a table with columns: Name, Line, Level (mm), Temperature (°C), Density (kg/m³), Water Level (mm), G.S.V (m³), and Time. The table is divided into sections: 'Tank Movements' and 'Pipelines'. The 'Tank Movements' section shows data for TK001, including Start, Stop, and Difference values. The 'Pipelines' section shows a total G.S.V of 0.000.

Name	Line	Level (mm)	Temperature (°C)	Density (kg/m³)	Water Level (mm)	G.S.V (m³)	Time
Tank Movements							
TK001	Start	10,113	18.60	1,000.00	0	10,068.575	26/04/2012 09:35
	Stop	10,086	18.60	1,000.00	0	10,055.208	26/04/2012 09:35
	Difference	-27	0.00	0.00	0	-13.367	00.00
Pipelines							
						0.000	

 41 Pipelines

12.1 Toolbar Icons

	Print Preview (see "Print Preview")
	Print (see "Print")

12.2 Movement Header

The **Movement Header** details are at the top of the **Movement Certificate** screen. The **Name**, **Product** and **displayedClass** of the movement can be amended (dependent on the access rights for the current user), along with the custom data (which is dependent on the movement class).

Any changes that are made are saved when the **OK** button is clicked.

12.3 Inventory Figures

To amend any incorrect inventory figures, click into the field containing the value to be amended and then type the new value. Then click away from the field or press the **Tab** key to move to the next field and the GSV values will be updated.

To amend any adjustment figures, click into the field containing the value to be amended and then type the new value.

Any changes that are made are saved when the **OK** button is pressed. An entry will also be written to the audit trail detailing the changes that were made.

12.4 Pipelines

The pipelines section allows configured pipelines to be added to the certificate. Once a pipeline is added, various settings can be changed e.g. if the pipeline is full or empty before and after the movement. Using the capacity of the pipeline, adjustments can be made to the **Movement Certificate** giving more accurate inventory figures.

To add a pipeline click anywhere on the pipeline section and the **Add Pipelines** screen will appear:

42 Add pipeline

Click **Add** to add a pipeline.

Select which pipeline to add from the **Pipeline** dropdown box and the movement tank from **Tank ID** dropdown box. The adjustments will be automatically calculated on the Movement Certificate.

12.5 Print Preview

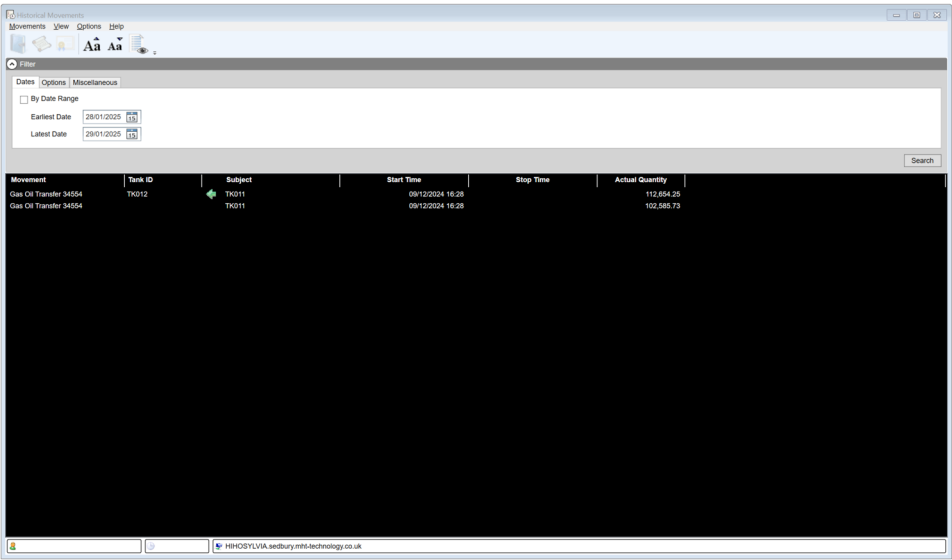
The Movement Certificate can be previewed by clicking on the **Print Preview** button  on the toolbar.

