

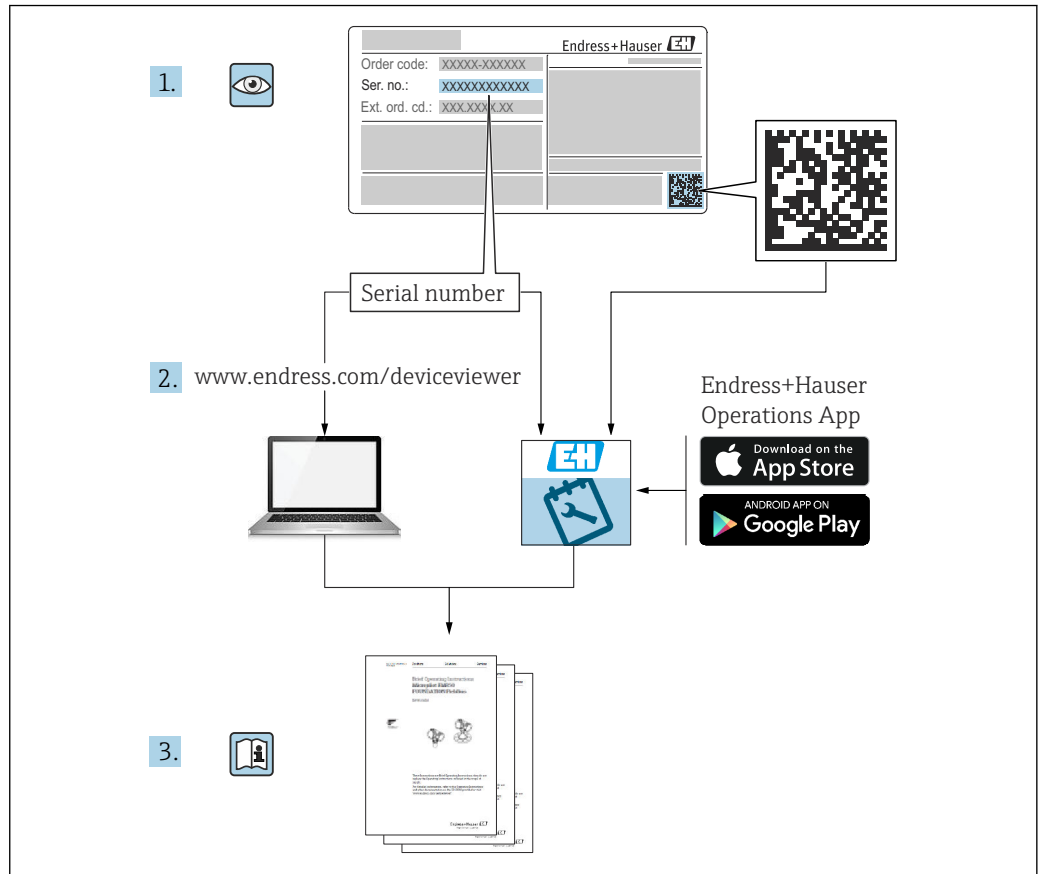
Operating Instructions

Tankvision Professional NXA85

Simple Movements



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



A0023555

Change history

BA01653G/01.16

- Valid for software version: 18.0.2
- Initial version

BA01653G/02.17

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

BA01653G/03.24

- 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.

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1 About this document

1.1 Document function

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

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

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.

1.3.2 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

1.4 Documentation

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

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

1.5 Registered trademarks

1.5.1 Windows®, Windows Server®

Windows and Windows Server are registered trademarks of the Microsoft Corporation

1.5.2 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

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


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

3 Incoming acceptance and product identification

3.1 Incoming acceptance

On receipt of the delivery:

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

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

3.2 Product identification

The following options are available for identification of the 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 Operators Manual

4.1 Introduction

Tankvision Professional has two movement packages. The Full Movements package is a paid for license option which contains more functionality than the Simple Movements package which is freely available to all users.

Features which the Full Movements package possesses and the Simple Movements package does not include:

- **Multi-tank movements:** In full movements you can configure a receipt into 5 tanks, for instance.
- **Flow rate monitoring:** Operators can be notified of unplanned stoppages while the movement progresses or imbalances between flow rates in the source and destination tanks in a transfer.
- **Site policy enforcement:** Supervisors can configure what alerts operators will receive during the movement process according to the source or class of the movement. Safety policy options can be made strictly enforced or overridable with audited events.
- **Reporting:** Operators can print out a movement ticket for the movement detailing the consequences of the movement to the inventory held on site.

