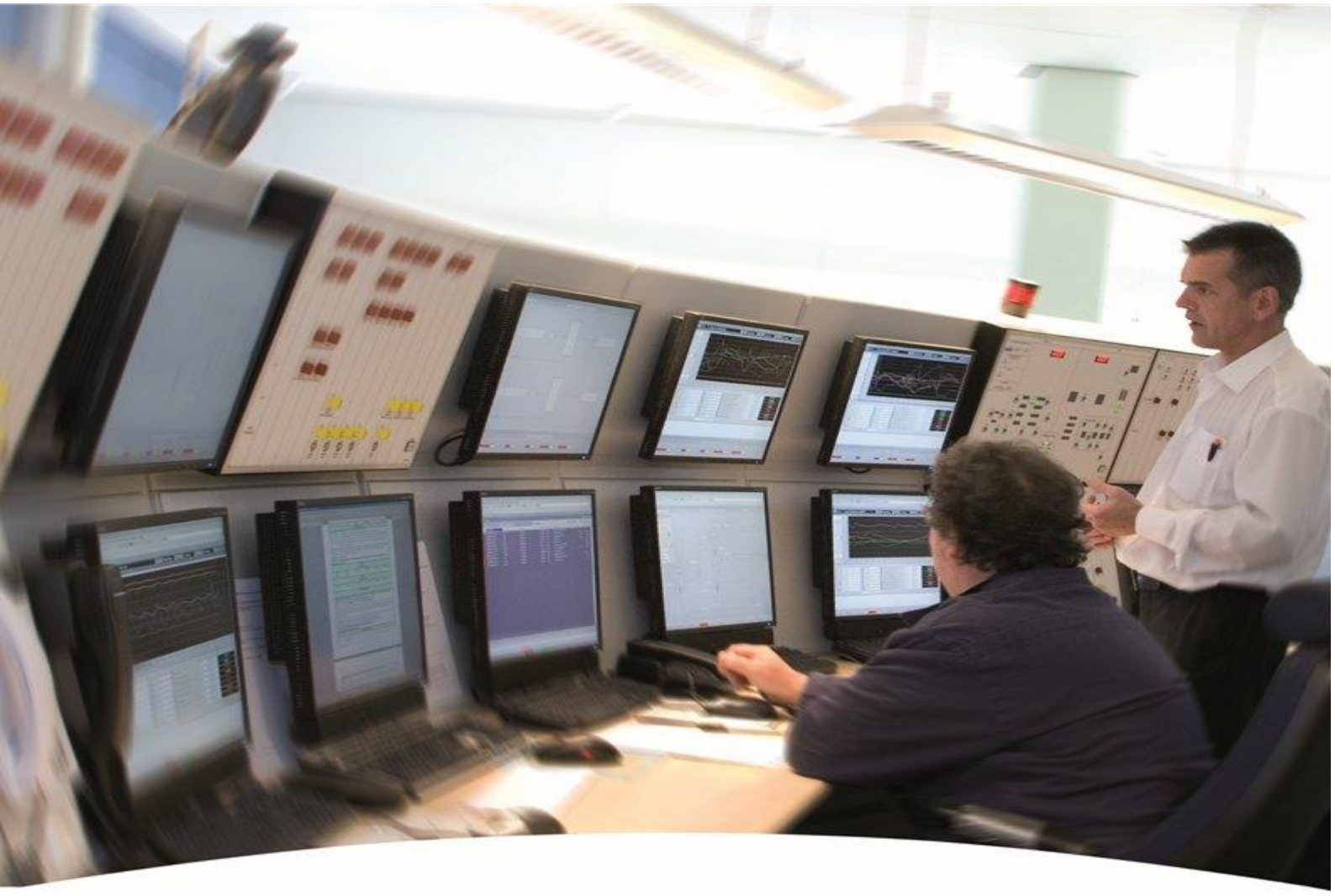
Honeywell



User’s Manual
ENTIS R130.1

PREFACE

About this Guide

This manual describes how to operate the ENTIS system. It has been written for operators, as well as system supervisors, to provide them with all the information required to operate the system.

For installation details refer also to the ENTIS Installation Guide.

Safety and prevention of damage

'Cautions', and 'Notes' have been used throughout this manual to bring special matters to the immediate attention of the reader.

A Caution draws attention to an action which may damage the equipment.

A Note points out a statement deserving more emphasis than the general text but does not deserve a "Warning" or a "Caution".

Additional information

Contact Honeywell, or its representative, if you require additional information. Also, refer to the list of related documents in Appendix for more information.

Legal aspects

The information in this manual is copyright property of Honeywell, Netherlands.

Honeywell disclaims any responsibility for personal injury or damage to equipment caused by:

- Deviation from any of the prescribed procedures
- Execution of activities that are not clearly documented

Support

For support, contact your local Honeywell Process Solutions Customer Contact Centre (CCC). To find your local CCC visit the website, https://process.honeywell.com/us/en/contact-us

Revision History

ENTIS User Manual (This document)

ETDOC-X615-en-101A	September 2019 (1st Release)
ETDOC-X615-en-110.1	December 2019 (R110.1)
ETDOC-X615-en-120.1	June 2020 (R120.1)
ETDOC-X615-en-121.1	September 2020 (R121.1)
ETDOC-X615-en-121.2	August 2021 (R121.2)
ETDOC-X615-en-130.1	December 2022 (R130.1)

Documentation References

The following list identifies publications that may contain information relevant to the information in this document.

ETDOC-X612-en-R130.1	ENTIS Quick Start Guide
ETDOC-X613-en-R130.1	ENTIS Installation and Configuration Guide
EHDOC-X136-en-511B	Experion HS Software Installation Users Guide
EHDOC-XX75-en-511A	Network and Security Guide
EPDOC-X111-en-501	Experion PKS Backup and Restore User's Guide
EHDOC-X127-en-511C	Experion Server and Client configuration guide
EHDOC-XX80-en-510A	Experion Operator's Guide

ENTIS documentation on HPS web:
https://process.honeywell.com/us/en/products/terminals/enraf-tank-gauging/entis-tank-inventory-system

Experion HS Network and Security Guide:

https://process.honeywell.com/us/en/support/product-documents-downloads?search=%2522experion%2520lx%2520network%2520and%2520security%2520planning%2520guide%2520exdoc-xx75-en-511a%2522

Contacts

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INTRODUCTION

ENTIS is a unique Tank Inventory Management System developed for Windows 10 Enterprise, and powered by the Experion platform, to display Tank inventory data.

Real Time Inventory

ENTIS is a Windows 10 Enterprise application. Data is retrieved via dedicated Communication Interface Units (CIU's) and processed through to the open ENTIS database. Various displays are available for inventory management. These displays include bar graphs, tabular data, iconized tanks, and a whole range of modules such as trending, report printing, and a "what if" tank calculator.

Movement

Movement is offered as a licensed feature in ENTIS. The base offering does not include movement. Three license options are available: simple movement, advanced movement, and infrastructure pipelines.The infrastructure pipeline license is only available for advanced movement and cannot be purchased with base offering or simple movement.

Simple Movement

Simple movement supports transfers from/to a selected tank or movements between two tanks. It displays the current measurement values for the selected tanks, the expected values after the movement has completed, and verifies whether the movement is possible depending on the current tank status, available space, product type etc.

Advanced Movement

Advanced movement is used for calculating and setting up movements. Advanced movements are not limited to tanks only. Many object types e.g. pipe line and train can be selected. Transfers can also be one-to-many and many-to-one. ENTIS monitors the transfers but by itself does not control the movements in sense of opening and closing valves. During the active transfer, all related data will be published to the Experion Scada points.

Infrastructure Pipelines

The Infrastructure pipelines license allows the creation of movement object which can be used to configure advanced movement. It also allows for the accounting of the product in the physical pipes connected to the tanks during advanced movements.

Numerical & Graphical Display

The graphical displays provide a quick overview of tank data. The numerical displays can be customized to suit your own particular needs. These displays can be either tank or group related. Several graphical displays are also available, and tank images can be customized per tank if required.

Networking

The network facilities of the Experion system allow you to integrate ENTIS into your plant's networks.

Alarm System

ENTIS provides you with an array of programmable alarm set points. Privileged users can create their own alarms for all measured and calculated data. During inactive periods, tanks can be put into a leak detection mode. Alarms and acknowledgements, together with all tank information, are stored and recorded for future review and traceability.

ENTIS Redundancy Support

The ENTIS system can be used in a redundant server mode, with automatic failover capabilities.

Refer the instructions provided in section 5 of ENTIS Installation and Configuration Guide for more details about Installing ENTIS with redundancy.

Hot Standby & CIU Redundancy Support

The ENTIS system can be enhanced for use in critical applications with hot standby and CIU redundancy support. CIU redundancy support can cover the unlikely event of a network failure, providing sustained and reliable data to your management system. After the occurrence of an error, the second CIU will automatically start and take over the lost functionality. Following the switch over, all gauge data will be rescanned and recalculated to ensure data reliability.

Multiple gauges

ENTIS supports tanks on which multiple gauges are installed. Acquiring the level of two gauges enables the function to program an alarm to be raised when the difference between the two measurements exceeds the programmed limits.

Test Alarm Support

ENTIS can be used to generate test alarms for the 954 servo.

Profiles

ENTIS supports temperature and density profiles data acquired from the gauges including the extended profile of 50 points provided by the 954 Servo gauge.

Reporting Enhancements

ENTIS reporting now allows for the use of customized customer name, sites and logos, on the standard and Legal Metrology-approved report set.

ENTIS Language Support

Next to English ENTIS supports the languages: French, Italian, Dutch, Chinese, Spanish or Russian language. ENTIS will appear in the language as being set at commissioning. User with Admin rights can change the language of ENTIS when required. Experion menu items are available in English, French, Italian, Dutch, Chinese, Spanish or Russian language.

Refer the instructions provided in section 6.1 of ENTIS Installation and Configuration Guide for changing the language.

Experion Alarms & Events Screen Language Support

ENTIS supports the user to view the alarm and event description in either of English, French, Italian, Dutch, Spanish language.

Tank hooks to address a specific tank from Experion

From ENTIS it is possible to see the tank details of a specific tank by selecting the “Tank Detail” screen and by selecting the required tank. In some cases it is very useful to have a direct link to the tank “Tank Detail” screen and the selected tank. For example when you have a HMIWeb page in Experion and you want to link the tank details from this page.

%HwProgramData%\Experion PKS\Client\MenusAndToolbars\EntisHTML\Entis.HTML?tab=tank-details\T111

In case of linking anther tank instead of T111 you need to replace the tank name at the end of the link.

The part between the brackets below needs to be replaced with the tank name:

%HwProgramData%\Experion PKS\Client\MenusAndToolbars\EntisHTML\Entis.HTML?tab=tank-details\[TankName]

To test the link in Experion Station you can execute the link in the Experion “Command” bar.

INTERFACE GUIDELINES

The ENTIS user interface consists of a set of inter-related graphical objects together with a set of rules governing their deployment, such as windows, dialog boxes, task icons, colours and others.

Although ENTIS is a Windows application, there are certain additional conventions used in ENTIS that will be described in this chapter. This chapter also describes a basic set of rules to help the user learn how to use ENTIS

Help

ENTIS supports the displaying of the PDF of the User's Manual. Navigating to the Help menu item will open the pdf version of the ENTIS User's Manual.

Data Status

Measured and calculated data is indicated by a status sign.
The statuses are shown in the following table:

Status
& Data is manually overwritten
S Data is stored
? Data has reduced accuracy
F Data is in fail
K Data is not scanned
^ Data is over range
v Data is under range
U Data is uninitialized
No data available (Data is not displayed)
Data is valid (Data is displayed)

S&W, Liq/Vol Ratio and Molar Weight are always manually entered

SECURITY CONSIDERATIONS

General Guidelines

ENTIS runs on the Experion HS platform; therefore, Experion's security guidelines / recommendations should be followed in any ENTIS deployment.

Experion HS provides a comprehensive Network and Security Guide (ID: EHDOC-XX75-en-511A) that should be reviewed prior to an ENTIS deployment. It contains numerous guidelines to help ensure a secure deployment.

In addition to the information provided in that manual, this section provides some additional security-related details.

This information is ENTIS-specific and is meant only to augment the Experion documentation.

Signed Assemblies

Digitally signing files allows users to confirm that those files were provided by Honeywell.

Honeywell has digitally signed the assemblies that it provides with ENTIS. Note that this does not include third-party assemblies that are not maintained as a part of the ENTIS product line.

Users can confirm that their ENTIS assemblies are signed by bringing up the assembly properties via Windows Explorer.

Users can check for signing by right-clicking on the dll/exe, and selecting Properties from the context menu.

If the ensuing dialog has a Digital Signatures tab, and there is a "Honeywell Limited" signer listed, then your assembly has been properly signed by Honeywell.

Network Shares

ENTIS creates the following network shares beyond what Experion configures, and documents, in their Network and Security Guide.

Shares created by Server-Client install are as follows:

Table 1 : Network Shares

Name	Location	Nodes	Usage
ENTISRepository	C:\ProgramData\Honeywell\ENTIS	Server	Used by File Replication to replicate contents to a redundant server
Broker	C:\Program Files (x86)\Mosquitto	Server	Used to exchange the certificate and configuration file with a redundant server.

Access to the shares is limited to users of the groups Administrators, Product Administrators and Local servers.

Access Control List

ENTIS will set up the appropriate access controls on its files for the application to run securely.

This ACL configuration step is run automatically as a part of the installation process.

In addition to the ENTIS-specific ACL settings, ENTIS also relies on the standard Experion ACL implementation, as is described in the Experion Network and Security Guide.

Backup & Restore

For the backup and restoration process for the node, please refer to the following sections of the Experion PKS Backup and Restore User's Guide, EPDOC-X111-en-501 on process.honeywell.com.

1. Backups on a Physical node.
2. Backups on a Virtual node.
3. Restoring Physical Nodes.
4. Restoring Virtual Nodes.

User Accounts and Roles

User roles define the set of operations that a user is allowed to perform. ENTIS leverages the Experion platform and its user roles. For information on the roles, please refer to the “User accounts and Experion user roles” section in the Network and Security Guide (ID: EHDOC-XX75-en-511A). Note that the Legal Metrology user roles are ENTIS specific and explained in more detail in the ENTIS Sealing guide. For a high level description of enabled/disabled features, please refer to Appendix B.

Physical and Environmental Considerations

While the security issues for ENTIS on Experion are largely the same as for any IT server, the physical access of a tank information system can be particularly important. For physical and environmental considerations, please see the Physical and Environmental Considerations section in the Network and Security Guide (ID: EHDOC-XX75-en-511A).

System Monitoring

ENTIS and Experion provide a number of ways to detect potential evidence of intrusion. The System Monitoring section of the Network and Security Guide (ID: EHDOC-XX75-en-511A) provides details on this subject. In addition to the information in that guide, it should be added that ENTIS wll write events into the ENTIS event log, which is available through the Windows event viewer.

Vulnerability Reporting

In the previously mentioned Network and Security Guide (ID: EHDOC-XX75-en-511A), please refer to the section titled “How to report a security vulnerability” for information pertaining to reporting potential security vulnerabilities against Honeywell products.

TOOLBAR

Toolbar

The toolbar is present in Experion Station. It offers a fast navigation tool for ENTIS displays. Based on their access level, users can navigate to ENTIS screens by clicking on the associated menu icons.

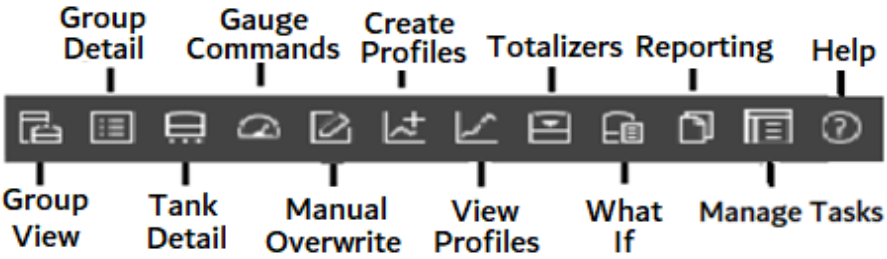


Figure 1: Tool bar

Status bar

The status bar includes the following display areas:

DateTime

Displays the current system date and time.

Alarms

Whenever an alarm is raised, the alarm icon will start blinking in red. Clicking on the icon will open the Alarm display.

System

If it is blinking in blue, the system status is OK. If any system related issues come up, it will start blinking in red. Click on it to open the system status view.

Message, Alert

Any message or alert logged by Experion will be available here.

Figure 2: Status bar

Server Name

Server to which Experion Station is connected. Click on the icon to view details.

Station Name

The connected Station name will be displayed here.

Role

Displays the logged-in user role. Click on it to enter the credentials and change the role.

ENTIS MULTI SCREENS USING SAFEVIEW

Multi-screen layouts are achieved using the Experion SafeView application. ENTIS comes with preconfigured workspace settings files that implement various screen layout configurations. The image below shows the window layout for each screen configuration.

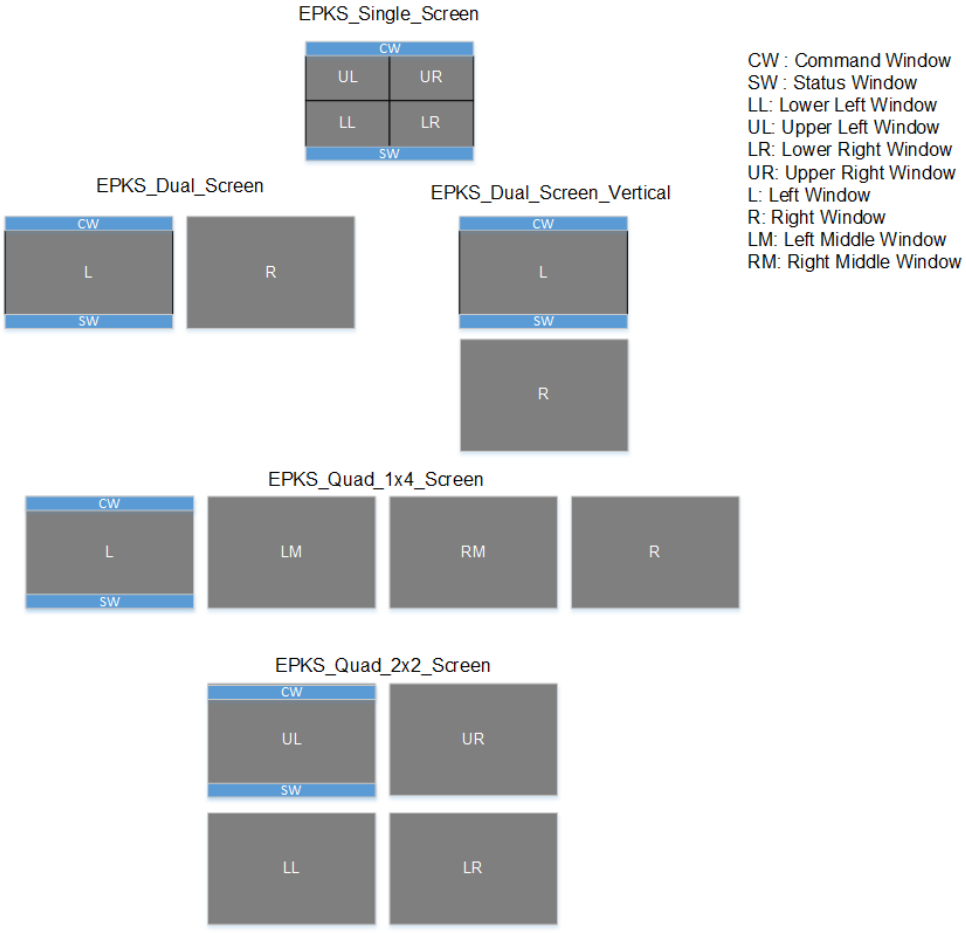


Figure 3 : ENTIS Multi Screen

The actual screen resolutions depend on the hardware that the system runs on and needs to be configured. This configuration is normally done during the installation process but can also be done at a later stage, instructions on how to do this can be found in the installation manual.

Customize the SafeView Windows

The WDL files included with ENTIS are preconfigured to display certain Experion or ENTIS pages in each “window”. This can be changed to any page:

1. Use the **>>** button to make a window active/focus on respective window title bar.
   Note: Only one of the windows will have output focus.

2. Use ENTIS or Experion menu’s and open any page (e.g. Alarm, ENTIS Group View, etc.)

To Hide unwanted Windows click on Hide <Placeholder>. To for example go back from 4 to 3 windows.

Exit Multi Screens

1. From Experion Station Select the Menu Station -> Exit

2. From SafeView application menu -> Exit.

Note: Exiting SafeView will reset the customized page selections to the default screens installed with ENTIS

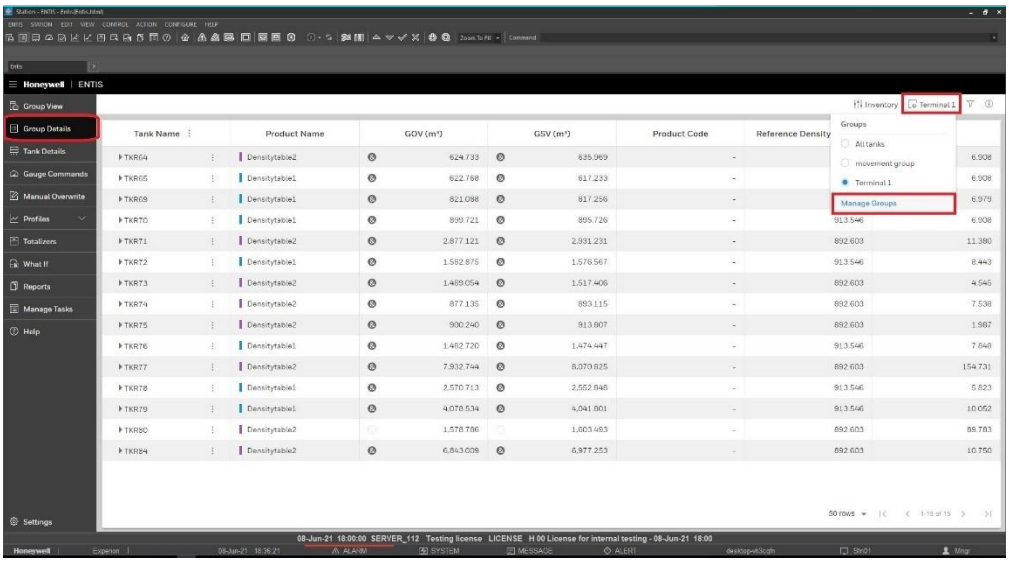
MANAGE DISPLAYS

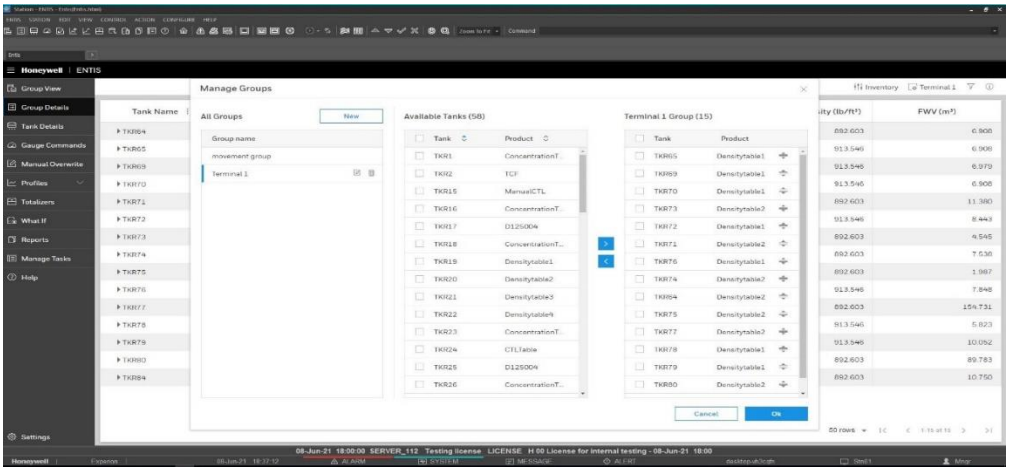
Manage displays are used to create user defined views and user defined Groups of tanks which helps operator to monitor tank inventory for huge tank farms, Manage Displays can be created via Group detail / Group view of ENTIS

Manage Groups

Tank groups can be defined to allow for easier navigation between subsets of tanks.

The Manage Groups dialog can be opened from the Group View, Group Detail, or Totalizers screen.



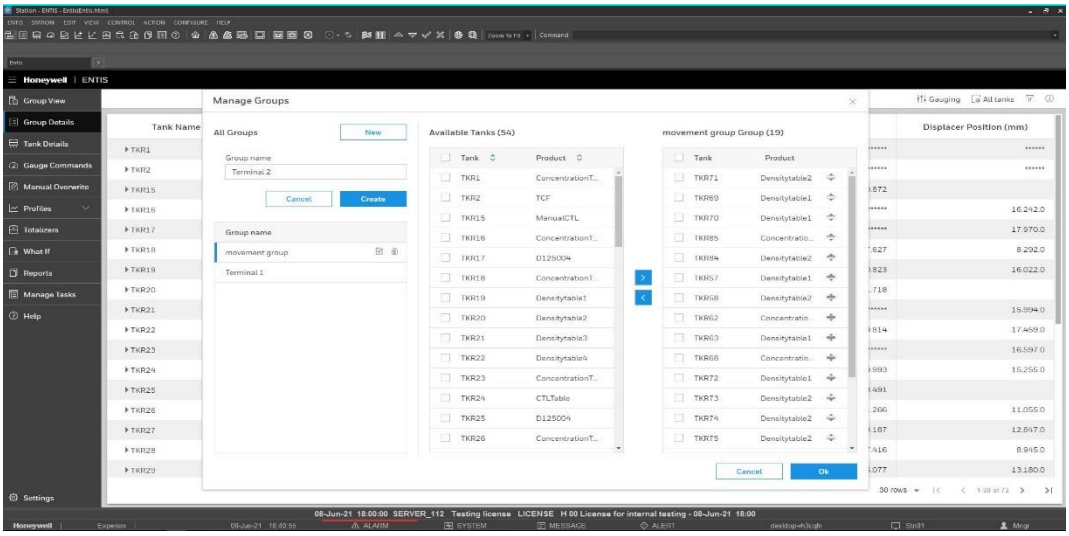


This dialog displays the following main sections:

- On the left side, all created tank groups are displayed.
- In the middle part, the available tanks to be added to the tank group are shown.
- At the right side, the tanks which are a member of the selected tank group are displayed.

Creating a Group

1. Log on as a user with SUPV permissions (or higher).
2. Click the Manage Groups icon from either the Group View or the Group Detail display. The Manage Groups dialog opens.
3. Click on **New**
   An edit field opens where you can enter the tank group name.
4. Enter the tank group name and click Create.
   The tank group is added to the list of created Tank Groups.
5. In the middle part of the screen, select the tanks that you want to add to the group.
6. Click on 
   The selected tanks are moved from the middle panel to the right part of the dialog.
7. Click **OK**.
   The dialog closes.
   The newly created group can be selected in the Group selector dropdown box on the various UI screens.
8. Similarly, to remove tanks from a group, select the tanks in the right part of the screen and click on 



Note that the “All tanks” group is available by default and cannot be removed or altered.

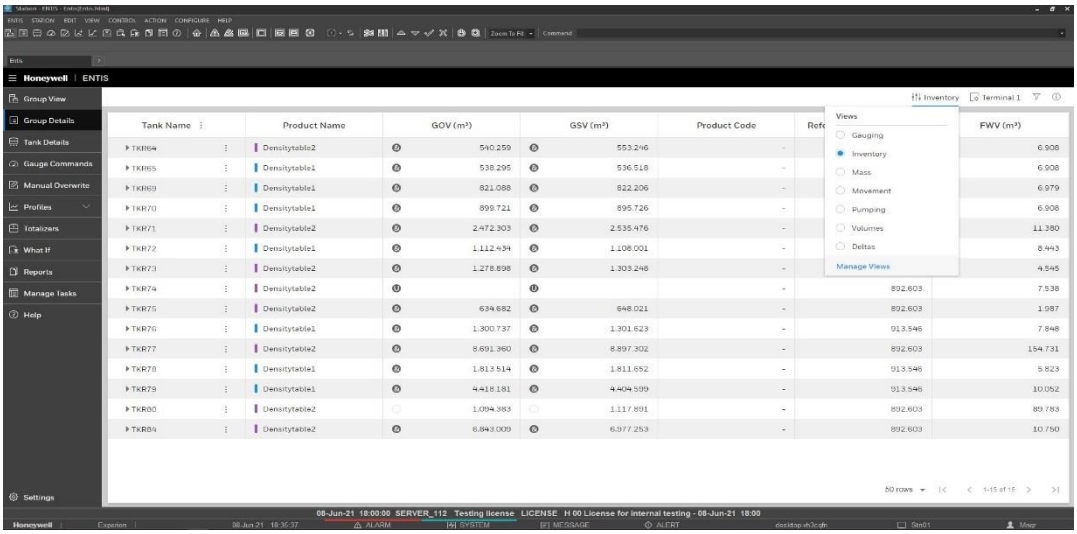
Manage Views

The Group Detail displays tank inventory data for multiple tanks in a tabular format. Tanks are organized in rows, while the entities are displayed in columns.

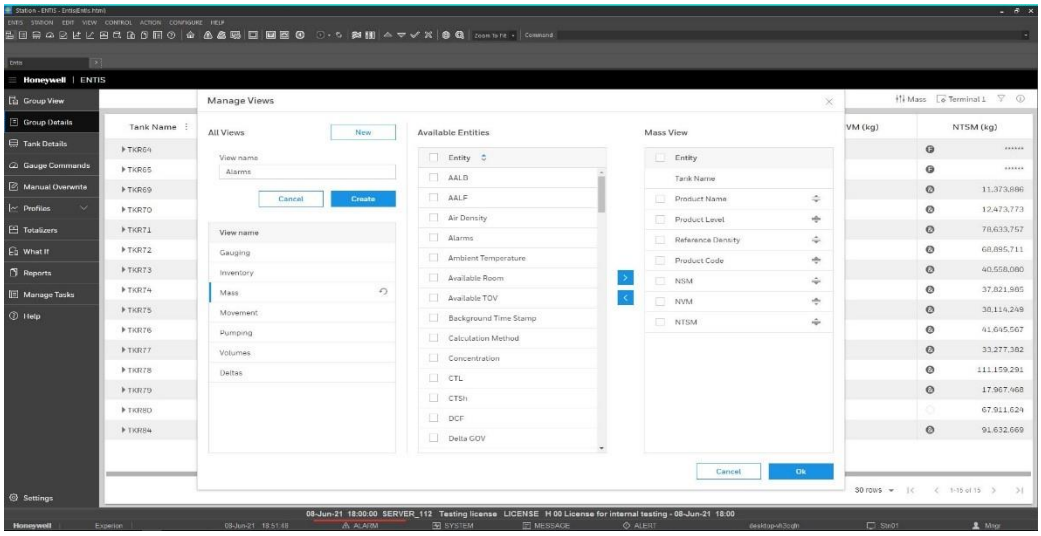
This dialog enables the user to customize the view that defines the columns to be displayed in Group Detail. The first column (Tank name) is fixed.

A number of predefined views are available; it is also possible to create new views.

Note : Manage views option also available in “Group View but that is independent from Group details.

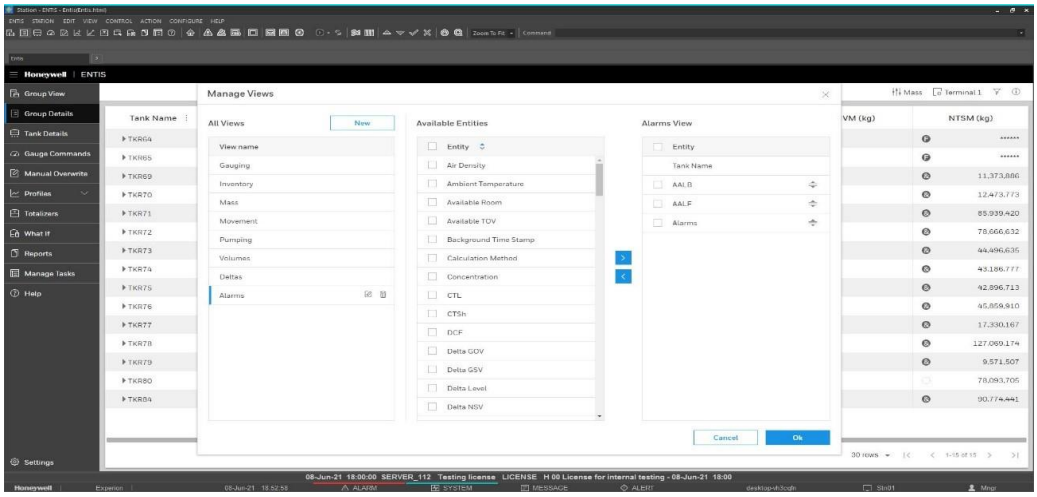


The predefined views can be altered, but not deleted. However, they can be reset as shown below:



Newly created views can be altered and deleted.

The Manage Views dialog can be launched from the Group Detail screen.



This dialog displays the following main sections:

- At the left side, all available views are shown.
- In the middle part, the available entities to be added to the view are displayed.
- At the right side, the entities which are available in the selected view are shown.

Creating a view

1. Log on as a user with SUPV level permissions (or higher).
2. Click the **Manage Views** icon from the Group Detail display.
   The Manage Views dialog opens.
3. Click on **Create**.
   An edit field opens where you can enter the view name.
4. Enter the view name and click **Create**.
   The view is added to the list of available views.
5. In the middle pane of the dialog, select the entities that you want to add to the view.
6. Click on **>**
   The selected entities are moved from the middle pane to the right side of the dialog.
7. Click **OK**.
   The window closes. The newly created view can be selected in the View selector dropdown box on Group detail.
8. Similarly, to remove entities from a view, select the entities in the right part of the screen and click on **<**

Note: The order of the entities can be changed by dragging and dropping them on the right part of the Manage Views dialog.

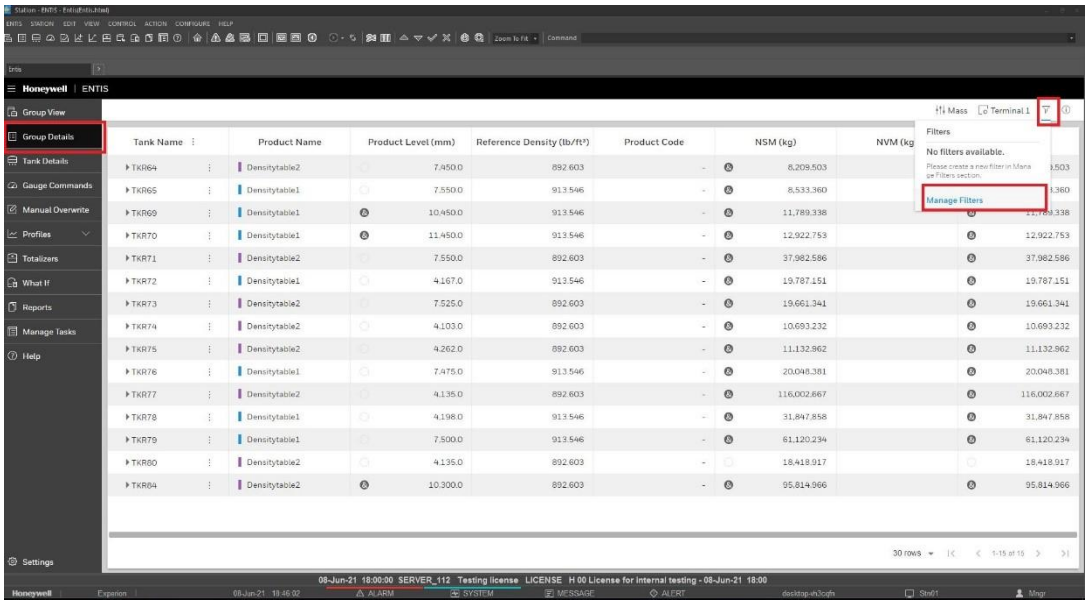
Manage Filters

This dialog offers the possibility to define filters on tanks to be displayed in a Tank Group.

A few examples of filters:

- Show tanks with a certain Product name.
- Show tanks with a Product temperature above a certain value.
- Show tanks with a Product level between 2 values.

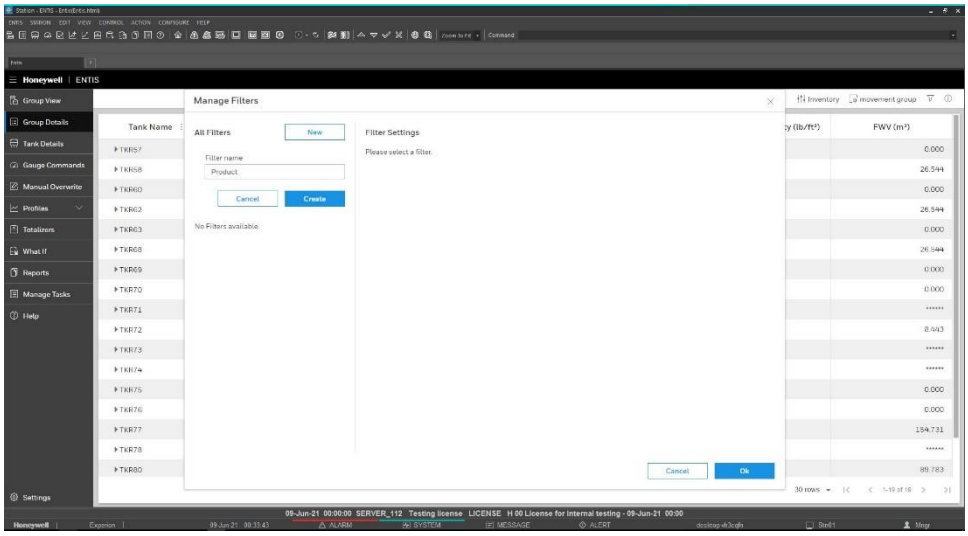
The Manage Filter dialog can be launched from the Group Detail display.

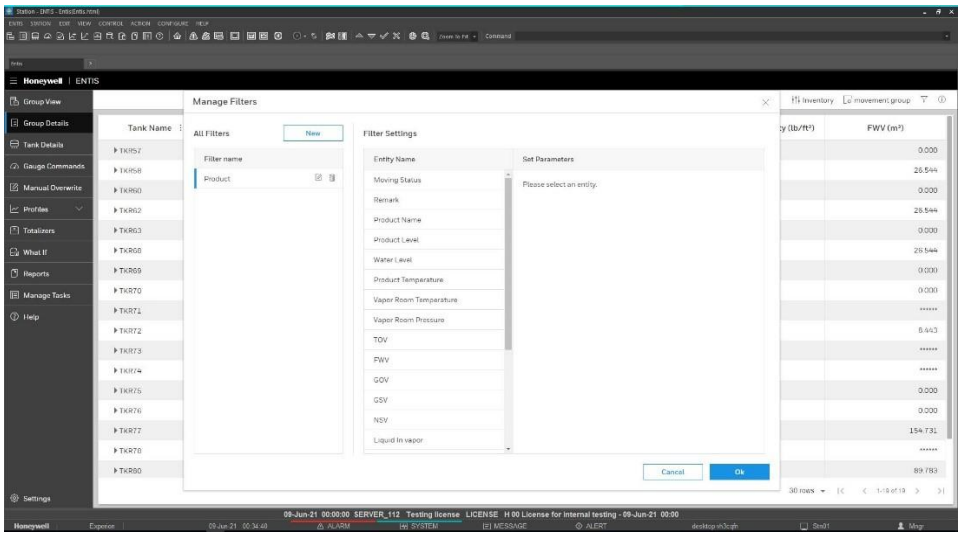


Window layout

This window displays the following main sections:

- At the left side, all created filters are shown.
- In the middle part, the entities that can be used in a filter are displayed.
- At the right side, the configured parameters (Operation, Value) for the selected filter are shown.


Honeywell | ENTIS
Manage Filters
All Filters
New
Filter Settings
Please select a filter.
Filter name
Product
Cancel
Create
No Filters available.
Cancel
Ok
Tank Name
FWV (m³)


Honeywell | ENTIS
Manage Filters
All Filters
New
Filter Settings
Filter name
Product
Entity Name
Set Parameters
Please select an entity.
Moving Status
Remark
Product Name
Product Level
Water Level
Product Temperature
Vapor Room Temperature
Vapor Room Pressure
TOV
FWV
GOV
GSV
NSV
Liquid In vapor
Cancel
Ok
Tank Name
FWV (m³)

Creating a filter:

1. Log on as a user with SUPV level permissions (or higher - see note below)
2. Click the **Filter** icon from the Group Detail display.
   Then click **Manage Filters**.
3. Click on **New**
   An edit field opens where you can enter the filter name.
4. Enter the filter name and click **Create**
   The filter is added to the list of created filters.
5. In the middle part of the dialog, select the entity that you want to be used in the filter.
6. In the right part of the dialog, select the Operation and the Value.
7. Click **OK**
   The window closes. The newly created filter can be selected in Group detail by clicking on **Filter**, then selecting the required filter.

Note: When logged on as Operator, a filter can be selected to be viewed, but not c*reated* or changed.

GROUP VIEW

The Group View display shows the tanks from the selected group in a tile layout.

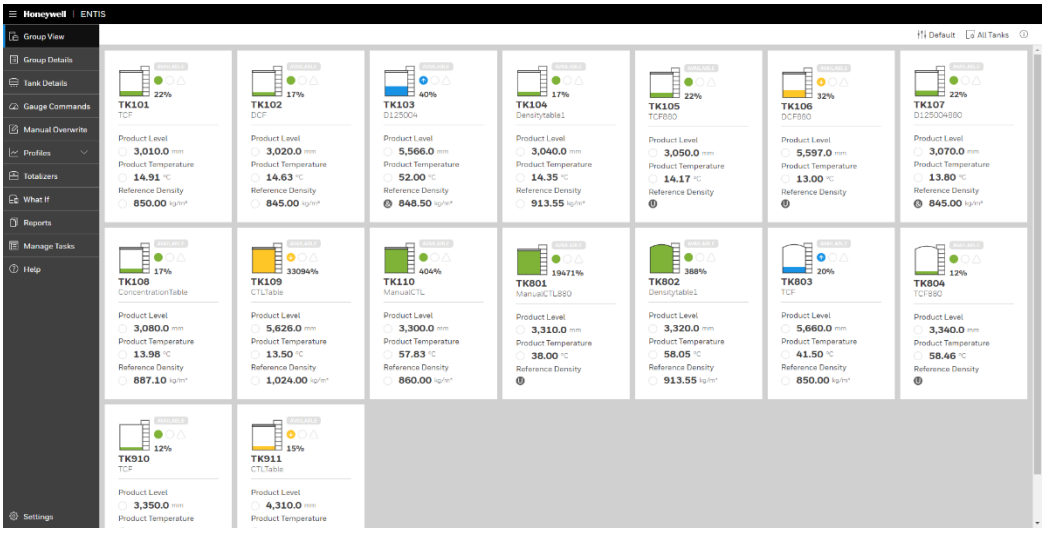


Figure 4 : Group View with default entities

Each tile shows the tank icon (1), movement status icon (2), flow direction icon (3), target movement direction (4), alarms icon (5), level percentage (6), tank name (7), product name (8) and the entities from the selected view (9).

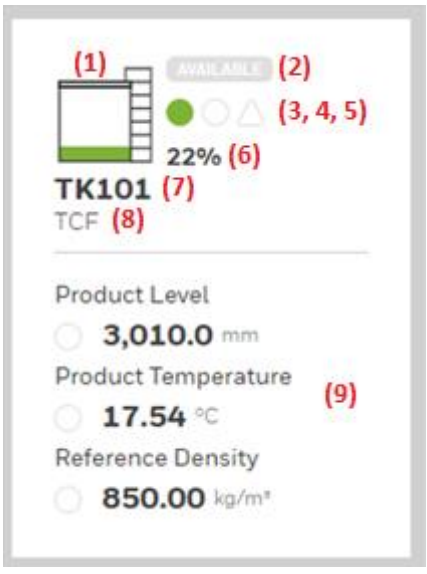


Figure 5 : Tank Tile

Tank Icon

The tank icon of each tank is configurable, this is done in the CIU 888 Service tool. The tank icon also functions as a bar graph showing how far the tank is filled, the color of the bar graph is based on the Product colors settings in the settings screen.

The movement status can have the following values:

Movement Status	Description
ACTIVE	This tank is part of an active movement.
AVAILABLE	This tank is available for movement.
ARMED	This tank is armed for movement.
CLOSED	This tank is available for movement. The previous movement has been closed recently.
PAUSED	The tank is in movement but temporary on hold.
RESUMED	This tank is part of an active movement and was on hold for a certain period.
UNKNOWN	Unknown tank movement status.

Flow Direction Icon

The flow direction icon shows the actual flow direction, it can have the following value:

Icon	Description
	Product flowing into the tank.
	Product is stable in tank.
	Product flowing out of the tank.
	Flow cannot be determined.

Target Movement Direction Icon

The target movement direction icon shows the direction of the configured movement, it can have the following value:

Icon	Description
	Product configured to move into the tank.
	Product configured to move out of the tank.
	Product movement not configured.

Alarm Icon

The alarm icon shows if there is one or more alarms for the tank, it has the following values:

Icon	Description
	When there are no alarms
	When there is one or more alarms

When there are alarms, hovering over the alarm icon will show detailed alarm information:

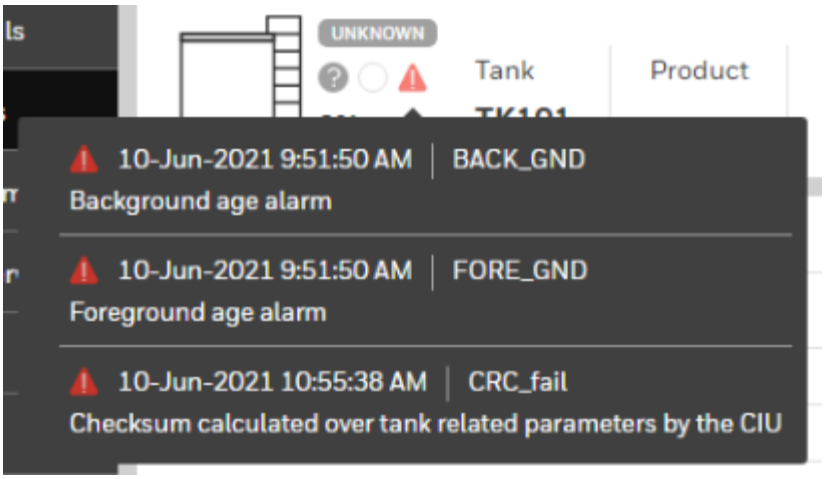


Figure 6 : Alarm icon tooltip

Entities

Initially the view ‘Default’ with entities Product Level, Product Temperature and Reference Density are displayed on the tiles. These entities can be changed by selecting a different view, this can be done by clicking on the active view that is shown in the top right corner of the display and selecting another view.

Views can be configured with up to 5 different entities, see the chapter about Manage Views on how to configure views.