12.6 Print

The Movement Certificate can be printed by clicking on the **Print** button  on the toolbar.

13 Historical Movements

The **Historical Movements** screen is accessed from the **Summary** screen. To start the **Historical Movements** screen select the **Historical Movements...** item from the **Movements** menu, or click the **Historical Movements** button  on the toolbar. The **Historical Movements** screen allows access to movements that are no longer displayed on the **Summary** screen.



 43 Historical Movements screen

13.1 Toolbar Icons

	Movement Log (see "Movement Log")
	Movement History (see "Movement History")
	Movement Certificate (see "Movement Certificate")
	Make text larger
	Make text smaller
	Opens Preview of Movement Activity Report

13.2 Filter

The **Filter** for historical movements can be hidden or shown by selecting **Show Filter** from the **View** menu or by clicking on the arrow on the filter header.

The **Filter** allows selection of the criteria for the movements to be displayed in the list of historical movements. These criteria are grouped into 3 types:

- **Dates**

To filter movements by date **By Date Range** must be ticked. Dates can then be entered for the **Earliest Date** and **Latest Date**. Movements will be included in the list if the date range spanned from creating the movement to the last movement component being closed overlaps with the date range defined by **Earliest Date** and **Latest Date**.

- **Options**

- **Show Planned Movements**

If movement components with a status of **Planned** are to be displayed, this must be ticked.

- **Show Open Movements**

If movement components with a status of **Open** or **Reopened** are to be displayed, this must be ticked.

- **Show Closed Movements**

If movement components with a status of **Closed** are to be displayed, this must be ticked.

- **Show Cancelled Movements**

If movement components with a status of **Cancelled** are to be displayed, this must be ticked.

- **Show Subjects**

If movement subjects are to be displayed this must be ticked.

- **Show Tanks**

If movement tanks are to be displayed this must be ticked.

- **Show Activities**

If timed activities for a movement are to be displayed this must be ticked.

- **Miscellaneous**

- **Movement Name**

Allows filtering of movements by the name of the movement.

- **Movement Type**

Allows filtering of movements by the type of the movement.

- **Movement Class**

Allows filtering of movements by the class of the movement.

- **Tank ID**

Allows filtering of movements by the ID of a tank involved in the movement either as a subject or a tank.

To apply the filter to the list, click the **Search** button.

13.3 Search Results

The search results are displayed in a list similar to the views on the **Summary** screen.

To amend the columns that are displayed select **Maintain View...** from the **Options** menu ( see Movements Configuration Manual BA00394G for more details).

13.4 Movement Activity Report

Produces a hardcopy report of the movements that have occurred on a given day. Report needed to show the inter-tank transfers that are routinely done to keep the fuel fresh in the tanks.

14 Movements Ticketing

14.1 Introduction

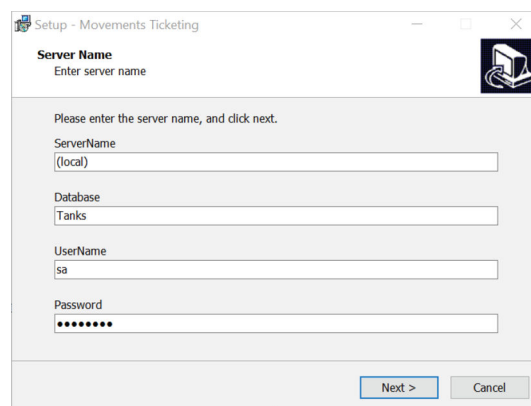
The Movements Ticketing software package allows the user to create movements tickets as required by the Saudi Custody Measurement Standards Committee.

The software package requires a connection to a working installation of Tankvision Professional but is otherwise an independent module.

14.2 Installation

The installation file is named *Movements.Ticketing.Setup.exe*.