Should these features be useful to site operations in most cases a simple license upgrade can be supplied from your local sales representative.

4.2 Operation

4.2.1 Terminology and Concepts

At the most basic level there are 2 stages to setting up a simple movement. In the first stage the user calculates the target level for a tank based on the current state of that tank and the quantity to move, pre-alarms are also entered that will sound during the progress of the movement. In the second stage the movement is set, which informs the system that tank levels are expected to move and starts the monitoring of the process.

Once the movement has completed the movement is stopped, which ends the monitoring of the tank.

The movement details are held in the system against each tanks' record, which means that there is no historical information regarding the movement preserved in the system, and that only one movement process can be defined for a tank at any time.

4.2.2 Simple Movements in Grid View

There is a default view in **Grid View** called **Movements** and is the basic user interface for monitoring movements.

Tank ID	Product Level	Product Name	Start Level	Target Level	Target Direction	Planned Volume	Transferred Volume	Volume Left	Time to Stop Gauge	Volume Flow Rate	Simple Movement Status	Target Pre Alarm 1	Target Pre Alarm 2
BT-01	2.086	LOWCET6	1.468	1.319		-1.994	7.792	-9.786		0.000	Active	1.329	1.369
BT-01X	1.340	AGGASOIL	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-02	1.371	BPULSDR	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-03	1.479	TEXDERV	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-03X	1.416	RF0608B2	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-03Y	1.479	RF0608B3	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-04	1.479	BPULSDR	1.479	1.943		1.994	0.000	1.994		0.000	Active	0	0
BT-04X	1.416	BPULSDR	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-04Y	1.479	BPULSDR	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-05	1.371	USLOWCN	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-05X	1.371	G13/072	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-06	1.480	LOWCET5	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-06X	1.416	RF0608B2	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-06Y	1.479	RF0608B2	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-07	1.479	G110075	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-07X	1.416	EU11Dnl	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-07Y	1.521	17BOILA	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-08	1.479	TEXULSDR	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-08X	1.416	TEXULSDR	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-08Y	1.479	TEXULSDR	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-11	1.109	BPULSP95	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-11X	1.109	EMPTY	0	0		0.000	0.000	0.000		0.000	Stopped	0	0
BT-12	1.101	BPSUPER	0	0		0.000	0.000	0.000		0.000	Stopped	0	0

1 Grid View Movements View

By default; on this view you are shown various data and statistics concerned with the movement:

- **Planned Volume:** The movement quantity expressed as a standard volume.
- **Simple Movement Status:** The state the tank is in: Active or Stopped.
- **Start Level:** The level in the tank when the movement was set.
- **Time to Stop Gauge:** An estimate of the time until the target level is reached based on the current flow rate.
- **Target Level:** The level to which you have planned as the end point of your movement.
- **Target Direction:** The direction the level is moving.
- **Transferred Volume:** The volume (standard) that has been moved since the movement was set.
- **Volume Left:** The volume (standard) that has yet to be moved to complete the movement.
- **Target Pre Alarm:** The levels configured as early warnings of the movement completing.

Planned Volume differs from **Planned Quantity** in that the **Planned Volume** for movements where product is being removed from the tank is displayed as being negative and the **Planned Quantity** is always positive. The **Target Direction** field indicates the direction of the movement when the flow rate is in the expected direction.


It is possible you may need to create your own version of this view if you typically use other measurements to calculate your movements, weight or TOV for instance.