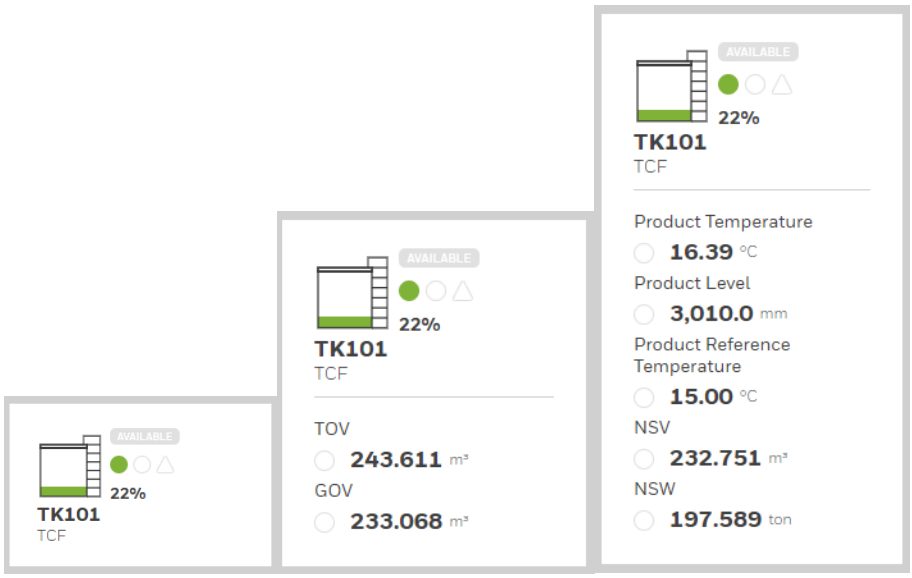


Figure 7 : View examples

Context Menu

When hovering over a tile, a 3-dot menu button is shown. Clicking on this button will open the context menu. From this menu the operator can start delta, configure movement actions and execute gauge commands. For more information about the context menu see chapter GROUP DETAIL.

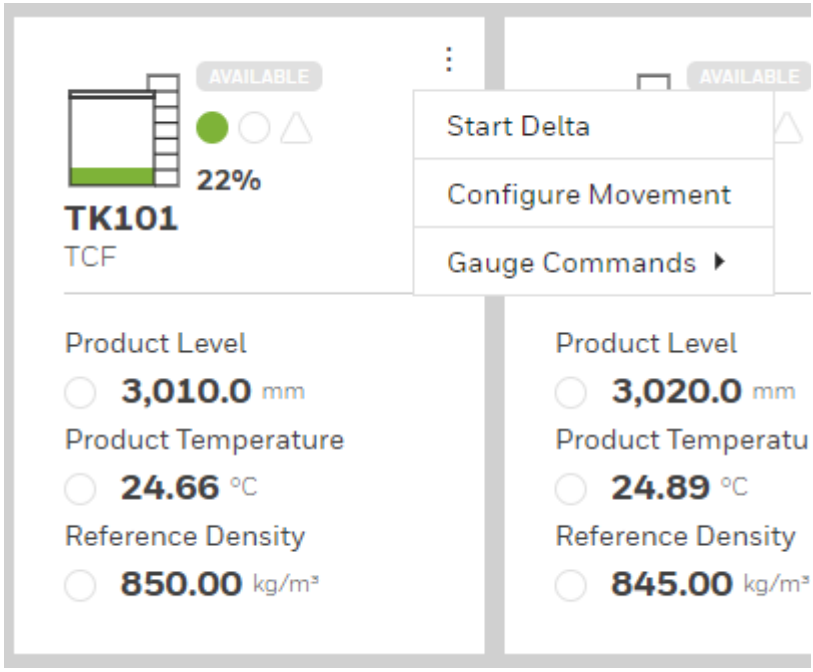


Figure 8 : Context menu of a tank

How to select the Group View display

1. Group View is the default display when ENTIS is started. You can also access the Group view display from the menu, or from the icon in the toolbar.

2. Select the desired group from the Group selection dropdown box (default set to ‘All tanks’).
3. Select the desired view from the View selection dropdown boxentity. (default set to ‘Default’).

GROUP DETAIL

The Group Detail display show tank inventory data for multiple Tanks in a tabular format. Tanks are organized in rows, while the entities are displayed in columns.

In addition, this display enables the user to make use of additional functionality such as the Delta column (licensed option). Dimensions are user-definable and displayed in the column header.

The user can create their preferred views via the Manage Views dialog.

Display layout

The display presents Tank data in a tabular format. The data displayed on the grid depends on the selected view. Both values and - if applicable - statuses, are displayed. Clicking the mouse on the column header will sort the selected column. Multi column sorting is available by holding the Shift button and selecting multiple column headers. A blue line on the column header will indicate that it is sorted, with the blue line position indicating if the sort is ascending (top) or descending (bottom).

A user definable number of columns, measured from the first column, can be identified as fixed columns. Fixed columns do not scroll horizontally. The user can select the number of rows they want to view on a page and toggle between them via ‘Previous’ and ‘Next’ buttons.

The user can also filter the rows by using ‘Filter’ button where they can select the column where filter should be applied and set the parameters of filtering accordingly.

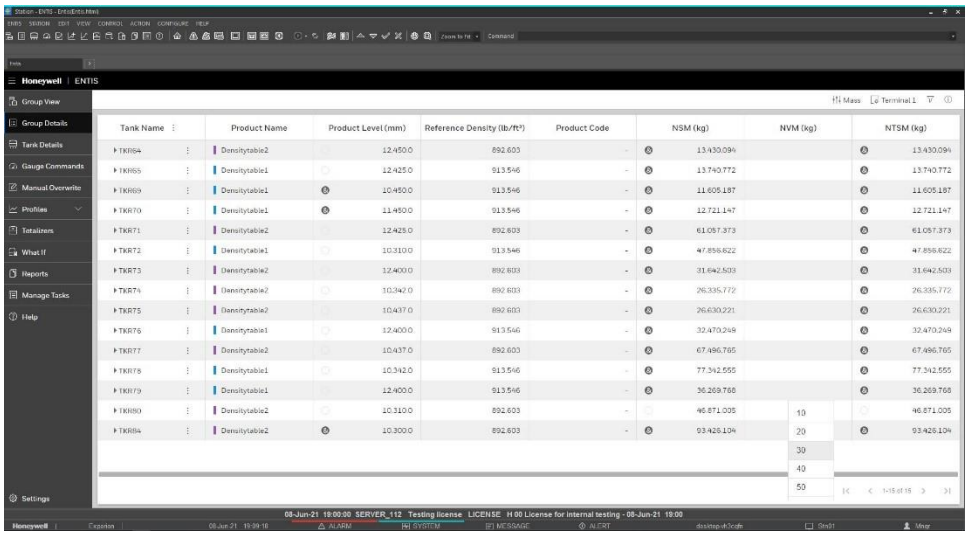


Figure 9: *Group Detail*

Opening the Group Detail Display

1. Click on the ‘Group Detail’ menu item, or the ‘Group Detail’ icon in the tool bar

2. The ‘Group/Tank’ display will appear
3. Select a Group from the dropdown combobox
4. Tank data will appear in the table
5. ‘All’ indicates that all the tanks will be shown
6. Change the View from the the view dropdown

Column width: The current size is stored whenever the user selects another view, or the window is closed.

Delta column

The Delta column displays the difference between the actual value and the start value. This feature enables an operator to verify tank operations with real-time data. Delta values are available for GOV, TGSV, Total Mass, NSV, Level, GSV and TOV.

The Delta column is only available in the Group Detail display. The column can be enabled via the Define View dialog.

When the Delta column is available in Group Detail, a click on the Delta column header (the horizontal ellipses) gives the following context menu:

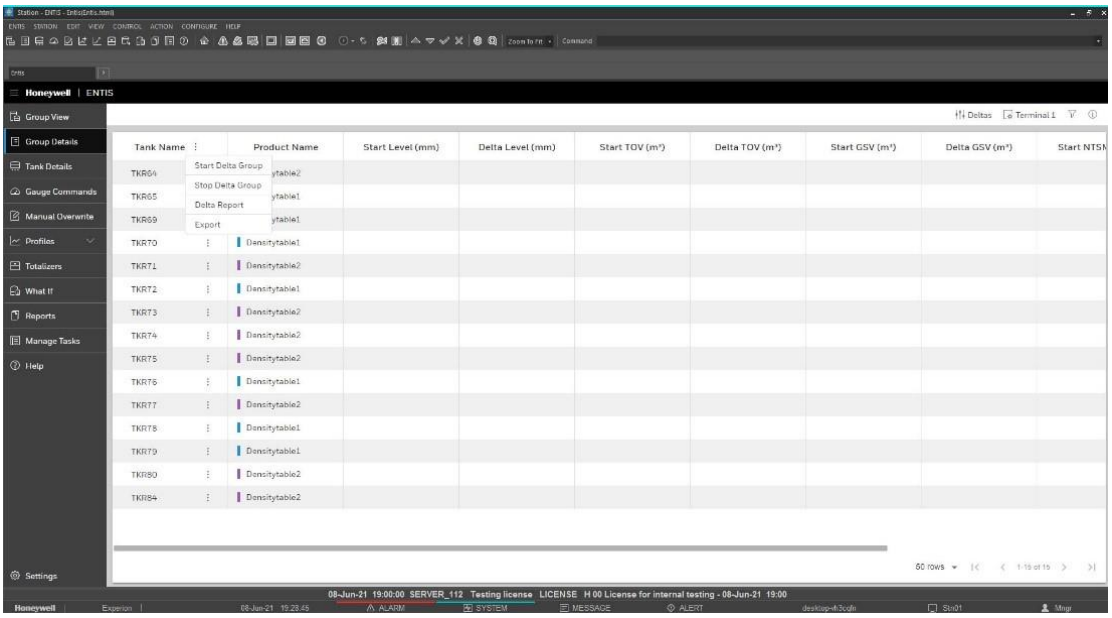


Figure 10: Delta Column

Selecting a Delta Column

Clicking on the horizontal ellipses on the delta tank entity gives the following menu:

Start Tank When clicked, the delta calculation for the selected tank (row) will be started or restarted

Stop Tank When clicked, the delta calculation for the selected tank (row) will be stopped and cleared

Start Group When clicked, the calculation for a group of tanks is started

Stop Group When clicked, the calculation for a group of tanks is stopped and blanked

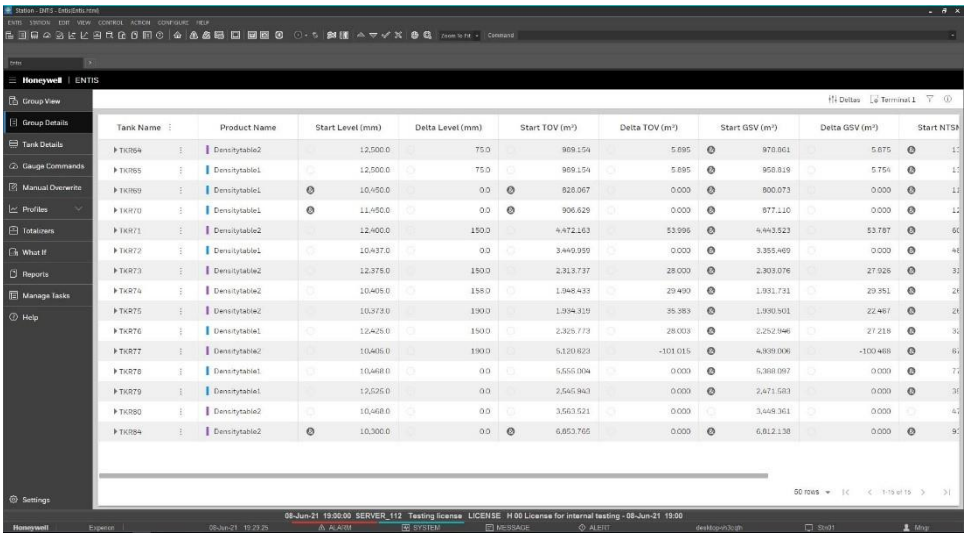
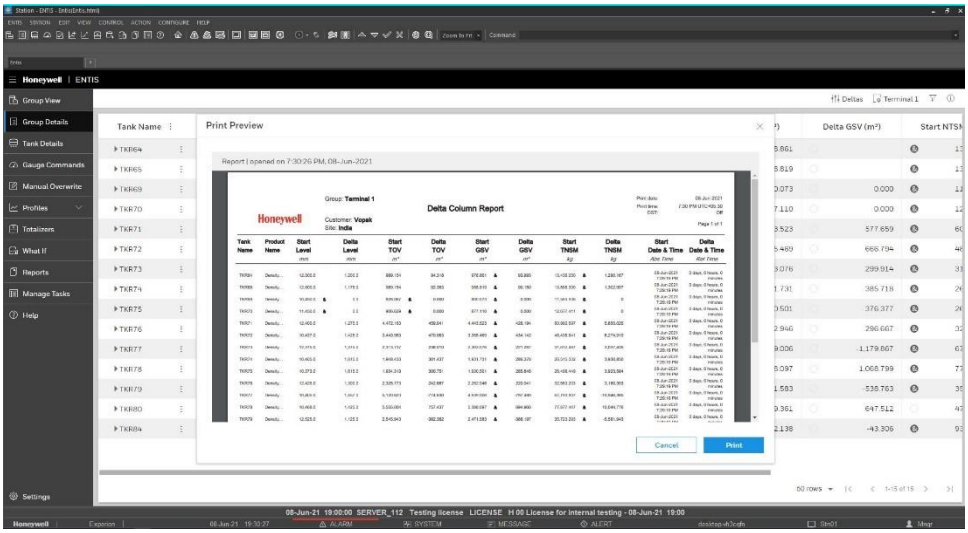


Figure 11 : Delta Column group

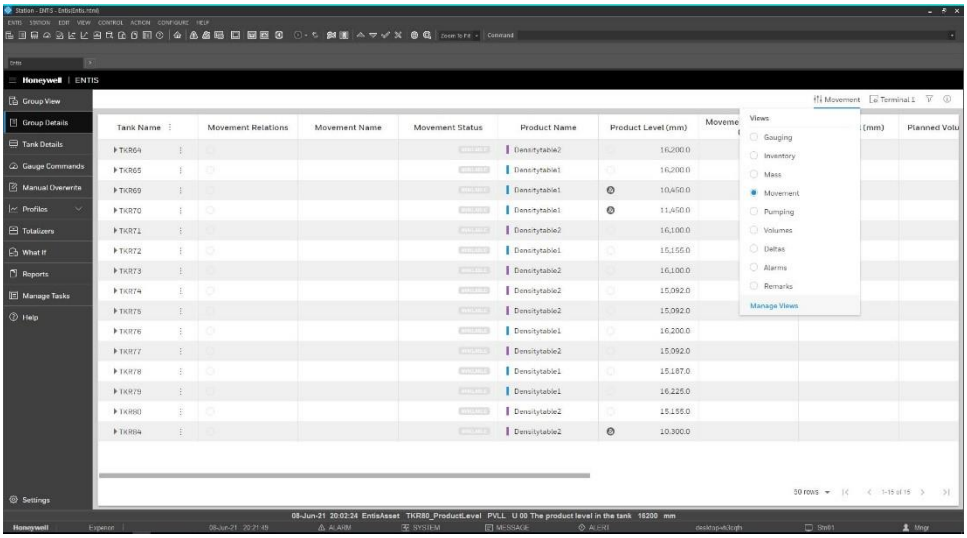
Delta Report The delta values will be printed in form of report.

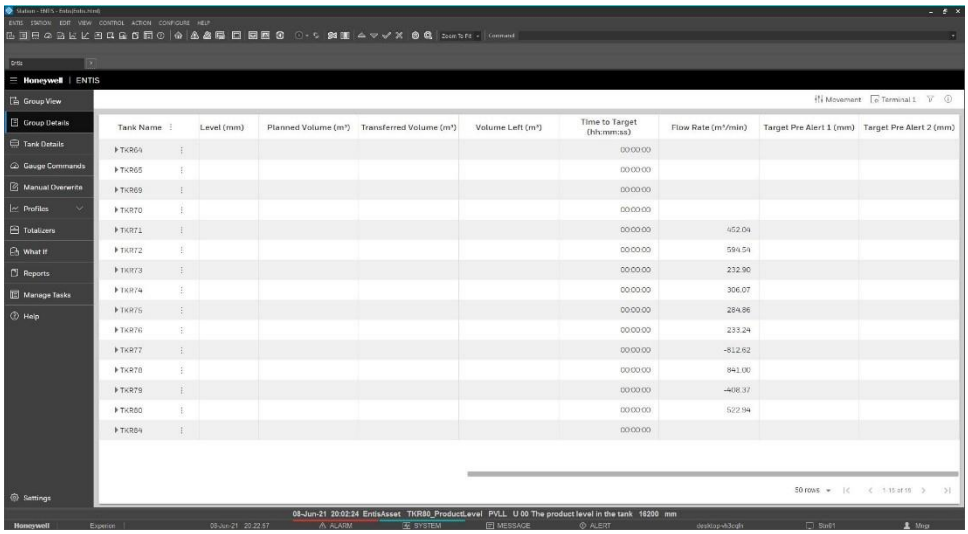


Group Details Movement view \

Group detail manage view have some default views Movement view is one among them. Movement view can be selected in combination with Group of tanks, which are used for movement transfer operartion

Below screen shows Movement view.




Honeywell | ENTIS
Group View
Group Details
Tank Details
Gauge Commands
Manual Overwrite
Profiles
Totalizers
What If
Reports
Manage Tasks
Help
Settings
Movement
Terminal 1
Tank Name
Level (mm)
Planned Volume (m³)
Transferred Volume (m³)
Volume Left (m³)
Time to Target (hh:mm:ss)
Flow Rate (m³/min)
Target Pre Alert 1 (mm)
Target Pre Alert 2 (mm)
TKR64
TKR65
TKR69
TKR70
TKR71
TKR72
TKR73
TKR74
TKR75
TKR76
TKR77
TKR78
TKR79
TKR80
TKR84
00:00:00
452.04
594.54
232.90
306.07
284.86
233.24
-812.62
841.00
-408.37
522.94
50 rows
08-Jun-21 20:02:24 EntisAsset TKR80_ProductLevel PVLL U 00 The product level in the tank 16200 mm

Group Detail Alarm Column

This column can be used to display PAL statuses in the Group Detail display with different colour indication based on priority.

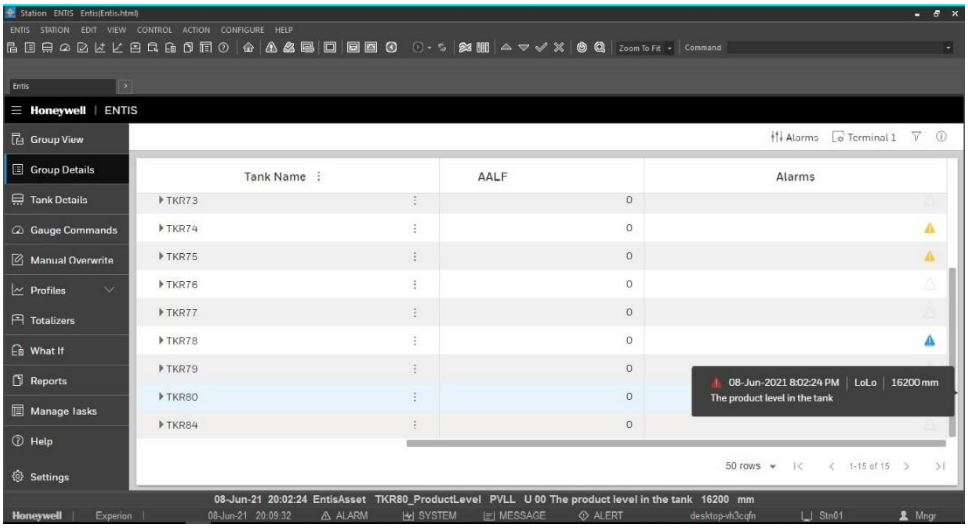


Figure 12 : Alarm Column

Selecting an Alarm column from Group Detail

To view an alarm, the columns must be added through the “Manage View” dialog in Group Detail.

1. Go to ‘Manage View’ from Group Detail
2. Select Alarm columns from the Available Entity list.
3. Click on the OK button.

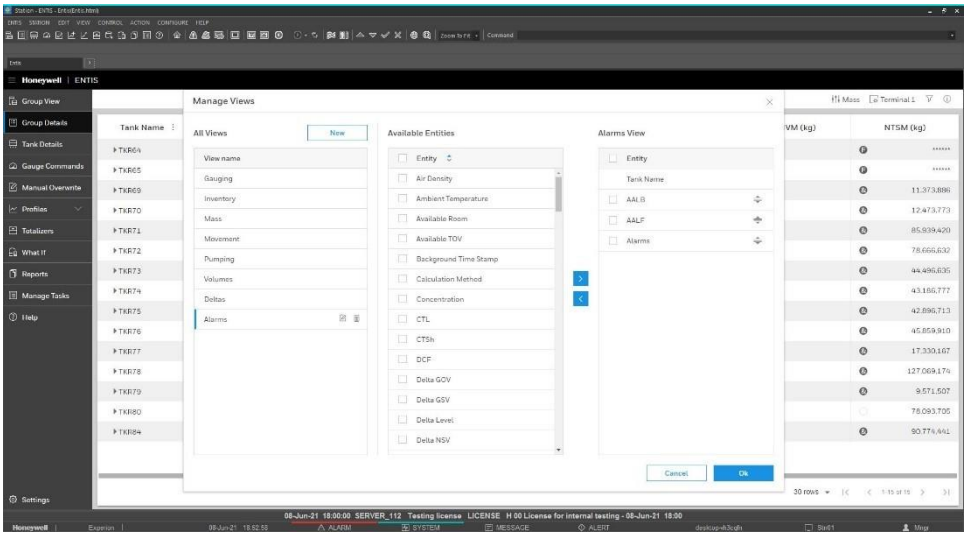


Figure 13 : Alarm Column views

4. When the View is selected in Group detail, the selected columns will be available in the display.

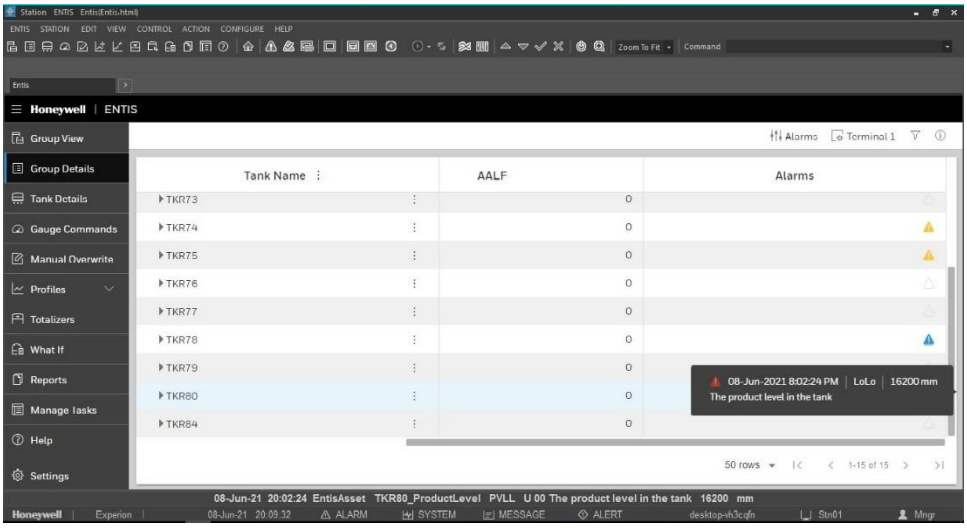


Figure 14: Group Detail Alarm Column

Remark Column

This column allows the user to enter additional text in the Remarks field. The text can be entered by a left mouse click on the edit icon. See example below. This field is only available on the Group Detail display.

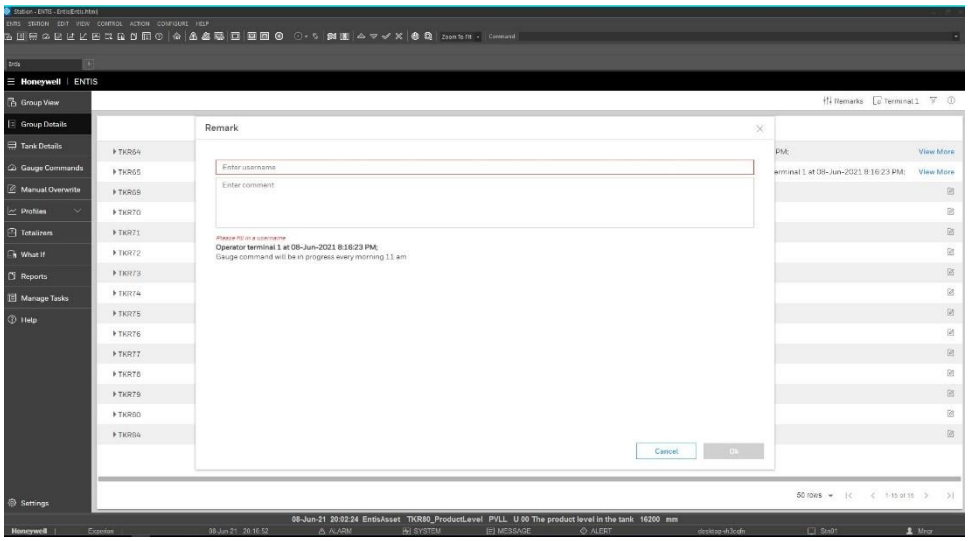


Figure 15: Remarks Column

Selecting the remark column from Group Detail

The remark columns must be added through the “Manage View” option in Group Detail.

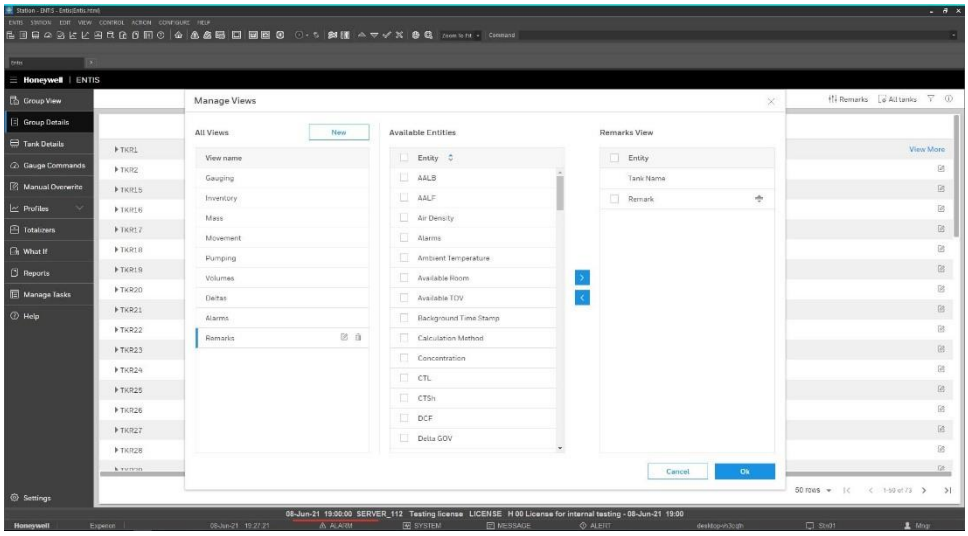


Figure 16: Remarks Views

1. Select Manage View from Group Detail.
2. Select the Remark column from the Available Entity list.
3. Click on the **OK** button.
4. Select the View in Group detail screen.
5. Left mouse click on remark field edit icon for selected tank.
6. Enter user name and save remarks.
7. Remark will be available for the selected view in Group Detail.

Adding a remark from group detail

1. Remark can be edited by a left mouse click on the edit icon.

2. Upon clicking, the remarks column is expanded as shown in the screenshot below.

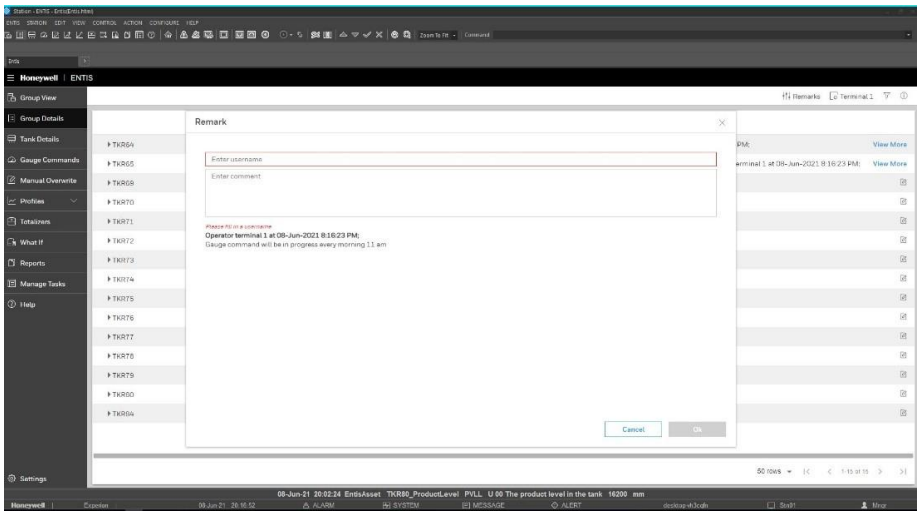


Figure 17: Remarks Views edit

3. The user can add their username and remarks and click **OK**. The remark is saved as history with username, date, time, and the remark.

TANK DETAIL

Tank Detail is a display that shows all measured and inventory data for one particular tank and is updated continuously.

Data presentation

1. Measured data is always presented as green text.
2. Calculated data, such as inventory data is presented as black text.
3. Status and Validity information is available in circular indicators.
4. Units are shown in black after the status and validity symbols.

Display layout

The tank detail window consists of two main parts, the first part is the toolbar which is shown below:

Figure 18: Tank Detail Toolbar

The toolbar shows a combo box at the left-hand side that can be used to change the tank for which the information will be shown.

The combo box only lists the tanks that are in the currently selected tank group which can be changed from the tank group selection menu located at the right-hand side of the toolbar.

The information icon, when clicked, will show an overview of all the icons that can occur on the screen.

The second part of the tank detail window is the Graphical Pane, this is shown below:

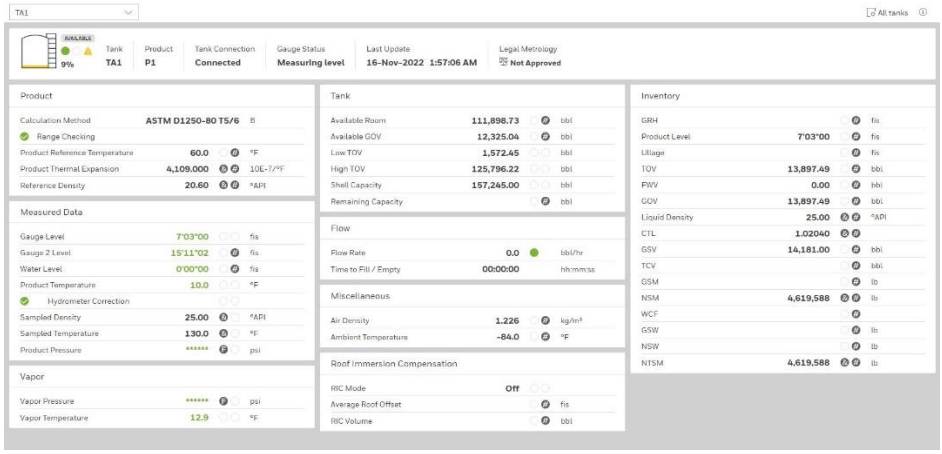


Figure 19: Tank Detail graphical pane

The graphical pane consists of the following sections:

- General tank information (see GROUP VIEW for more info on the tank/indicator icons)
- Product
- Measured Data
- Vapor Room
- Tank
- Flow
- Miscellaneous
- Roof Immersion Compensation
- Inventory

The 'Gauge Level' in the Measured Data and 'Product Level' in the Inventory section differ in the value they represent:

Gauge Level: The product's level as measured by the gauge without correction (can be Ullage or Innage).

Product Level: Corrected Innage product level as used in tank data calculations

The time to fill is calculated from available TOV/flow TOV. The time to empty is calculated from available room/flow TOV.

Some entities are only displayed depending on the volume correction, calculation method and if the tank has zoning enabled, see below for some examples.

Example 1: No zoning, S&D correction, TCF method

This window selection is based on a tank without zoning that uses S&D correction and TCF method calculation.

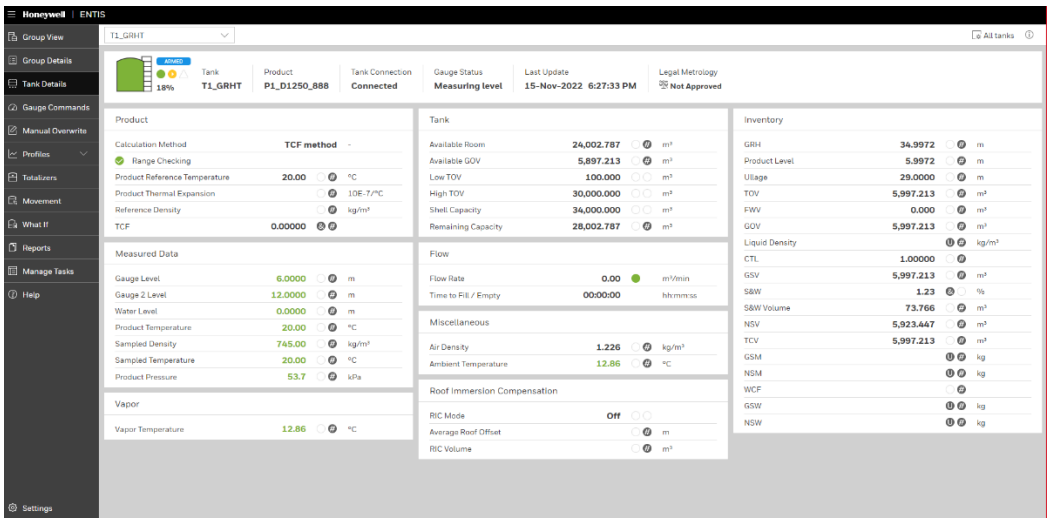
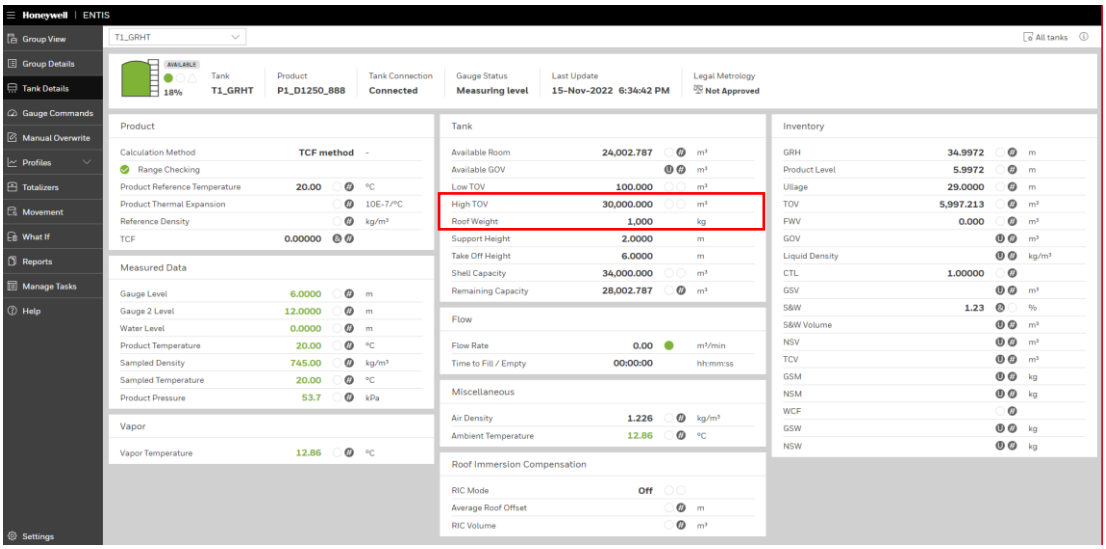


Figure 20 : Tank detail with No zoning, S&D correction, TCF method

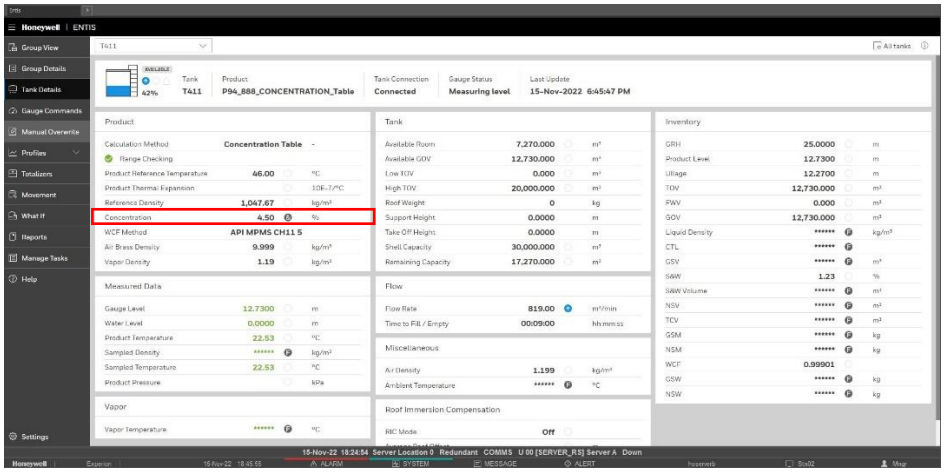
Example 2: Zoning

This window selection is based on a tank without zoning that uses S&D correction and TCF method calculation.



Example 3: Concentration Table

This window selection is based on a tank without zoning that uses S&D correction and TCF method calculation.



The window selection is based on tanks with calculation method ‘Concentration Table’.

Selecting the Tank Detail display and choosing a tank

Proceed as follows:

1. Click on the ‘Tank Detail’ menu item, or on the ‘Tank Detail’ icon in the Experion toolbar.
2. The page can also be reached by clicking on a tank in the Group View/Detail screens.

Figure 21: Tank Detail Icon

3. The ‘Tank details’ window will appear.
4. Optionally select a tank group to filter the tanks that are shown in the tank selection box.
5. Select the desired tank from the tank selection box.

GAUGE COMMANDS

Modern gauges often support special commands and/or functions. These commands can be used, for example, to ‘Block’ the displacer at a certain level, or for testing alarm contacts remotely.

The available command and function can be dependent on the type of gauge or the application.

The Gauge Command display for ENTIS is ‘gauge aware’. It shows the user an icon corresponding to the gauge type, and shows which functions are enabled for that particular gauge.

Tab layout

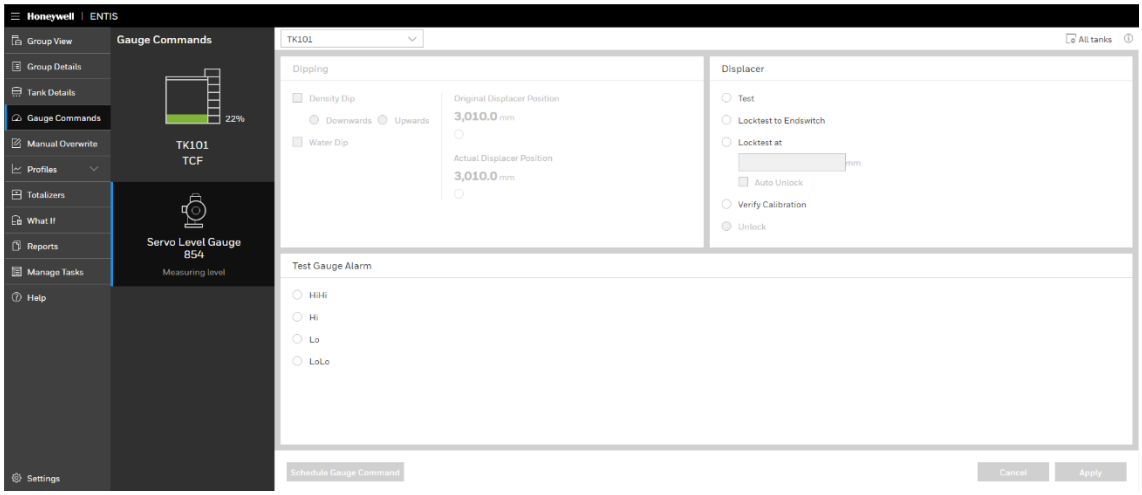


Figure 22: Gauge Commands

1. Select the group.
2. Select the tank.
3. Select one of the available command tab.
4. Click on the desired function and press Apply.

How to issue a Dipping Command

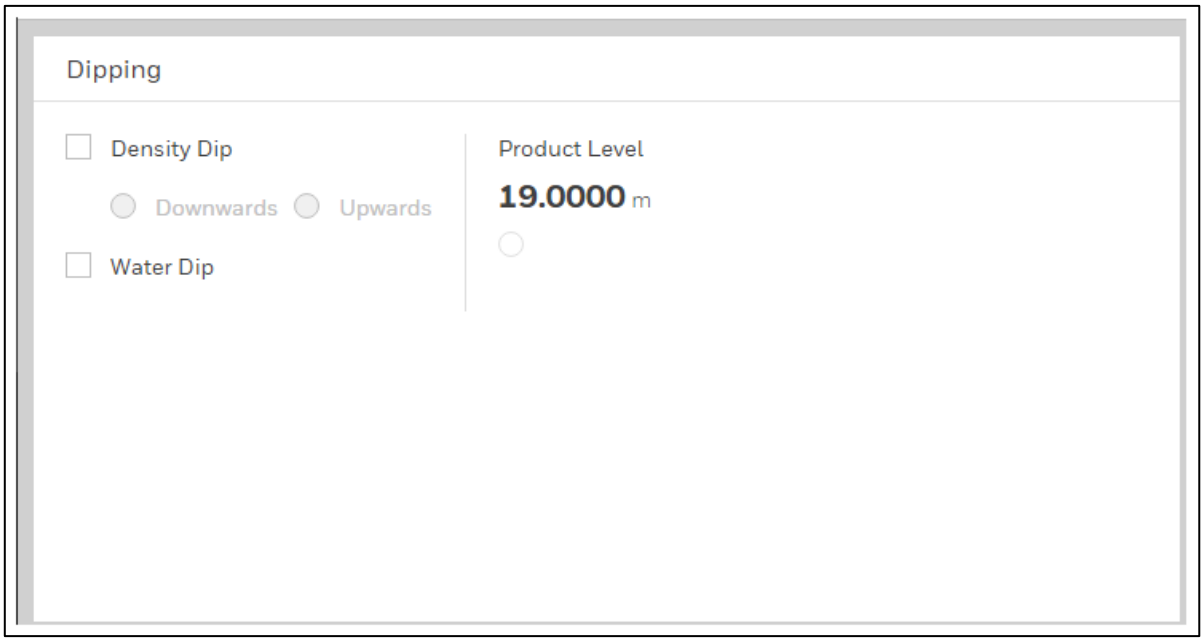


Figure 23: Dipping Command

Proceed as follows:

1. Click on the ‘Gauge Commands’ tab.
   The Dipping section will be displayed by default.
2. Select a group from the dropdown.
   The selected group will be displayed in the tool bar.
3. Individual tanks can be selected from dropdown.
4. Select the command you want to issue from the check boxes:

- *Density dip*
  Select to execute a density dip. This command only applies to 854 type gauges with the density option. Select one of the two radio buttons. Density can be executed in two ways:
  - Downwards
  - Upwards
- *Water dip*
  Select to execute a water dip

How to issue a Displacer Command

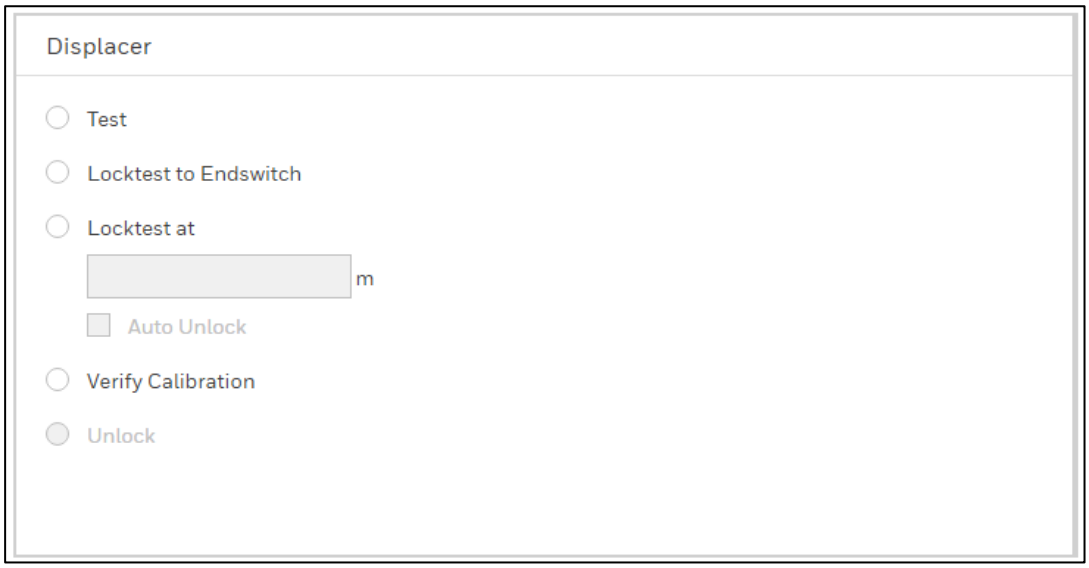


Figure 24: Displacer command

Two different displacer commands can be issued:

1. Go to the ‘Displacer’ panel of the ‘Gauge Commands’ tab.
2. Select a group from the dropdown.
   The selected group will be displayed in the tool bar.
3. Individual tanks can be selected from dropdown.
4. Select the command you want to issue by means of the radio buttons.

Table 2: Displacer Commands

Radio Button	Comman Description
Test	The level gauge will be set in lock test for approx. 1 minute, followed by an unlock command
Lock Test	When selecting this radio button, a data entry field will be enabled
Lock Test at	Enter the Lock test value
Auto Unlock	When selecting this check box, the displacer will be lowered automatically after reaching the value entered in the data entry field.
Verify Calibration	When selecting this radio button, the displacer will be raised until the CA setting in the servo gauge is reached

Displacer commands such as locktest and verify calibration will result in an "unknown" Product/Gauge Level with "No data available status". SCADA point data will go to 0.0 in this case. This could cause L/LL alarms to be triggered in Experion if setpoints are set to 0 or below.