During installation the user may configure 4 settings.



44 Installation Options

ServerName

The name of the server where Tankvision Professional is installed. If this is on the same physical machine the default value of **(local)** may be used.

Database

The database within Tankvision Professional where movement data is stored. By default this is **Tanks**.

UserName

The username to use to connect to the Tankvision Professional database. The default setting is the **sa** user.

Password

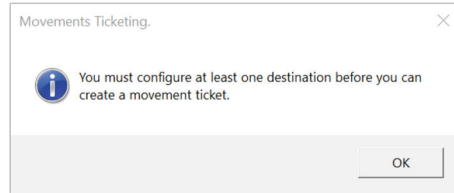
The password that corresponds to the above configured user.

The installation program will automatically install any required third party components. On successful completion of the installation, the system must be rebooted.

14.3 Configuration

Before the Movements Ticketing system can be utilised, it must be configured.

Attempting to create a new ticket without properly configuring the module will result in error messages such as that shown in the following figure.



45 Invalid Configuration

14.3.1 Security

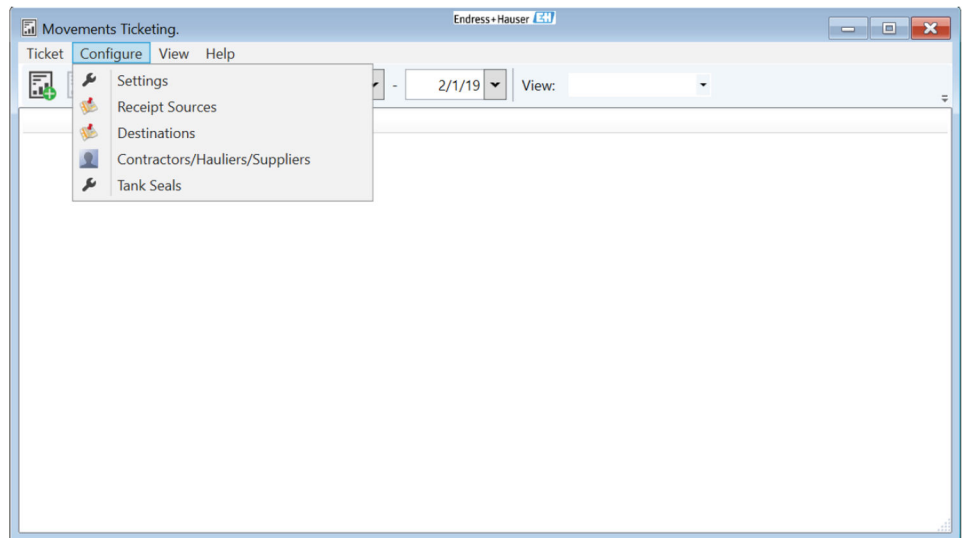
The Movements Ticketing module obeys security settings in place on the Tankvision Professional server to which it is connected.



See the Tankvision Professional configuration manuals for details.

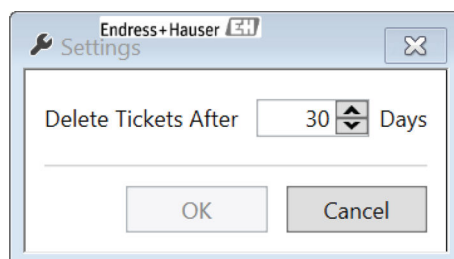
14.3.2 Settings

Settings are accessed using the **Configure** menu option.