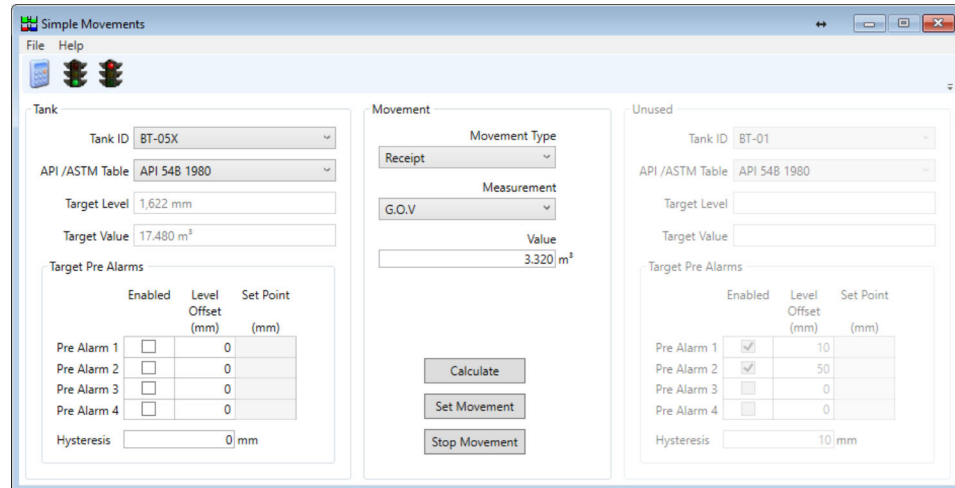
Documentation for this is in the Tankvision Professional System Operation manual BA00396G.

Additional fields available to be added to **Grid View** views that are related to the Simple Movements feature are as follows:

- **Movement Target Type:** Indicates which tank measurement was used to define the movement quantity.
- **Planned Quantity:** The numerical value of the movement quantity.
- **Quantity Transferred:** The amount of product that has been transferred since the movement was set.
- **Quantity Left:** The amount of product that needs to be transferred to complete the movement.
- **Transferred Mass:** The quantity transferred since the movement was set expressed as a mass.

4.2.3 Setting a movement


To set a movement on a tank, locate the tank in your **Grid View** display and right click on it to bring up the context menu and then select **Set Movement**. This will then launch the **Simple Movements** module. Alternatively select the tank with a left click and then click the movement button  on the **Grid View** tool bar.



 2 Simple Movements Data Entry Window

In order to configure a movement you need to complete the details required to calculate the target level for the tank you have selected. If you plan to transfer a quantity from one tank to another in your tank gauging system you may configure both at the same time using this screen.

Typically, you will choose the tank you wish to move product in to or out of, then determine the type of movement you wish to perform, choose the measurement method you will use to plan the movement and then **Calculate** resulting target level. Repeat the process if you are not satisfied with the result. Once you have a target level, click **Set Movement** and you are ready to switch on the pumps, open valves and so on.

 In order to calculate the target level for your movement there needs to be valid, current tank gauging data on which to base the calculations. Live tank values that are missing, such as product level, reference density or product temperature might prevent a successful calculation resulting in not being able to set a movement.

If you need to change the target level during the movement activity, you can recalculate and click **Set Movement** again. Note that the new movement will start from the current position in the tank, not the position when you originally set the movement.

4.2.4 Stopping a Movement

When the movement has completed you can set the tank's movement status back to stopped in the following ways:

- **Context Menu in Grid View:** Right-click on the tank in **Grid View** and select **Stop Movement**.
- **Simple Movements Module:** Open the **Simple Movements** window, select the tank and click **Stop Movement**.

Stopping a movement has the effect of deactivating the target level and pre-alarms for the tank.

4.2.5 Simple Movement Parameters

Movement Type


The **Movement Type** field determines the direction of the movement, and in some cases determines the target and planned quantity for the movement.

Type	Description
Receipt	Planned quantity is to be received in to the tank; resulting in a net increase in product in the tank.
Load	Planned quantity is to be removed from the tank; resulting in a new decrease in the amount of product in the tank.
Empty	Take all the available product out of the tank; the target level will be the tank's minimum operating level.
Fill	Add enough product into the tank to fill the ullage space.
Transfer To	Enables second tank: Move a defined quantity of product from the tank on the left to the tank on the right.
Empty To	Enables second tank: Move all available product from the left-hand tank into the righthand tank.
Fill From	Enables second tank: Move enough product from the right-hand tank to fill the ullage space in the left-hand tank.

Measurement

Unless one of the **Fill/Empty** options is selected you can choose how you want to plan the quantity for the movement.