How to issue a Test Gauge Alarm

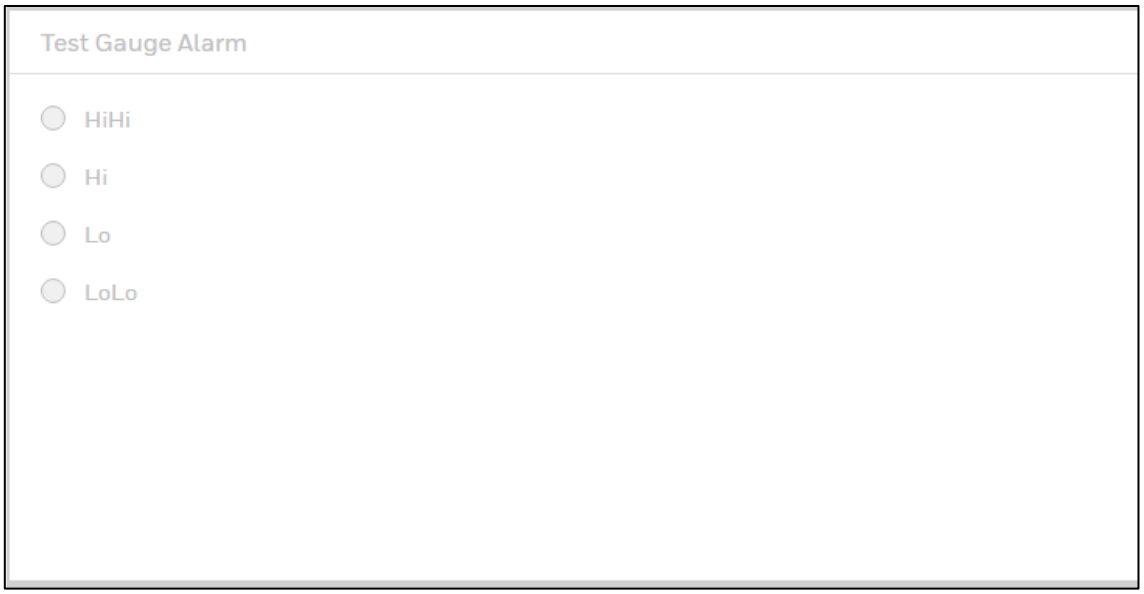


Figure 25: Tank Gauge Alarm

Proceed as follows:

1. Go to the ‘Test gauge alarm’ section of the ‘Gauge Commands’ tab.
2. Select a group from the dropdown.
   The selected group will be displayed in the tool bar.
3. Individual tanks can be selected from dropdown.
   - Alarm tests: Click on one or more alarms you want to test

This command can be used to test the alarm settings in the radar gauge. The alarm settings to be tested are HiHi, Hi, Lo, LoLo in any combination.

How to cancel commands

An unlock command can be sent to the level gauge in order to cancel the command in progress.

Running Dipping Commands

This window shows the progress of a dipping command. The progress indicator is used to show the percentage of completion of the issued command.

The progress of the following dipping commands can be monitored:

- Density dip
- Water dip

Tab layout

At start-up, the Tank name, dipping command and original displacer position are shown. After start up, the actual displacer position is displayed.

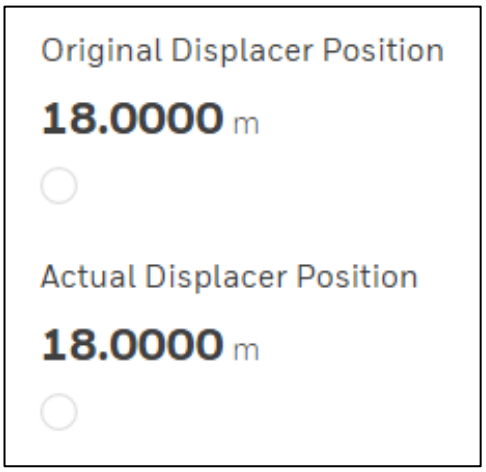


Figure 26: Displacer

Title bar Displays the selected tank name and the issued command

Displacer Position
This group box shows the displacer position:

Original - The level at start up

Actual - The actual position of the displacer

Running Displacer Commands

This window shows the actual displacer position during a Lock test or Verify calibration test command. These commands can only be issued for servo level gauges.

Tab layout

At start-up, the window shows the tank name and the displacer command in the title bar.

The group box shows the ‘Original’ displacer position (level at start-up) and the ‘Actual’ position. In addition to the level values the status and the dimension are displayed.

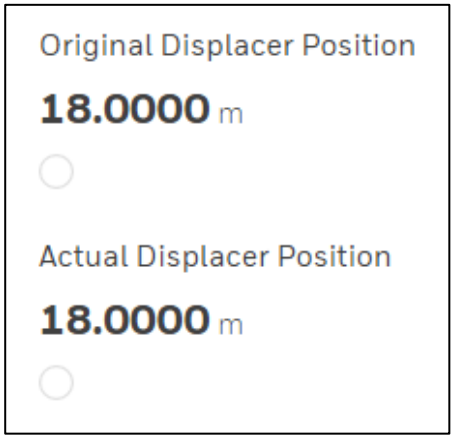


Figure 27: Displacer

Scheduling Gauge Command

This option is displayed at the bottom of left hand panel on the ‘Gauge Commands’ screen. This feature allows the user to send automated commands to gauges at a given time.

The user can create a task and schedule gauge commands for different intervals like daily, weekly, monthly etc., starting at a specific time. The tasks created here are shown on ‘Manage Tasks’ screen.

Once the gauge command is scheduled, it will be executed at the scheduled time.

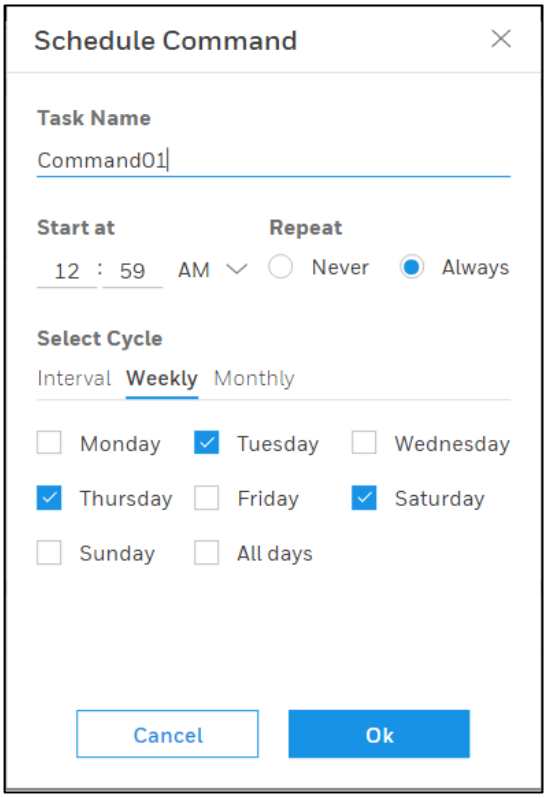


Figure 28: Schedule Command Screen

How to schedule a gauge command

- Choose the specifications of the gauge command that needs to be scheduled. Then click on Schedule button.
- **Task Name :** This is user defined field which defines name of the task.
- **Starts at :** User can choose when the task execution will start.
- **Repeat :** If the task has to be executed only once, ‘Never’ should be selected. If is a repeated task, ‘Always’ should be chosen.
- **Select Cycle :** User can choose the frequency of the task from below available 3 options. The option will only be enabled when ‘Repeat’ is ‘Always’.

1. **Interval :** User can give any interval in hh:mm.After the ‘start at’ time, this task will be executed continuously at the given interval.
2. **Weekly :** The user can choose the days. Every week this task will be executed on the selected days, and the time provided in ‘start at’.
3. **Monthly :** The user can choose the dates in a month. Every month this task will be executed on the provided dates, and the time provided in ‘start at’.

- **Never:** User can opt for scheduling the gauge command only once without repeating it.

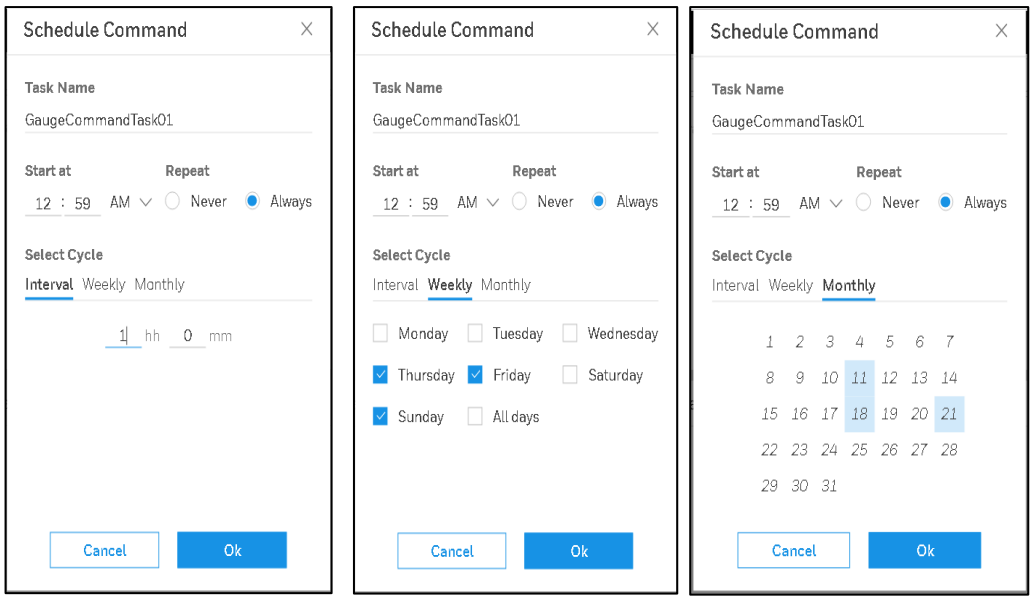


Figure 29: Scheduling screens

MANUAL OVERWRITE

This display allows the user to manually overwrite tank data. The ’Manual Overwrite’ display can, for example, be used to overwrite an invalid entity, or to enter the value of an entity that is not being scanned or for which automatic measurement has stopped scanning (formerly known as ‘killed’).

This display supports basically two actions:

- Stop scanning an entity (formerly known as ‘kill’)
- Resume scanning an entity (formerly known as ‘resurrect’)

  Enter manual data for an entity

Display Layout

The ‘Manual Overwrite’ window consists of two main parts:

- The entity selection pane (left)
- The entity overwrite area (right)

All Entities

This panel shows a tree with all available entities.

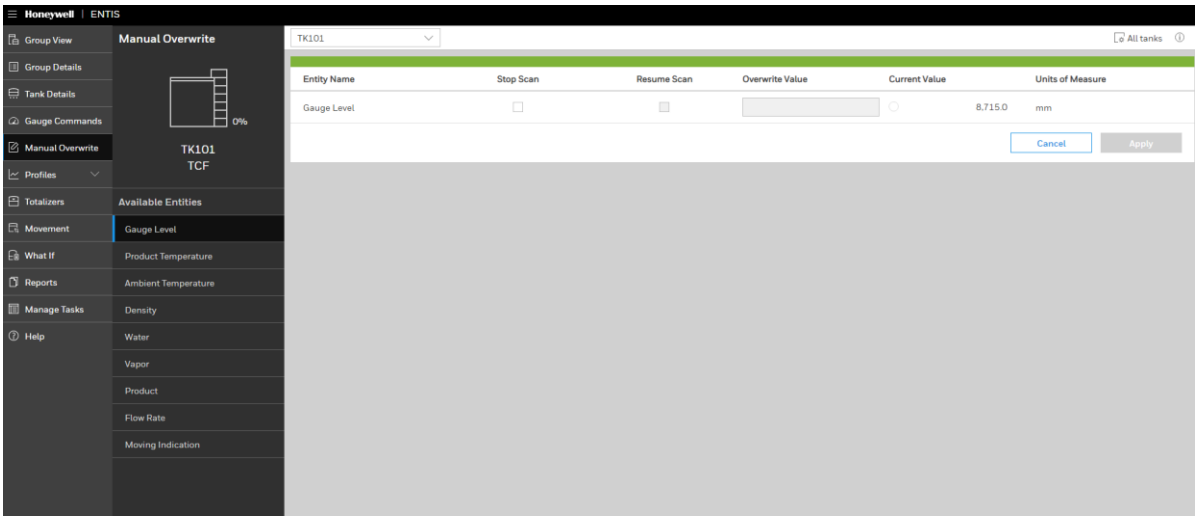


Figure 30: Manual Overwrite

Entity Pane

The entity overwrite area consists of four fields.

Table 3: Entity Fields

Entity Name	This fields shows the selected entity
Stop Scan	This check box indicated whether the entity is not scanning. Marked means not scanning (or stopped). This check box is not present by every tank entity.
Resume Scan	This checkbox enables the user to resume scan of an entity which was previously stopped. This check box is not present by every tank entity.
Overwrite Value	This column may contain a mix of data entry fields, combo boxes and check boxes depending on the entity being displayed. The entity can be overwritten by entering/selecting a value in this column.
Current Value	This column displays the current value of the selected entity if: - the entity status is set to manual. (with manual data icon) - the entity has actual data. (with actual data icon) If the entity has stopped scanning, it will be displayed with killed icon and blank value
Units of Measure	Shows the entities unit of measure

Performing a Manual Overwrite

1. Click on the ‘Manual Overwrite’ icon.
2. Click on the tree icon at the left site in the tool bar.
   The ‘Group/Tank’ window will appear.
3. Select a group from the tree view.
4. Select the tank you want to overwrite.
5. Select the entity you want to overwrite from the ’All Entities’ pane and click on Apply. The entity is now in ‘killed’ state and the ‘Current value’’Overwrite value’ field will be enabled.
6. Click on the ‘Stop Scan’ check box of the selected entity in the right pane means killed.The ‘Current value’ field will be enabled.
7. Click on the ‘Overwrite value’ field.
8. Enter the manual value.

9. Click on **Apply**.

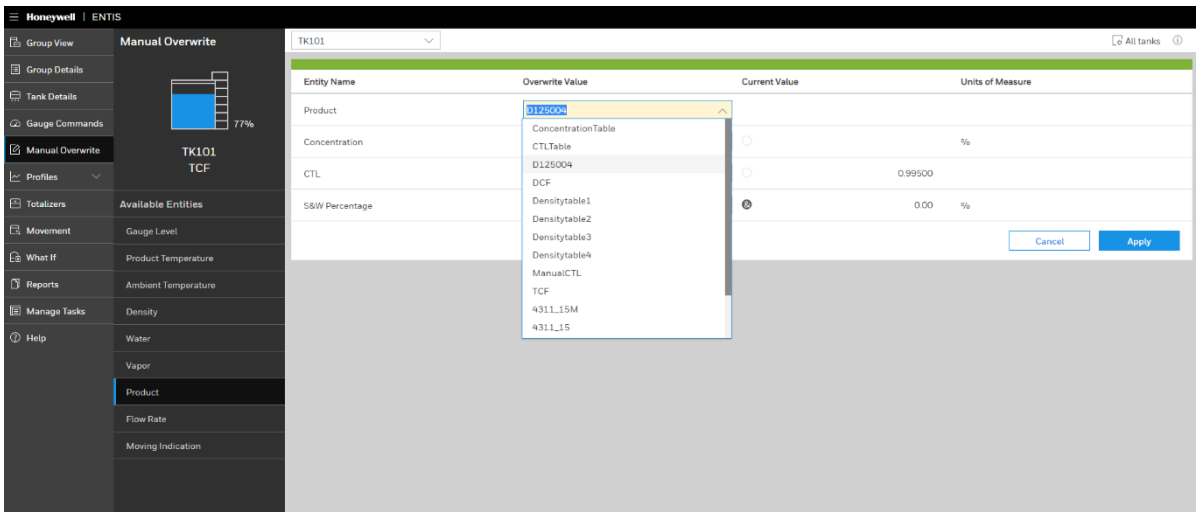


Figure 31 : Manual Overwrite Parameter

Before you begin entering data into the currently selected entity field, the field background will be white. After entering the value the background changes to yellow to indicate that you have made a change and not yet saved it.

If you want to save the entered values click on the Apply button.

Ambient Temperature overwrite can only be performed on tank number 1 of a given CIU.

The entities Sample Density, Sample Temperature and Hydro correction have a close relation. In the entity tree they are put on one line. In the data area they are always shown together (3 lines) but can be edited individually. However Sample Density and Sample Temperature must be edited as a pair.

For Sample Density, Sample Temperature and Reference Density, there are usage conditions present that are based on the calculation method selected for the product.

The Product entity can be manually overwritten with another Product from the Product Database that is configured by the CIU888 Service Tool. The Concentration and S&W percentage entities can be overwritten if they are supported by the calculation method configured in the product.

PROFILES

The primary Profiles usage is to create profiles for a selected tank and to show a graphical display of the density and/or temperature variation of the product in a tank.

The user has a number of options to generate profiles such as:

Density profile:
Used to measure the observed density.

The 854 or 954 servo gauge is commanded to start a density measurement.

The density measurement moves the displacer through the product in the tank, and determines the density at 10 equidistant points if a 854 gauge is connected, and up to 50 equidistant points if a 954 gauge is connected.

Temperature profile:
VITO probe connected to Radar or servo gauges will allow user to have temperature profiles on ENTIS, Number of temperature points configured in VITO associated at different level's will decide Average temperature in profile graph.

Density and temperature profile:
Determines a density and temperature profile for different product types in the tank.

Combined profile:
Measures the water interface, and determines a density profile.

Combined profile (Incl. Temperature)
Measures the water interface and determines a density and temperature profile.

Interface Profile
An Interface profile command starts a density measurement between two specified levels.

The interface profile measurement moves the displacer through the product in the tank and determines the density at 10 equidistant points if an 854 gauge is connected, and up to 50 equidistant points if the 954 gauge is connected between the two specified levels.

Display layout

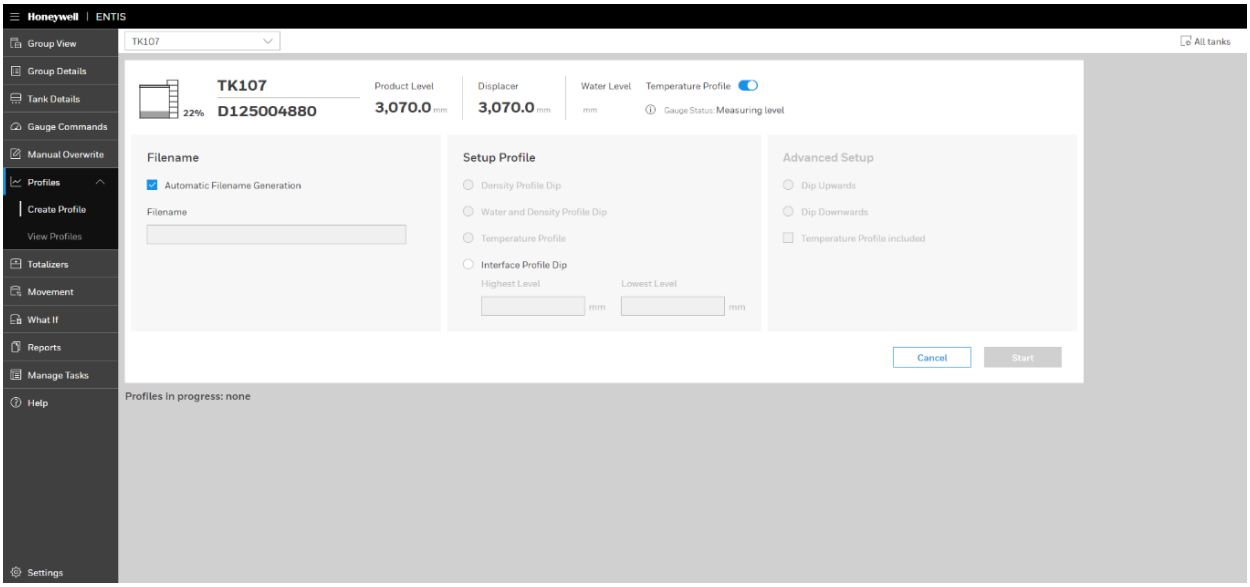


Figure 32 : Create Profile

This display has the following sections:

- At the upper part, tank data is displayed.
- In the middle part, the selection can be made for the type of profile to be created.
- At the bottom part, a progress window is displayed for each profile currently in progress.

How to create a profile:

1. Select Profiles | Create Profile
   This opens the Create Profile screen.

2. When using a user defined filename, uncheck the checkbox “Automatic Filename Generation”. This gives you the opportunity to enter your own filename in the edit box. By default, the checkbox is checked.
   In that case the filename is:
   [tankname]_yyyy-mm-ddThh-mm-ss.json

3. Select the required profile type (Density, Combined, Temperature, Interface); For an Interface profile, enter the Highest and Lowest level.

4. Select advanced data Upwards or Downwards (only for Density and Interface profile) and “Temperature profile included” (for Density, Combined and Interface)

5. Select advanced data Upwards or Downwards (only for Density and Interface profile) and “Temperature profile included” (for Density, Combined and Interface).
6. Click on **Start**.
   The profile command will be sent to the CIU888;
7. When the profile is ready, this will be indicated by a popup dialog:

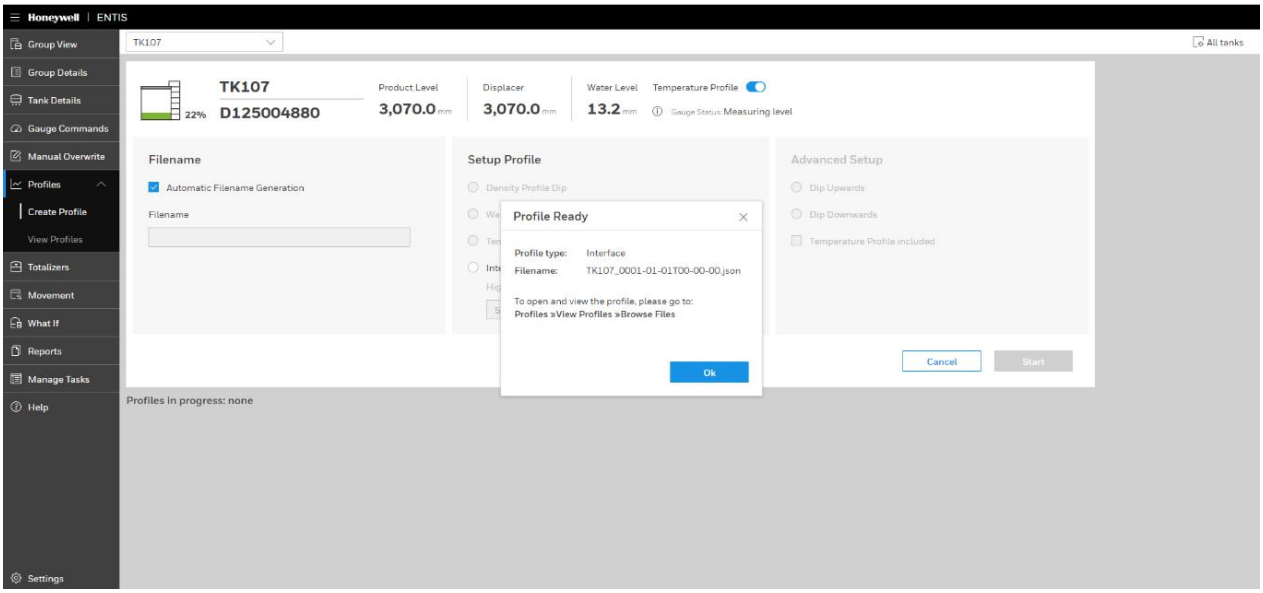


Figure 33 : Profile Ready

Viewing a profile:

1. Select Profiles | View Profiles
   This opens the View Profiles screen
2. Click on Browse Files.
3. In Filters, select whether you want to see all profiles, or only certain types (Density, Combined, Temperature, Interface)
4. In Filters, update the date range as required
   (by default, it shows the profiles from the last week)
5. From the list of profiles, select the profiles you want to view.
6. Click Open:
   The selected profiles are displayed.

Profile screen examples

Temperature Profile

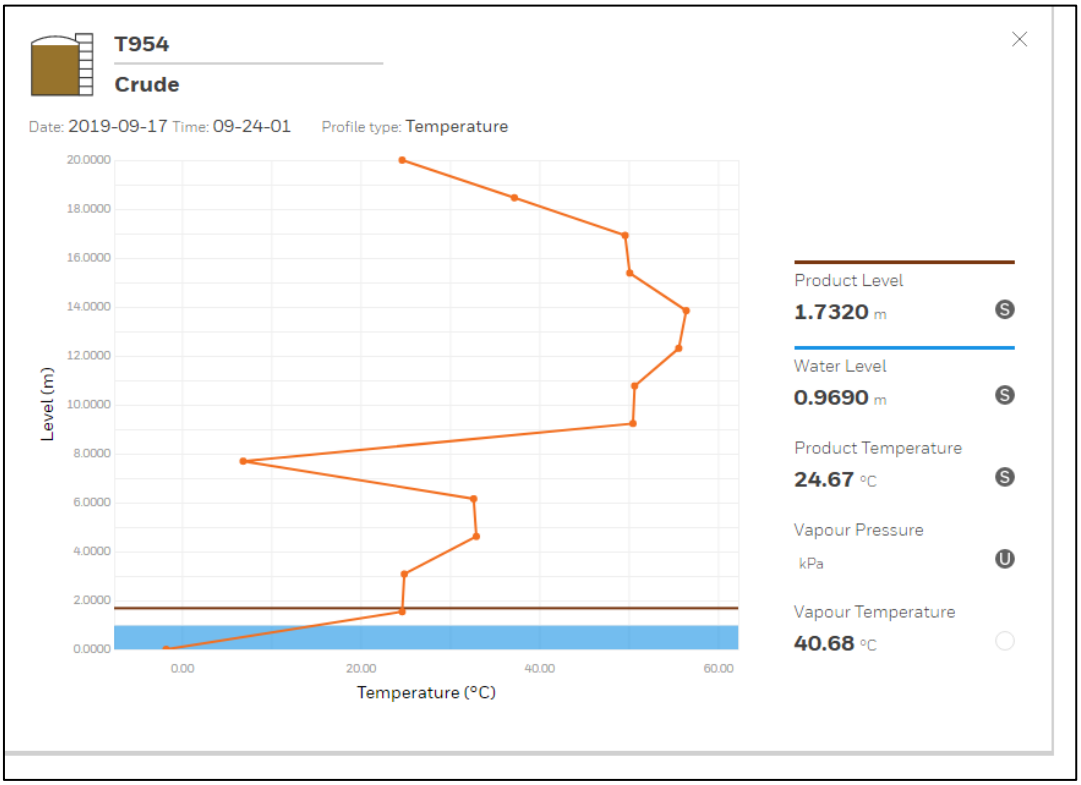


Figure 34: Temperature profile

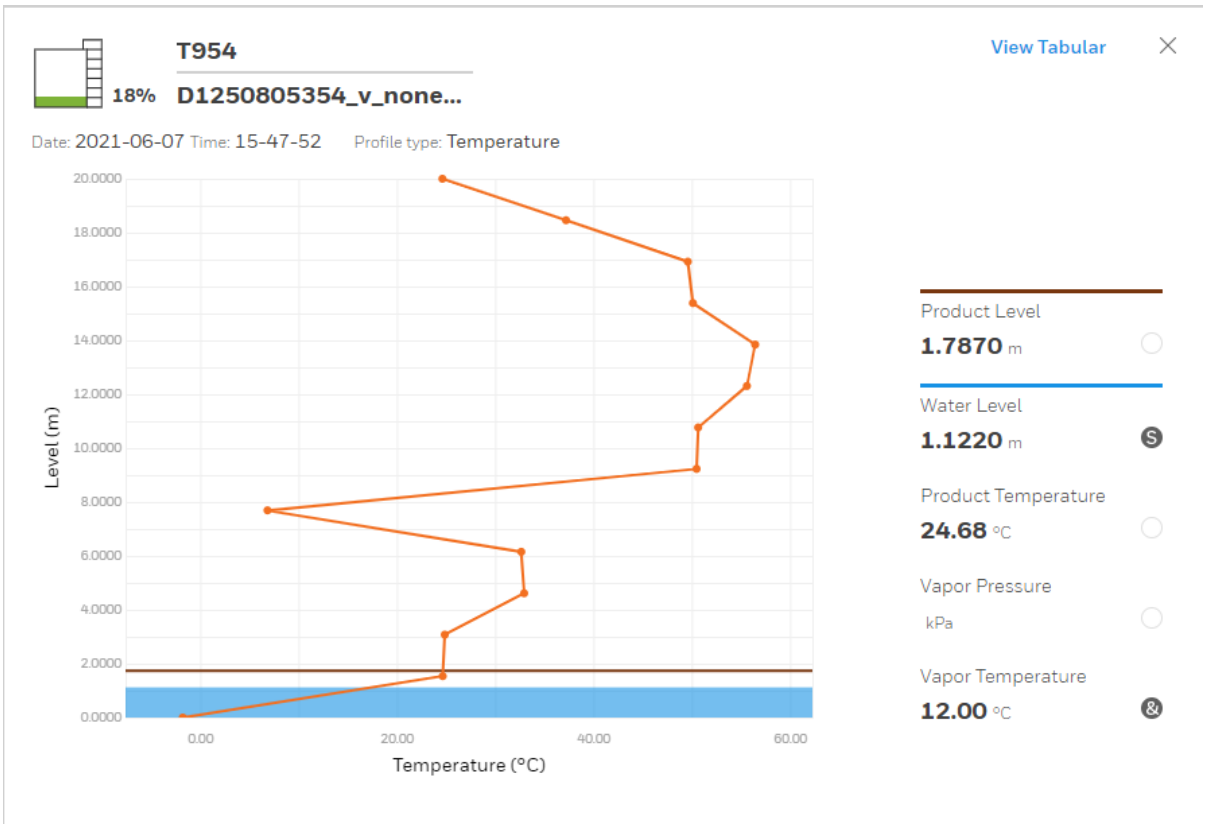


Figure 35 : Temperature profile – Graph view

Profile

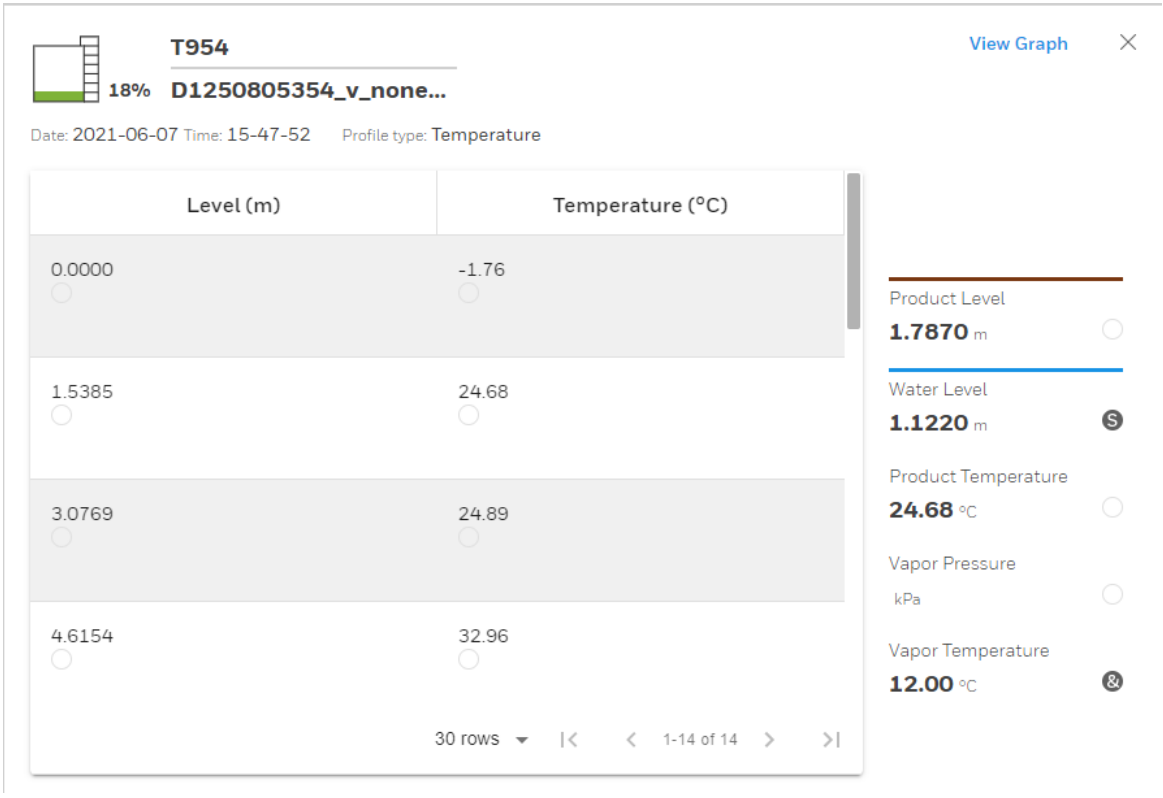


Figure 36 : Temperature profile – Tabular view

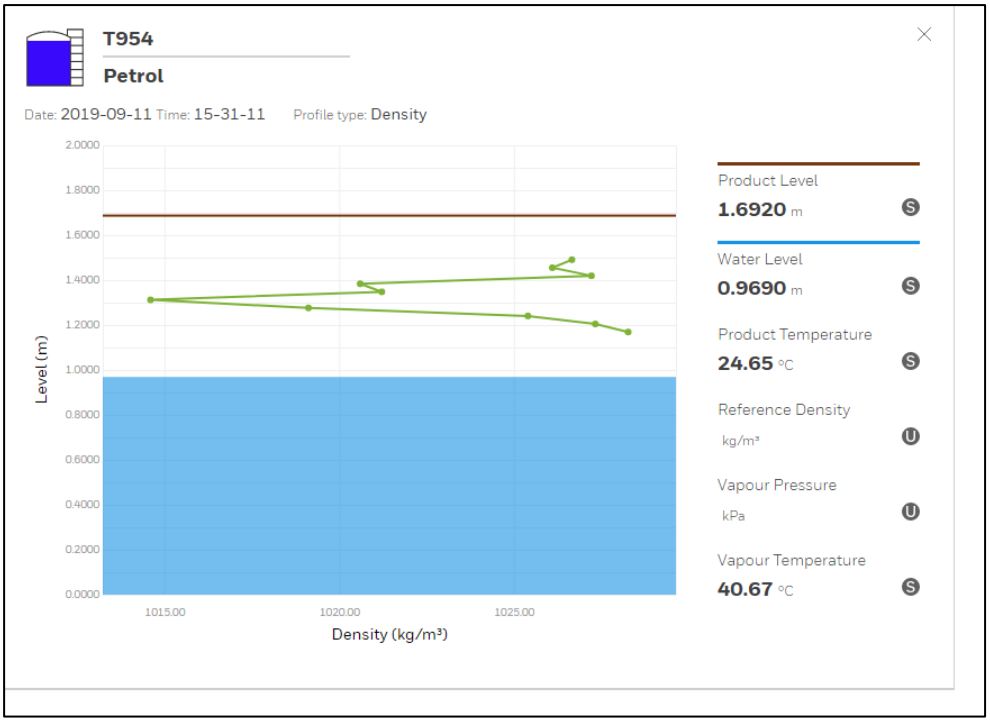


Figure 37: Density Profile

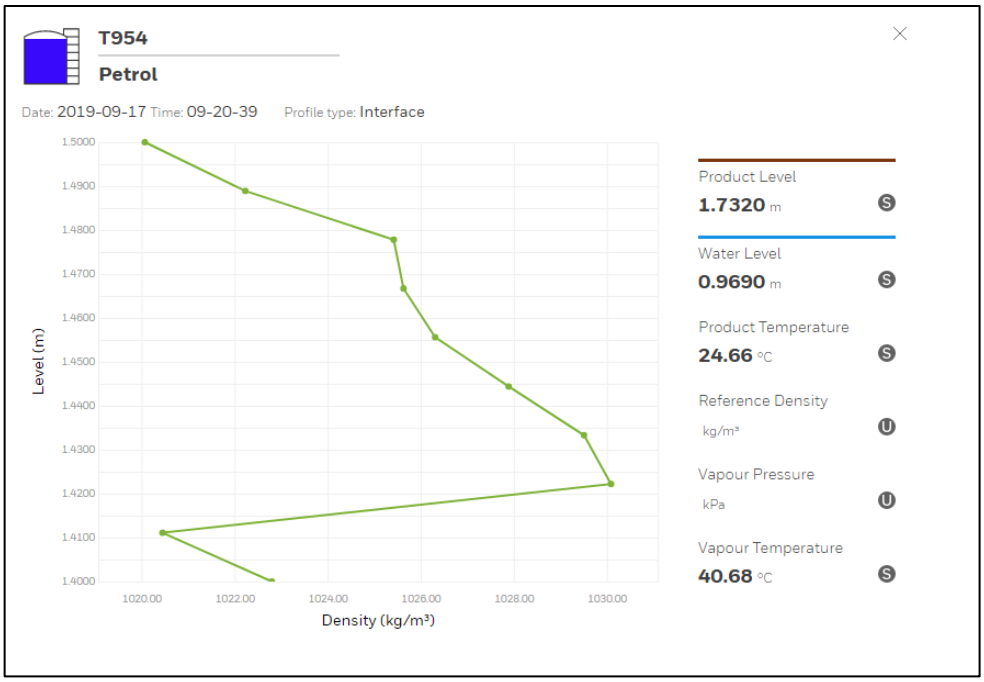


Figure 38: Interface Profile

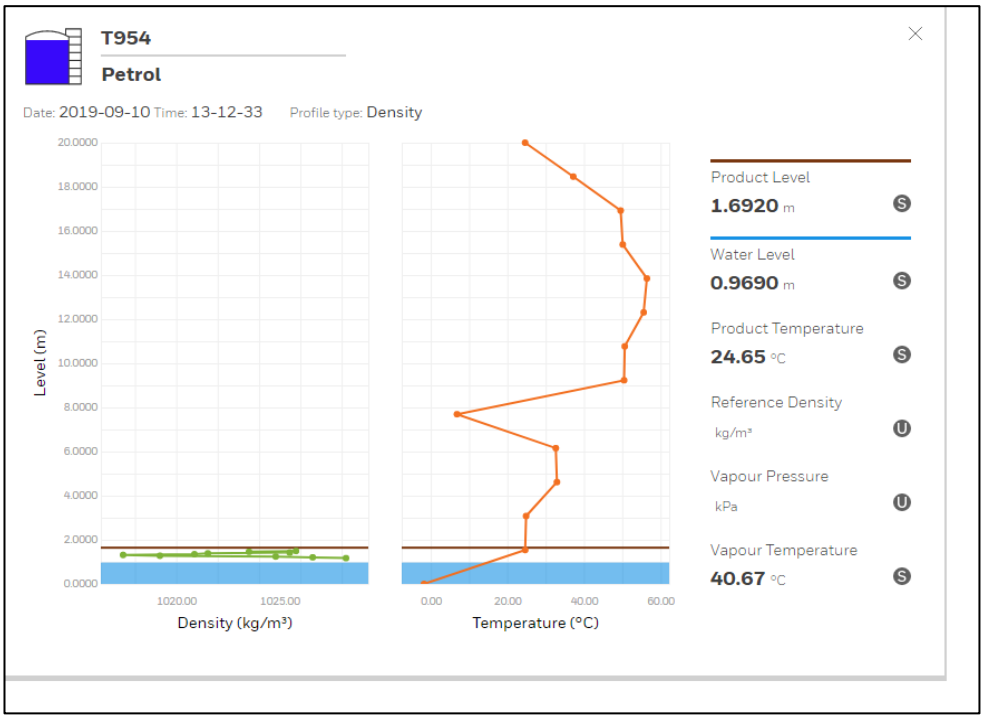


Figure 39: Density and Temperature profile

Profile

Figure 40: Density profile

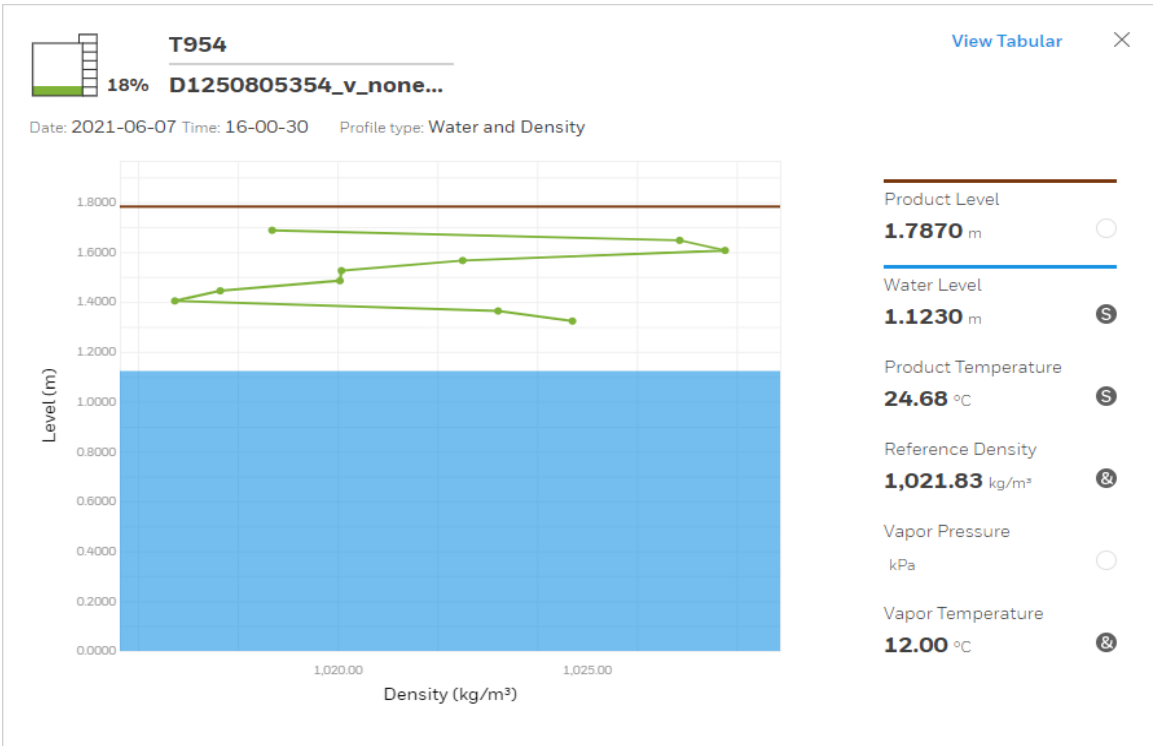


Figure 41 : Combined profile – Graph view

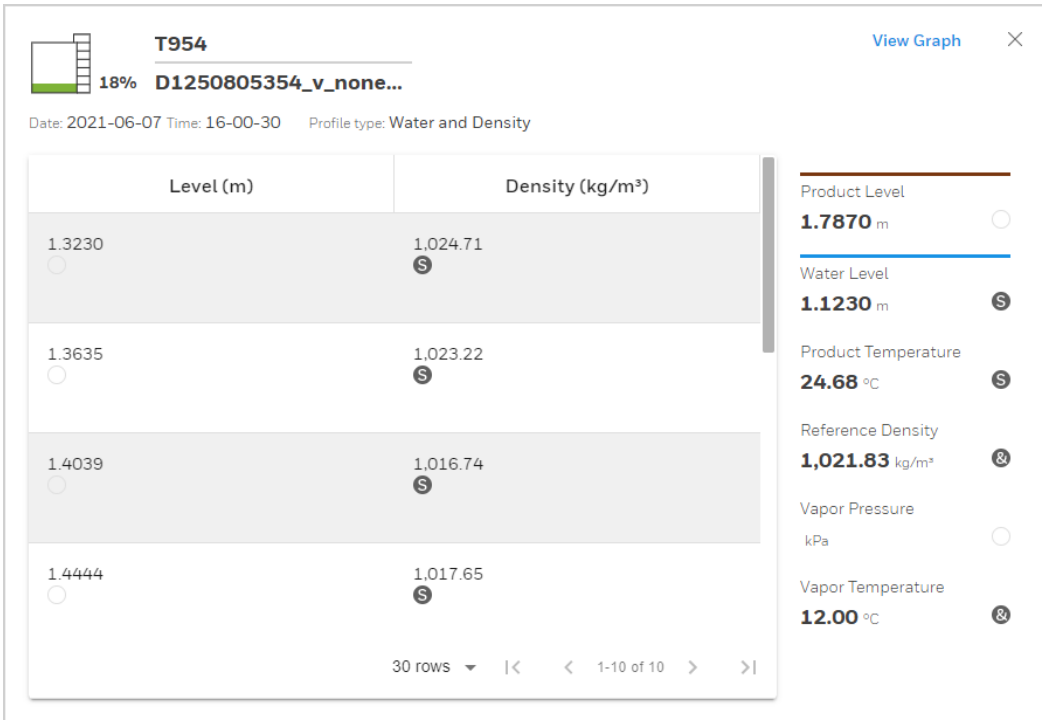


Figure 42 : Combined profile – Tabular view

MOVEMENT

Movement is a licensed feature in ENTIS. The base offering does not have movement feature.

Simple movement

If the user has Simple movement license, using the Movement screen, a user can calculate and set a movement:

- From/to a selected tank, or
- Between two selected tanks.

It displays the current measurement values for the selected tanks, the expected values after the movement has completed, and verifies whether the movement is possible depending on the current tank status, available space, product type etc.