46 Configuration menu option

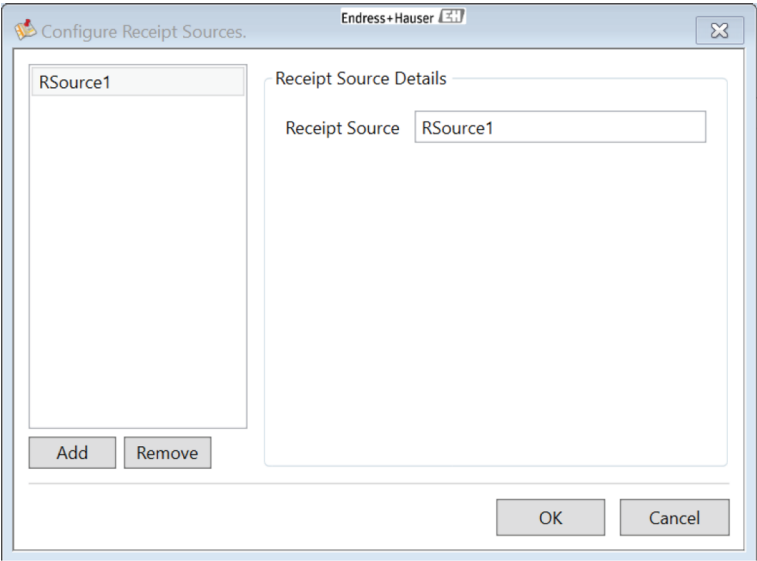
Settings menu option



47 Settings

This setting allows the user to specify the number of days movement tickets will be held in the system before being automatically deleted.

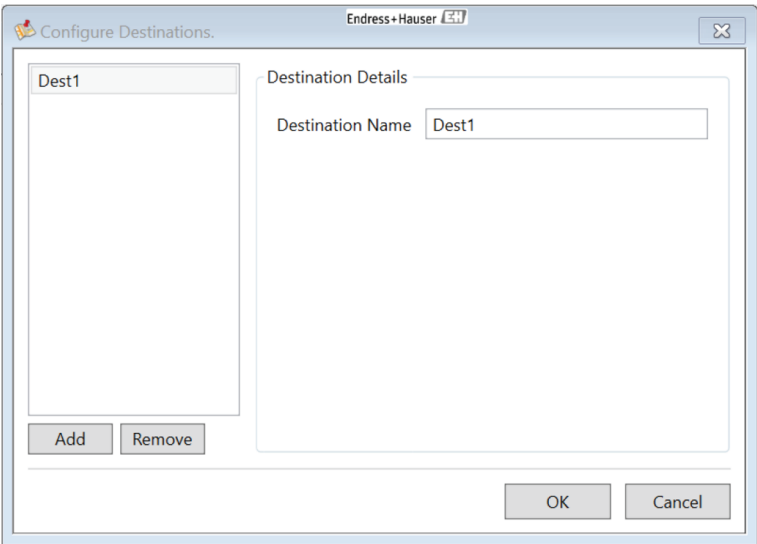
Receipt Sources menu option



48 Receipt Sources

This setting allows the user to configure receipt sources. The size of the **Receipt Source** name is restricted to 8 characters.

Destinations menu option



49 Destinations

This setting allows the user to configure destinations. The size of the **Destination Name** is restricted to 8 characters.

Contractors/Hauliers/Suppliers menu option

Endress+Hauser

Configure Contractors/Hauliers/Suppliers.

Contr1
Haul1
Supplier1

Add Remove

Contractor/Haulier/Supplier Details

Name Supplier1

OK Cancel

50 Contractors, Hauliers and Suppliers

This setting allows the user to configure Contractors, Hauliers and Suppliers. The **Name** field is limited to 28 characters in length.

Tank Seals menu option

Endress+Hauser

Tank Seals

TK001
TK002
TK003
TK004
TK005
TK006
TK007
TK008
TK009
TK010
TK011
TK012
TK013
TK014
TK015

Tank Seals - TK001

	Seal Identity	Date Fitted
Seal 1	Seal1	5/12/18
Seal 2	Seal2	13/12/18
Seal 3	Seal3	19/12/18
Seal 4	Seal4	25/12/18
Seal 5	Seal5	1/1/19

OK Cancel

51 Tank Seals

This setting allows the user to record seals fitted to each tank in the Tankvision Professional database. Each tank may have a maximum of 5 **Seal Identity** numbers, which can be up to 5 characters in length.