Measurement	Description	Transfer Compatible
Absolute GOV	The value specified is the target gross observed volume for the tank.	No
Absolute TOV	The value specified is the target total observed volume for the tank.	No
Absolute GSV	The value specified is the target gross standard volume for the tank.	No
Absolute Weight	The value specified is the target gross weight for the tank.	No
Absolute Mass	The value specified is the target gross mass for the tank.	No
Absolute Level	The value specified is the target level for the tank.	No
GOV	The value specified is the gross observed volume to be moved.	Yes
TOV	The value specified is the total observed volume to be moved.	Yes
GSV	The value specified is the gross standard volume to be moved.	Yes
Weight	The value specified is the weight of product to be moved.	Yes
Mass	The value specified is the mass of product to be moved.	Yes
Level	The values specified is vertical distance the product level is to be moved in the tank. If used with a transfer, the level change is defined for the source tank, the equivalent change in standard volume is applied to the destination tank.	Yes

 The difference in **TOV** and **GOV** calculations is that **TOV** treats water in the tank as product. So if you have installed automatic water sensing equipment in tanks containing a mixture of ethanol and gasoline you should use **TOV** in order to ignore the false water readings.

Commands

Calculate

Calculate a target level based on the current tank gauging data, the movement type, measurement and value. No change is made to the database as a result of this.

Set Movement

Change the status of the tank to **Active** and set the target level and prealarms previously calculated.

Stop Movement


Change the status of the tank to **Stopped** and disable any target level and pre-alarms configured on the tank.

4.2.6 Pre-alarms

Pre-alarms are intended as a way to use the Tankvision Professional alarm and event handler to provide notification of the progress of movements. Up to 4 pre-alarms can be defined each with a different offset from the target level. The system uses the direction information you specify to decide whether the alarm will go off when the level goes under or over a given level, so you should always define a positive offset value. The calculated set point is displayed for you to check the results of your calculation.

Pre-alarms are deactivated when the movement status is returned to **Stopped**.

Target Pre Alarms			
	Enabled	Level Offset (mm)	Set Point (mm)
Pre Alarm 1	<input checked="" type="checkbox"/>	10	1,612
Pre Alarm 2	<input checked="" type="checkbox"/>	50	1,652
Pre Alarm 3	<input type="checkbox"/>	0	
Pre Alarm 4	<input type="checkbox"/>	0	
Hysteresis		10 mm	

 3 Pre-alarm configuration

4.2.7 Transfers

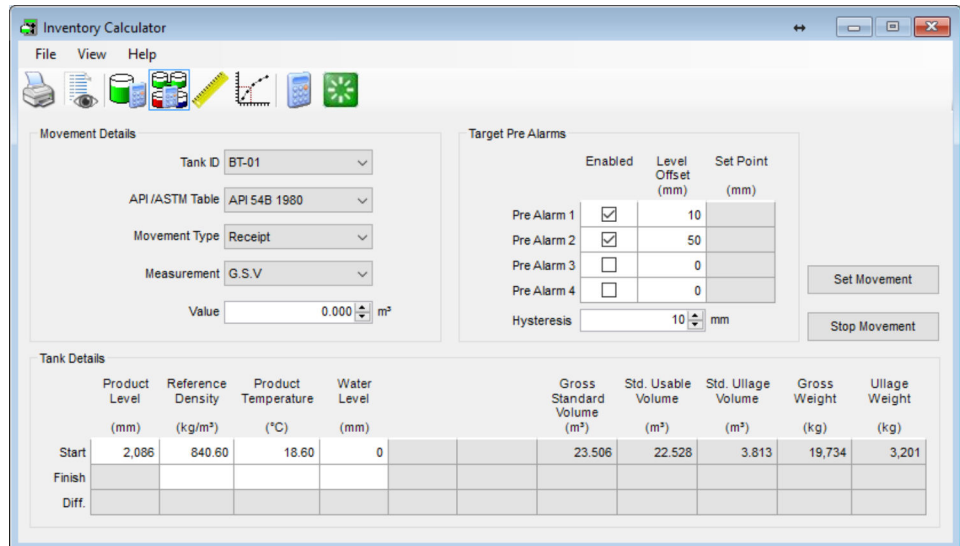
Certain movement types involve 2 tanks, selecting one of these enables the right hand tank detail controls. The tank details on the left hand side are the source tank for **Empty To** and **Transfer To**; for **Fill From** the source tank is on the right. Conceptually, you are in effect configuring 2 movements at once, one receipt and one load that share a common movement quantity.

The Pre-alarms for each side of the transfer are independently configured.