How to access the Movement screen

1. On the main application menu, select the **Movement** option.

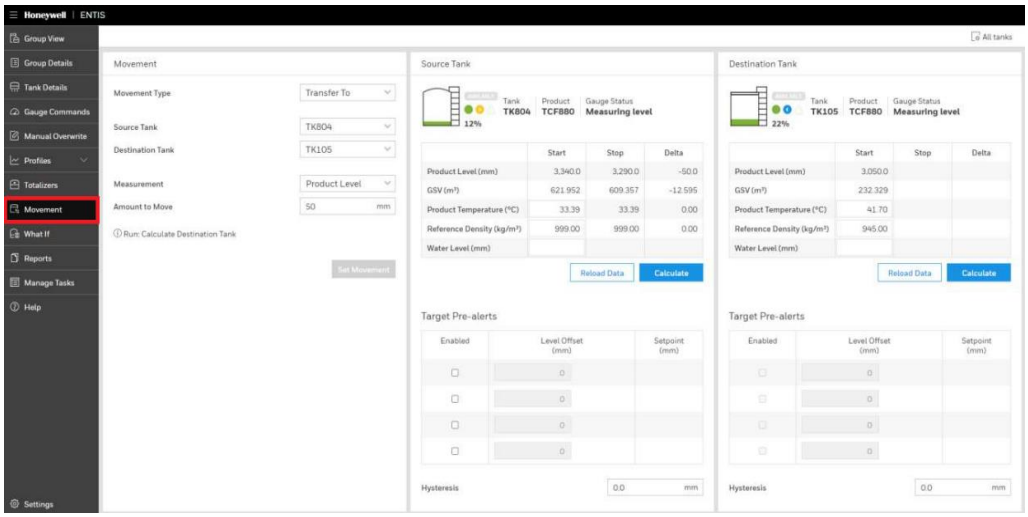


Figure 43 : Movement option in main application menu

2. Click on the **Movement** menu item, or the **Movement** icon in the tool bar.

3. On the Group Details screen, click on the row menu (denoted by 3 dots after the tank name) and select the Configure Movement option, which will take you to the Movement screen, where the current tank will have been selected as the Source Tank:

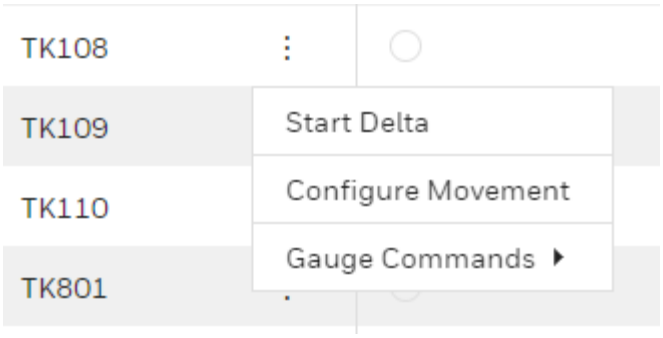


Figure 44 : Configure Movement option in Group Detail screen

4. Or, on the Group View screen, click on the context menu (denoted by 3 dots in the top right corner of a tank tile) and select the Configure Movement option, which will take you to the Movement screen, where the current tank will have been selected as the Source Tank:

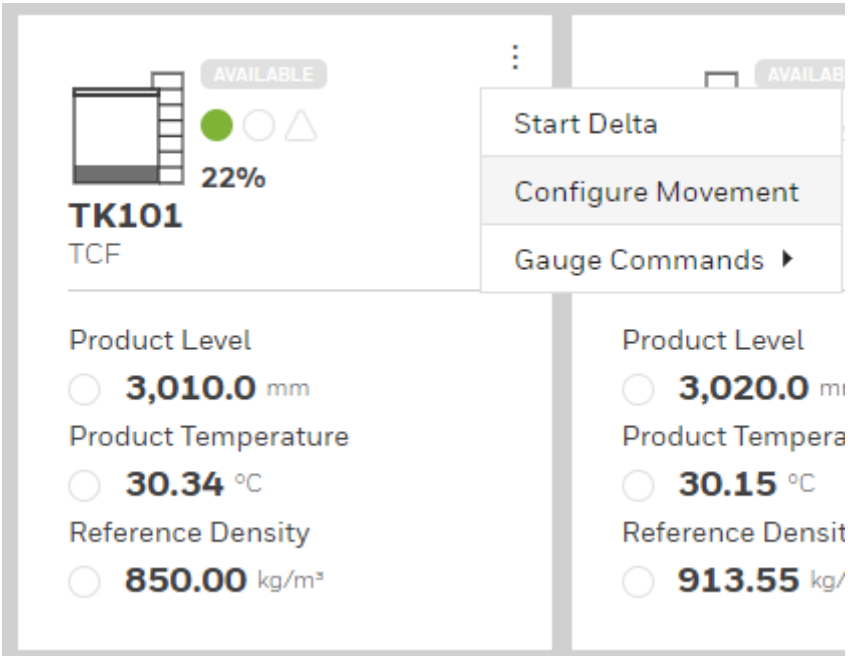


Figure 45 : Configure Movement option in Group View screen

The screen contents

The screen is divided into 3 vertical sections:

- Movement,
- Source Tank,
- Destination Tank.

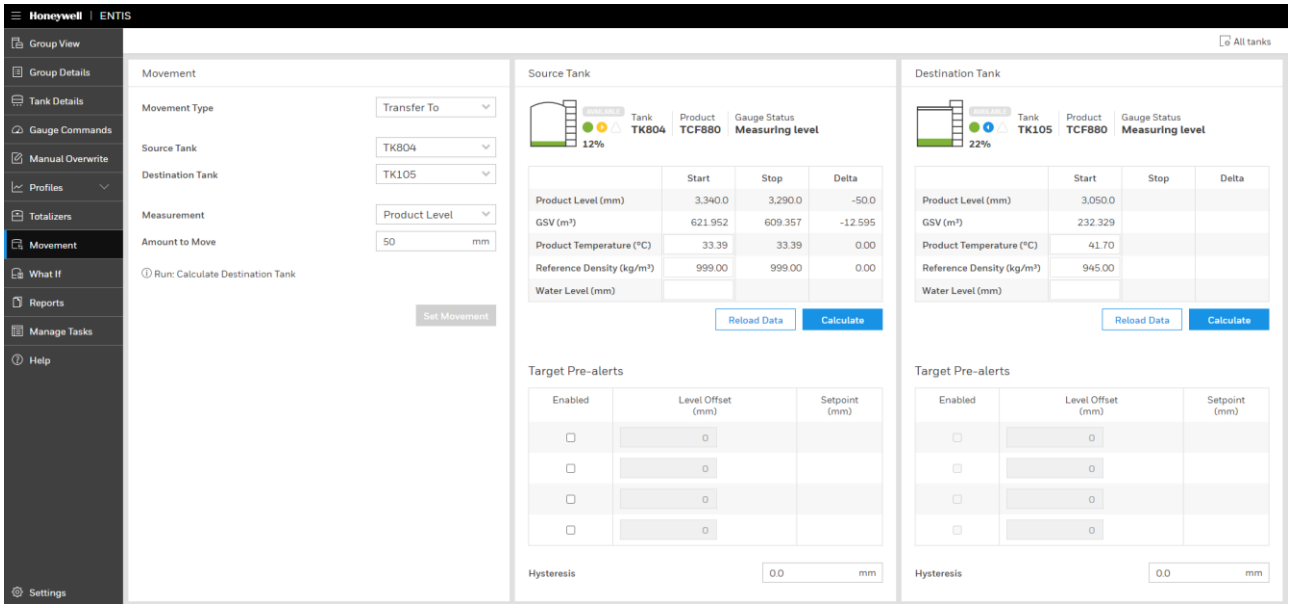


Figure 46 : Simple movement configuration

Source Tank and Destination Tank will be disabled if no Movement Type has been selected.

Movement Types that can be selected are listed below along with the direction of flow:

Table 4 : Movement

Movement Type	Source direction	Destination direction
Receive	In	-
Load	Out	-
Transfer To	Out	In
Fill	In	-
Fill From	In	Out
Empty	Out	-
Empty To	Out	In

For the movement types Receive and Load, only a Source Tank can be selected.

Measurements that can be selected are:

- GOV,
- TOV,
- GSV,
- NTSM,
- NTSW,
- Product Level.

Validations and information messages

The Calculate and Set Movement buttons will be enabled or disabled depending on the selected parameters, entered values, current tank status, and the calculation results.

An information or error message will be displayed at the bottom of the Movement section to guide you through the process, such as:

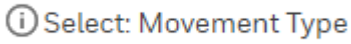


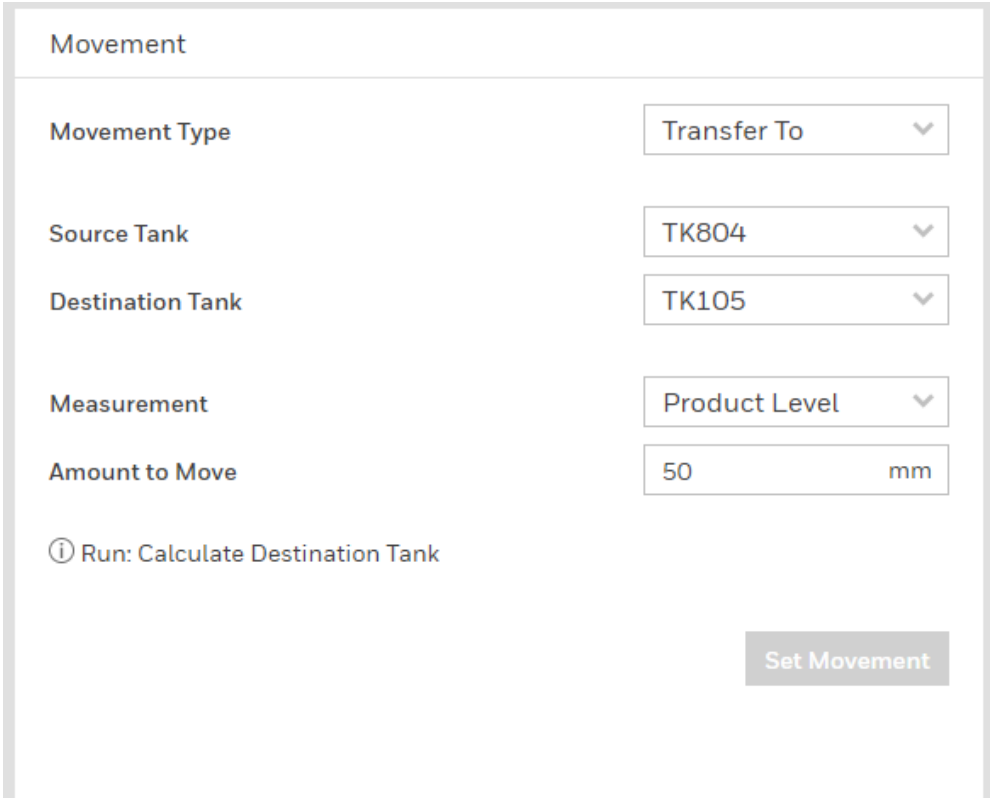
Figure 47 : Information message

Step 1: Select the Movement Parameters

Select:

- A Movement Type,
- The Source Tank, and if applicable, also the Destination Tank.
- The preferred Measurement,

and enter the required Amount to Move, as in the following example:



The right units will be displayed depending on the selected measurement and the parameter type.

The current status of the selected tanks or tanks will be displayed, as in the following example.

The current and target levels will be displayed for: product level, GSV, the selected measurement, product temperature, reference density and water level. These last three can be adjusted by the user.

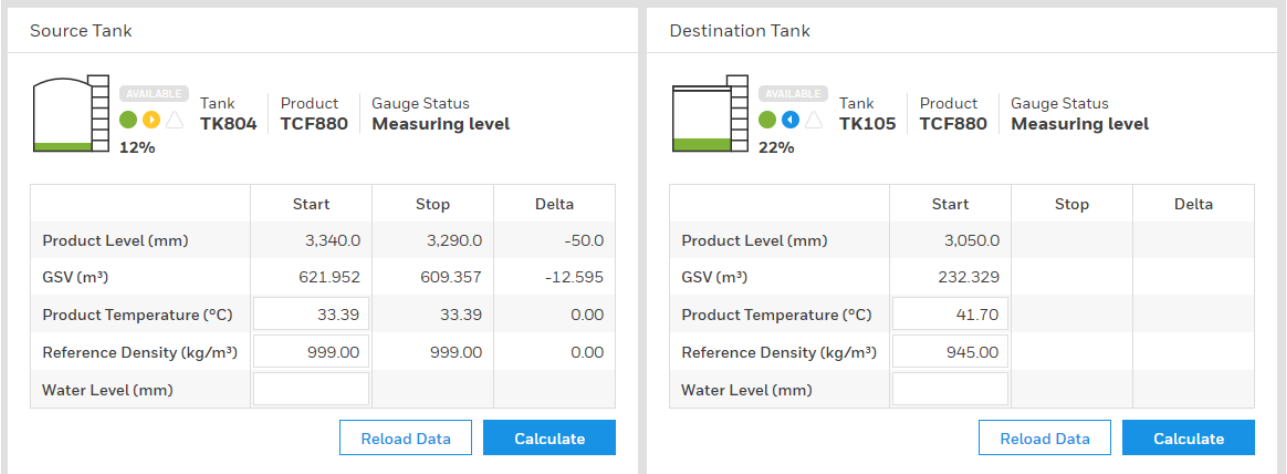


Figure 48 : Source and Destination tank calculations

Step 2: Calculate Source

Click the Calculate button in the Source Tank selection.

After a few seconds, the calculated target values will be displayed in the column under the label “Target”.

If the calculated values are valid, the Calculate button in the Destination Tank section will be enabled.

Step 3: Calculate Destination

Click the Calculate button in the Destination Tank section.

Identical to the Source the Target values for the Destination will now be calculated.

If the calculated values are valid, the Set Movement button is enabled.

Step 4: Target Pre-alerts

Optionally, after each tank’s calculation has succeeded, you can enter and enable up till 4 alerts for the desired level offsets. The corresponding setpoints will be calculated and displayed. An alert will be triggered when each setpoint is reached.

You can also enter a Hysteresis value for the alerts for each tank, in order to avoid repeated alerts on each setpoint due to small up and down changes in the tank during the movement process.

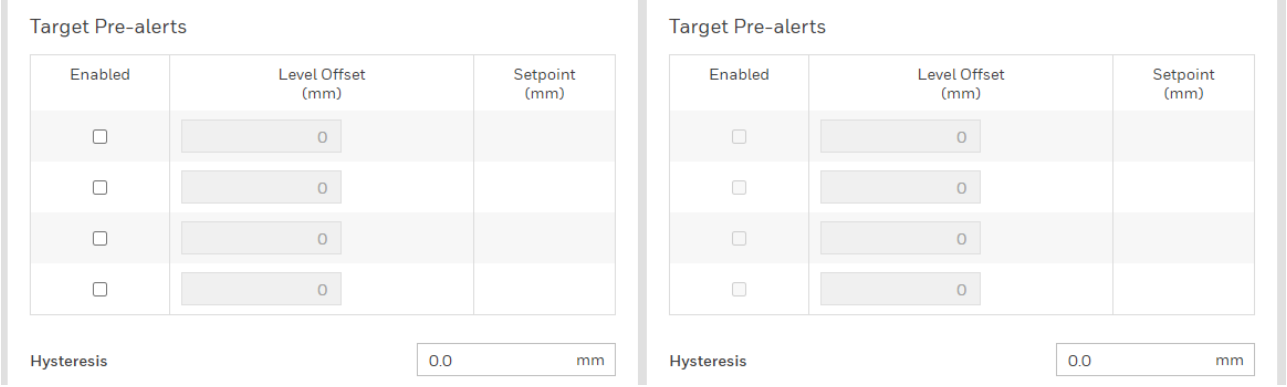


Figure 49 : Target Pre-alerts

Step 5: Set Movement

When you have selected all the parameters you require, you can click the Set Movement button.

The movement will then be set on the selected tank or tanks. The movement progress can be followed on the Group Details or Group View screen.

Advanced movement

Advanced movement is available if the user has purchased the Advanced Movement license. Advanced movement is used for calculating and setting up movements. There can be a movement configured between a tank and an object/tank, multiple tanks and an object/tank, or one tank/object and multiple tanks.

Advanced movement can be configured from the Configure Movement dialog window, which can be launched by any of the following methods:

1. In the left pane, click Movement, and then click **New Movement** as shown in the following figure.

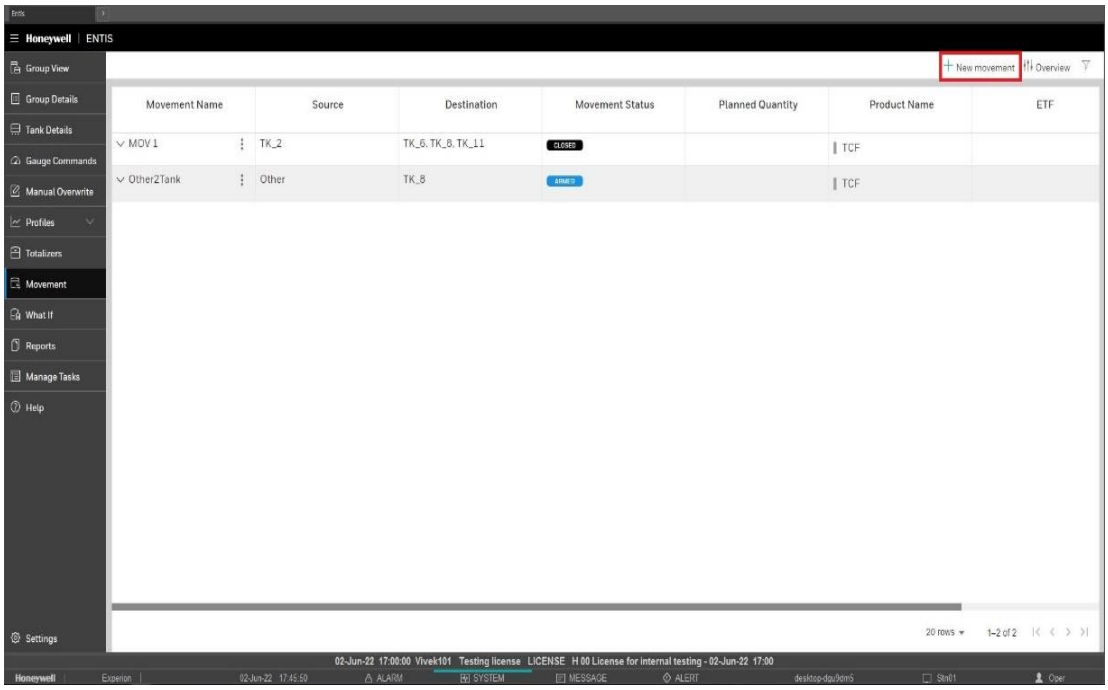


Figure 50 : Advanced Movement Main Screen (New Movement)

2. On the Group or Group Details view, click the vertical ellipsis icon next to a tank to open the Context menu, as shown in the following figure. Click **Configure Movement**.

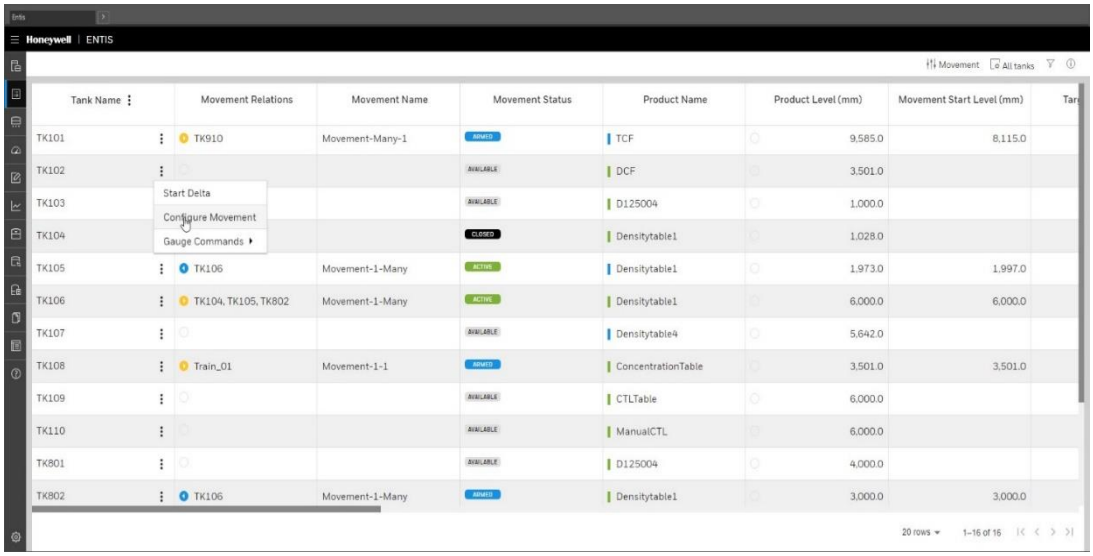


Figure 51 : The context menu on the Group View screen

The Configure Movement window appears as shown in the following figure.

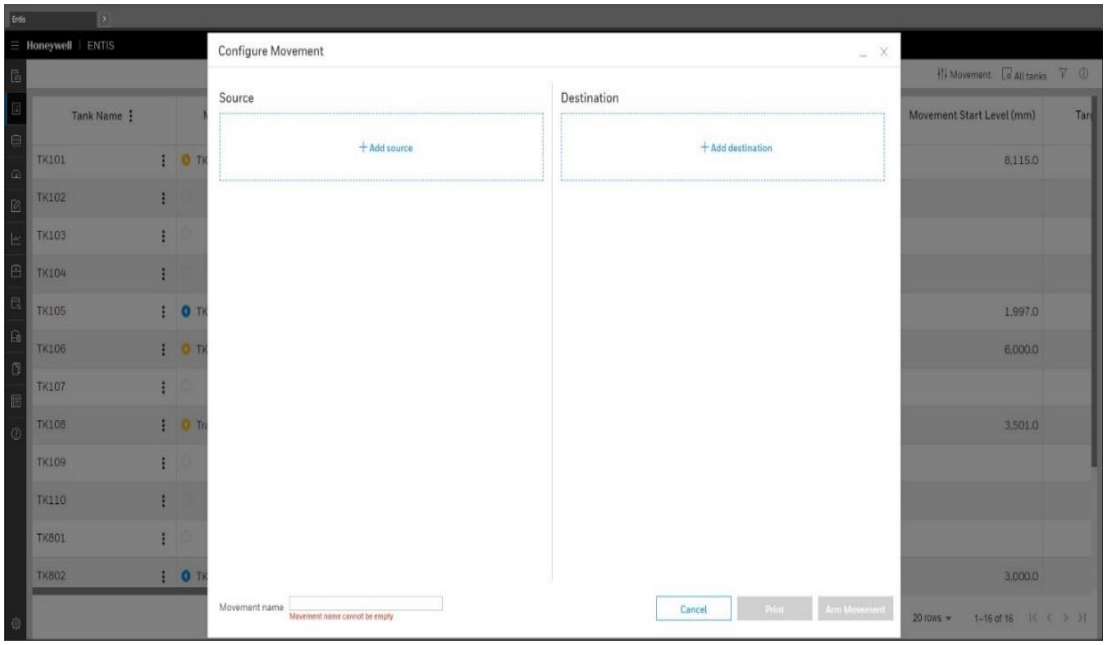


Figure 52 : Configure Movement window

Configure Movement

The Configure Movement window consists of three sections:

Source Section

The left side of the window is the source – from where the product is taken.

Destination Section

The right side of the window is the destination – from where the product is transferred to.

Bottom Section

Additionally, at the bottom of the window, you can name a movement and perform actions such as Cancel, Print, and Arm Movement.

From Source/Destination sections, the user can select the transfer object, movement type, measurement and enter quantity to move. It is possible to calculate target values, reload data, add infra pipes, configure target pre-alerts and perform other actions.

Type of movements

There are three types of movements:

One to one

A one-to-one transfer can be a configured between a tank and an object or a tank that has the same product and is not in movement.

Figure 53 : One to one transfer

Many to one

Many-to-one transfers can be configured between many tanks and a tank or an object. All tanks must contain the same product. Thus, the dropdown box will filter out tanks that do not have the same product.

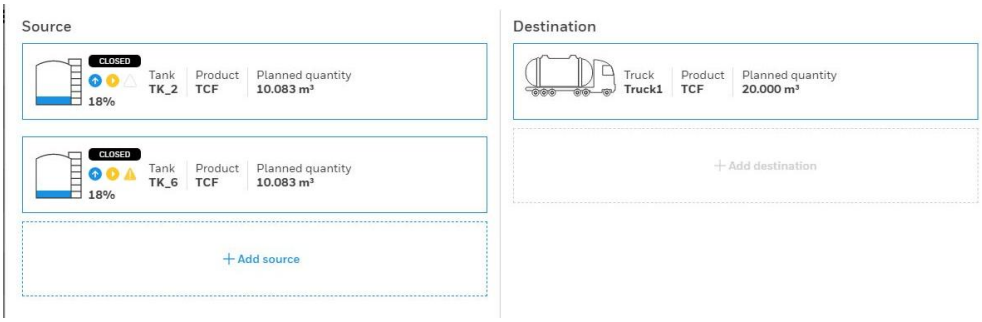


Figure 54 : Many to one transfer

One to many

A one-to-many transfer can be configured between a tank or an object and many tanks. Here, the source is one tank or object with many tanks for the destination. The same rules apply as for many to one transfer.

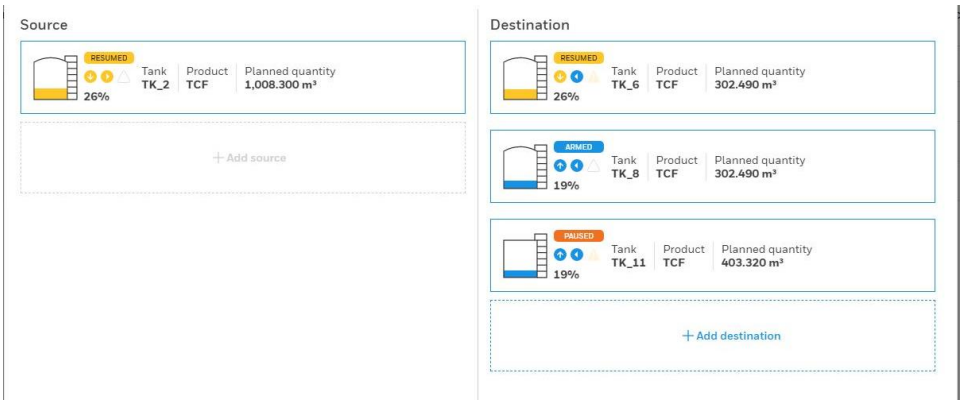


Figure 55 : One to many transfer

Steps to configure Advanced movement

1. **Name the movement**

   The user should give the movement a name in the input at the bottom of the window. The movement cannot be armed or printed without providing a movement name. If the **Movement Name** field is blank, an error message is displayed.

2. **Add Source and Destination objects**

   The user must add source and destination. To add a source or destination, click the **Add source** or **Add destination** button that is present in Figure 52 : Configure Movement window. The following figure is displayed after adding source/destination.

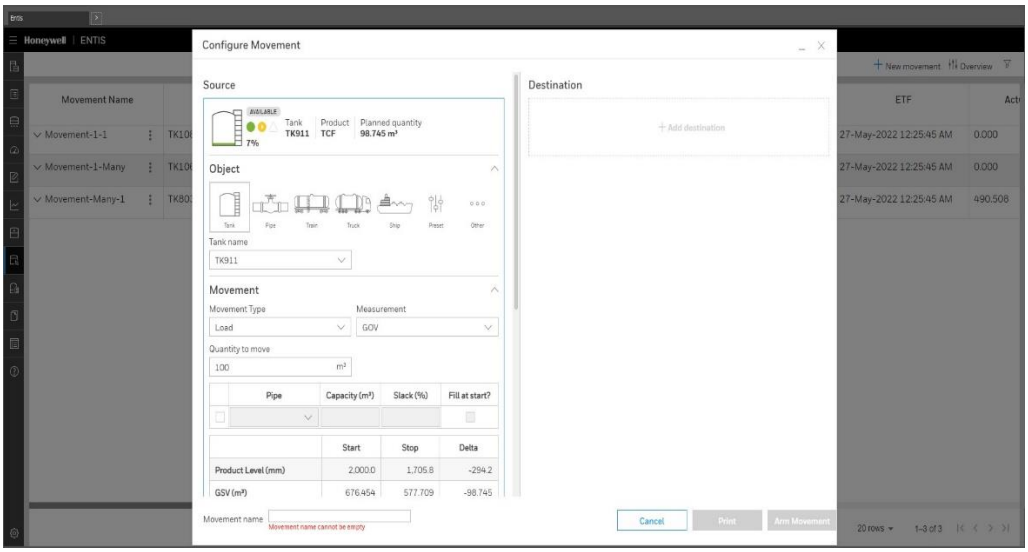


Figure 56 : Advanced movement with the source being configured

Transfer Objects consist of the following sections:

Object Details Section

The icon representing the selected object type, the name of the object, the product, and the planned quantity are displayed in this section. If the selected object type is a tank, in addition to the tank icon, the tank status, measurement values, and icons as mentioned in the tank icons section of Group View can be seen.

The planned quantity for tanks is the Delta value of the selected measurement calculated using the quantity to move. The quantity to move is the planned quantity for the other object types.

Figure 57 : Object Details Section

Object Selection Section

The user must first select the object type. The available object types for selection are Tank, Pipe, Train, Truck, Ship, Preset, and Other.

Figure 58 : Object Selection Section

If **Tank** is selected, all the tanks that are not in movement are listed in the dropdown box from which the user can select the required tank. Note that if the Configure Movement Dialog Window was launched by clicking on the tank's context menu in the Group View or Group Details, that tank is automatically selected in the dropdown box. The user has the ability to change the object at any time before clicking the "Save" button. However, all filled in details will be reset upon switching objects.

If Preset is selected, all the user-created movement objects, except movement objects of type infrastructure pipe, will be listed in the dropdown box.

For the rest of the object types, namely Pipe, Train, Truck, Ship and Other, the user should input a name.

Movement Section

The next step in configuring a movement is to fill the details in the Movement section.

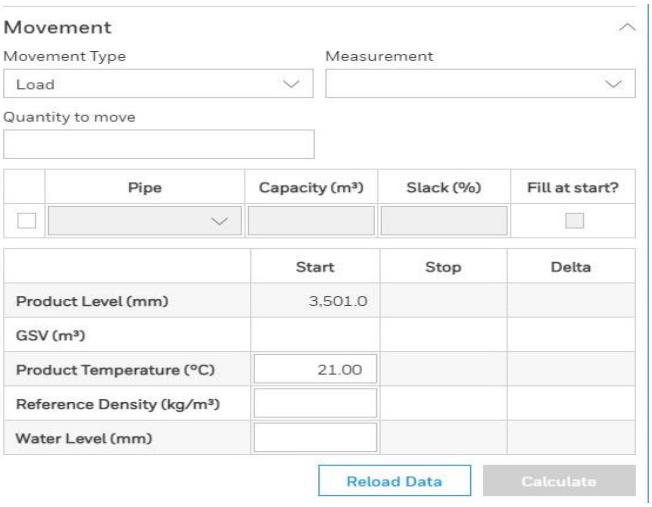


Figure 59 : Movement Section

1. The Movement type can be selected from the dropdown box. On the source side, the user can select “Load” or “Empty”. On the destination, the user can select “Receive” or “Fill”. For “Empty” and “Fill” movement types, the measurement and quantity are set automatically and can’t be changed.

2. The user can select “GOV”, “TOV”, “GSV”, “NTSM”, “NTSW”, “Product Level”, “Absolute GOV”, “Absolute TOV”, “Absolute GSV”, “Absolute NTSM”, “Absolute NTSW”, or “Absolute Product Level” as the Measurement.

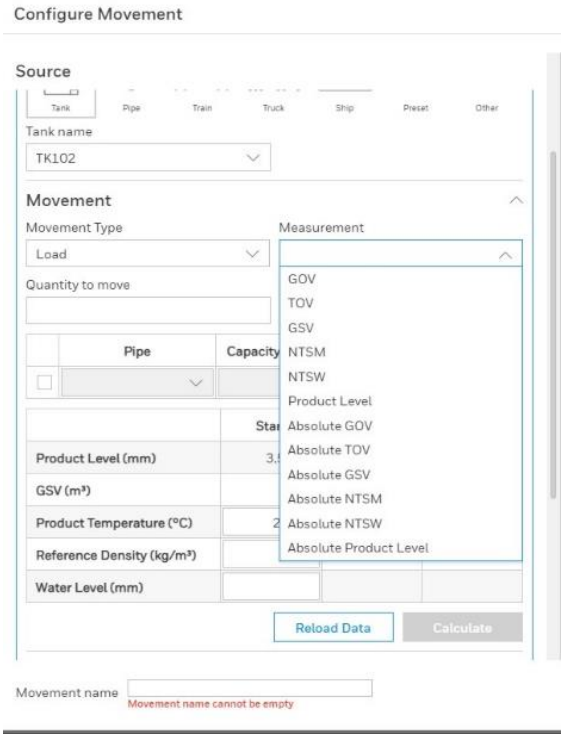


Figure 60 : Various Measurements

3. For the Quantity to move, user can enter the desired amount to move. The right units will be displayed depending on the selected measurement and the parameter type.
4. Optionally, the user can add infra pipelines to the movement configuration. Infra pipelines are explained in detail the next section.
5. If the object type is tank, the tank table can be seen, and it displays the Start, Stop, and Delta levels for: Product level, GSV, the selected Measurement, Product temperature, Reference density, Water level, and Total Pipe Volume. Product temperature, Reference density, and Water level can be adjusted by the user. If infra pipe is added, Total Pipe Volume can be seen. The Start Column data is populated as per the tank selected.

The user is required to click the “Calculate” button, which calculates the outcome of the movement and populates the result in the Stop and Delta columns of the tank table.

The Delta Value is the difference between the Start level and the Stop level. The Delta values of Objects on source side will have negative as the product is been taken out and objects on the destination side will have positive Delta values as product is added into them. “Calculate” button will be disabled, if tank, Measurement or Quantity to move details are not availabe.

Figure 61 : Tank table in Movement Section

Target Pre-alerts Section

Optionally, the user can configure the target pre-alerts by selecting the measurement and filling in the offset and hysteresis after each tank’s calculation has succeeded. Up to four pre-alerts can be added for the desired level offsets. The corresponding setpoints will be calculated and displayed. An alert will be triggered when each setpoint is reached. To avoid repeated alerts on each setpoint due to small up and down changes in the tank during the movement process, the user can enter Hysteresis value for the alerts.

Figure 62 : Target Pre-alerts section

Finally, the user must save the object. The “Save” button will not be enabled in case of validation or calculation error. Object Selection, Movement Type, Measurement, and Quantity to Move must be filled. If the object type is tank, the calculation should be successful.

Note that the user can also cancel or delete the movement configuration and start over.

Repeat the same steps to configure the other side of the movement in order to make a valid movement configuration. An example of many to one can be seen in the Figure 63: Advanced movement example.

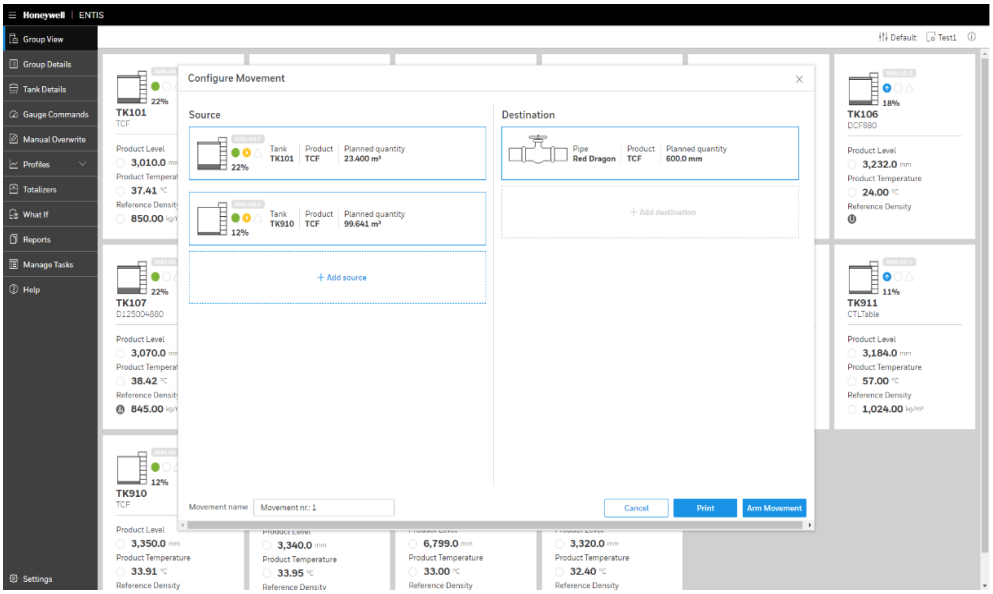


Figure 63 : Advanced movement example

Validation, errors and informational messages

There are two types of messages. The first type is a validation message. These messages are for individual inputs. The second type is an action flow error or guidance information. These messages inform the user of what should be done while configuring the movement.

Once data is entered, the user might see validation messages when the entered value is incorrect. For individual input, validation messages will appear below the input. Validation message will appear in red color.

The second type of message will appear above the action buttons. That is, above the “Delete” button. This message will be in red or gray, with an “i” icon on the left. This type of messages will inform the user about flow errors or guide the user through the process of configuring the movement. It will suggest what to do next.

3. Print the Movement

When the movement is configured, the user can make a report and print it by clicking the “Print” button. Once the button is clicked, the user will be presented with another window that contains a PDF preview for the current configuration. See Figure 64: Advanced movement print preview. From there, the user can print the movement configuration.

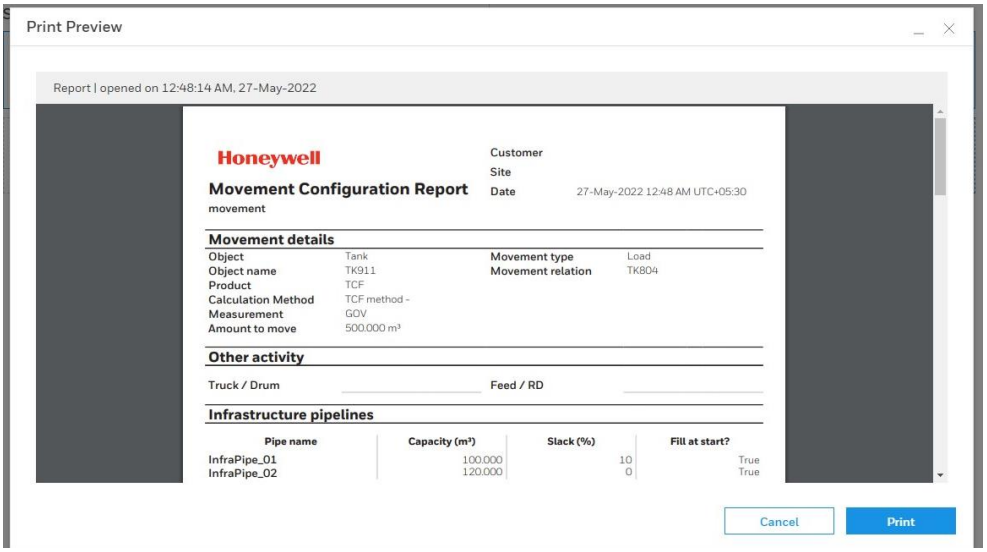


Figure 64 : Advanced movement print preview

Movement End Report

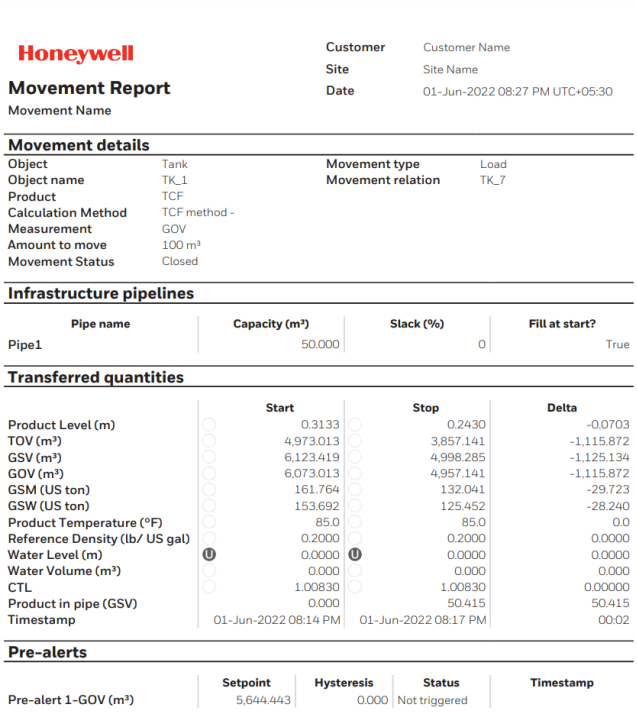
A movement end report can be generated from the Movement main screen once a movement is in the closed state. This report shows the summary of the movement along with all the transfers. The report data is based on the actual tank inventory snapshots captured at the start and end of the movement. Therefore, this report can only be generated for closed movements.

The report is structured into multiple pages where each page describes the summary of individual transfer objects. The first page of the report contains the summary of the transfer object, which is part of multiple transfers. This page describes the complete summary of the movement. Similarly, the other pages describe the summary of other transfer objects involved in the movement. Depending on the type of transfer object, each page of the report contains sections describing the movement details, infrastructure pipelines used, transferred quantities, and pre-alert status and timestamps if triggered.

Transfer objects which are of type ‘Tank’, include a section called “Transferred quantities” which contains three columns: “Start”, “Stop” and “Delta”. “Start” is a snapshot of the tank record when movement is Activated. “Stop” is the snapshot when the movement is Closed. “Delta” is the difference between Start and Stop.

For example, let's have a one-to-many movement from tank T101 to tanks T102 and T103. Since T101 is part of multiple transfer, the first page will have the summary of T101. If T103 is activated first and later T102 is activated, then the "Start" record for T101 is set when T103 is activated and the "Stop" record will be set when T102 is closed.

Movement End Report template



Honeywell

Movement Report
Movement Name

Customer	Customer Name
Site	Site Name
Date	01-Jun-2022 08:27 PM UTC+05:30

Movement details

Object	Tank	Movement type	Load
Object name	TK_1	Movement relation	TK_7
Product	TCF		
Calculation Method	TCF method -		
Measurement	GOV		
Amount to move	100 m³		
Movement Status	Closed		

Infrastructure pipelines

Pipe name	Capacity (m³)	Slack (%)	Fill at start?
Pipe1	50.000	0	True

Transferred quantities

	Start	Stop	Delta
Product Level (m)	0.3133	0.2430	-0.0703
TOV (m³)	4,973.013	3,857.141	-1,115.872
GSV (m³)	6,123.419	4,998.285	-1,125.134
GOV (m³)	6,073.013	4,957.141	-1,115.872
GSM (US ton)	161.764	132.041	-29.723
GSW (US ton)	153.692	125.452	-28.240
Product Temperature (°F)	85.0	85.0	0.0
Reference Density (lb/ US gal)	0.2000	0.2000	0.0000
Water Level (m)	0.0000	0.0000	0.0000
Water Volume (m³)	0.000	0.000	0.000
CTL	1.00830	1.00830	0.00000
Product in pipe (GSV)	0.000	50.415	50.415
Timestamp	01-Jun-2022 08:14 PM	01-Jun-2022 08:17 PM	00:02

Pre-alerts

	Setpoint	Hysteresis	Status	Timestamp
Pre-alert 1-GOV (m³)	5,644.443	0.000	Not triggered	

Figure 65 : Movement End Report template

How to Generate Movement End Report

When a movement is completely closed (all the transfers are closed), the "Generate report" option will be enabled for that movement.

To generate the Movement End report, perform the following steps:

1. Go to the Movement main screen.
2. Click the vertical ellipsis icon.
3. Click **Generate report**. This option is disabled for a movement in Closed state.

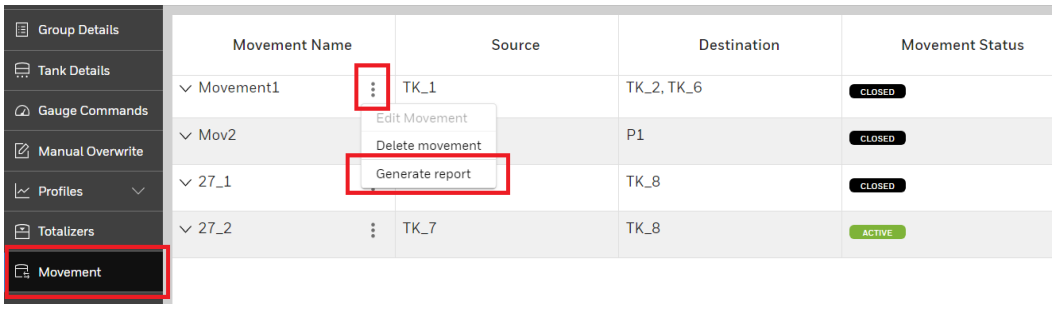


Figure 66 : Generate Movement End Report

The **Generate report** option is disabled for status other than “Closed” because for the transfers that are not Closed, the Movement will not have any Stop snapshot for the tank so, the report won’t be able to show the correct summary of the movement.

4. Arm the Movement

The user can arm the movement in the same way as they can print. The movement will be armed and the window will dismiss when you click the 'Arm Movement' button. A new row with movement details will be added to the Advanced Movement Main Screen. In the Group Details, the Movement Status is updated to Armed.

The user can now perform movement actions.

Note that once a movement is canceled, the movement state of the tank will be set to closed.

Movement Actions

The initial status of a configured movement is Armed. The user can perform movement action on the tank by clicking on the context menu of the tank in movement from Group View, Group Details, or Advanced Movement Main Screen (see Group Details context menu to activate movement).

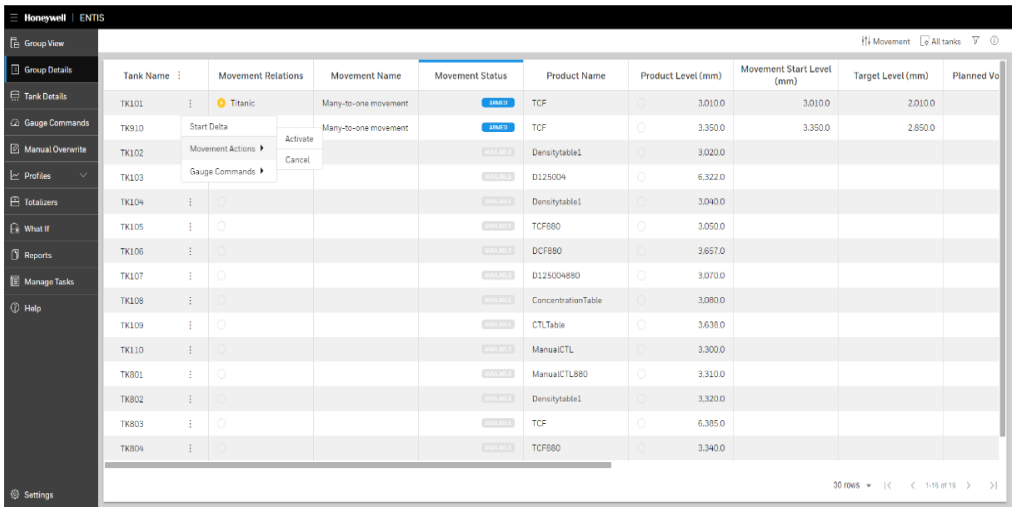


Figure 67 : Movement Actions when Movement Status is Armed

The user can activate or cancel an armed movement. Once activated, the user will see something similar to the Figure 68: Group Details screen with moving product. Also, once the movement is active, the user can pause and resume the movement from the same context menu.

Note that once a movement is canceled, the movement state of the tank will be set to closed.

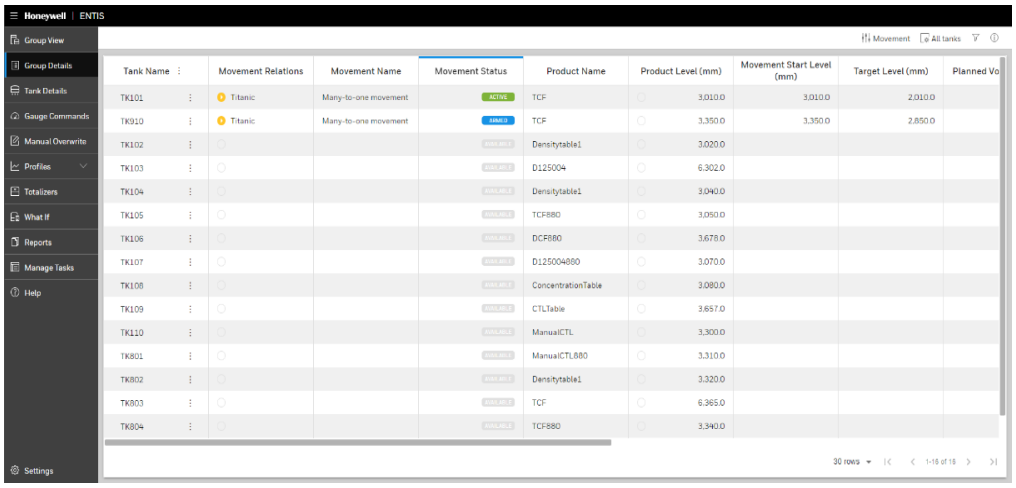


Figure 68 : Group Details screen with moving product

Edit Movement

A configured movement which is not closed/cancelled can be edited from the Edit Movement dialog window, which can be launched by any of the following methods:

1. Click on the **Edit Movement** button from the movement summary line in the Advanced Movement Main Screen as shown in the Figure.