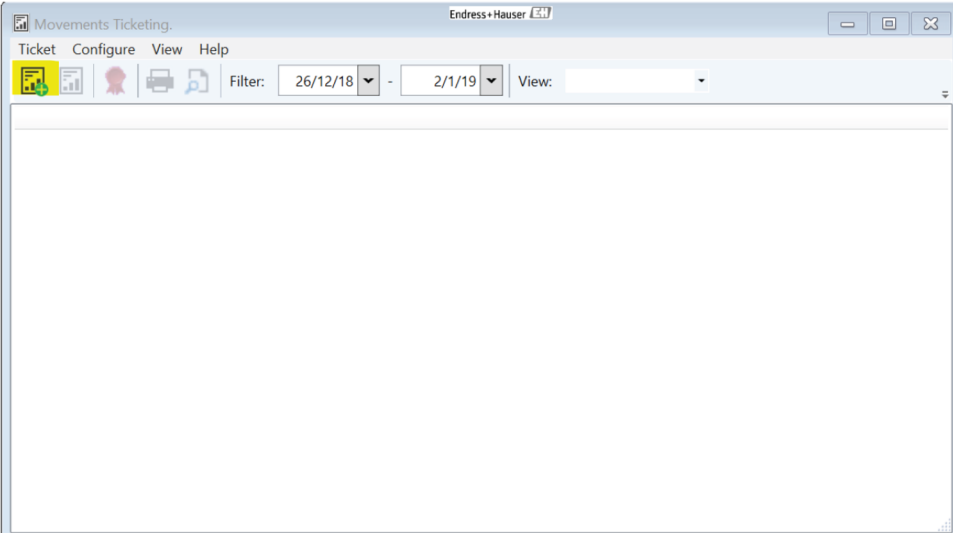
When a seal is replaced, the previous seal identity and the date of replacement is recorded internally.

14.4 Operation

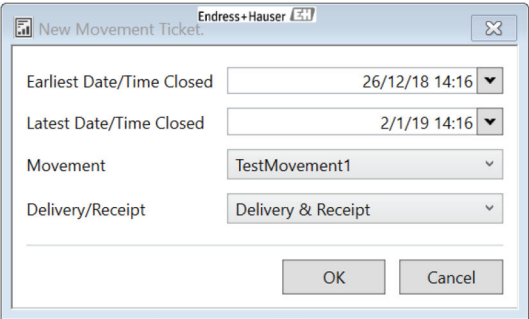
Once the system is configured correctly, movement tickets may be created.

14.4.1 Creating a new ticket

A new movement ticket is created by clicking the **New Ticket** icon (see figure), by selecting **File → New Ticket** or by pressing **Ctrl-N**.



52 New Ticket Creation



53 Create a new ticket

When the user selects to create a new ticket, a movement search box is opened to enable the user to locate the movement to create a ticket for. Changing the **Earliest** and **Latest** time fields will populate the **Movement** selection box with all the movements which were closed between the 2 dates.

The user can also select whether to produce a ticket for the delivery section of the movement, the receipt section of the movement or both. Clicking **OK** will create a new ticket for the selected **Movement** and **Delivery/Receipt** option as shown.

 54 *New ticket creation*

 Tickets details can also be accessed by double clicking the relevant ticket in the main window.

The name of the movement for which the ticket was created.

The section of the movement being recorded.

Automatically generated index for this ticket.

User editable 9-digit batch number.

The Tankvision Professional site to create the ticket against.

The id corresponding to the site selected above. (This relies on the id being configured for the site in Tankvision Professional.)

The destination for the ticket. The user may choose any destination configured in the system.

The order number corresponding to this ticket.

The contractor, haulier or supplier this ticket relates to. The user may choose any contractor, haulier or supplier configured in the system.

The receipt source for this ticket. The user may choose any receipt source configured in the system.

The receipt order number which relates to this ticket.