4.2.8 Inventory Calculator

Much of the functionality in the previous sections also exists in the **Inventory Calculator** Movement page. You can calculate target levels, **Set** and **Stop movements** and configure Pre- Alarms for a tank. However, there is no facility for configuring transfer type movements.

One thing that the **Inventory Calculator** affords is the ability to evaluate the affect a movement will have on a tank's inventory. This What-if scenario planning is the main reason for using this screen.

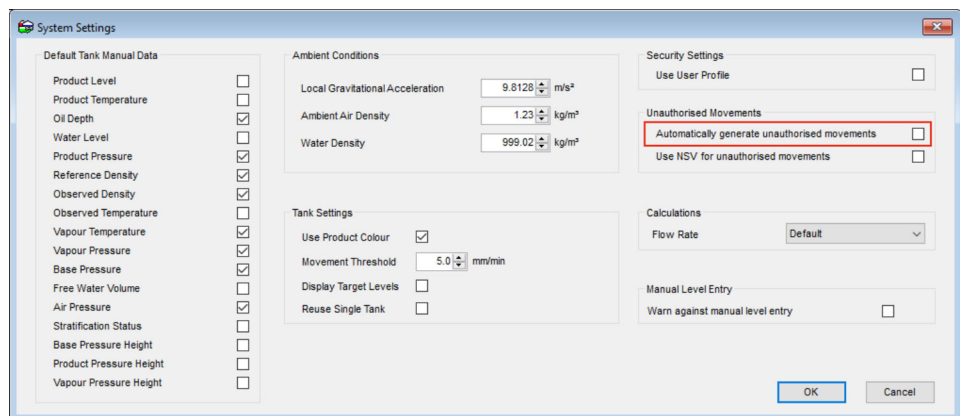


4 Inventory Calculator Movement Page

4.2.9 Automatic Control of Unauthorised Movements


The system can automatically disable the two unauthorised movement alarms when a movement is set and then automatically re-activate them when the movement is stopped.

To set up the automatic control of unauthorised movements first enable **Automatically generate unauthorised movements** in the Tankvision Professional settings dialog - from **Home Page → Admin → System Settings** menu option.



5 System setting for Automatically generate unauthorised movements

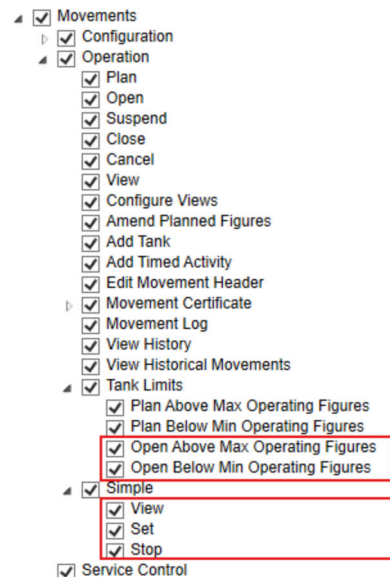
Then on each tank to be monitored for unauthorised movements, enable the appropriate alarms and configure suitable thresholds. When the **Automatically generate unauthorised movements** flag is set the alarm detection algorithm examines the status of the tank to see if it is supposed to be moving or not. If a movement is set, then the unauthorised movement detection is disabled, when you stop the movement the current tank levels are recorded and the alarms are reactivated.

 For information on the configuration of unauthorised movement alarms consult the Tankvision Professional System Configuration manual BA00390G.

5 Configuration Manual

5.1 Security Settings

Using security policies it is possible to control access to the Simple Movements features. The settings that affect this are found under **Movements** → **Operation** in the group security editor.



6 Security Settings for Simple Movements

Simple → View

Privilege is required to permit user access to the **Simple MovementsSet Movement** window.

Simple → Set

Grants the user the ability to start a movement on tanks.

Simple → Stop

Grants the user the ability to stop a movement on tanks.

Tank Limits → Open Above Max Operating Figures

If set the users will be able to open movements that have a target level greater than the maximum operative level for the tank. They will be warned about this, and their action will be entered in the audit trail.

Tank Limits → Open Below Min Operating Figures

If set the users will be able to open movements that have a target level below the minimum operating level. A warning will be given and the action will be audited.

i It is not recommended that customers use both movements packages simultaneously, this can lead to confusion with movement alarms and automatic operation of the unauthorised movement detection. If you have purchased a license for the full movements package it is recommended that you disable the all access to the **Simple Movements** using these security options.

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