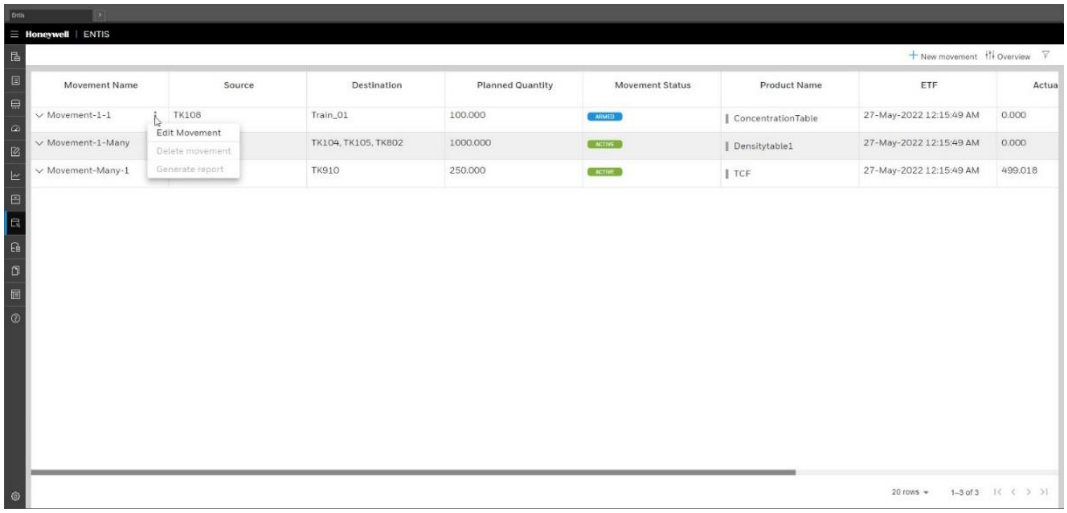


Figure 69 : Advanced Movement Main Screen (Edit Movement)

2. On the Group or Group Details view, click the vertical ellipsis icon next to a tank to open the Context menu as shown in the following figure.
   Click **Edit Movement**.

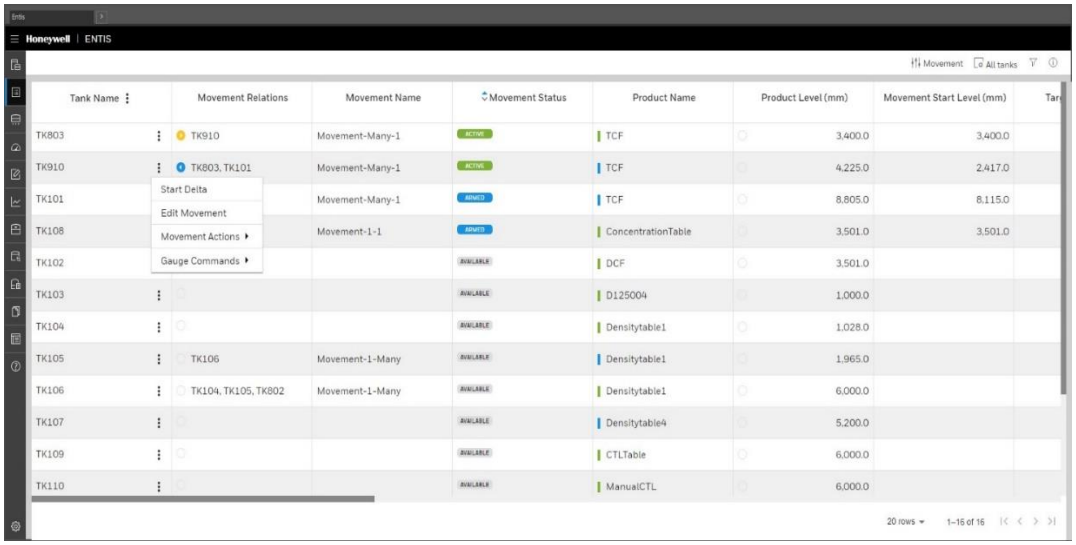


Figure 70 : A context menu in Group details

An Edit Movement dialog window, as seen in the figure below, opens with the movement data preloaded.

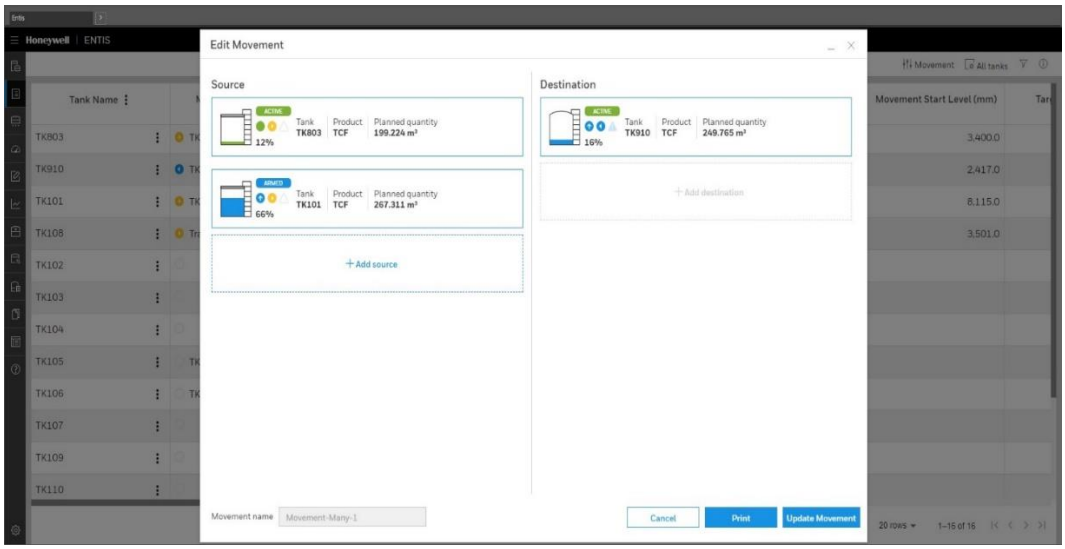


Figure 71 : Edit Movement with preloaded data

Using the Edit Movement Dialog Window, the user can perform the following:

1. If the movement is armed, edit Movement Type and Measurement.
2. Edit the Quantity to move, Infra Pipelines and Target Pre alerts.
3. Add new source object to a One to One or Many to One movement.
4. Add new destination to a One to One or One to Many movement.
5. If the source tank is in armed status, delete a source object in a Many to One movement.
6. If the destination is in armed status, delete a destination object in a One to Many movement.

While editing the source or destination object, any changes made in measurement, movement type, or quantity to move require the tank data to be reloaded and calculated once again.

Infrastructure Pipelines

The user can account for the volume of the transferred product in the physical pipe attached to the tanks using the infrastructure pipeline section in the source and destination object. This allows the user to visualize and report the volume of the product that may additionally be removed at the source object and the volume of the product that may additionally be added in the destination object.

Note: Infra pipes is a Movement object of type infra pipe that can be created from the Movement Objects tab in the Settings modal. The creation of movement objects is explained in the Settings section.

The infrastructure pipeline section can only be seen if the transfer object is a tank. By checking the checkbox, the user will be able to add infra pipes to the transfer object. Also, clicking on the checkbox also adds an additional row “Total Pipe Volume” tank table.

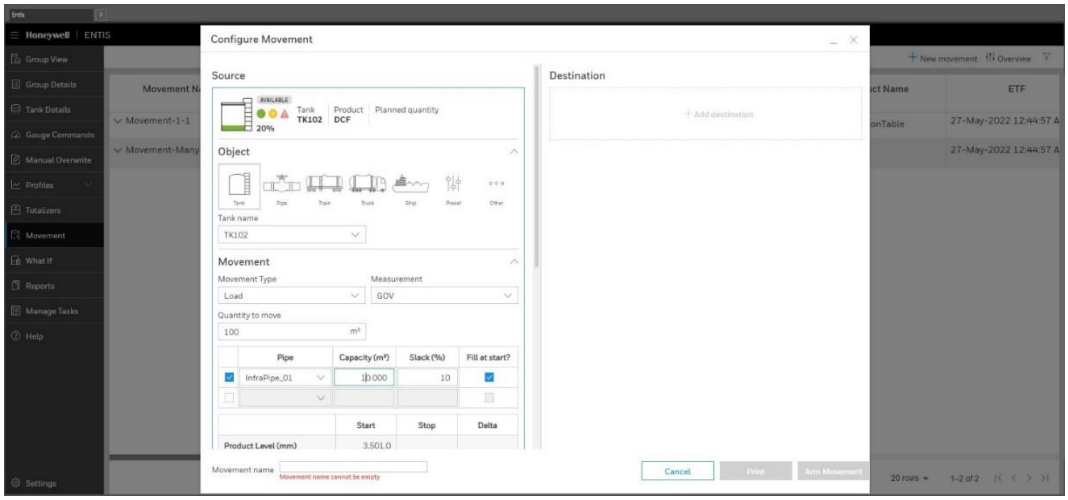


Figure 72 : Infra Pipe added in Configure Movement

Each infra pipe row has the following fields:

Pipe

The user can select the infra pipe attached to the tank from the dropdown box that lists all the Movement Objects of type infra pipe that are not already selected. Once an infra pipe is selected in source side, it will no longer be available for selection in the source side. Similarly, an infra pipe selected in destination side will no longer be available for selection in the destination side.

Capacity

Once the infra pipe is selected, the capacity input field is automatically populated with the capacity entered during the creation of the Movement Object. However, the user can make changes to the capacity.

Slack

The user can also input the slack percentage, which would be the space allowed in the infra pipe.

Fill at start

The "Fill at start checkbox" can be seen only on the source side. The user can check the box to indicate if the infra pipe should be filled during movement. If checked, the “Total Pipe Volume” row in the tank table shows the additional volume that will be taken out of the tank. The volume of the pipe is the product of the slack discounted pipe capacity and the tank’s CTL. The Planned Quantity of

the transfer object is also updated, which is the sum of the delta values of the Total Pipe Volume and the Gross Standard Volume (GSV).

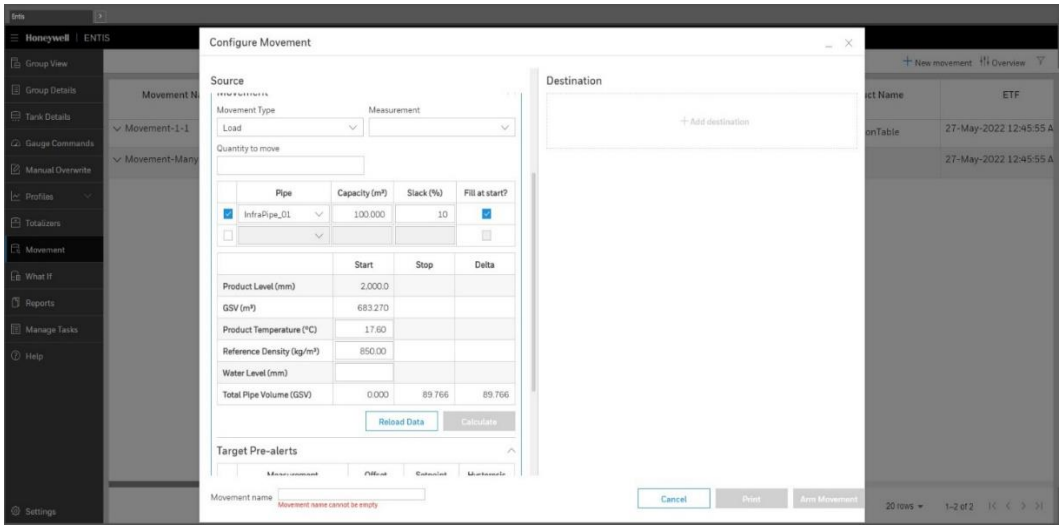


Figure 73 : Total Pipe Volume Example

Note that only those infra pipes that have the Fill at start checkbox checked are accounted for in the Total Pipe Volume calculation. The unchecked infra pipes effectively mean that the pipe already has the product, and no additional volume is taken out of the tank.

Empty at end

The Empty at end checkbox can be seen only on the destination side. The user can check the checkbox to indicate if the content in infra pipe should be emptied at the end of the movement. If checked, the “Total Pipe Volume” row in the tank table shows the additional volume that will be added to the tank. The volume of the pipe is the product of the slack discounted pipe capacity and the tank’s CTL. The Planned Quantity of the transfer object is also updated, which is the sum of the delta values of the Total Pipe Volume and the Gross Standard Volume (GSV).

Note that only those infra pipes which have the Empty at end checkbox checked are accounted for in the Total Pipe Volume calculation. The unchecked infra pipes effectively mean that the pipe content is not emptied at the end.

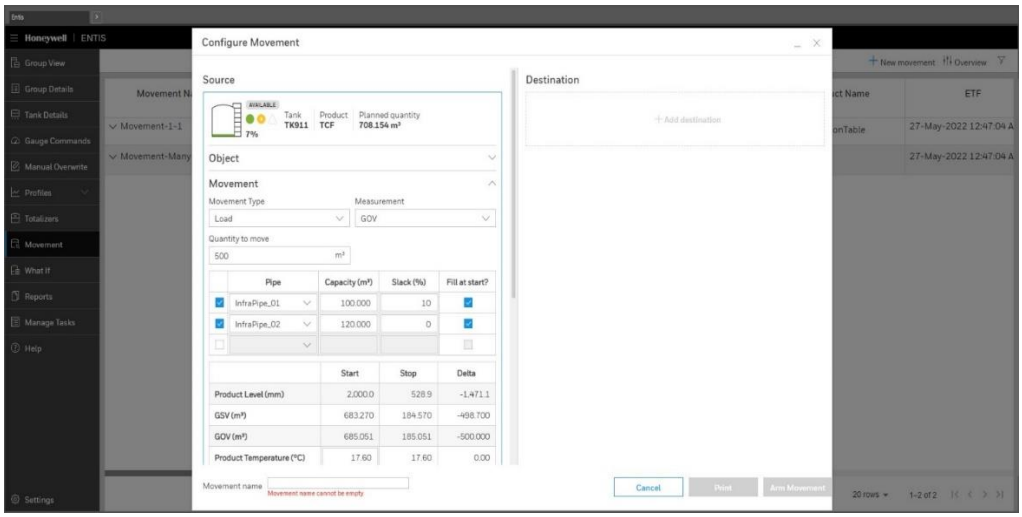


Figure 74 : Object with multiple infra Pipes

Multiple infra pipes can be added to a source/destination object, but each infra pipe on one side can be mapped to only one object on the other side. That is when multiple infra pipes are added to a source object, each of the destination objects can only have one infra pipe each. Similarly, when multiple infra pipes are added to a destination object, each of the source objects can only have one infra pipe each.

In addition, if a source or destination object has multiple infra pipes, the same side cannot have more objects.

Advanced Movement Main screen

The Advanced Movement main screen presents movement data for multiple movements in a tabular format. Movements are organi**s**ed in rows while the entities are displayed in columns**.** The data displayed on the grid depends on the selected view. Clicking the mouse on the column header will sort the selected column. A blue arrow on the column header will indicate that it is sorted, with the blue arrow direction indicating if the sort is ascending (up) or descending (down).

A user-definable number of columns, measured from the first column, can be identified as fixed columns. Fixed columns do not scroll horizontally. The user can select the number of rows they want to view on a page and toggle between them via the “Previous” and “Next” buttons.

The user can also filter the rows by using the “Filter” button, where they can select the column where the filter should be applied and set the parameters of filtering accordingly.

Note: Advanced Movement Main Screen is a part of Advanced movement. Hence, it will be seen only if the user has purchased an Advance movement license.

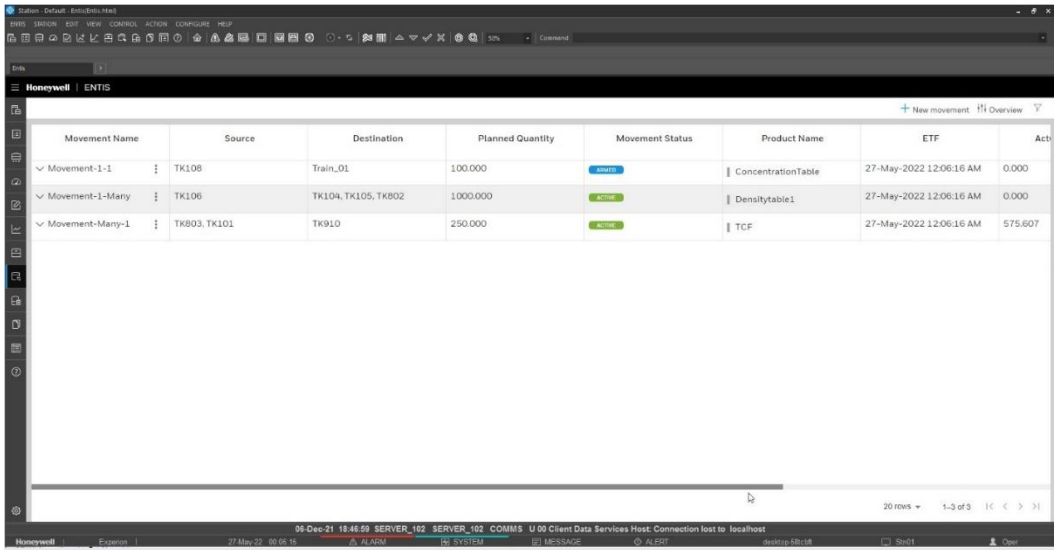


Figure 75 : Advanced Movement Main Screen

Opening the Advanced Movement Main Screen

1. Click on the “Movement” menu item, or the “Movement” icon in the tool bar.

2. The “Advanced Movement Main” screen will appear.
3. Movement data will appear in the table.
4. “Overview” is the default view that shows all the movements.
5. Change the View from the view dropdown.

   Column width: The current size is stored whenever the user selects another view, or the window is closed.

New Movement

New Movement can be configured by launching the Configure Movement Dialog from the Advanced Movement Main Screen by clicking on the icon shown below.

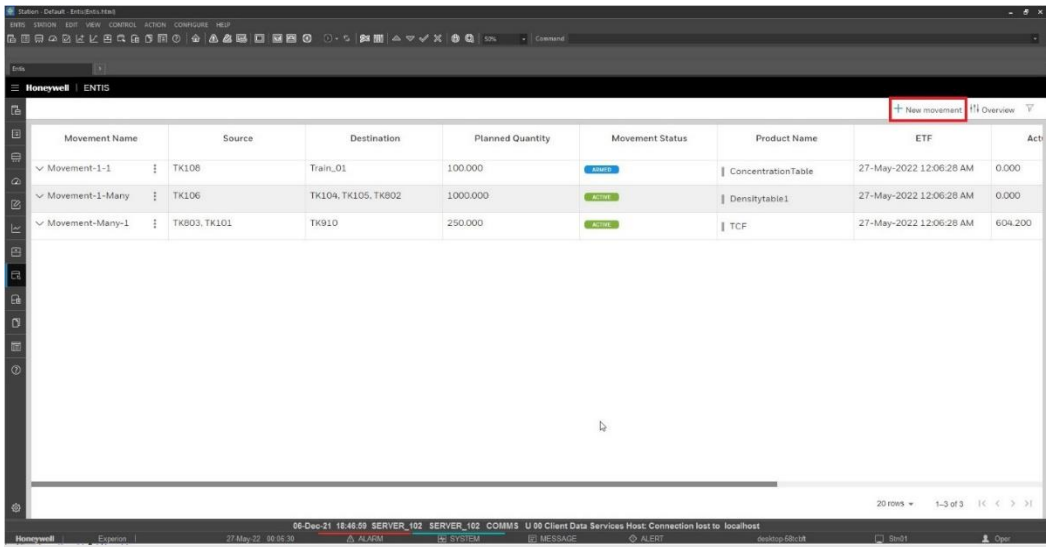


Figure 76 : Advanced Movement Main Screen (New Movement)

Manage Views

Movement views allow the user to customise the view that defines the columns to be displayed in the “Advanced Movement Main” screen. The first column (Movement name) is fixed.

A number of predefined views are available; it is also possible to create new views. The predefined views can be altered, but not deleted. Newly created views can be altered and deleted.

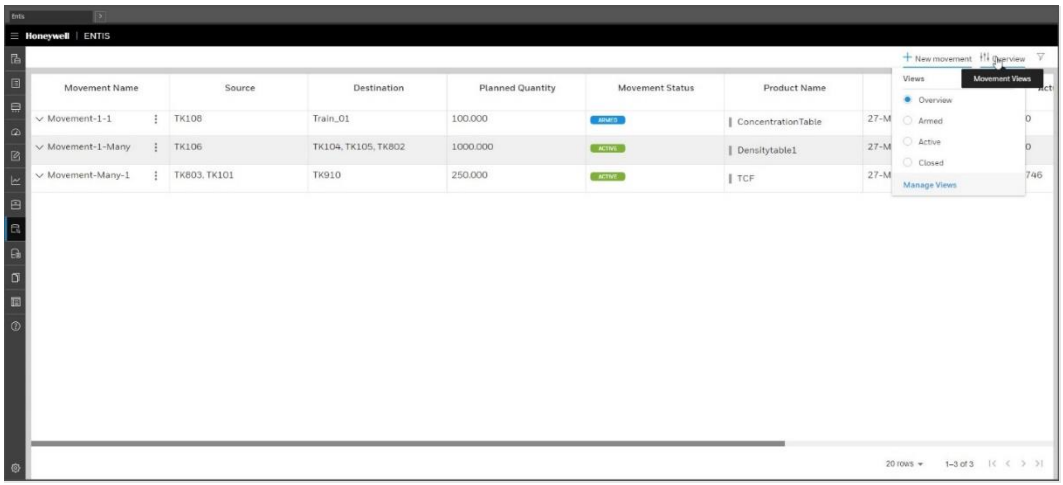


Figure 77 : Predefined Movement Views

Note: The Manage views option is also available in other screens, but that is independent from the Advanced Movement Main Screen views.

The Manage Views dialog can be launched from the Advance Movement Main Screen.

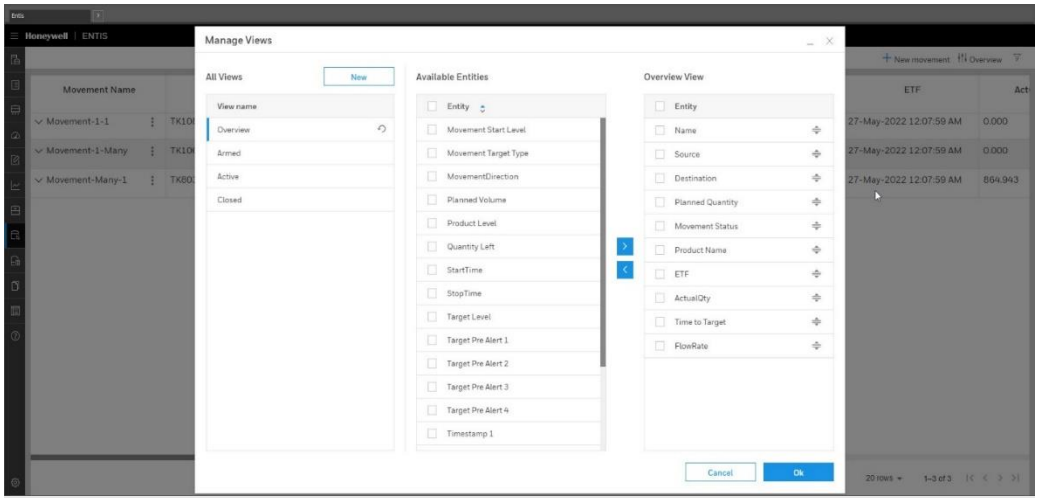


Figure 78 : Manage Views Dialog

Manage Filters

Movement Filters allow the user to customise the rows to be displayed in the “Advanced Movement Main” screen. A number of predefined filters are available; it is also possible to create new filters.

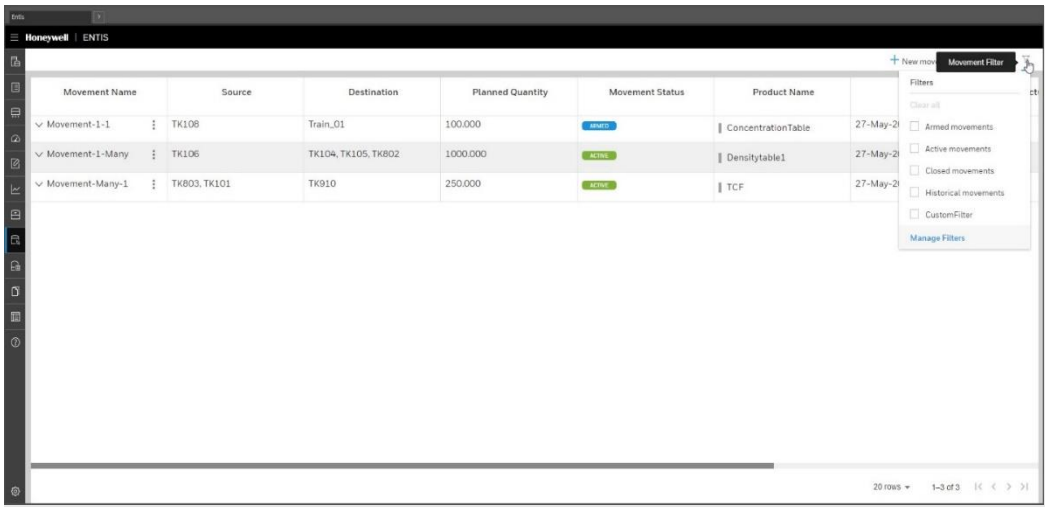


Figure 79 : Predefined Movement Filters

Note*:* The Manage Filters option available in other screens is independent of the Advanced Movement Main Screen Filters.

The Manage Filters dialog can be launched from the Advance Movement Main Screen.

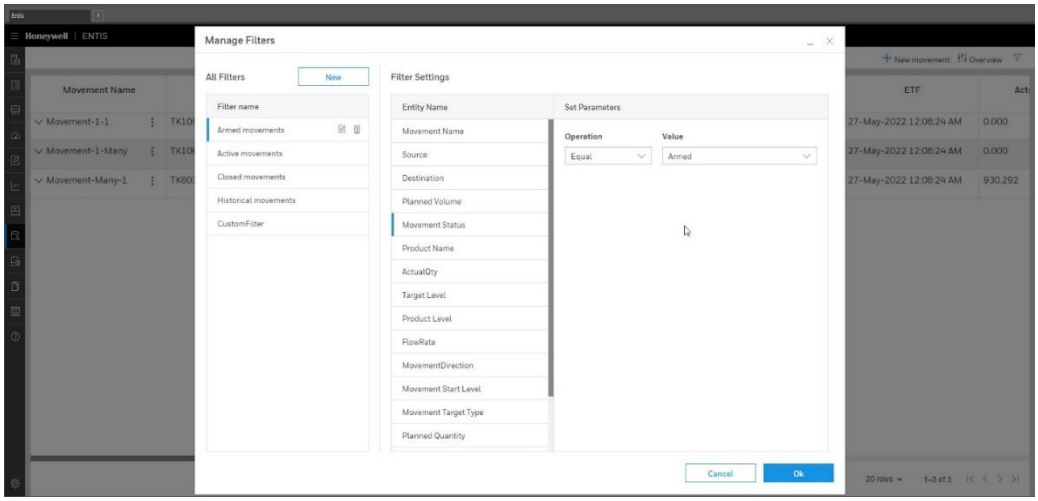


Figure 80 : Manage Filters Dialog

Movement Summary

A summary of each movement is displayed in the “Advanced Movement Main” screen in tabular format. The expand icon to the left of the Movement Name expands to display the transfers involved in that movement.

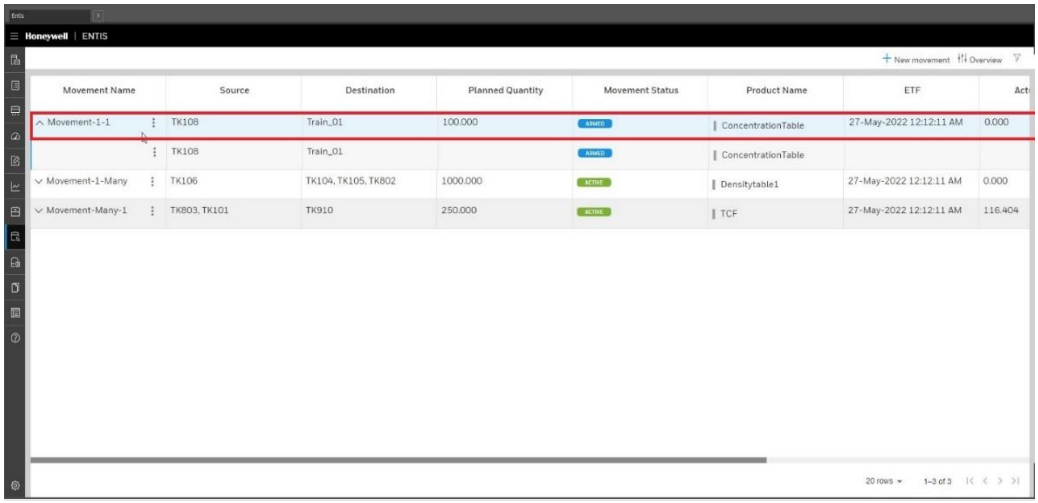


Figure 81 : Movement Summary line

Context Menu

Each row in the table has a vertical ellipsis menu icon to the right of Movement Name. Clicking on this button will open the context menu. From the summary line context menu, the operator can Edit Movement, Delete Movement and Generate

Report. Edit Movement will be enabled if Movement is not closed. Delete Movement and Generate Report will be enabled if Movement is closed.

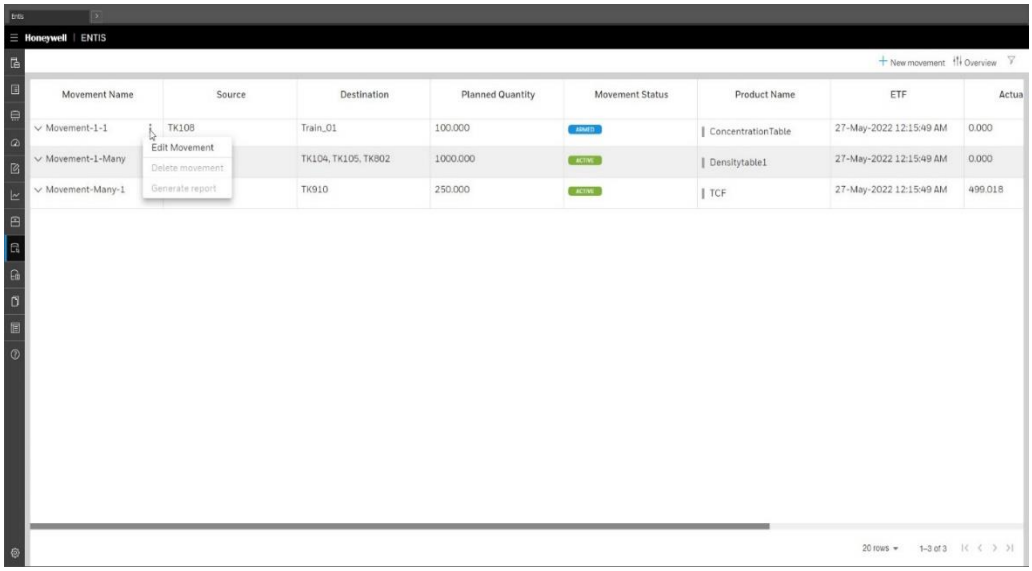


Figure 82 : Summary line context menu

From the transfer line context menu, the user can start or cancel the movement. Also, once the movement is active, the user can pause and resume the movement from the same context menu.

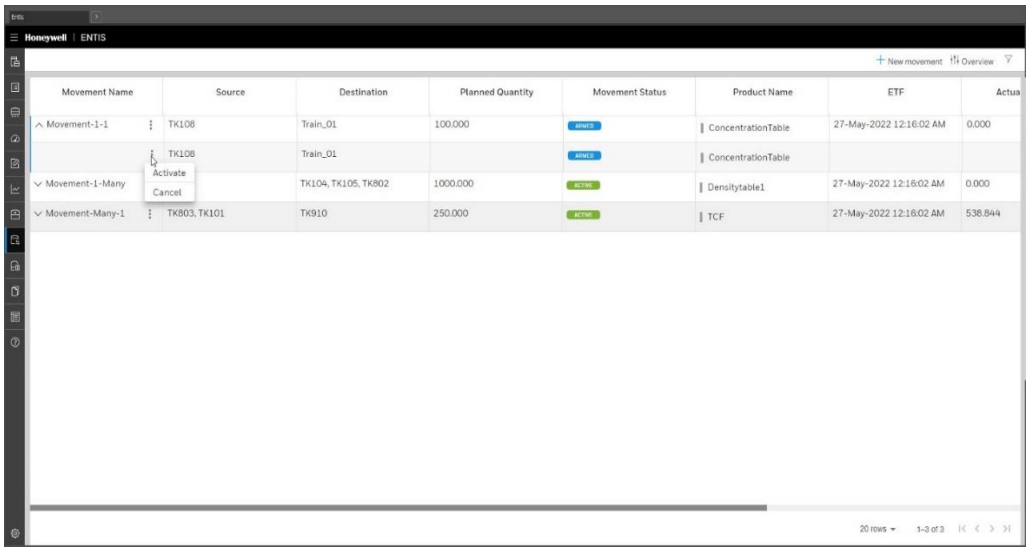


Figure 83 : Transfer line context menu

Note that once a movement is canceled, the movement state of the tank will be set to closed.

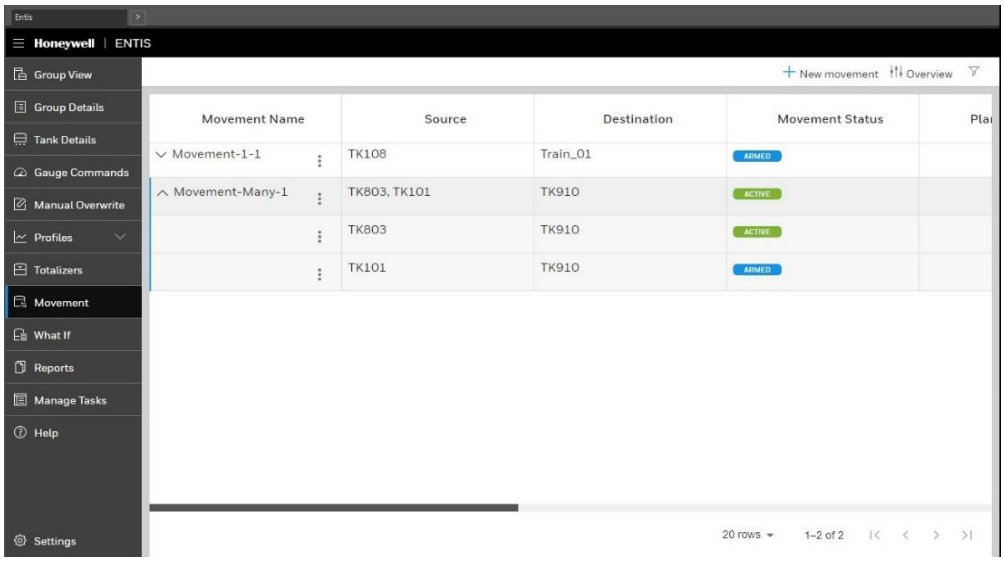


Figure 84 : Advanced Movement Main Screen (Many to One movement)

TOTALIZER

Totalizers offer an easy way to totalize and view the contents of a group of tanks. It totalizes the different parameters of the available tanks in a group, such as GOV, GSV, TGSV, NTSM, TOV and Available TOV..

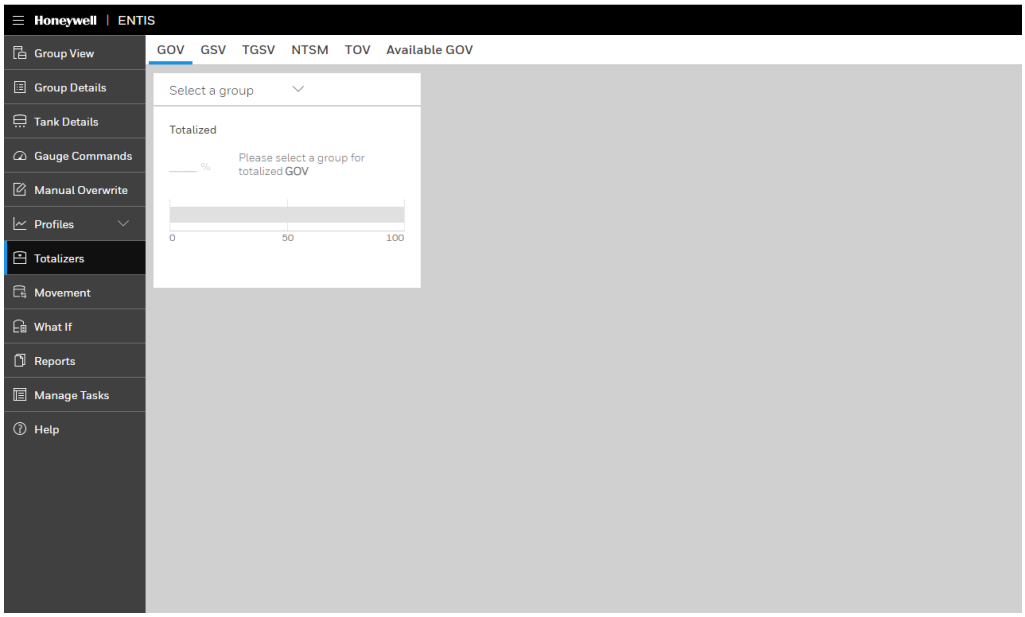


Figure 85: Totalizer

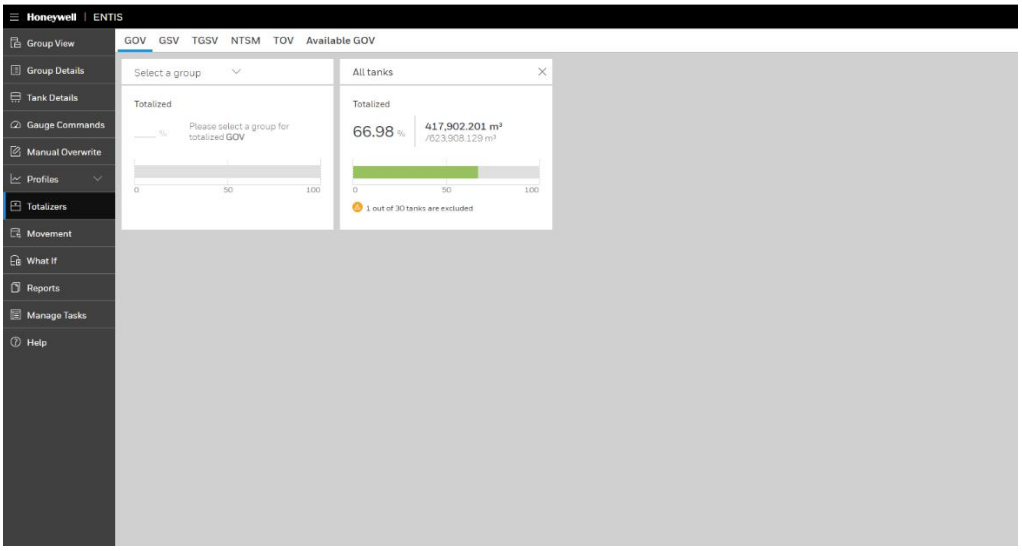


Figure 86:Totalizer_All

How to select the Group Totalizer

Proceed as follows:

1. Click on the ‘G*roup Totalizer*’ icon.

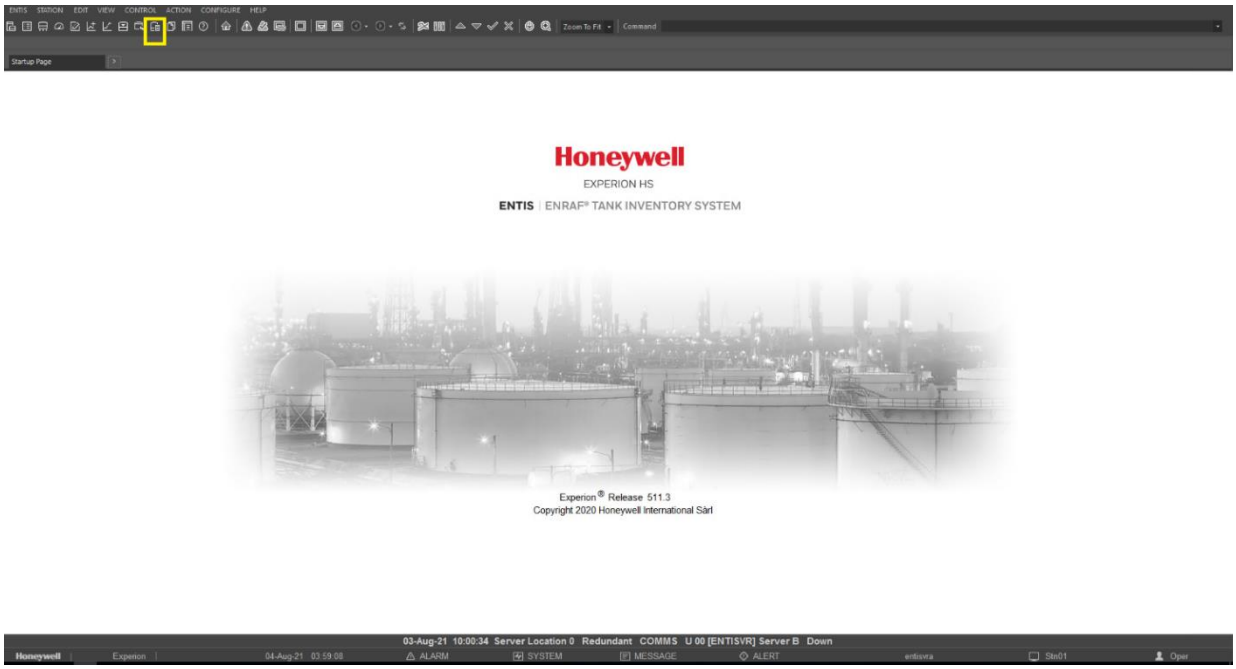
Figure 87: Totalizer Icon

2. Click on the tree icon at the left site in the tool bar.
3. The ‘*Group/Tank*’ window will appear.
4. Select a *group* from the tree view. The selected group will be displayed in the tool bar.
5. Other groups can be selected from the combo box in the tool bar or from the ‘*Group/Tank*’ window.

WHAT IF

What if (tank calculator) is a predictor tool that calculates and tells us values of other parameters, based on the custom input values of points.

1. Click on What If icon from menu toolbar



Tab layout

On What-If screen, choose the desired group and tank from the drop down.

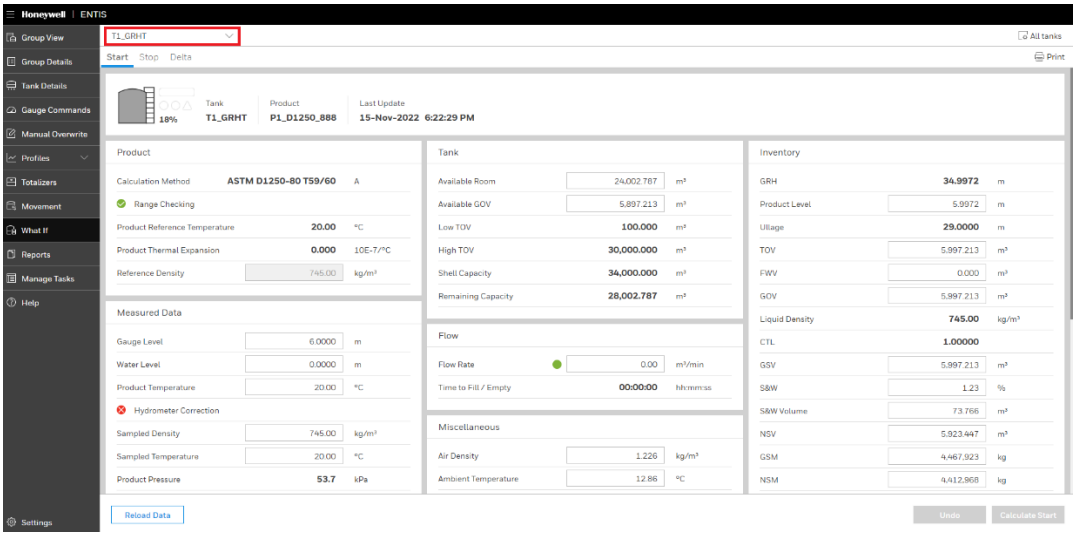


Figure 88: What – If layout

How to use What If (Tank Calculator)

1. Open the Tank Calculator from the toolbar of the Experion.
2. Select a Group/Tank
3. The Tank Calculator always starts up with the actual inventory data at that moment
4. The Start screen will pop up
5. All white fields are data entry fields and their contents can be modified.

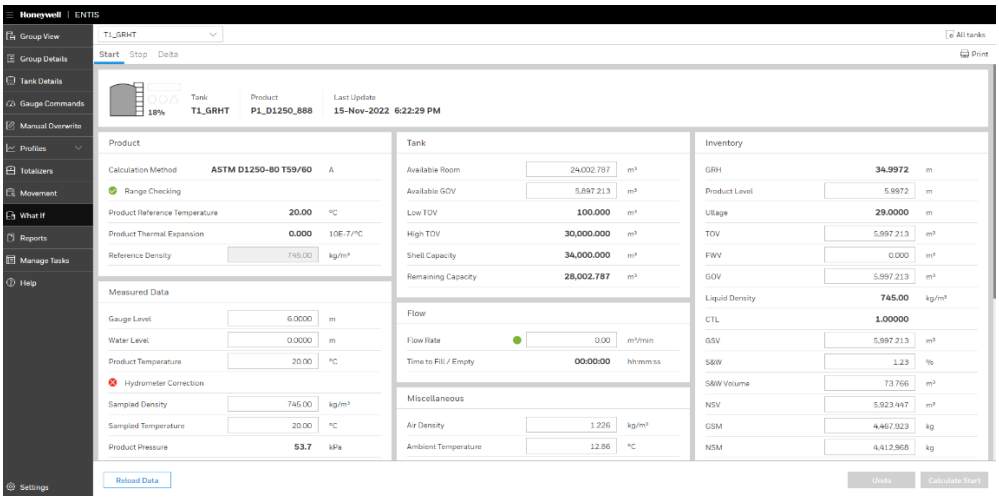


Figure 89: What – If Start

6. The system will calculate other values and display them by pressing the Calculate Start button.
7. To restore values to real time values coming from the CIU, click on Reload Data.