The task id for this ticket.

The transaction code for this ticket.

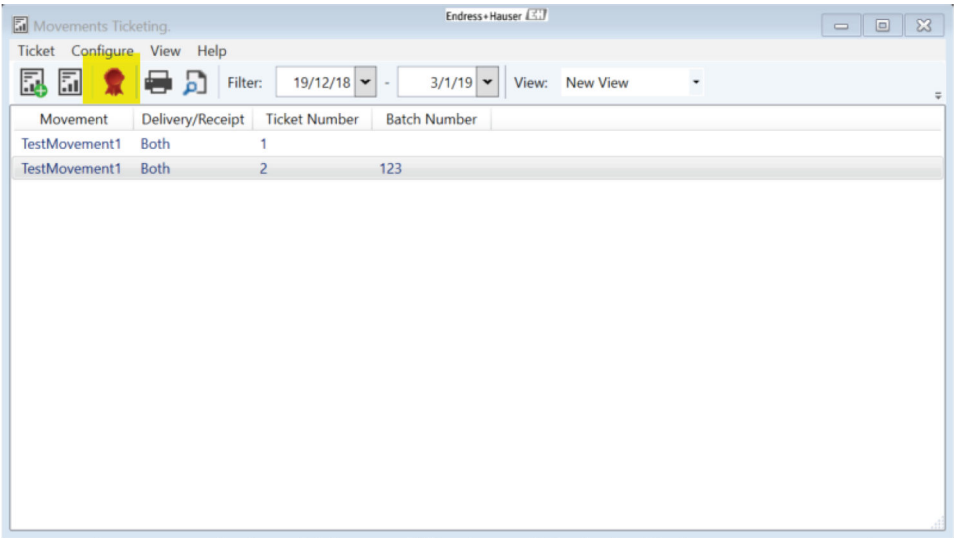
Product Type

The product type this ticket applies to. The user may choose from any product type configured in Tankvision Professional.

The user may also edit the values for each individual parcel within the ticket. Any changes to parcel volumes will be automatically recalculated.

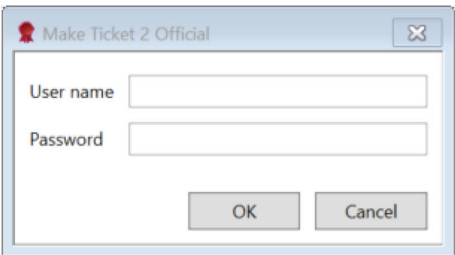
14.4.3 Making a ticket official

A ticket can be made official by selecting the ticket in the main window and then clicking the **Make Ticket Official** icon (see figure) or by selecting **File → Make Ticket Official** from the menu.



55 Making a ticket official

A ticket may only be made official by a user with sufficient security rights configured in Tankvision Professional. To make a ticket official this user must enter their login details everytime a ticket is made official.

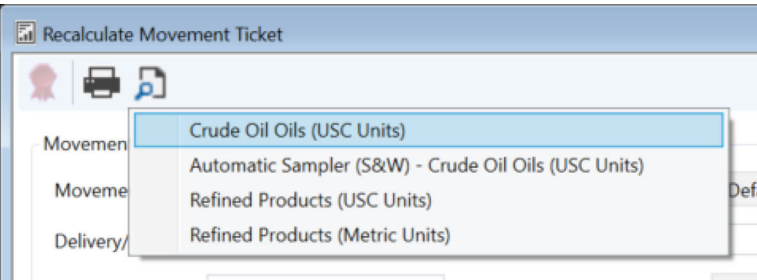


56 Login to make official

Once a ticket is made official it can no longer be edited.

14.4.4 **Printing**

Both the main screen and the ticket view have both print and print preview options. In all cases the user must choose the printed ticket format.



 57 *Print options*

15 **Glossary**

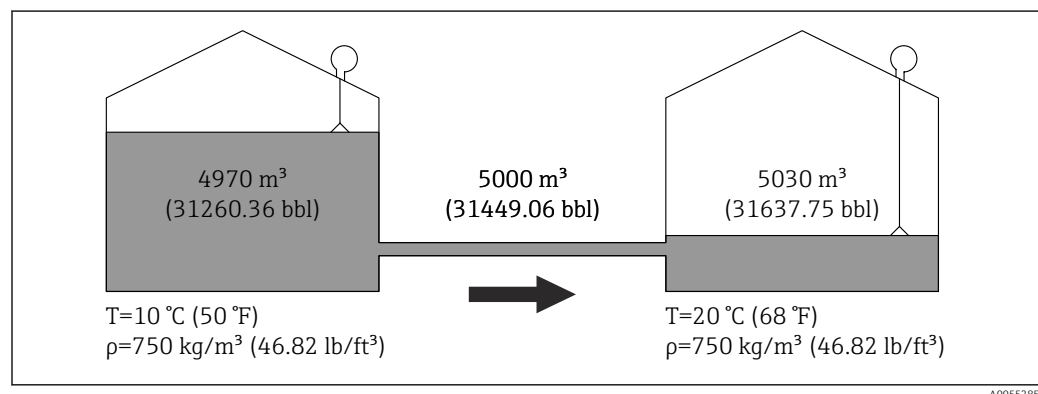
Load	Product is taken from a tank to a place outside the site.
Receipt	Product arrives from outside the site to be stored in a tank on site.
Transfer	Product is moved between 2 or more storage vessels on the site.
ETF	Estimated time to finish.
Actual Volume	The volume transferred since the movement was opened.
Planned Volume	The volume to be transferred by the movement.
Subject	The movement subject is the tank or transport which will receive or export the whole of the planned volume.

16 Appendix: Transfer Volume Calculations

This chapter deals with the methods used to calculate volumes when transferring product between tanks, and the differences between movements configured using the Quick Transfer and the Movement Wizard.

16.1 General Principles

In general the quantity transferred between any 2 vessels is calculated as a standard volume. The reason being that conditions in the source and destination may not be the same. For instance if the temperature in the source tank is 10 °C (50 °F) and the temperature in the destination tank is 20 °C (68 °F) the aim to fill the destination will require a smaller volume from the source tank than will appear in the destination through thermal expansion of the product, as illustrated in the figure below. There is no attempt to calculate the net change in temperature if product from one tank is mixed with another, it is assumed that the conditions (temperature, pressure and density) in the tanks will remain constant throughout the movement.

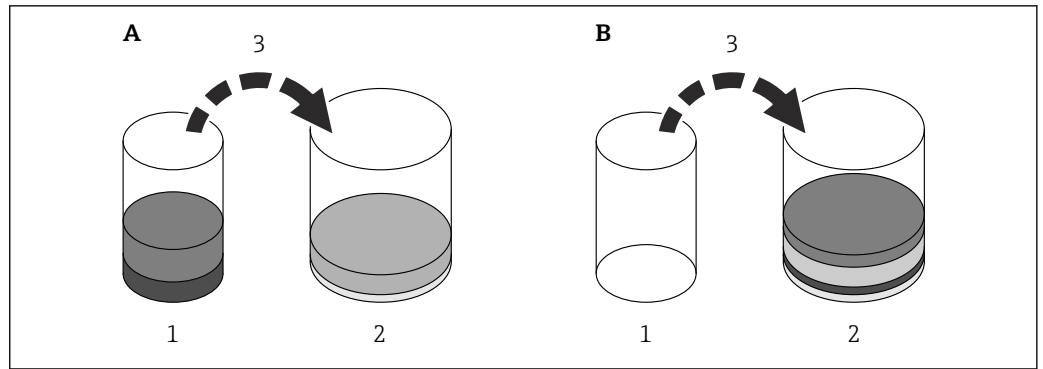


58 Illustration of tank transfer

The second principle is that the aim of the movement calculations is to derive a target level that will remain constant once the movement is opened and to which all alarm notifications refer. Level gauges are the most commonly used instrument to measure the quantity in tanks, therefore attempting to define a target in some derived quantity, be that a volume or mass, would lead to unstable target levels. This was attempted in previous versions of movements but was not well received. Once a movement is opened the target level for the movement is calculated and it is this level to which the operator monitors the progress of the activity.