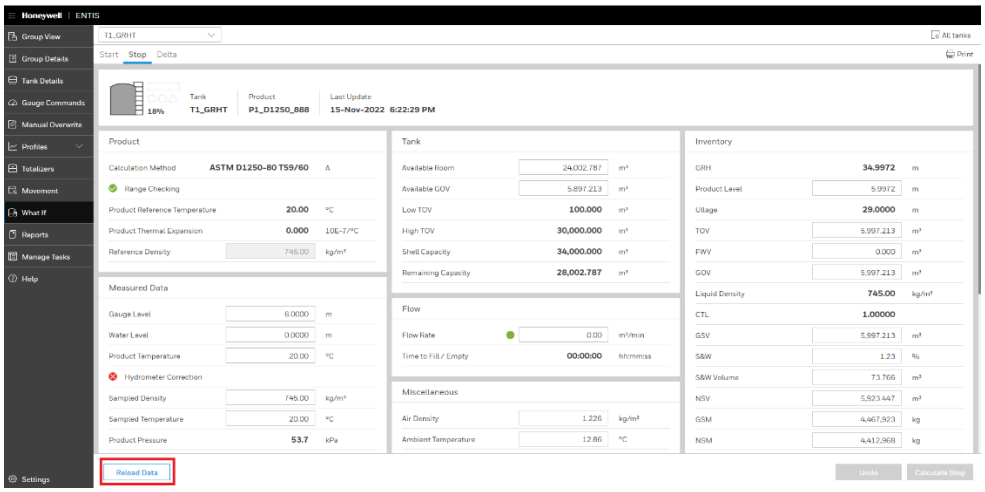


Figure 90: What – If Reload

Note: While performing What If calculation, following entities - Reference Density, Sample Density and Sample Temperature values can\cannot be modified based the calculation method and product code. Refer to Appendix A to know more about this relation.

REPORTS

The Reports display makes it possible to print out reports in pre-defined templates. A user can preview and print Tank Detail and Group Detail reports from this display. The tank data displayed in the reports consists of the last available measured and inventory data received from the gauge. It also displays the second level when dual gauges are connected.

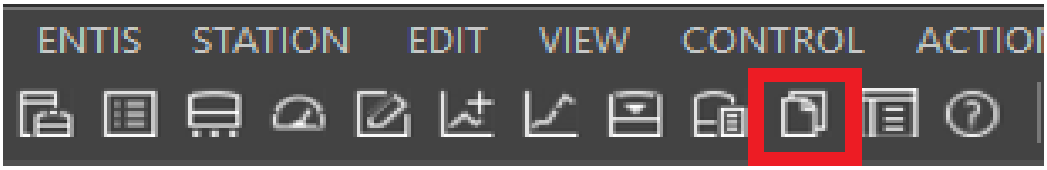


Figure 91: Reports

Report Printing

The Report printing window consists of four main parts:

- The Browse Reports
- The type of report combo box
- The tank/group combo boxes
- The template combo box

Reports types

Select one of the report types from the combo box.
The following Options are enabled depending of the selected report:

Group/Tank Two combo boxes used to select a group or a tank name

Template Depending on the selected type of report, the '*Template*' combo box will list the available templates

How to select Reporting

1. Click on the 'Reporting' icon or you can also select 'Reports' from the options available on left side of the screen.

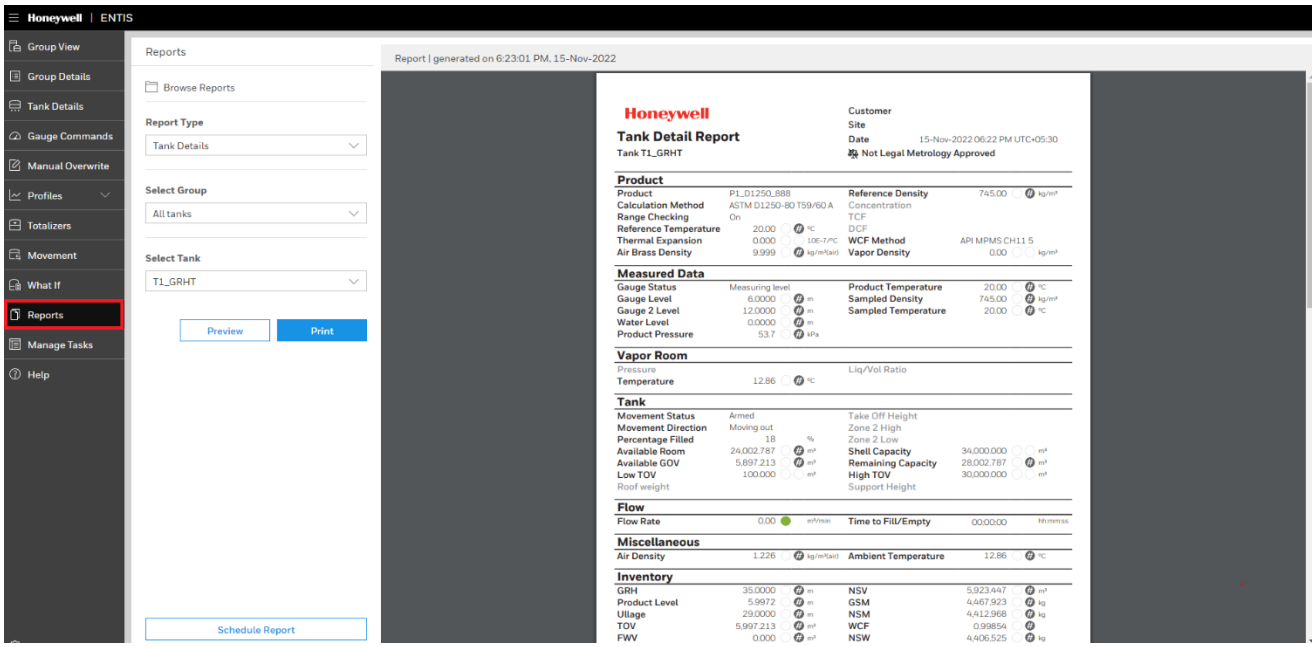
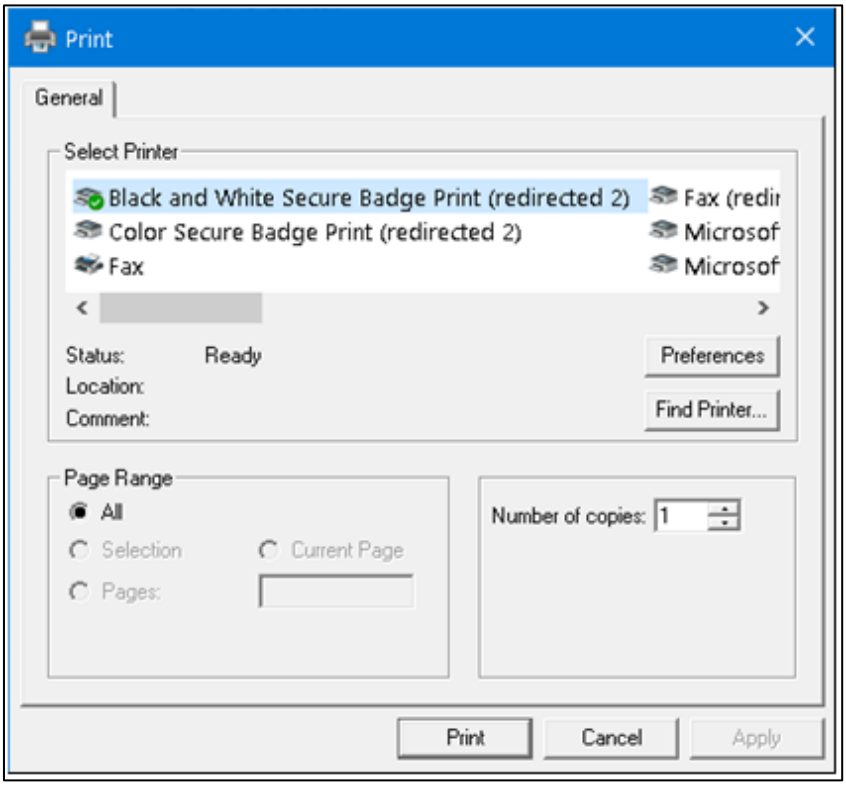


Figure 92: Reporting icon

2. Select Tank Details or Group Details from the combo box.
3. Select a Template.
4. Click on Preview.



Browse Reports

This option will be displayed on the top of the ‘Reports’ screen. All the saved PDF files can be selected for viewing again.

Filters

A combo box is available to select the report type, listing only the reports belonging to that report type. The calendar option allows the user to select the date range.

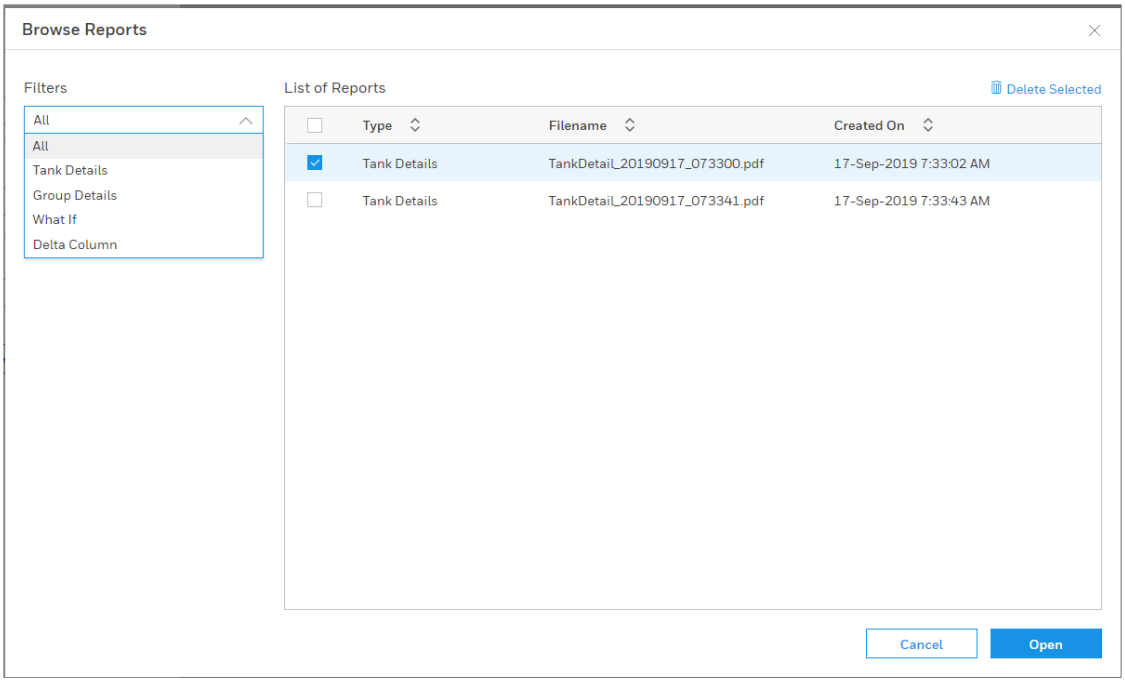
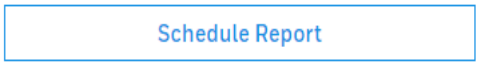


Figure 93: Browse Reports

Report Scheduling



This option is displayed at the bottom of the ‘Reports’ screen. This feature allows the user to schedule automated reports.

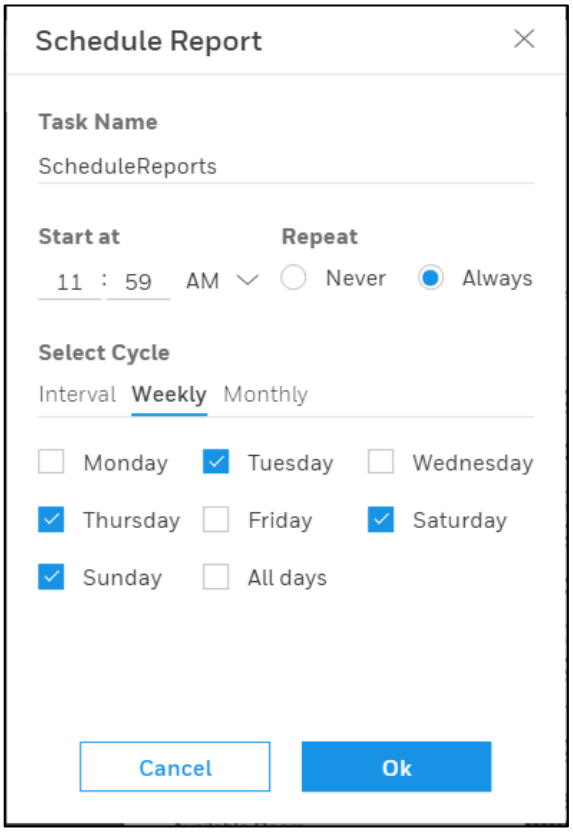


Figure 94: Schedule report

The user can create a task and schedule reports for different intervals like daily, weekly, monthly. The tasks created here are shown on ‘Manage Tasks’ screen.

Once the report is scheduled, it will get automatically generated (and saved) at the Reports path at the scheduled time.

How to schedule a report

- Choose the specifications of the report that needs to be scheduled and then click on ‘Schedule Report’ button.
- Make the following selections for the scheduled report.
- **Task Name :** This is user defined field which defines name of the task.
- **Send report to the printer :** User can enable if report is to be printed through configured printer.

  Note: Please ensure physical printer is connected and it is configured as default printer on the current system
- **Starts at :** User can choose when the task execution will start.
- **Repeat :** If the task has to be executed only once, ‘Never’ should be selected. If it is a repeated task, ‘Always’ should be chosen.
- **Select Cycle :** User can choose the frequency of the task from below available 3 options (. It will be enabled only when repeat is chosen as ‘Always’)

  1. **Interval :** User can give any interval in hh:mm, after ‘start at’ time this task will be executed continuously after the given interval.
  2. **Weekly :** User can choose the days, every week this task will be executed on the provided days and time provided in ‘start at’.
  3. **Monthly :** User can choose the dates in a month, every month this task will be executed on the provided dates and time provided in ‘start at’.

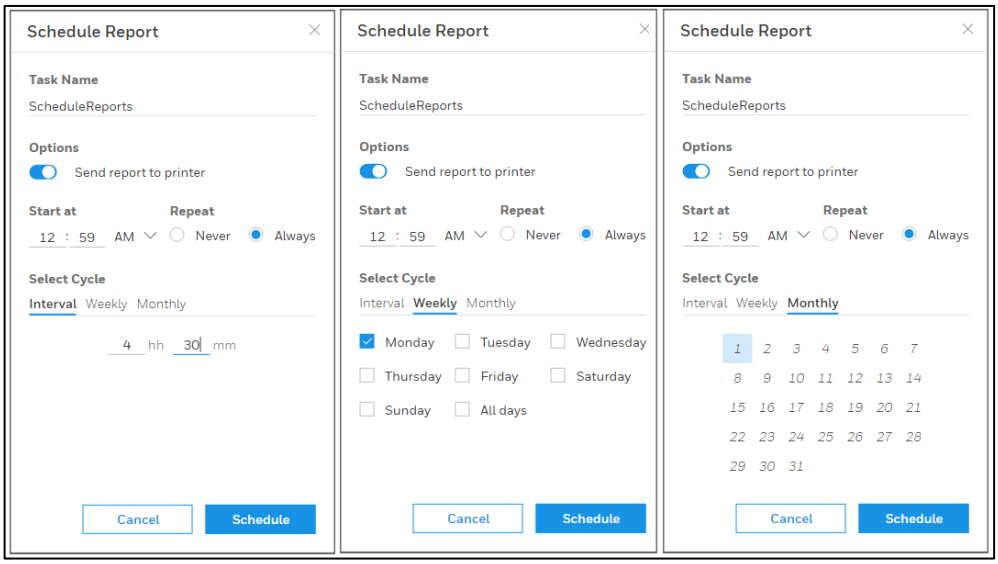


Figure 95: Schedule report screens

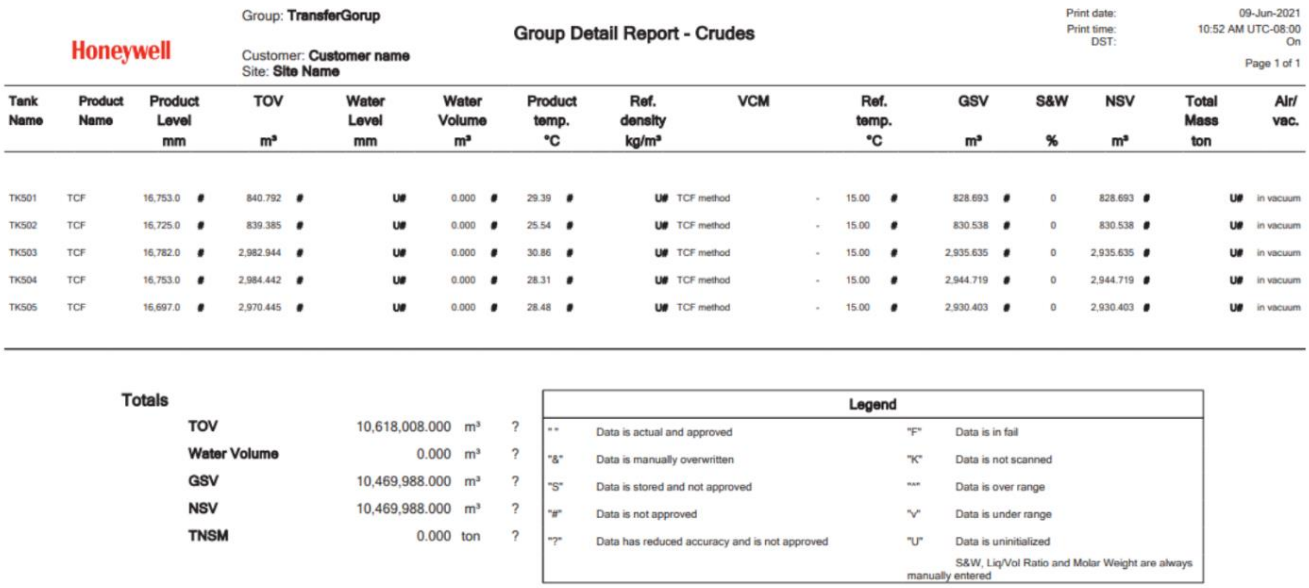
Templates

The format of a printout is defined by templates. ENTIS supports following templates:

- Tank Detail
- Group Detail – Crudes, CTL, General Product, Inventory, Measured
- What If
- Delta Column

Report Templates

Example of a group detail printout.



Honeywell

Group: **TransferGorup**

Customer: **Customer name**
Site: **Site Name**

Group Detail Report - Crudes

Print date: 09-Jun-2021
Print time: 10:52 AM UTC-08:00
DST: On

Page 1 of 1

Tank Name	Product Name	Product Level mm		TOV m³		Water Level mm		Water Volume m³		Product temp. °C		Ref. density kg/m³		VCM		Ref. temp. °C		GSV m³		S&W %		NSV m³		Total Mass ton		Air/ vac.
TK501	TCF	16,753.0	#	840.792	#		U#	0.000	#	29.39	#		U#	TCF method	-	15.00	#	828.693	#	0		828.693	#		U#	in vacuum
TK502	TCF	16,725.0	#	839.385	#		U#	0.000	#	25.54	#		U#	TCF method	-	15.00	#	830.538	#	0		830.538	#		U#	in vacuum
TK503	TCF	16,782.0	#	2,982.944	#		U#	0.000	#	30.86	#		U#	TCF method	-	15.00	#	2,935.635	#	0		2,935.635	#		U#	in vacuum
TK504	TCF	16,753.0	#	2,984.442	#		U#	0.000	#	28.31	#		U#	TCF method	-	15.00	#	2,944.719	#	0		2,944.719	#		U#	in vacuum
TK505	TCF	16,697.0	#	2,970.445	#		U#	0.000	#	28.48	#		U#	TCF method	-	15.00	#	2,930.403	#	0		2,930.403	#		U#	in vacuum

Totals

TOV	10,618,008.000	m³	?
Water Volume	0.000	m³	?
GSV	10,469,988.000	m³	?
NSV	10,469,988.000	m³	?
TNSM	0.000	ton	?

Legend

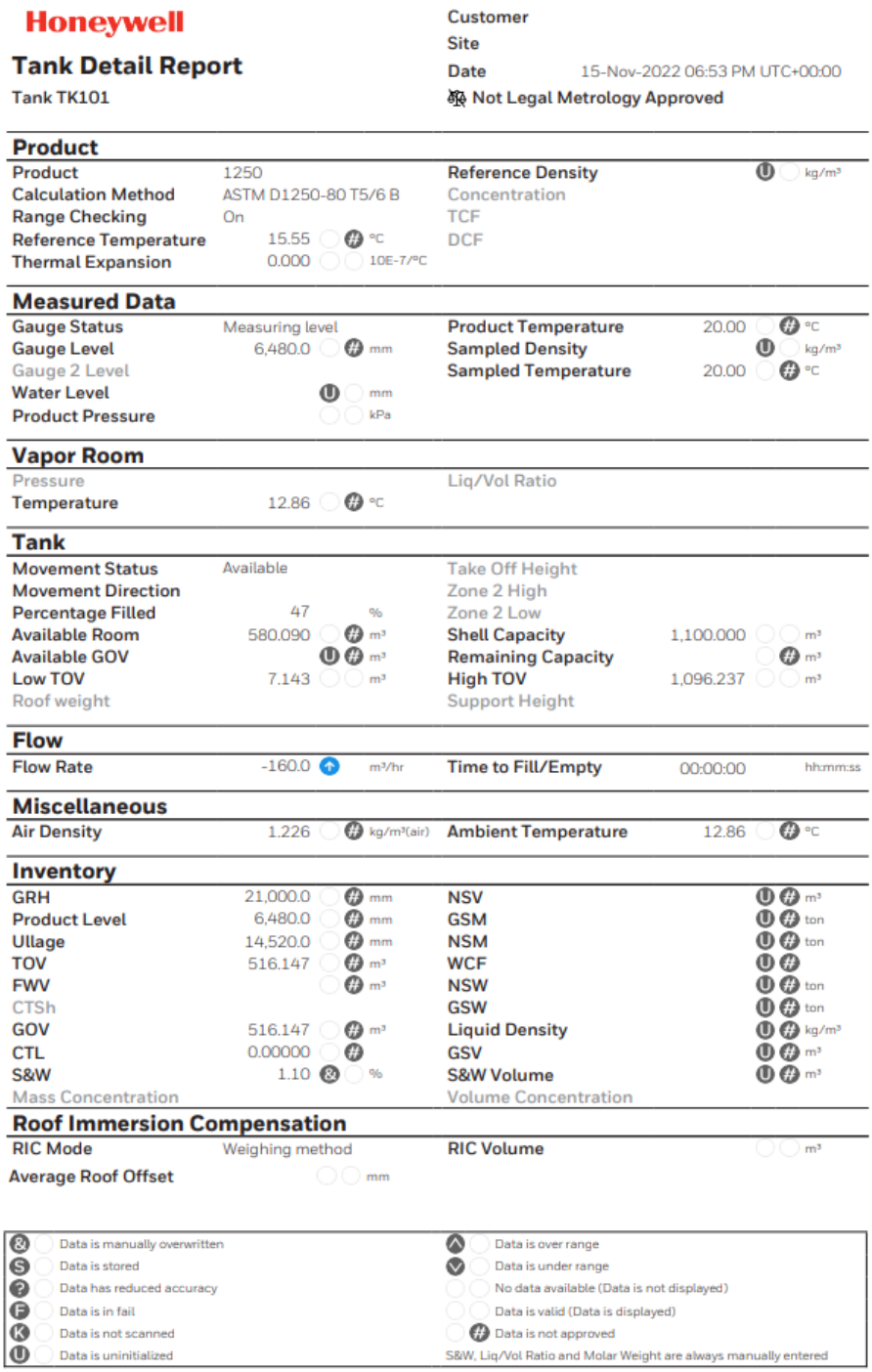
" "	Data is actual and approved	"F"	Data is in fail
"&"	Data is manually overwritten	"K"	Data is not scanned
"S"	Data is stored and not approved	"^"	Data is over range
"#"	Data is not approved	"v"	Data is under range
"?"	Data has reduced accuracy and is not approved	"U"	Data is uninitialized

S&W, Liq/Vol Ratio and Molar Weight are always manually entered

Figure 96: Group detail report

Tank Details

Example of a tank detail printout.



Honeywell

Tank Detail Report

Tank TK101

Customer
Site
Date 15-Nov-2022 06:53 PM UTC+00:00
Not Legal Metrology Approved

Product

Product	1250	Reference Density	kg/m³
Calculation Method	ASTM D1250-80 T5/6 B	Concentration	
Range Checking	On	TCF	
Reference Temperature	15.55 °C	DCF	
Thermal Expansion	0.000 10E-7/°C		

Measured Data

Gauge Status	Measuring level	Product Temperature	20.00 °C
Gauge Level	6,480.0 mm	Sampled Density	kg/m³
Gauge 2 Level		Sampled Temperature	20.00 °C
Water Level	mm		
Product Pressure	kPa		

Vapor Room

Pressure		Liq/Vol Ratio	
Temperature	12.86 °C		

Tank

Movement Status	Available	Take Off Height	
Movement Direction		Zone 2 High	
Percentage Filled	47 %	Zone 2 Low	
Available Room	580.090 m³	Shell Capacity	1,100.000 m³
Available GOV	m³	Remaining Capacity	m³
Low TOV	7.143 m³	High TOV	1,096.237 m³
Roof weight		Support Height	

Flow

Flow Rate	-160.0 m³/hr	Time to Fill/Empty	00:00:00 hh:mm:ss

Miscellaneous

Air Density	1.226 kg/m³(air)	Ambient Temperature	12.86 °C

Inventory

GRH	21,000.0 mm	NSV	m³
Product Level	6,480.0 mm	GSM	ton
Ullage	14,520.0 mm	NSM	ton
TOV	516.147 m³	WCF	
FWV	m³	NSW	ton
CTSh		GSW	ton
GOV	516.147 m³	Liquid Density	kg/m³
CTL	0.00000	GSV	m³
S&W	1.10 %	S&W Volume	m³
Mass Concentration		Volume Concentration	

Roof Immersion Compensation

RIC Mode	Weighing method	RIC Volume	m³
Average Roof Offset	mm		

Data is manually overwritten	Data is over range
Data is stored	Data is under range
Data has reduced accuracy	No data available (Data is not displayed)
Data is in fail	Data is valid (Data is displayed)
Data is not scanned	Data is not approved
Data is uninitialized	S&W, Liq/Vol Ratio and Molar Weight are always manually entered

Figure 97: Tank detail

Delta Column

Honeywell

Group: **TransferGorup**

Customer: **Customer name**
Site: **Site Name**

Delta Column Report

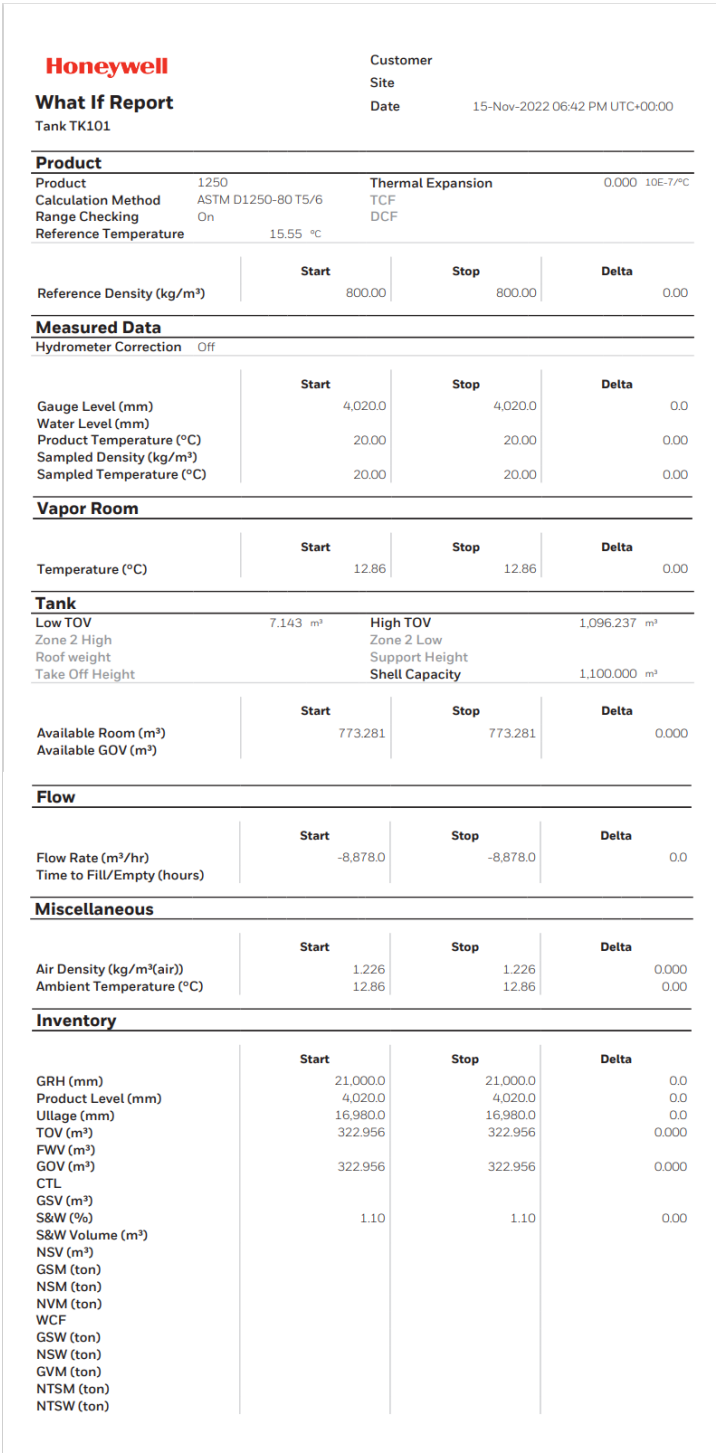
Print date: 11-Jun-2021
Print time: 7:35 AM UTC-08:00
DST: On

Tank Name	Product Name	Start Level *mm*	Delta Level *mm*	Start TOV *m³*		Delta TOV *m³*	Start GSV *m³*		Delta GSV *m³*	Start TNSM *ton*		Delta TNSM *ton*	Start Date & Time *Abs Time*	Delta Date & Time *Rel Time*
TK501	TCF	17,632.0	-13,090.0	884.938		-656.931	870.602		-640.703		U		09-Jun-2021 11:12:41 AM	1 days, 20 hours, 22 minutes
TK502	TCF	17,660.0	-13,118.0	886.344		-658.337	873.838		-644.030		U		09-Jun-2021 11:12:44 AM	1 days, 20 hours, 22 minutes
TK503	TCF	17,688.0	-13,231.0	3,143.023		-2,337.482	3,105.621		-2,292.588		U		09-Jun-2021 11:12:46 AM	1 days, 20 hours, 22 minutes
TK504	TCF	17,717.0	-13,317.0	3,154.957		-2,354.625	3,104.730		-2,297.915		U		09-Jun-2021 11:12:49 AM	1 days, 20 hours, 22 minutes
TK505	TCF	17,887.0	-13,374.0	******	F		******	F		******	F		09-Jun-2021 11:12:51 AM	1 days, 20 hours, 22 minutes

Figure 98: Delta column report

What If ..

Example of a What If .. printout.



Honeywell

What If Report

Tank TK101

Customer

Site

Date 15-Nov-2022 06:42 PM UTC+00:00

Product

Product	1250	Thermal Expansion	0.000 10E-7/°C
Calculation Method	ASTM D1250-80 T5/6	TCF	
Range Checking	On	DCF	
Reference Temperature	15.55 °C		

	Start	Stop	Delta
Reference Density (kg/m³)	800.00	800.00	0.00

Measured Data

Hydrometer Correction Off

	Start	Stop	Delta
Gauge Level (mm)	4,020.0	4,020.0	0.0
Water Level (mm)			
Product Temperature (°C)	20.00	20.00	0.00
Sampled Density (kg/m³)			
Sampled Temperature (°C)	20.00	20.00	0.00

Vapor Room

	Start	Stop	Delta
Temperature (°C)	12.86	12.86	0.00

Tank

Low TOV	7.143 m³	High TOV	1,096.237 m³
Zone 2 High		Zone 2 Low	
Roof weight		Support Height	
Take Off Height		Shell Capacity	1,100.000 m³

	Start	Stop	Delta
Available Room (m³)	773.281	773.281	0.000
Available GOV (m³)			

Flow

	Start	Stop	Delta
Flow Rate (m³/hr)	-8,878.0	-8,878.0	0.0
Time to Fill/Empty (hours)			

Miscellaneous

	Start	Stop	Delta
Air Density (kg/m³(air))	1.226	1.226	0.000
Ambient Temperature (°C)	12.86	12.86	0.00

Inventory

	Start	Stop	Delta
GRH (mm)	21,000.0	21,000.0	0.0
Product Level (mm)	4,020.0	4,020.0	0.0
Ullage (mm)	16,980.0	16,980.0	0.0
TOV (m³)	322.956	322.956	0.000
FWV (m³)			
GOV (m³)	322.956	322.956	0.000
CTL			
GSV (m³)			
S&W (%)	1.10	1.10	0.00
S&W Volume (m³)			
NSV (m³)			
GSM (ton)			
NSM (ton)			
NVM (ton)			
WCF			
GSW (ton)			
NSW (ton)			
GVM (ton)			
NTSM (ton)			
NTSW (ton)			

Figure 99 - What if .. report

EXPORT

The Export feature enables exporting tank data in the Group Detail screen to a CSV file which can be visualized with a spreadsheet application like Microsoft Excel.

Exporting Tank Data

1. In the Group Detail screen, click on the delta column header (three vertical ellipses) and select the ‘Export’ option from the context menu.

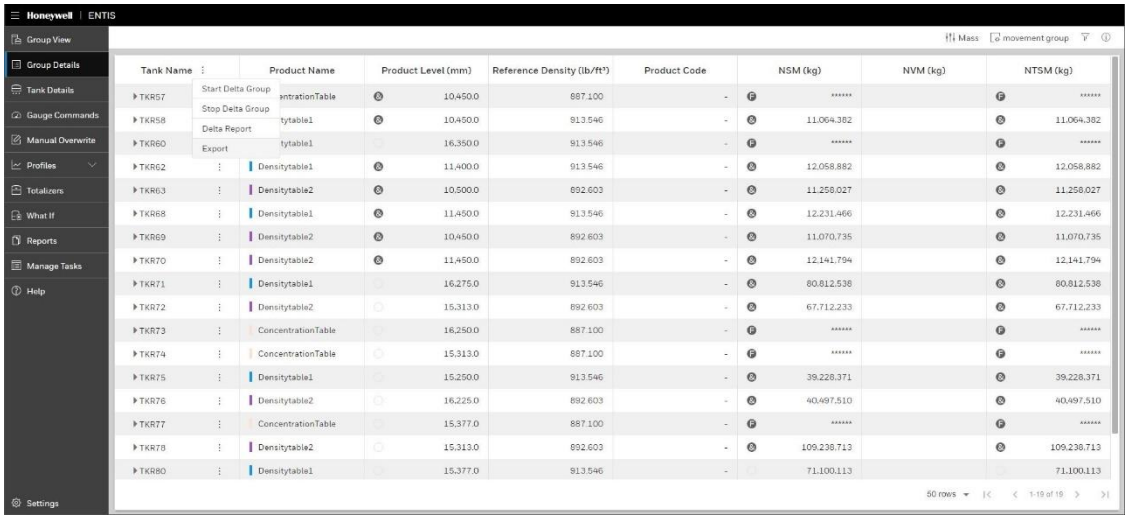


Figure 100 : Export option in group detail

2. From the Export modal that pops up, configure the group and view from the drop down options.

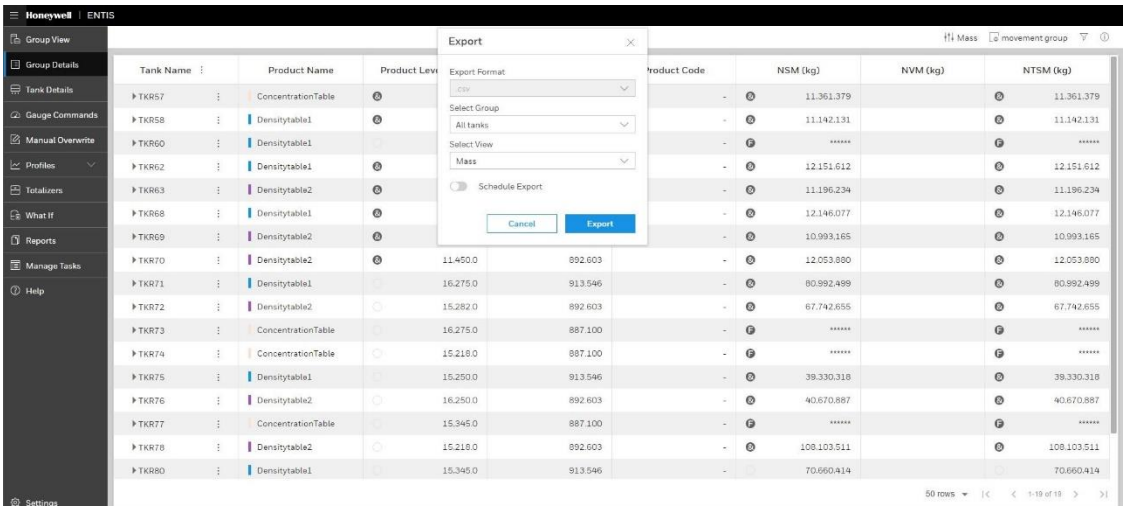


Figure 101 : Export modal

3. Click on Export. The exported csv file is saved in the Export path.

Scheduling Export

This feature allows the user to schedule automated exports. The user can create a task and schedule exports for different intervals like daily, weekly, monthly. The tasks created here are shown on ‘Manage Tasks’ screen.

Once the export is scheduled, it will get automatically generated (and saved) at the Export path at the scheduled time.

How to schedule an export

- In the Group Detail screen, click on the delta column header (three vertical ellipses) and select the ‘Export’ option from the context menu. Select the group and view for which export needs to be scheduled.
- Enable the Schedule Export toggle.

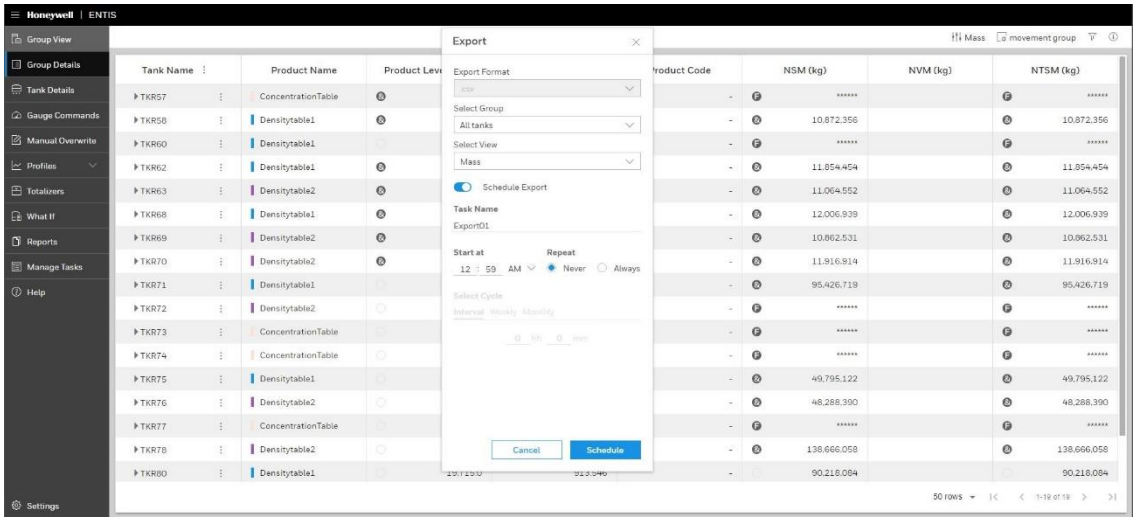


Figure 102 : Scheduling export

- Make the following selections for the scheduled export.
- **Task Name** : This is user defined field which defines name of the task.
- **Starts at** : User can choose when the task execution will start.
- **Repeat** : If the task has to be executed only once, ‘Never’ should be selected. If it is a repeated task, ‘Always’ should be chosen.

- **Select Cycle** : User can choose the frequency of the task from below available 3 options . It will be enabled only when repeat is chosen as ‘Always’

    1. **Never** : User can opt for scheduling the export only once without repeating it.
    2. **Interval** : User can give any interval in hh:mm, after ‘start at’ time this task will be executed continuously after the given interval.
    3. **Weekly** : User can choose the days, every week this task will be executed on the provided days and time provided in ‘start at’.
    4. **Monthly** : User can choose the dates in a month, every month this task will be executed on the provided dates and time provided in ‘start at’.

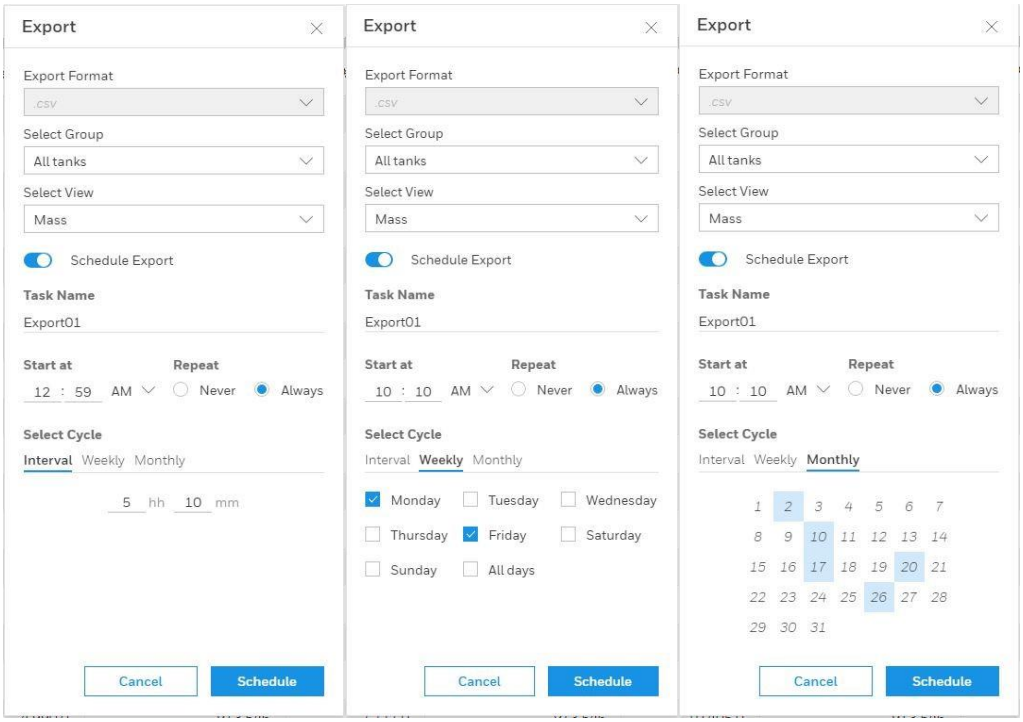


Figure 103 : Scheduling export screens

- Click on the Schedule button.

MANAGE TASKS

Once a Gauge Command/Reporting/Export task is scheduled, users can view the list of tasks on this window.

Users can edit the schedule of the tasks and - if needed - tasks can also be deleted from here.

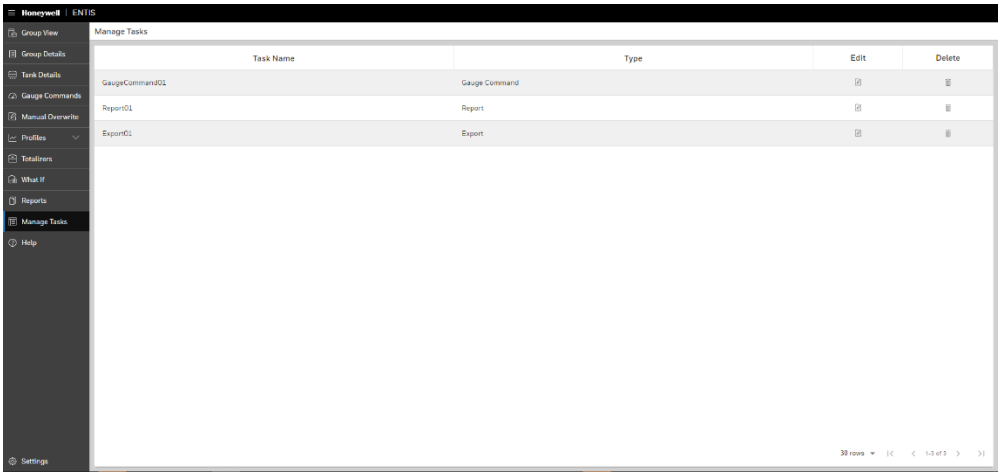


Figure 104: Manage Tasks

- User can open the Manage Tasks screen by clicking on ‘Manage Tasks’ icon from the experion toolbar or by clicking on the navigation menu on the left.

- The display will show the list of tasks scheduled, with their task name, type (Reporting/Gauge Commands), and Edit and Delete buttons.

How to edit/delete a task

1. Click on the edit button in front of the task.
   A scheduling screen will popup.

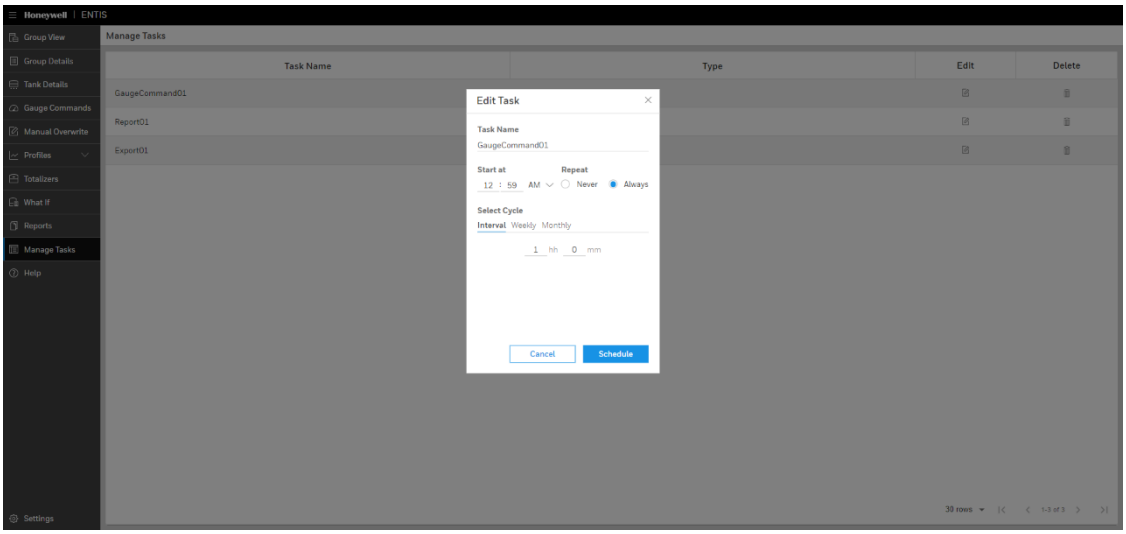


Figure 105: Scheduling screen

2. Change the details of the schedule and click **OK**.
   The task will be updated.
3. To delete, click on the delete button in front of the task.
   A confirmation dialog will pop up.