16.2 Using Total Observed Volume

When transferring mixtures of liquids from one tank to another **Total Observed Volume (TOV)** is probably the most appropriate movement target type as the inventory calculations provided in the tank gauging system work on the assumption that the movement quantity is of a homogenous composition not an emulsion of hydrocarbon and water for instance. Using the Quick Transfer window (see "Tank to Tank Transfer") only a pair of tanks acting as source and destination can be specified as illustrated in the figure below. Any mixture must, therefore, be transferred in its entirety to the other vessel.

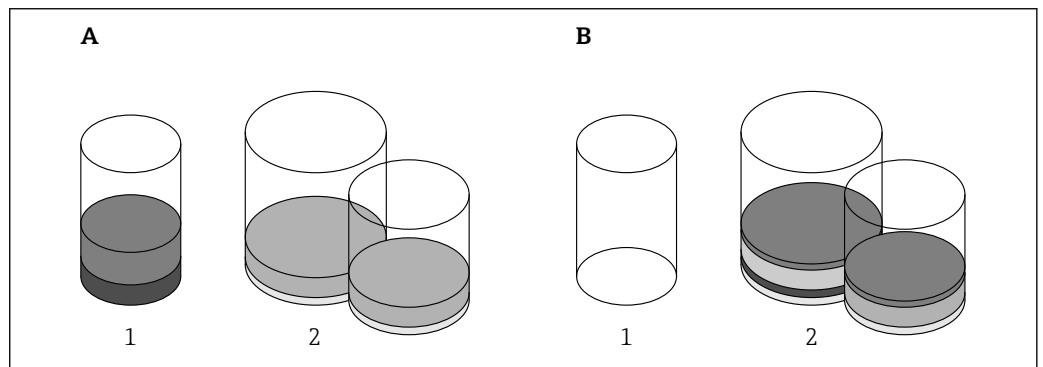


A0055286

59 Simple transfer comprising a source mixture of product and water

- A Before
- B After
- 1 Source
- 2 Destination
- 3 Transfer

This contrasts with the Movement Wizard, where the possibility of multiple destinations means that it is too complex to plan how much of each component in the mixture will be transferred to each destination. Illustrated below, the water is all sent to one tank and the product is split between the 2 destinations.



A0055287

60 One to many transfer comprising a source mixture of product and water

- A Before
- B After
- 1 Source
- 2 Destination

As a consequence the use of TOV and Absolute TOV in the Quick Transfer window will determine the target volume in the destination to be the sum of the current destination's TOV and the TOV quantity to be transferred from the source. Whereas in the movement wizard the volume transferred from the source in the Tank Movements page (see "Tanks Page") consists of just the product component of the mixture. To transfer a mixture of liquids the operator must manually enter the target volumes for the destination tanks. The **No Control** option will not work in these circumstances.

16.3 Strip vs Empty

Stripping is distinct from emptying the tank in that it removes absolutely all material from the tank. Typically, a strip will be performed prior to taking the tank out of service for maintenance, although the practice is common for other reasons on some sites. In many cases stripping the tank may require supervisory confirmation of moving the tank beyond the minimum operating level. Stripping makes use of the movements system's ability to plan using TOV as the aim is to remove all liquids from the tank; hydrocarbon and water.

Emptying the tank removes all product from the tank leaving behind any free water and dead stock below the minimum operating level. Emptying the tank will never require supervisory confirmation, as the target level is the larger of the minimum operating level for the tank and the free water level. Emptying the tank should be viewed as getting the maximum amount of product out of the tank according to the safe operating requirements of the site.



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