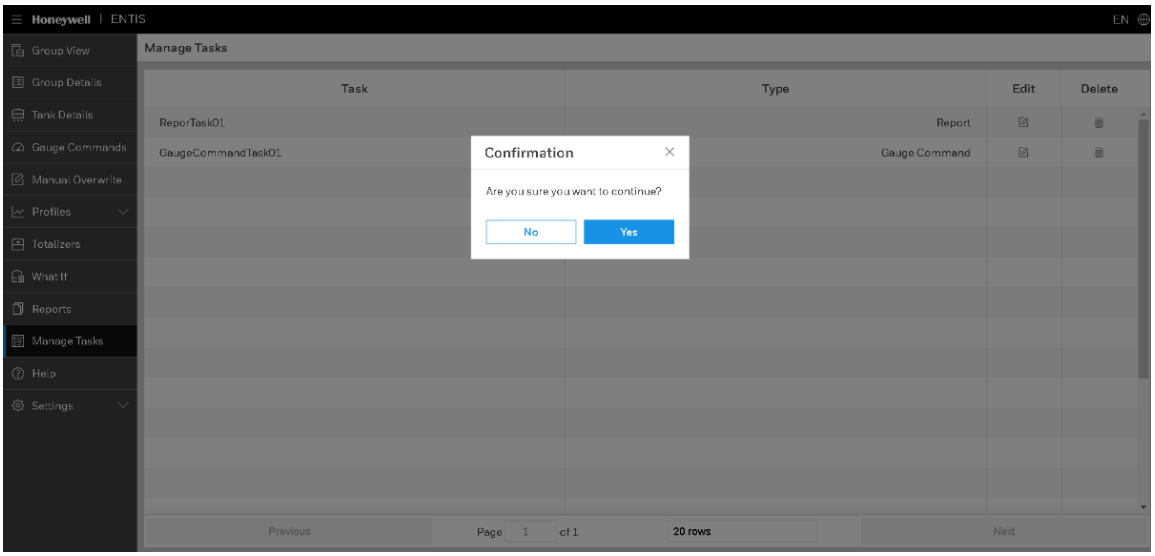


Figure 106: Confirmation Dialog

4. Click on **Yes** to delete the task.

HELP

HELP

This Display opens the ‘ENTIS User Guide’.

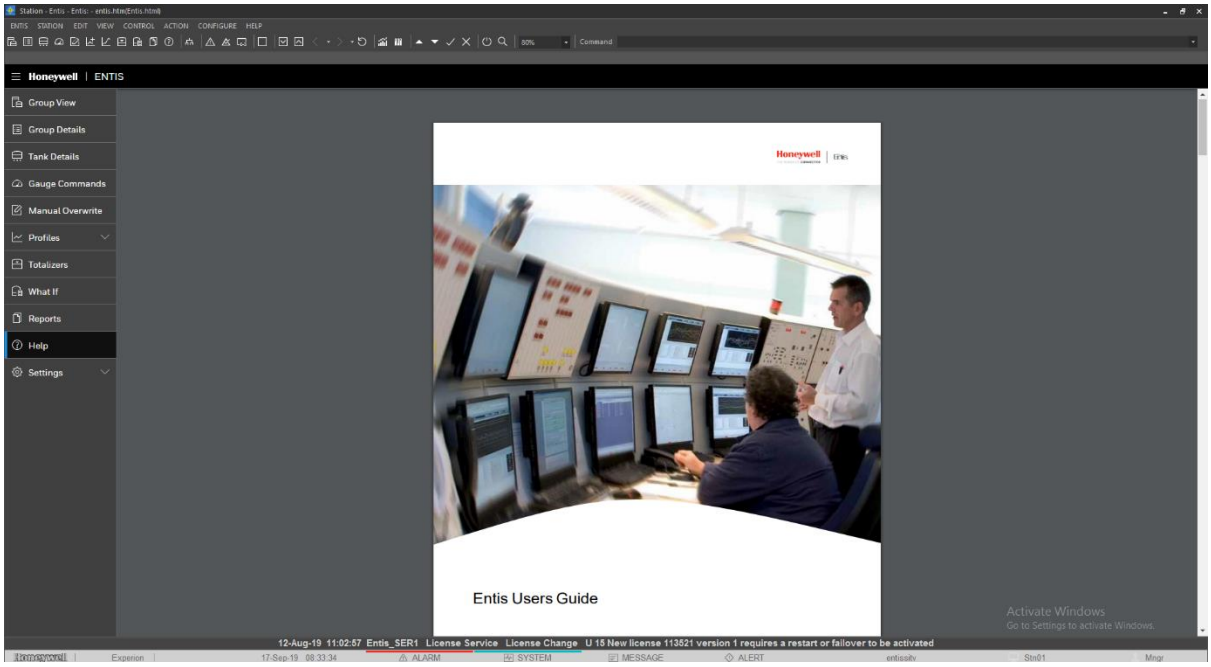


Figure 107: Help

How to select Help

1. Click on the ‘Help’ icon from the toolbar.

Figure 108: Help icon

2. You can also select ‘Help’ from the options available on left side of the screen.
3. On clicking either of the 2 options, the ‘ENTIS User Guide’ opens on the right panel of the ENTIS screen.

SETTINGS

General

Clock Synchronization

The master clock feature synchronizes the ENTIS application and CIU clocks, with the ENTIS clock serving as the master. See figure 65.

Having the ENTIS and the CIU clocks synchronized helps ensure that timestamps on alarms, events and operational data are consistent.

Product colors

The switch allows users to enable custom colors for products. If not enabled, default colors will be used, which are the flow rate moving colors. Once enabled each product will have an associated color which can be customized. The product names for color coding are not case-sensitive. The product colors table can be seen in figure 65.

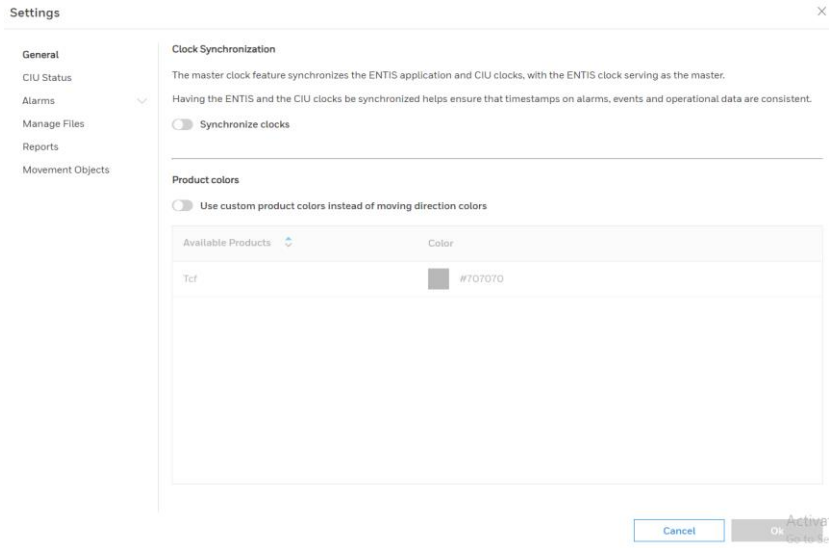


Figure 109 Settings modal General section

The user can also set the RGB or HEX color for that product by clicking on the '+' as shown in Figure 66.

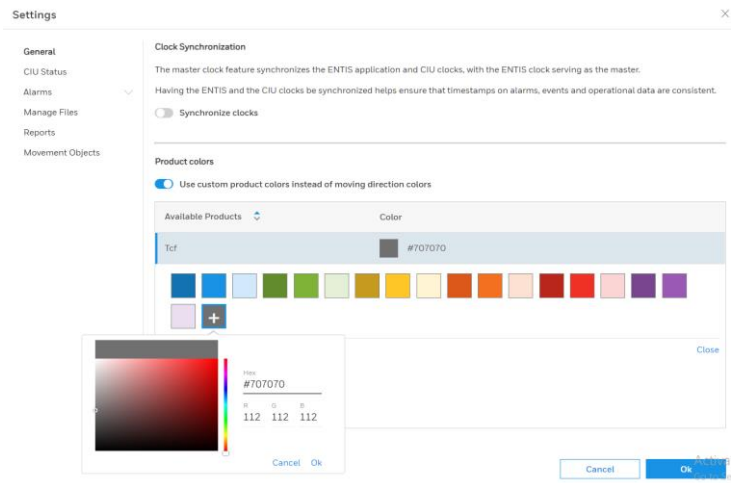


Figure 110 Settings modal General section custom Product Color

CIU Status

The CIU Status section shows a table with the configured CIU's and CIU pairs. Inside table there are five columns that display:

- CIU name. Any configured text.
- Type. Its either Primary or Secondary.
- IP address. Numeric digits separated by dots.
- Status. Its Active, Passive or Fail.
- Health. Icon will be green, yellow or red.

For CIU pair there is sixth column that contains a button to switch over. If one of the CIU's is in failure the switch over will be automatic. Otherwise, the user can switch a CIU with its second CIU manually with a help of this button. See figure 67.

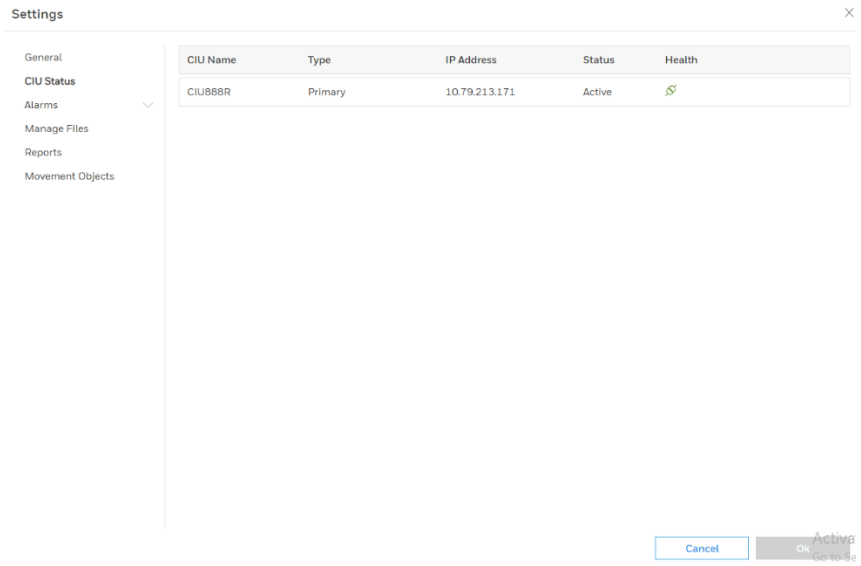


Figure 111 Settings modal CIU Status section

Alarms

Age Alarms

The system periodically checks the tank record time stamps against the system clock. If the difference exceeds a predefined value, an AGE alarm is generated. Aging values are checked on a per tank basis, so AAL's are generated for each tank separately. Form can be seen in figure 68, left side.

Foreground

A foreground age alarm is generated

Background

A background age alarm is generated

Deviation Alarms

The deviation alarm is an alarm that will be raised when Product level 1 and Product Level 2 on a tank deviate from each other. The deviation alarm is only applicable on tanks with dual gauges. With the switch you can enable or disable the deviation alarm for all tanks that have dual gauges.

Difference value

The difference value is the absolute value difference between Product Level 1 and Product Level 2. The difference alarm will only occur if both gauges are measuring level and are not in a failed state.

Unplanned Flow Alarms

The unplanned flow alarm is an alarm that will be raised when there is flow, but no flows are configured. Form can be seen in Figure 112 on the right side. There are three types.

1. Volume
2. Level
3. Mass

Overwrite Setpoint: The setpoint for an unplanned flow alarm can be manually configured using the **Overwrite Setpoint** field. When this field is left blank and the alarm is enabled by clicking **Ok**, the current measurement value (based on the alarm being configured) will automatically be used as the setpoint.

Current Setpoint: The **Current Setpoint** field displays the setpoint at which the unplanned flow alarm will be triggered.

Hysteresis: The **Hysteresis** field can be configured to prevent alarms from being raised if the currently monitored measurement (Volume, Level, or Mass) falls within the +/-hysteresis value from the current setpoint.

Volume Based Alarms

This can be used to configure an unplanned flow alarm based on volume. When the setpoint is not overwritten, the current TOV value will be used as the current setpoint.

Level Based Alarms

This can be used to configure an unplanned flow alarm based on level. When the setpoint is not overwritten, the current product level value will be used as the current setpoint.

Mass Based Alarms

This can be used to configure an unplanned flow alarm based on mass. When the setpoint is not overwritten, the current TNSM value will be used as the current setpoint.

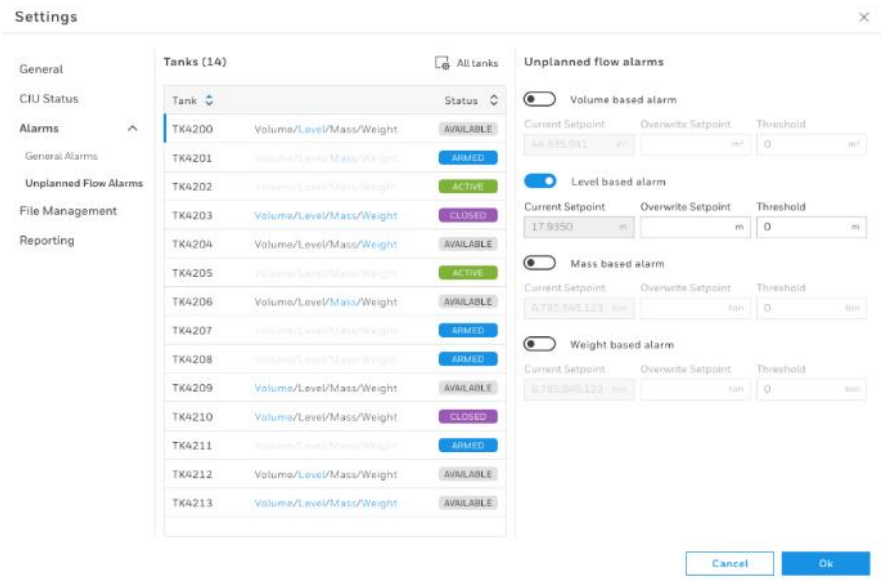


Figure 112 Settings modal unplanned flow alarms section

Manage Files

ENTIS generated files can be cleaned up/deleted after a defined number of days in the below configuration**.**

There are three sections in Manage Files:

1. Report
2. Movements
3. Profiles

1. Reports

For LM/Other reports, customers can define the number of days which files can be removed from Entis. By default, a minimum of 60 days is applied.

2. Movements

For Closed Movements, customers can define the number of days after which closed movements will be automatically cleaned up by Entis. By default, 1 day is applied and a maximum of 30 days can be configured.

3. Profiles

All profile data will be removed from Entis based on defined days.

Enable/Disable auto cleanup will remove files from Entis automatically based on the days configured. The Setting configure window is shown in the figure.

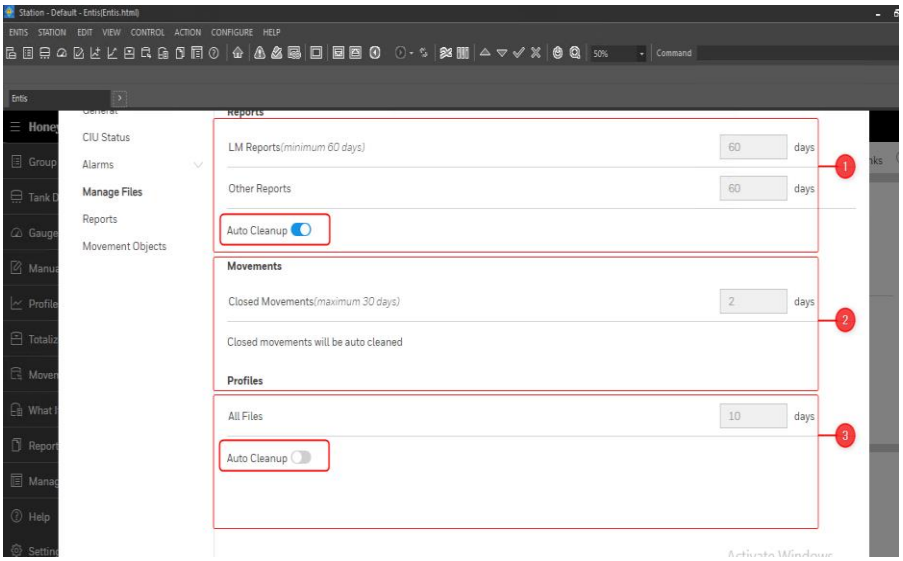


Figure 113 Settings modal Manage Files section

Reports

User can set the customized ‘Customer Name’, ‘Site Name’, and upload a ‘Customer Logo’ in settings modal reports section as shown in Figure 98: Delta column report. This information will be reflected in the Reports header.

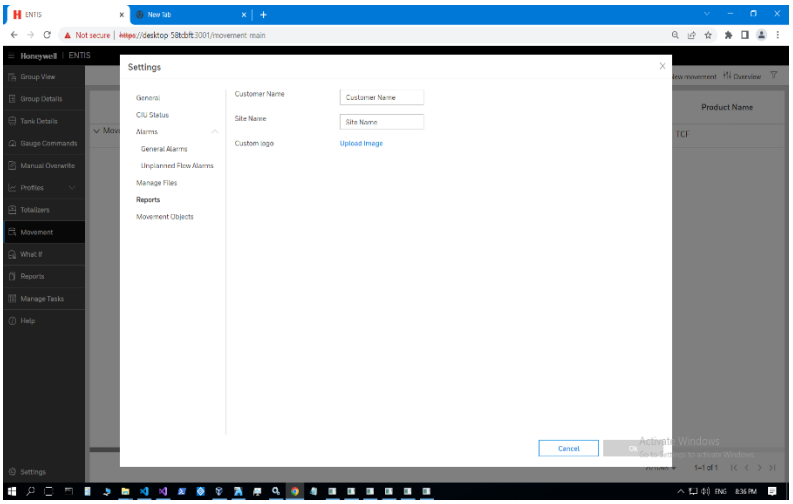


Figure 114 Settings modal Reports section

Movement Objects

ENTIS offers the feature of creating movement objects, and it is available as a part of the Infrastructure pipeline license. The Movement Objects Tab cannot be seen if the user does not have the license.

These objects include Pipe, Truck, Train Truck, Ship, Other. Movement objects can be used during movement configuration as a transfer object (only available with Advance Movement). Infrastructure pipe is a special movement object which is used to connect two tanks, and it cannot be selected as a transfer object.

Creating a movement object

To create a movement object, perform the following steps:

1. Go to **Settings**.
2. Select **Movement Objects**, click on **New**.
3. Select the **Object Type** (1) and enter the details of the object. Capacity is not a mandatory field as it can be modified at the time of movement configuration.

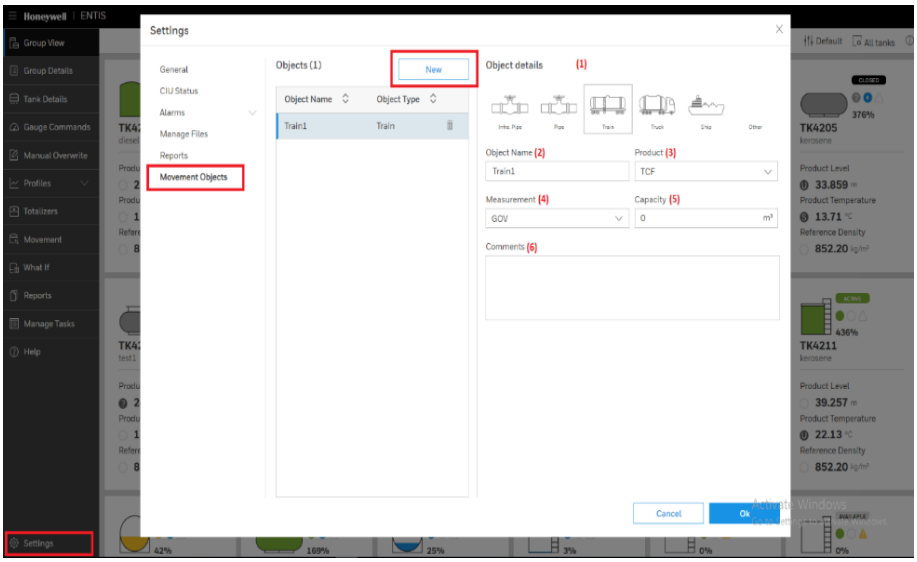


Figure 115: Movement object creation

- **Object Name** (2): The name of the object.
- **Product** (3): This is the product type to be stored in the object.
- **Measurement** (4): This is the measurement of the product (GOV, TOV, GSV, etc.).
- **Capacity** (5): This is the capacity of the object. It is not mandatory to set the capacity. It can be set during movement configuration.
- **Comments** (6): Operator can use this field to store additional details about the movement object.

4. Click **Ok**.

Note: The difference between *Infra Pipe* (infrastructure pipe) and *Pipe* (external pipe) is that infrastructure pipe is used to connect two tanks, whereas external pipe is the container to / from which the transfer is taking place. Infrastructure pipe can only be selected for tank-to-tank transfer.

Selection of Movement objects

1. Select **Configure Movement** for the tank you want to configure a movement.
2. On the **Configure Movement** screen, click on the **Preset** icon and select the movement objects from the drop-down under **Preset Name**.
3. Fill the fields as required.

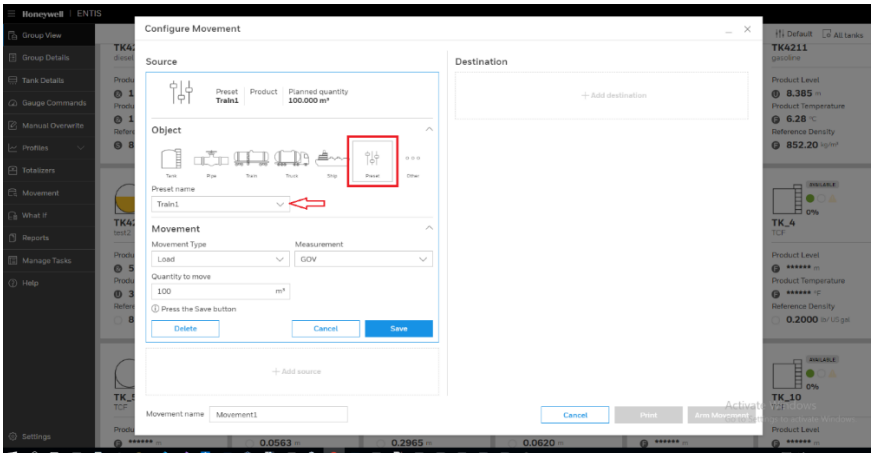


Figure 116: Movement object selection

Note: Infrastructure pipes are not available for selection under the “Preset” option. There is a separate section in the manual explaining how to select infrastructure pipes.

HOT STANDBY & REDUNDANCY SUPPORT ENTIS

When ENTIS is licensed and configured for redundancy, after the occurrence of a server failure, the second system will automatically take over the lost functionality of its counterpart to become the primary.

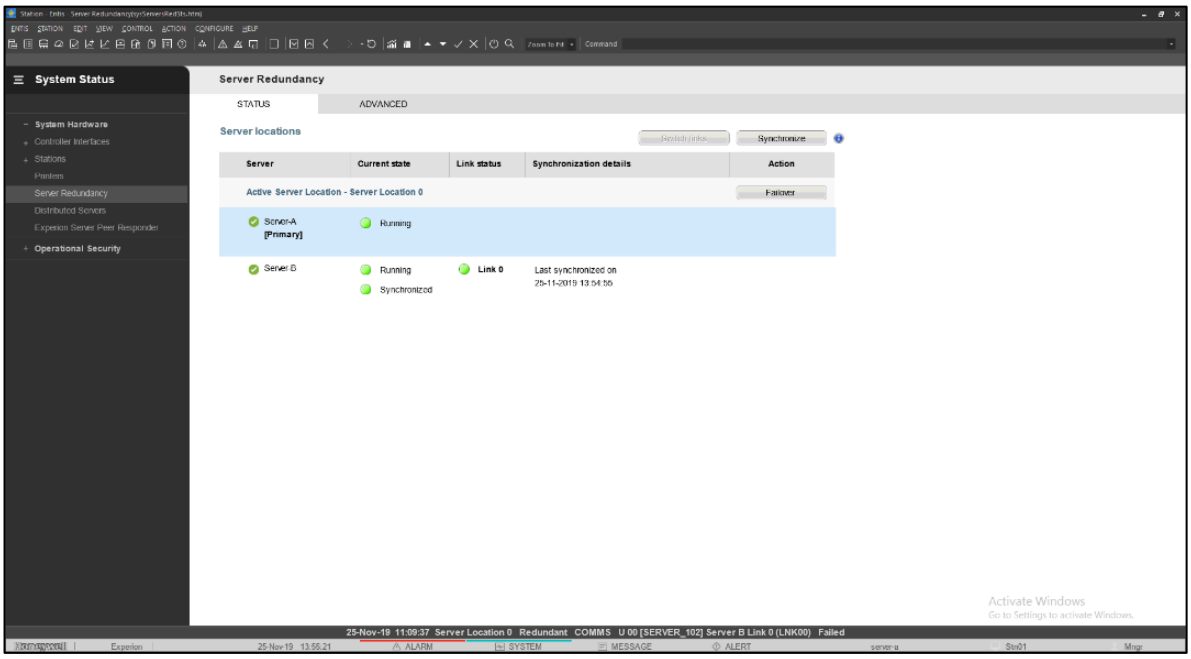
The user can also perform a manual switch over using the Server Redundancy display in Station.

How to perform a manual switch over

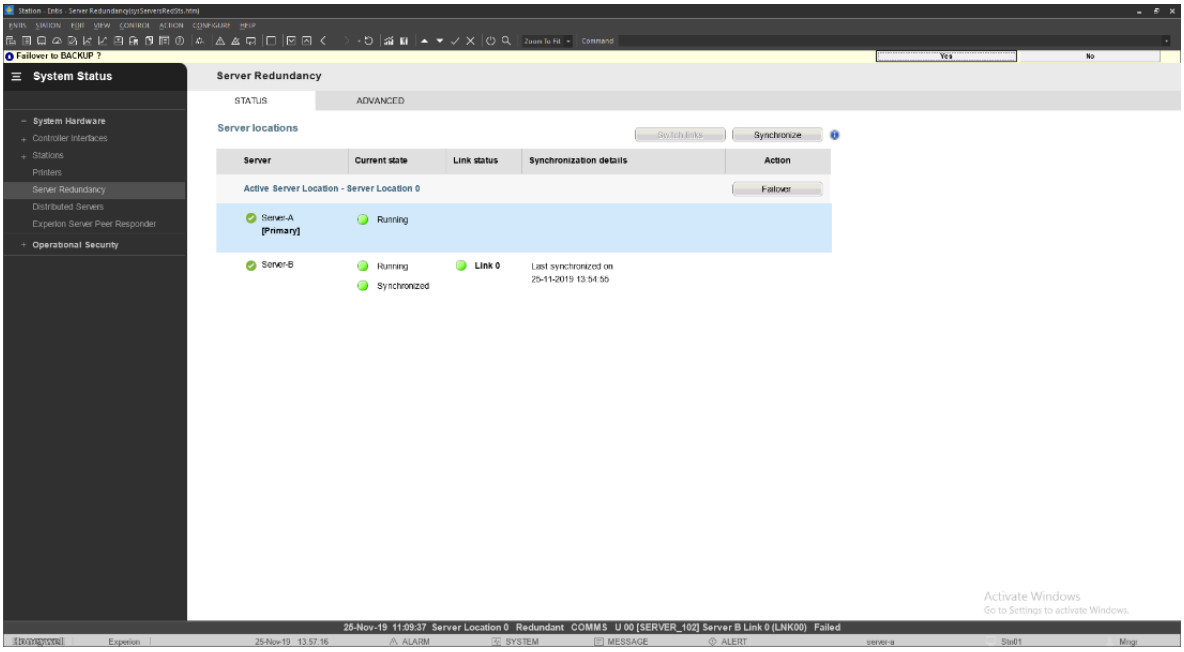
Proceed as follows:

1. Login with an account with mngr role access.

2. Select: **View | System status | Server redundancy**



3. Make sure the Primary and Secondary are synchronized(1).
4. Press **Failover**.



5. Press the **Yes** button (top right).

The redundant failover function is provided by Experio. Please refer to the Experion manual for all details related to this function.

Hot Standby & Redundancy Support (CIU 888)

ENTIS can be enhanced for use in critical applications with hot standby and redundancy support. Redundancy support can cover the unlikely event of a network failure, providing sustained and reliable data to your management system. After the occurrence of an error, the second system will take over the lost functionality. Following the switchover, all gauge data will be rescanned and recalculated to ensure the reliability of data.

The operator can also perform the switch over manually, after reviewing on the health status of the CIU 888. As shown in Figure 111 Settings modal CIU Status section.

How to Perform Manual Switch Over

Proceed as follows:

1. Click on the ‘Settings’ button on the left bottom of the screen. In settings modal navigate to ‘CIU Status’.
2. The CIU Status window will show the status of the CIU 888 with the following fields:
   - CIU Name — Name of the CIU 888
   - Type — Primary/Secondary
   - IP Address — The IP Address of the CIU
   - Status — Active/Passive
   - Health — Green if CIU is up and healthy, Red if network failure ; Yellow if health is less than and more than 0
   - Switch Over — Button for manual switch over
3. Click on the ‘Switch Over’ button. The Passive member will become Active and the Active member will become Passive.

ALARMS

CONFIGURE ALARMS

Alarms are primarily used to notify operators of conditions that might call for intervention. Alarms for standard points are specified when you configure your points in Quick Builder. The standard points of tanks for which alarms can be configured are given in the table below.

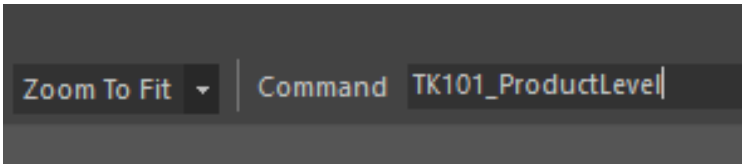
Table 5: Configuration Alarms

Point	Description
_DObs	The sampled density
_ProductLevel	The product level in the tank.
_GaugeLevel	The gauge level in the tank.
_Gauge2Level	The secondary gauge level in the tank.
_ProductTemp	The product temperature
_VapRoomPress	The product vapor pressure
_VapRoomTemp	The product vapor temperature
_WaterLevel	The water level in the tank
_WaterVol	The water volume
_ProductDRef	The reference density for the product in the tank.
_FlowTOV	The Total Observed Volume(TOV) of the product per time unit.
_GOV	The Gross Observed Volume(GOV). The GOV is the total volume of all petroleum liquids and sediment and water, excluding free water, at observed temperature and pressure
_GSV	The Gross Standard Volume(GSV). The GSV is the total volume of all petroleum liquids and sediment and water, excluding free water, corrected by the appropriate volume correction factor (VCF = CTL) for the observed temperature and API gravity, relative density, or density to a standard temperature, and corrected by the applicable pressure correction factor (Cpl) and meter factor.
_NSM	The product volume weight.
_TGSV	The Total Gross Standard Volume(TGSV).
_TNSM	The product plus vapor volume weight.
_TOV	The Total Observed Volume(TOV)
_GAL	Gauge Alarm
_AALB	Age Alarm Background
_AALF	Age Alarm Fore ground
_MovingStatus	The level moving status
_TCAL	Tank CRC Alarm
_DAL	Deviation Alarm between Product Level 1 and Product Level 2 on a tank
_UFLAL	Unplanned Flow Level Alarm
_UFVAL	Unplanned Flow Volume Alarm
_UFMAL	Unplanned Flow Mass Alarm
_PAT1, _PAT2, _PAT3, _PAT4	Target Pre Alert 1-4

How to configure Alarms

To configure an alarm for a point of a tank, follow the steps given below.

1. Type the point name prefixed with the tank name in the Command text box on top right corner of the station. For example, if an alarm must be configured for the _ProductLevel for tank TK101, the tank name should be prefixed with the tank name as shown below.



Press F12. This opens the point configuration screen as shown below.

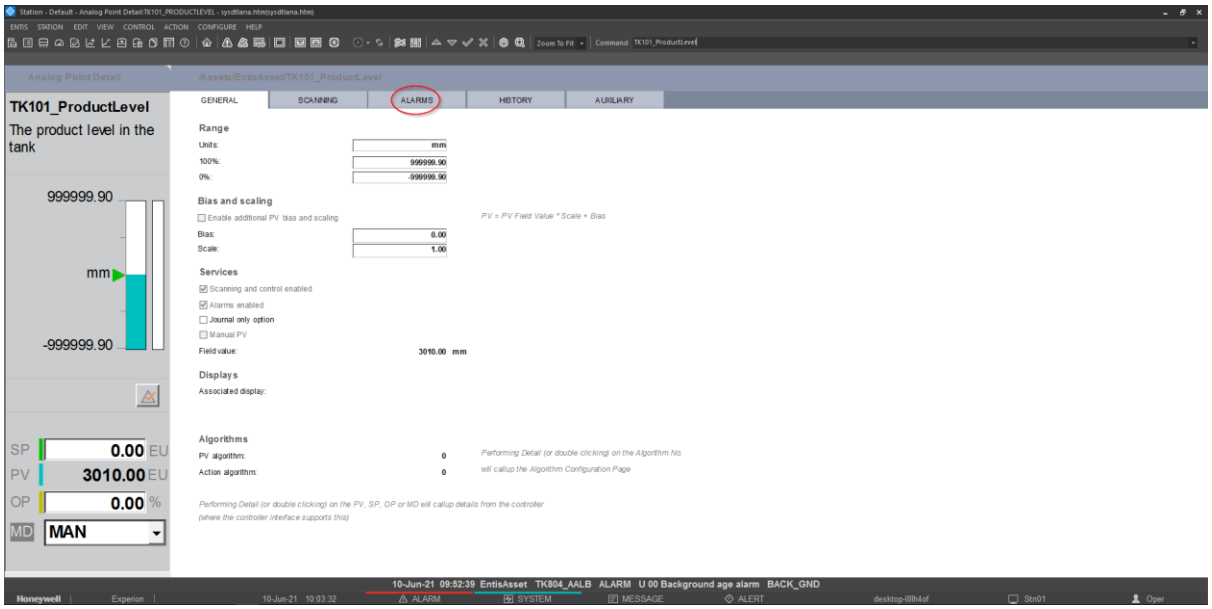
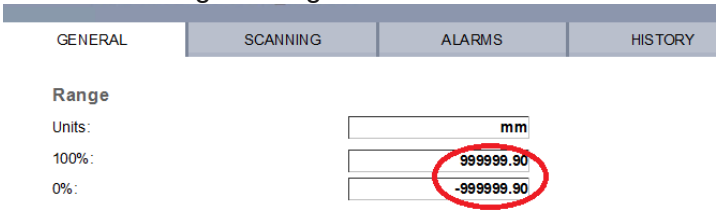


Figure 117: Configuration screen

2. Under the Range setting:



   a. Change the 0% and 100% value to the desired valid range for the point to a required physical limit for the specific data point type and tank combination

b. Press ENTER to confirm change

Note: This is only required to be done once per point and is important as it controls the deadband and unreasonable value alarm settings.

3. Click on the **Alarms Tab**.

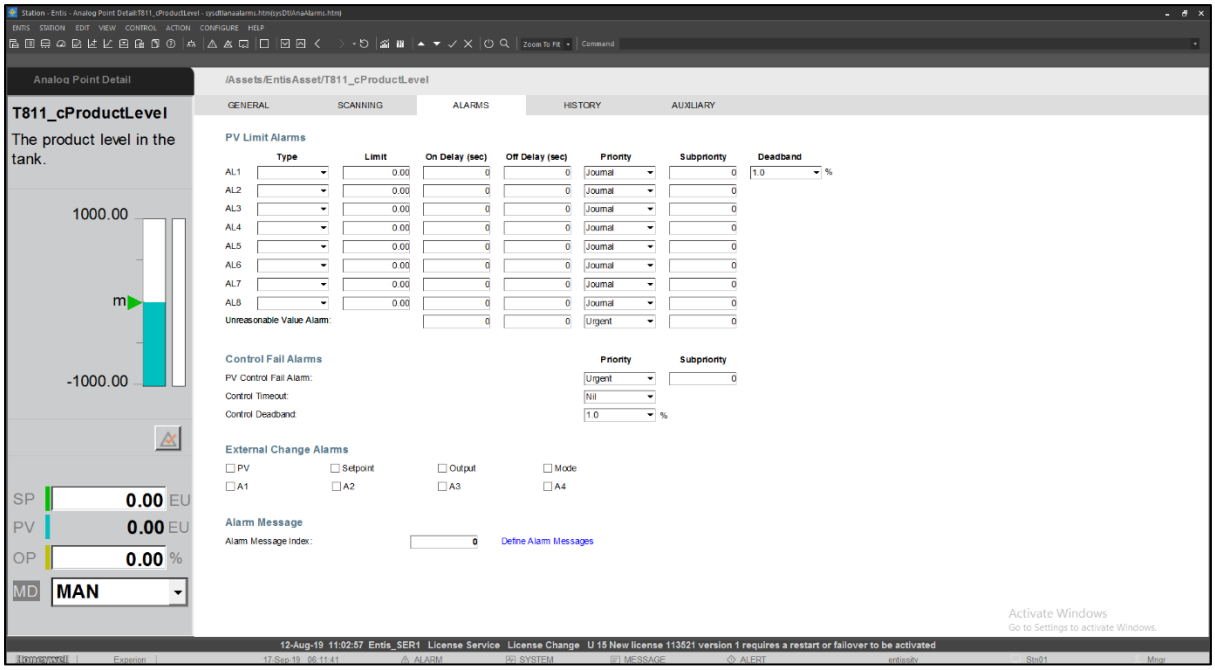


Figure 118: Alarm Configuration screen

4. Fill in the details of the alarm for the selected point of the tank (each time press ENTER to confirm changes).
    a. Type: PV HH,H,L,LL
    b. Limit: Setpoint at which it triggers
    c. Priority: Journal (off) – Urgent (highest priority)
    d. Deadband: Select the % deadband that prevents alarm from de-activating again until this deadband is exceeded

Note: Deadband % is based on the configured valid data range of the point. Thus, if left at default, 1% of -1000 to 1000m = 20m deadband around alarm setpoints. This is why it is important to set the range to realistic limits of the specific tank.

For more details on how to configure alarms, and to understand the parameters such as Type, Limit, On Delay etc. please refer to the "**About alarms and events for standard points"** section in the Experion Server and Client configuration guide, EHDOC-X127-en-511C.

VIEW ALARMS

The Alarms View in Station provides details about each alarm, such as the Date and time when it has occurred, the asset location, source, condition, priority etc.

Display Layout

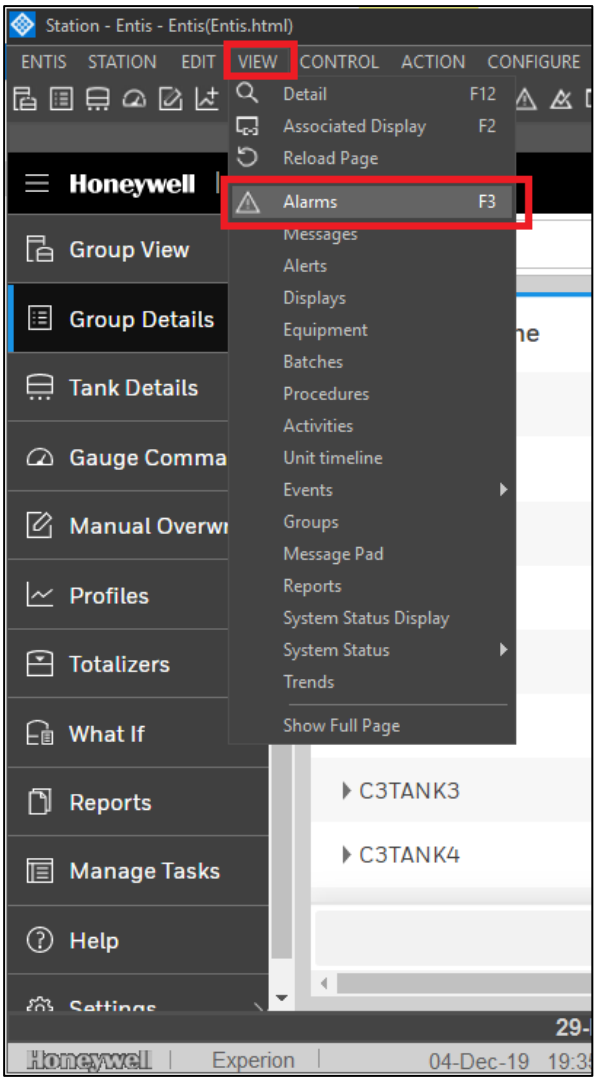
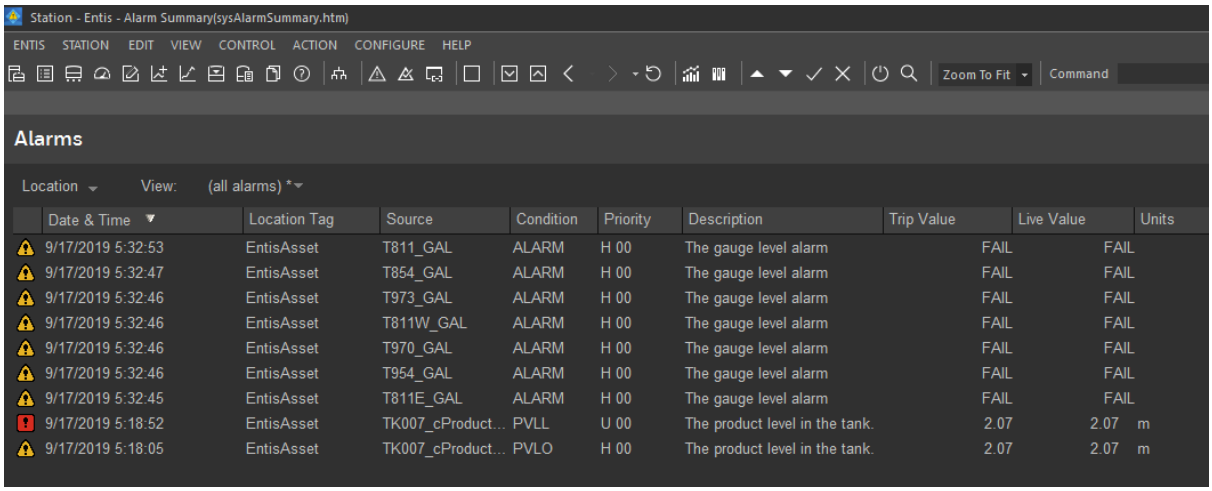


Figure 119: View Alarms

How to view Alarms

To view the Alarms page, go to the View menu and click on the Alarms item.

Alternatively, it can be accessed by clicking the Alarms icon  on the tool bar or the Display Alarm Summary icon flashing in red on the status bar.



Understanding the Alarms View

This screen has the following columns.

1. Priority of the Alarm with a visual icon.
   This column shows the alarm's state in symbolic way with a Yellow triangle  or Red square  with an exclamation mark in it. This represents the priority of the alarm, whether it is a critical, a high, a medium or a low alarm.

2. Date & Time
   Date and Time when the alarm was raised.

3. Location Tag
   Location of the Alarm. For ENTIS, it is generally ENTISAsset.
   Alarms can be filtered based on location.
   This location filter is available above Date & Time column.

4. Source
   The point or device that caused the alarm. If the point ID is too long to be fully displayed in the alarm summary, it will be truncated.
   To see the full name, place the mouse pointer over the partial point ID to display the full point ID.

5. Condition
   The alarm condition.

6. Priority

The priority of the alarm as listed below. The prefix letter indicates the general priority as listed below.

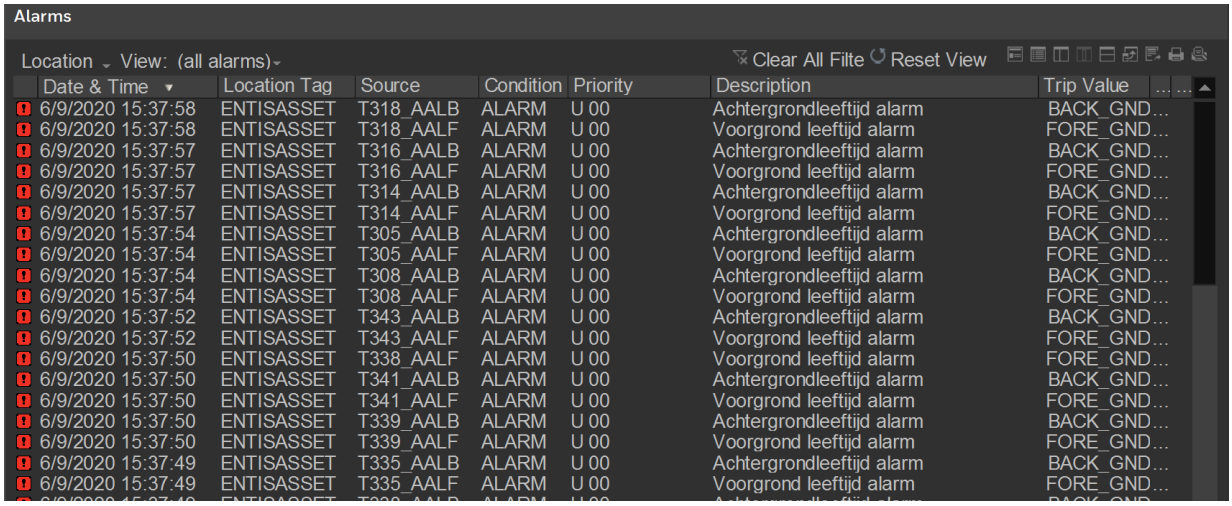
- Critical
- Urgent
- High
- Low

If a number follows the letter, it represents the relative priority within the general priority. For example, Urgent alarms can vary from U15 (most urgent) to U00 (least urgent).

7. Description

A description of the alarm. If the description is too long to be fully displayed in the alarm summary, it is truncated. To see the full description place the mouse pointer over the partial description to display the full description.

Description is available in the language choosen by the user.



Date & Time	Location Tag	Source	Condition	Priority	Description	Trip Value
6/9/2020 15:37:58	ENTISASSET	T318_AALB	ALARM	U 00	Achtergrondleeftijd alarm	BACK_GND...
6/9/2020 15:37:58	ENTISASSET	T318_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...
6/9/2020 15:37:57	ENTISASSET	T316_AALB	ALARM	U 00	Achtergrondleeftijd alarm	BACK_GND...
6/9/2020 15:37:57	ENTISASSET	T316_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...
6/9/2020 15:37:57	ENTISASSET	T314_AALB	ALARM	U 00	Achtergrondleeftijd alarm	BACK_GND...
6/9/2020 15:37:57	ENTISASSET	T314_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...
6/9/2020 15:37:54	ENTISASSET	T305_AALB	ALARM	U 00	Achtergrondleeftijd alarm	BACK_GND...
6/9/2020 15:37:54	ENTISASSET	T305_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...
6/9/2020 15:37:54	ENTISASSET	T308_AALB	ALARM	U 00	Achtergrondleeftijd alarm	BACK_GND...
6/9/2020 15:37:54	ENTISASSET	T308_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...
6/9/2020 15:37:52	ENTISASSET	T343_AALB	ALARM	U 00	Achtergrondleeftijd alarm	BACK_GND...
6/9/2020 15:37:52	ENTISASSET	T343_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...
6/9/2020 15:37:50	ENTISASSET	T338_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...
6/9/2020 15:37:50	ENTISASSET	T341_AALB	ALARM	U 00	Achtergrondleeftijd alarm	BACK_GND...
6/9/2020 15:37:50	ENTISASSET	T341_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...
6/9/2020 15:37:50	ENTISASSET	T339_AALB	ALARM	U 00	Achtergrondleeftijd alarm	BACK_GND...
6/9/2020 15:37:50	ENTISASSET	T339_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...
6/9/2020 15:37:49	ENTISASSET	T335_AALB	ALARM	U 00	Achtergrondleeftijd alarm	BACK_GND...
6/9/2020 15:37:49	ENTISASSET	T335_AALF	ALARM	U 00	Voorgrond leeftijd alarm	FORE_GND...

8. Trip value

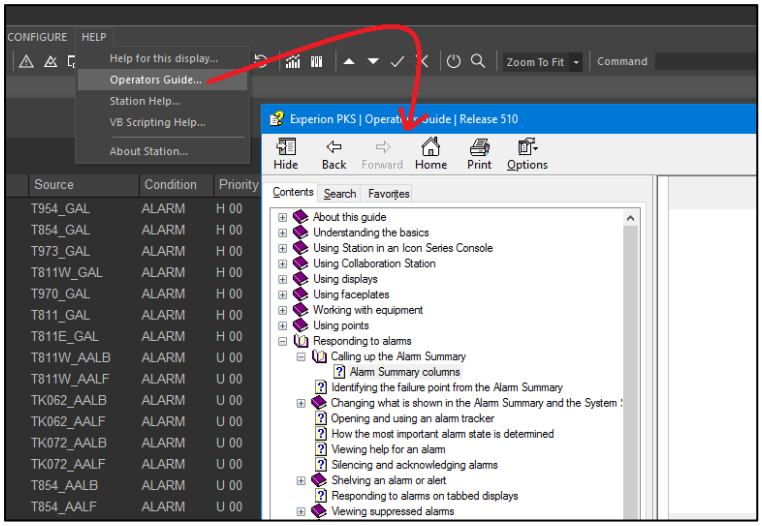
The value that triggered the alarm.

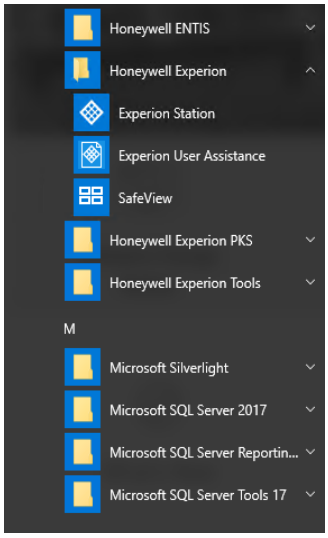
9. Live value

The current value. This value is continually updated. If the Format live value in Alarm Summary using PV Format setting in the Summary Displays tab of Server Wide Settings is enabled, live values in the Alarm Summary will be shown in the format configured for point parameter values. For information, see “Configuring precision values for point parameters.” Alternatively, two decimal places will be shown.

10. Units

The unit that the value represents, for example ml/s. Please refer Operators guide available in Help menu or Server and Client configuration guide in Experion HS in Start Menu for more details on viewing the Alarms and understanding them in detail.



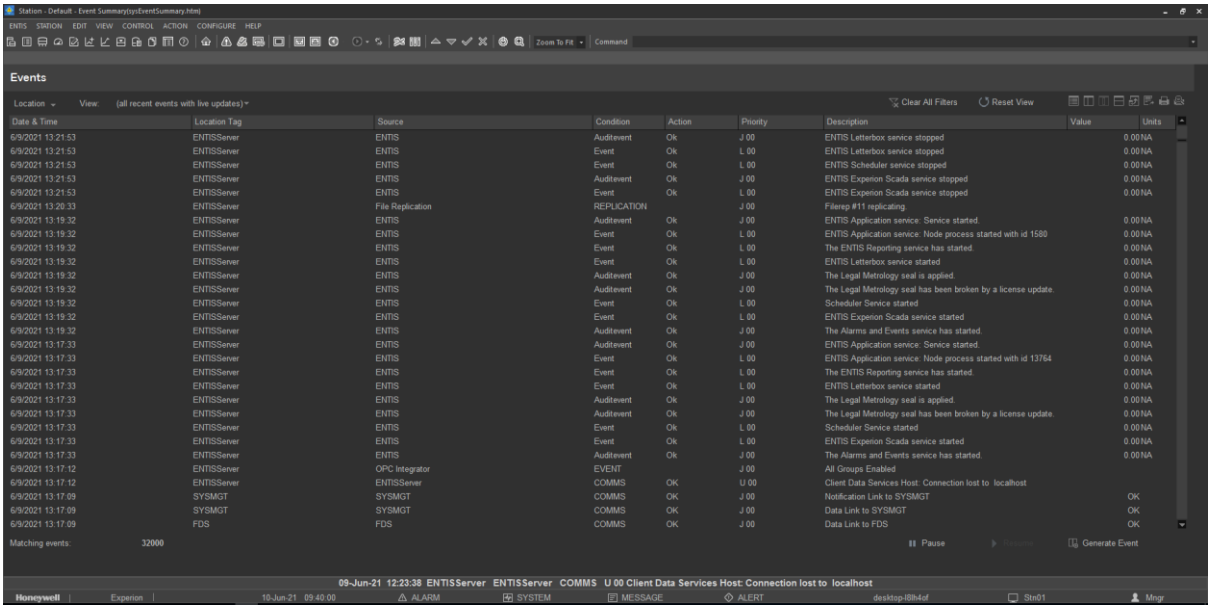


The alarms can also be transported to the recipients via the available SMS & Email option in Experion HS. The configuration for these can be obtained from "Configuring Alarm Paging" section in Sever & Client Configuration Guide in Experion HS in the Start Menu as shown in the above figure.

EVENTS

Viewing Events

Every event, such as a point status change or an operator action, is stored in an event database. The event database stores events for a specified period. Using Event archiving, you can archive these events to a network file server or to a disk where they can be stored for future retrieval and reporting. For information on archiving events or restoring events from archive, see the Experion Operator's Guide, EHDOC-XX80-en-510A.



How to view events

To view the events summary in Experion station, navigate to

View ->Events->Event Summary menu option on Experion Station as shown in the picture below.

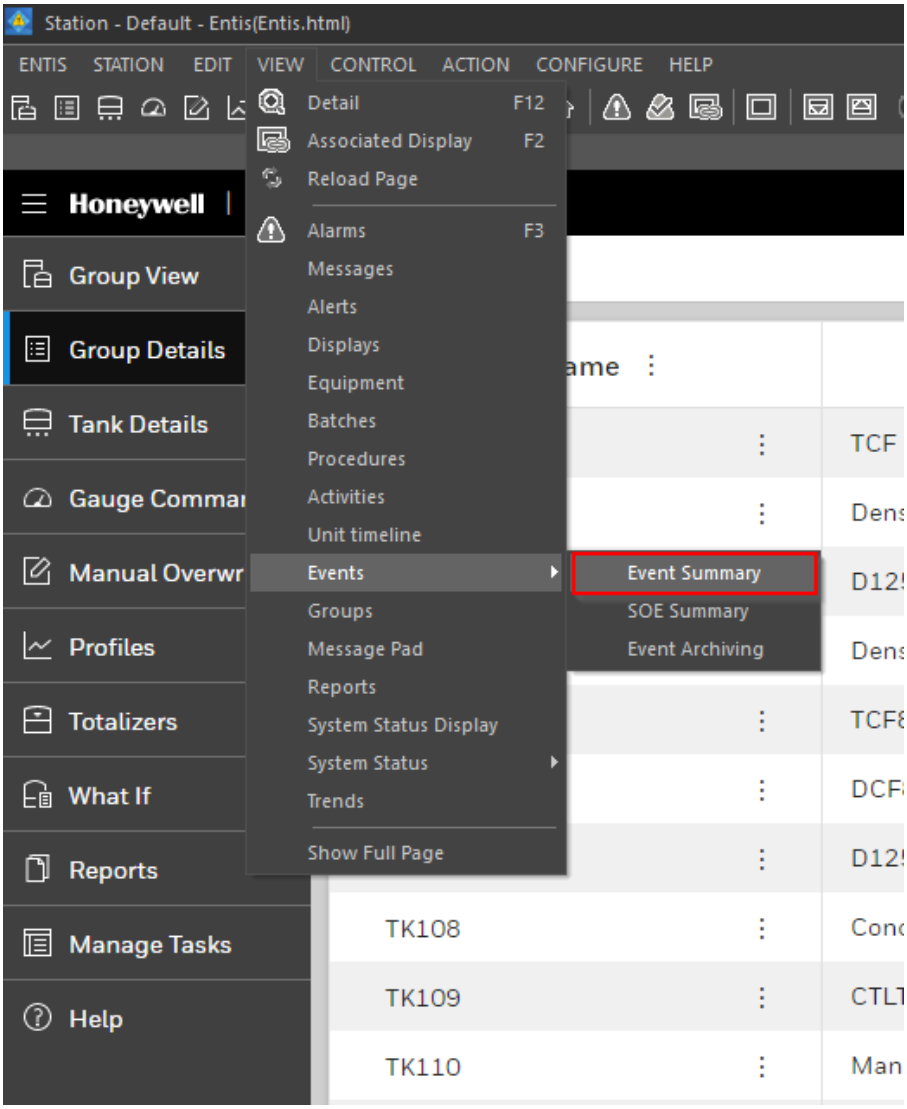


Figure 120: View Events

Understanding Events View

The Events summary is shown in tabular format with the following columns.

1. Date & Time

   The time and date at which the event was received.

2. Location

   The tag name of the asset to which the point or device belongs.

3. Source

   The point or device that caused the event. If the point ID is too long to be fully displayed in the event summary, it is truncated. To see the full name, place the mouse pointer over the partial point ID to display the full point ID.

4. Condition

   The event condition.

5. Action

   The action, either operator or system generated.

6. Priority

   The priority of the event. The prefix letter indicates the general priority:

   - Urgent
   - High
   - Low
   - Journal

   If a number follows the letter, it represents the relative priority within the general priority. For example, Urgent events can vary from U15 (most urgent) to U00 (least urgent).

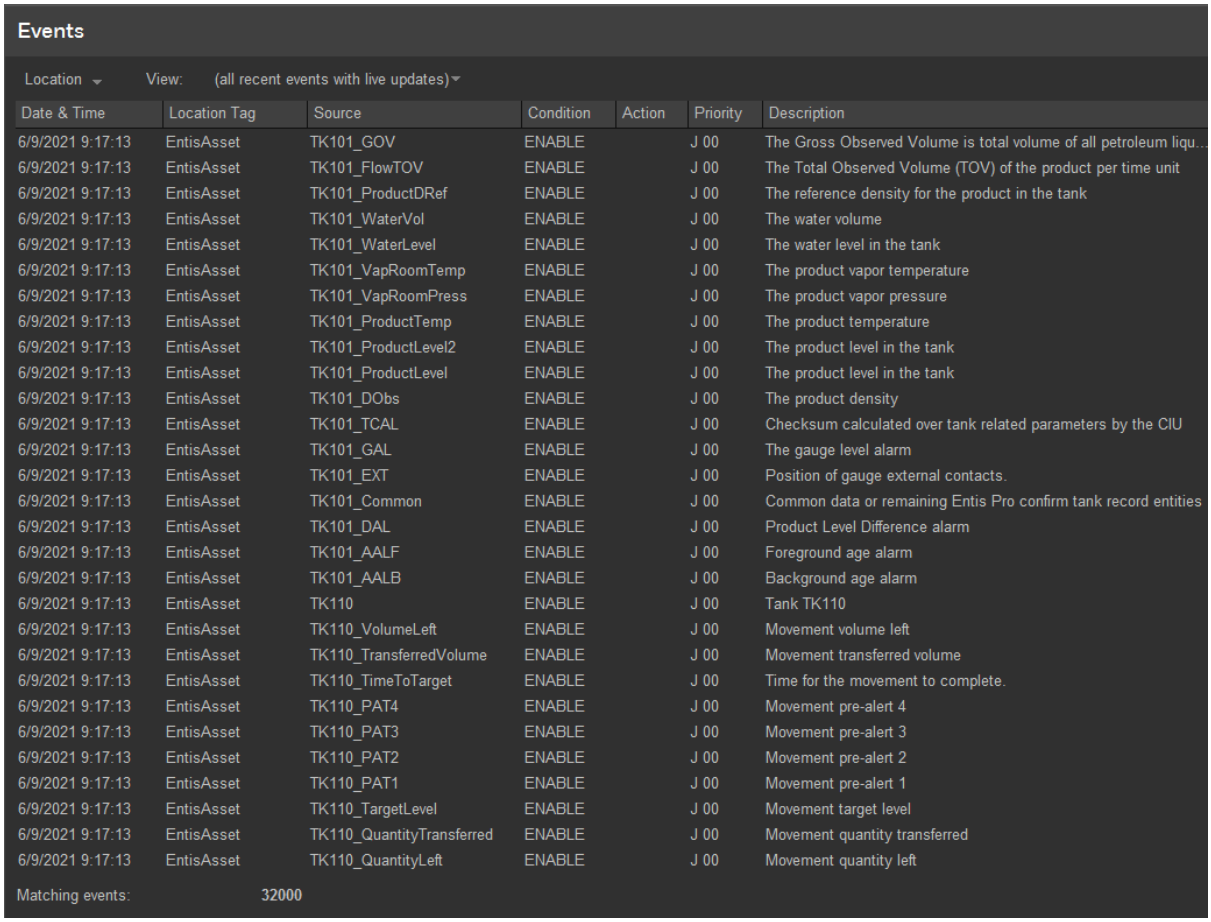
7. Description

   A description of the event.

   If the description is too long to be fully displayed in the event summary, it is truncated. To see the full description, place the mouse pointer over the partial description to display the full description.

   Description is available in the language choosen by the user.

Events



8. Value

   The value of the event.

9. Units

   The unit that the value represents, for example ml/s.

10. Operator

    The logged in Operator.

    Please refer **Operators guide** available in Help menu or **Server and Client configuration guide** in **Experion HS Pdf collection** in Start Menu for more details on viewing the Events and understanding them in detail.

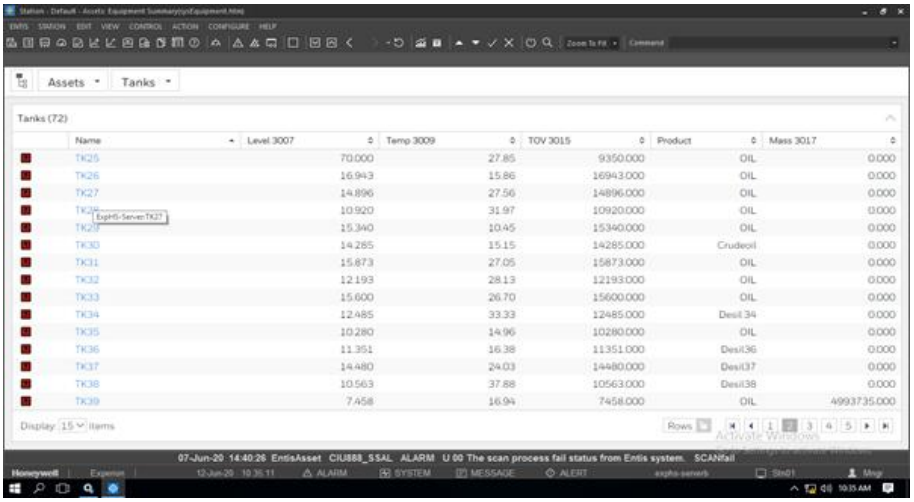
HISTORICAL AND REALTIME TRENDING

Pre-Configured ENTIS Trends for Experion points

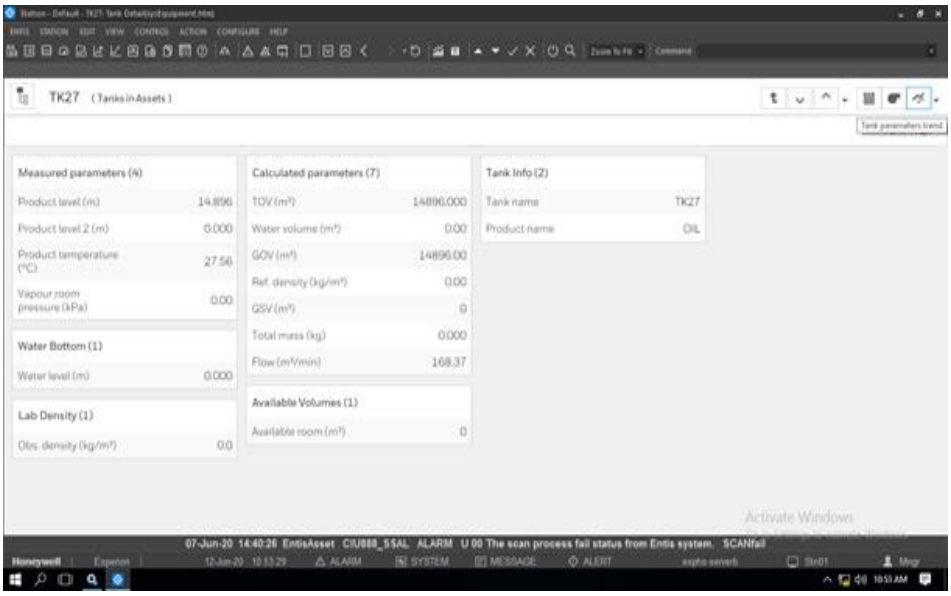
ENTIS comes with some tank data preconfigured for viewing as trends.

To View the Pre-configured ENTIS trends:

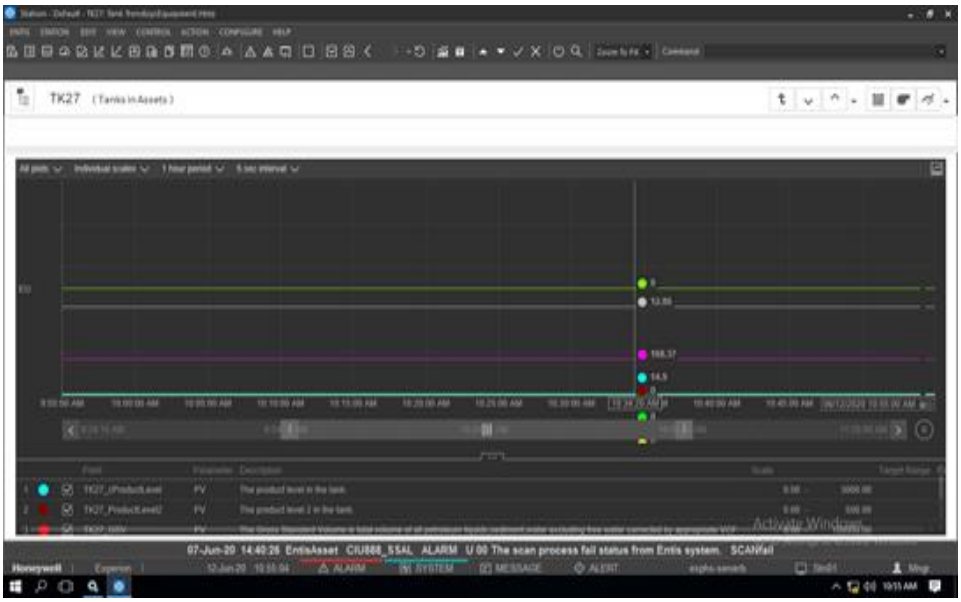
1. Navigate to View -> Equipment Menu item.
2. Click on the tank name link to navigate to the equipment tank detail view.



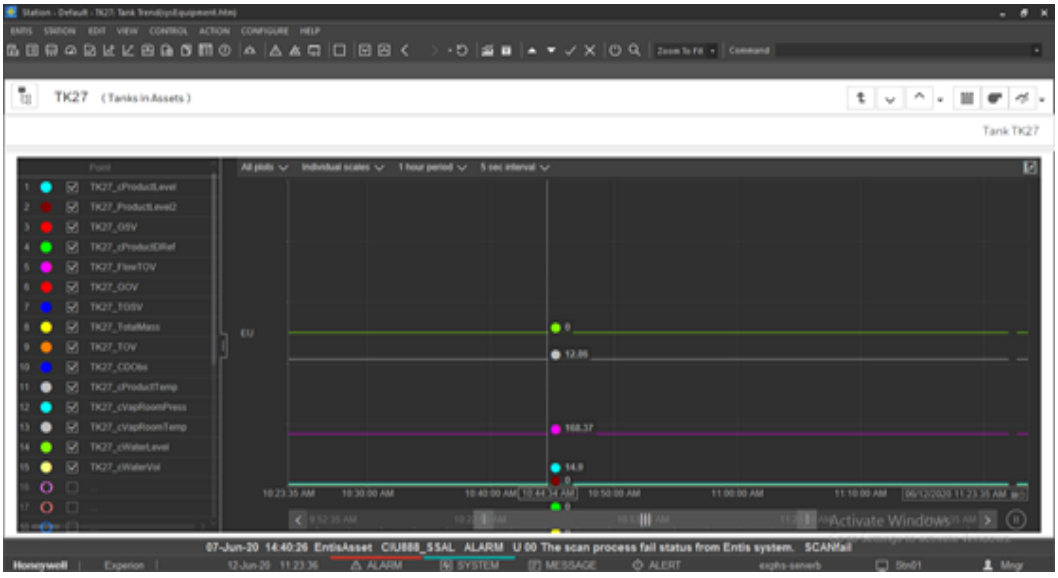
3. Click on the Trends icon to navigate to the trend view



4. The Trend data is Viewed as per the below Tank Parameters



5. The top right title bar of the trend graph contains icon to set tank parameters table in left or bottom orientation or hide parameters.



6. From the title bar:
    a. The trend interval and period can be selected.
    b. Pause the trend for analysis purpose
    c. Auto scale to point range, engineering unit
    d. Hide parameters or select from different tank.
    e. Custom range can be entered

7. **Export** the current view data
    a. Select any trend line and press Ctrl+C to copy to clipboard
    b. Paste into a text file or Excel workbook

Experion Trends

Using Experion trends, a user can view the historical or real time value trends of points. A trend display shows changes in point parameter values over time.

Trends can display data in several ways, including:

- Line graphs (the default)
- Bar graphs
- Numerical list of historical data
- X-Y plot of the value of one point against another (that is, one point on the x-axis and the other on the y-axis).

Each trend is identified by a number, and generally has a descriptive title.

How to create/view Trends

1. Click on View then go to Trends.

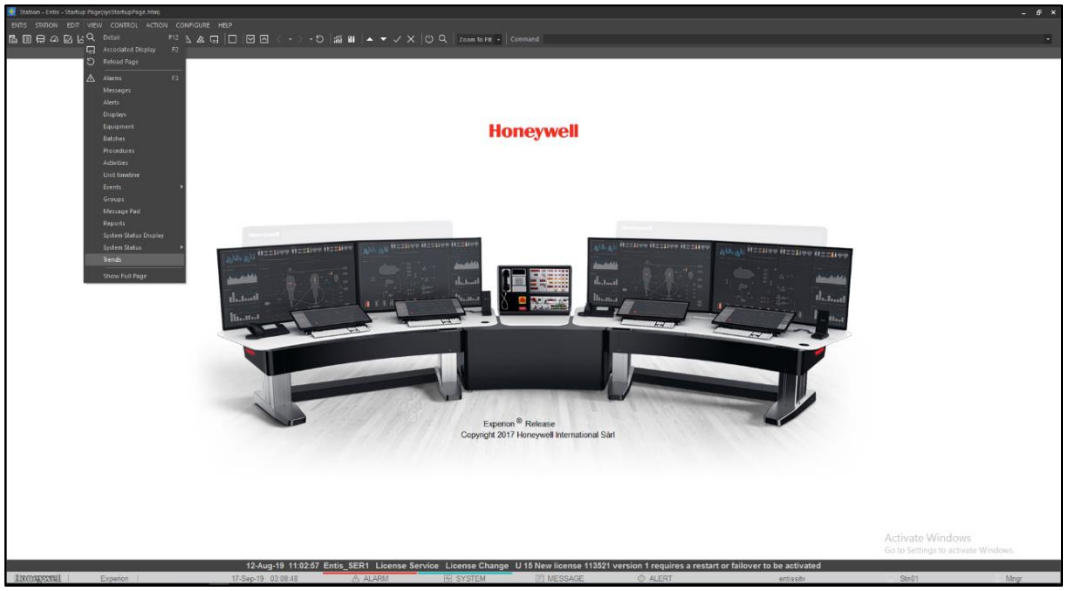


Figure 121: Trends

2. Make sure that the logged-in user has the MNGR or ENGR security level.

3. Click on **Configure Trends**.

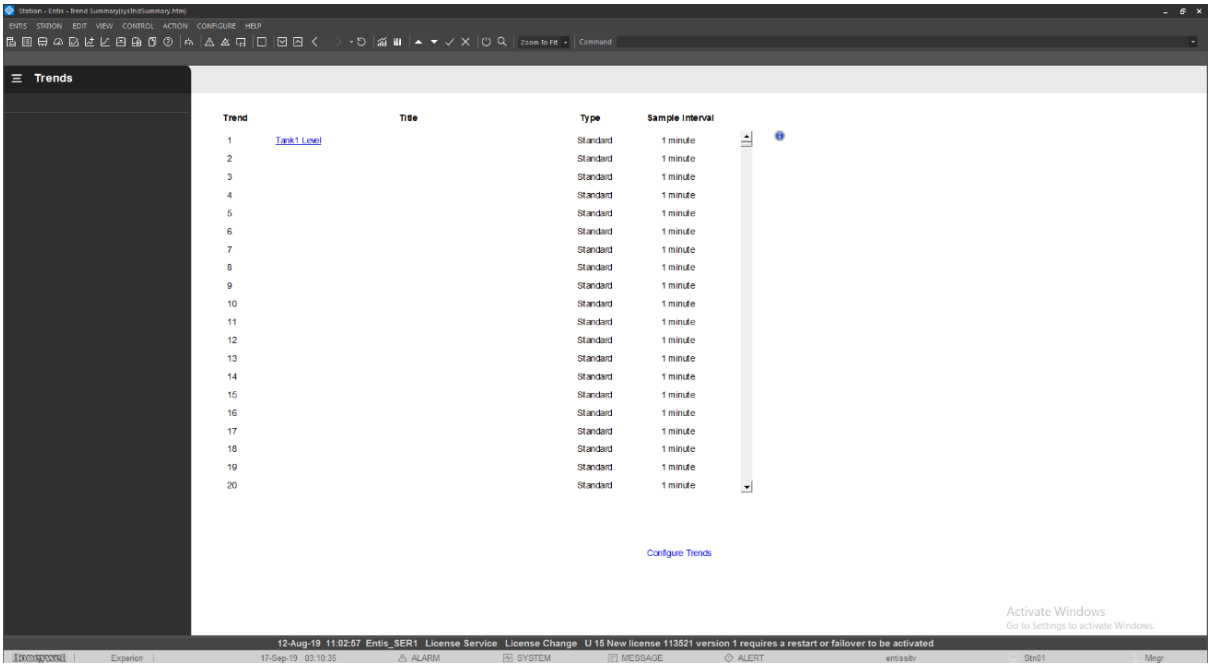


Figure 122: Configure Trends

4. Fill in the custom details, click on **Options**.
   Select color scheme Point Id (via the Point Browser window).

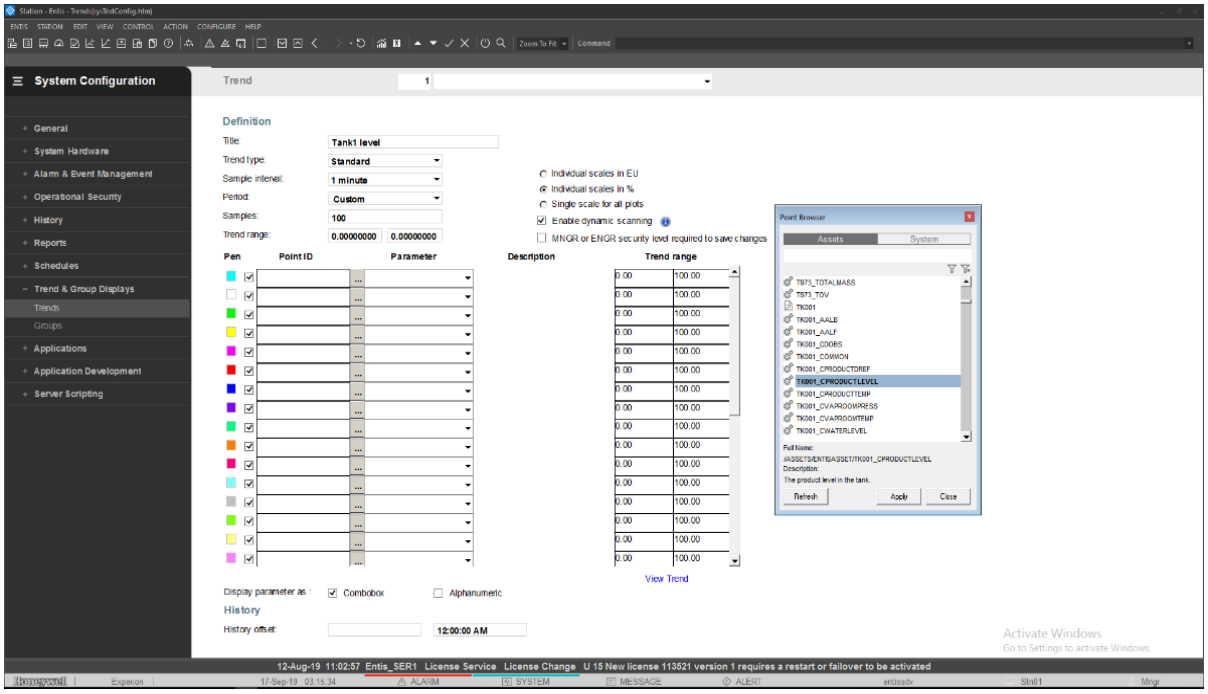


Figure 123: Select the point

Choose the parameter to be displayed in the trend from the dropdown. Then click on view trend.

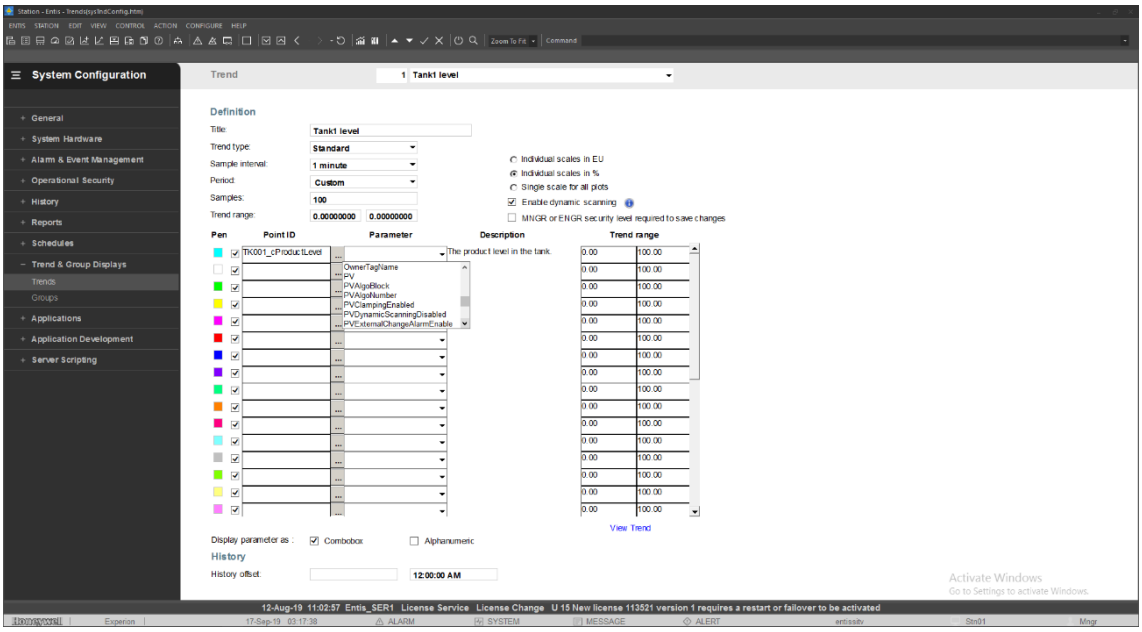


Figure 124: Select the parameter

Historical and Realtime Trending

View the current value of the point in the Current value column. The trend will be available on the graph screen.

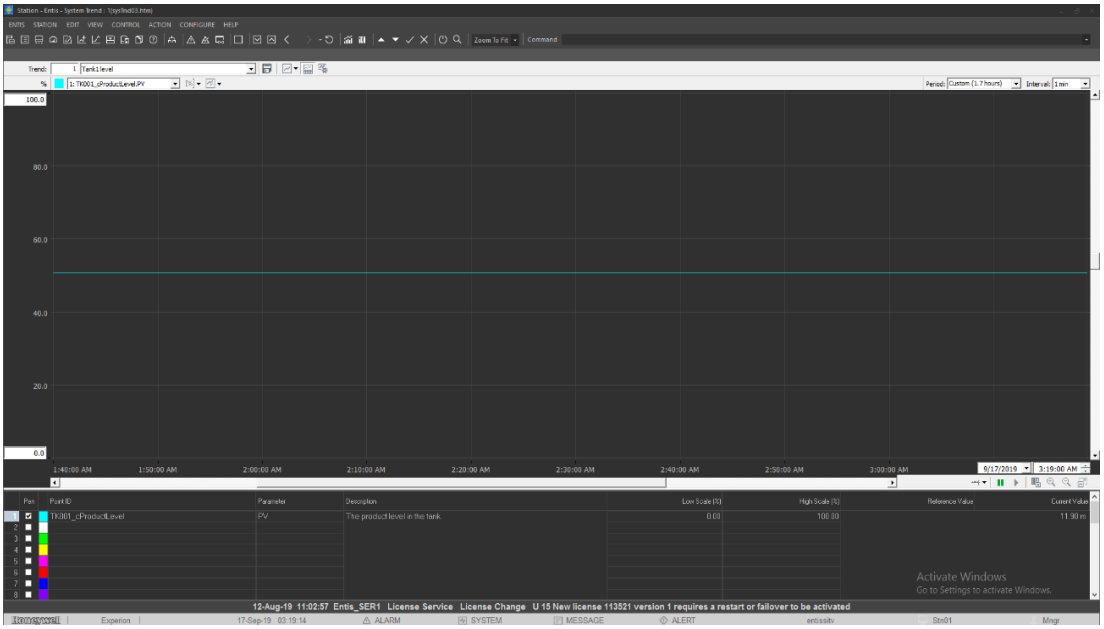


Figure 125: View Trend

View historical trends

Users can view historical trend by changing the date and time. The display will show historical trends if the trend was created and was running at the selected times.

To change the period on the trend you are viewing

1. In the Period box, select the period you want to see on your trend.
2. Click the Time selector and choose the required position of the selector.
3. In the Date box, type or select the desired date.
4. In the Time box, type the desired time and press **ENTER**.

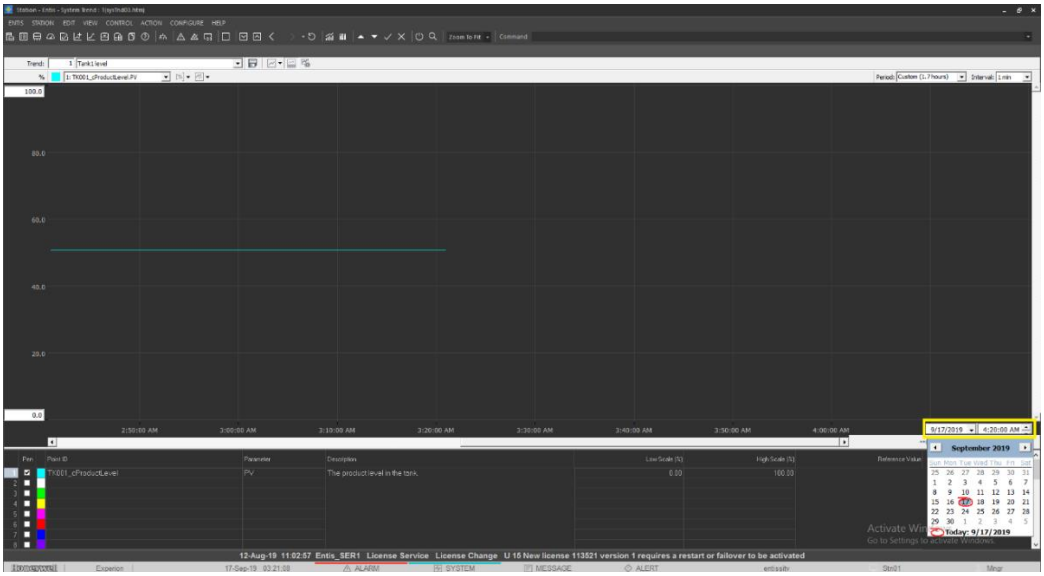


Figure 126: Historical Trend

ENTIS SCADA points specifications

To have the ENTIS data available for Experion to handle alarms, trending and other SCADA needs, ENTIS publishes the acquired and processed data to Experion SCADA points.

For each tank ENTIS allocates 42 SCADA points. Per CIU 4 SCADA points get added which Experion HS processes to update the alarms on connectivity and hot stand by status of the CIU 888's ENTIS connects to.

ENTIS SCADA Points are shown in below table:

The following points will be available from ENTIS R122.1.

Each CIU takes 4 SCADA Points:

Table 6 : SCADA Entities

Entity	SCADA Point name	Param	Link Type	Value Type	HISTLOW	Point description
CAL	[Controller]_CAL	OP				The communication alarm from ENTIS system to CIU
CCAL	[Controller]_CCAL	OP				The checksum status from ENTIS system to CIU is wrong
SSAL	[Controller]_SSAL	OP				The scan process fail status from Entis system
HAL	[Controller]_HAL	OP				CIU 888 Hot Standby Alarm

The next table show the 41 points for which most of them contain a user defined parameter which holds the SV (Status/Validity) value.

EntityID	Entity	SCADA Point name	Param	Point description
933	AALB	[Tank]_AALB	OP	Background age alarm
932	AALF	[Tank]_AALF	OP	Foreground age alarm
939	DAL	[Tank]_DAL	PV	Product Level Difference alarm
250	DObs (calculated)	[Tank]_DObs	A1	The product density
251	DObsStatus	[Tank]_DObs	Status	The product density
74	FlowTOV	[Tank]_FlowTOV	A1	The Total Observed Volume (TOV) of the product per time unit
99	FlowTOV	[Tank]_FlowTOV	Status	The Total Observed Volume (TOV) of the product per time unit
931	GAL	[Tank]_GAL	StateStringPV	The gauge level alarm
58	GOV	[Tank]_GOV	A1	The Gross Observed Volume is total volume of all petroleum liquids,sediment,water excluding free water at observed temp and pressure
59	GOVStatus	[Tank]_GOV	Status	The Gross Observed Volume is total volume of all petroleum liquids,sediment,water excluding free water at observed temp and pressure

60	GSV	[Tank]_GSV	A1	The Gross Standard Volume is total volume of all petroleum liquids,sediment,water excluding free water corrected by appropriate CTL
61	GSVStatus	[Tank]_GSV	Status	The Gross Standard Volume is total volume of all petroleum liquids,sediment,water excluding free water corrected by appropriate CTL
1060	MovementStartLevel	[Tank]_MovementStartLevel	A1	Movement start level
1062	MovementStatus	[Tank]_MovementStatus	OP	The tank movement function status
3	MovingStatus	[Tank]_MovingStatus		The Tank level moving status alarm
68	NSM	[Tank]_NSM	A1	The Nett Standard Mass of the product (NSM)
69	NSMStatus	[Tank]_NSM	Status	The Nett Standard Mass of the product (NSM)
1068	PlannedQuantity	[Tank]_PlannedQuantity	A1	Movement planned quantity
1070	PlannedVolume	[Tank]_PlannedVolume	A1	Movement planned volume
30	ProductDRef	[Tank]_ProductDRef	A1	The reference density for the product in the tank
31	ProductDRefStatus	[Tank]_ProductDRef	Status	The reference density for the product in the tank

198	cInnage	[Tank]_ProductLevel	A1	The corrected product level in the tank
199	cInnageStatus	[Tank]_ProductLevel	Status	The corrected product level in the tank
40	GaugeLevel	[Tank]_GaugeLevel	A1	The product level in the tank
41	GaugeLevelStatus	[Tank]_GaugeLevel	Status	The product level in the tank
2603	Gauge2Level	[Tank]_Gauge2Level	A1	The secondary gauge level in the tank
2604	Gague2LevelStatus	[Tank]_Gauge2Level	Status	The secondary gauge level in the tank
44	ProductTemp	[Tank]_ProductTemp	A1	The product temperature
45	ProductTempStatus	[Tank]_ProductTemp	Status	The product temperature
1072	QuantityLeft	[Tank]_QuantityLeft	A1	Movement quantity left
1074	QuantityTransferred	[Tank]_QuantityTransferred	A1	Movement quantity transferred
1076	TargetDirection	[Tank]_TargetDirection	A1	The direction of movement for the tank
1078	TargetLevel	[Tank]_TargetLevel	A1	Movement target level
1080	PAT1	[Tank]_PAT1	OP	Movement pre-alert 1
1082	PAT2	[Tank]_PAT2	OP	Movement pre-alert 2
1084	PAT3	[Tank]_PAT3	OP	Movement pre-alert 3

1086	PAT4	[Tank]_PAT4	OP	Movement pre-alert 4
9362	TCAL	[Tank]_TCAL	OP	Checksum calculated over tank related parameters by the CIU
66	TGSV	[Tank]_TGSV	A1	The Total Gross Standard Volume (TGSV)
67	TGSVStatus	[Tank]_TGSV	Status	The Total Gross Standard Volume (TGSV)
1000	TimeToFill	[Tank]_TimeToFill	A1	The time to fill the tank
1088	TimeToTarget	[Tank]_TimeToTarget	A1	Time for the movement to complete.
72	TNSM	[Tank]_TNSM	A1	The Total Net Standard Mass of the product (TNSM)
73	TNSMStatus	[Tank]_TNSM	Status	The Total Net Standard Mass of the product (TNSM)
54	TOV	[Tank]_TOV	A1	The Total Observed Volume (TOV)
55	TOVStatus	[Tank]_TOV	Status	The Total Observed Volume (TOV)
1090	TransferredVolume	[Tank]_TransferredVolume	A1	Movement transferred volume
941	UFLAL	[Tank]_UFLAL		Unplanned flow level alarm
942	UFVAL	[Tank]_UFVAL		Unplanned flow volume alarm
48	VapRoomPress	[Tank]_VapRoomPress	A1	The product vapor pressure

49	VapRoomPressStatus	[Tank]_VapRoomPress	Status	The product vapor pressure
46	VapRoomTemp	[Tank]_VapRoomTemp	A1	The product vapor temperature
47	VapRoomTempStatus	[Tank]_VapRoomTemp	Status	The product vapor temperature
1092	VolumeLeft	[Tank]_VolumeLeft	A1	Movement volume left
42	WaterLevel	[Tank]_WaterLevel	A1	The water level in the tank
43	WaterLevel	[Tank]_WaterLevel	Status	The water level in the tank
264	WaterVol	[Tank]_WaterVol	A1	The water volume
265	WaterVol	[Tank]_WaterVol	Status	The water volume

The next table show the 42nd SCADA Point of a tank which contains the remaining values published as User Defined Parameters of a point named [Tank]_Common:

EntityID	Entity	SCADA Point name	Param
933	AALB	[Tank]_Common	AALB
932	AALF	[Tank]_Common	AALF
103	AmbientTemperature	[Tank]_Common	AmbientTemperature
104	AmbientTemperatureStatus	[Tank]_Common	AmbientTemperatureStatus
75	AvailableRoom	[Tank]_Common	AvailableRoom
100	AvailableRoomStatus	[Tank]_Common	AvailableRoomStatus
76	AvailableTOV	[Tank]_Common	AvailableTOV
101	AvailableTOVStatus	[Tank]_Common	AvailableTOVStatus
53	BackgroundTimeStamp	[Tank]_Common	BackgroundTimeStamp
935	CCAL	[Tank]_Common	[ENTISTANKCONTROLLER]_CCAL

298	Concentration	[Tank]_Common	Concentration
299	ConcentrationStatus	[Tank]_Common	Concentration
262	CTL	[Tank]_Common	CTL
263	CTLStatus	[Tank]_Common	CTLStatus
107	CTSH	[Tank]_Common	CTSH
108	CTSHStatus	[Tank]_Common	CTSHStatus
939	DAL	[Tank]_Common	DAL
38	DisplacerPosition	[Tank]_Common	DisplacerPosition
39	DisplacerPositionStatus	[Tank]_Common	DisplacerPositionStatus
37	EXT	[Tank]_Common	EXT
940	FlowDirection	[Tank]_Common	FlowDirection
52	ForegroundTimeStamp	[Tank]_Common	ForegroundTimeStamp
931	GAL	[Tank]_Common	GAL
2600	Gauge2Status	[Tank]_Common	Gauge2Status
6	GaugeStatus	[Tank]_Common	GaugeStatus
226	GRH	[Tank]_Common	GRH
227	GRHStatus	[Tank]_Common	GRH
300	GSM	[Tank]_Common	GSM
301	GSMStatus	[Tank]_Common	GSM
302	GSW	[Tank]_Common	GSW
303	GSWStatus	[Tank]_Common	GSWStatus
88	HydrometerCorr	[Tank]_Common	HydrometerCorr
154	HydrometerCorrStatus	[Tank]_Common	HydrometerCorrStatus
198	Innage	[Tank]_Common	Innage
199	InnageStatus	[Tank]_Common	InnageStatus
64	LiqInVap	[Tank]_Common	LiqInVap

65	LiqInVapStatus	[Tank]_Common	LiqInVapStatus
25	MassCalcType	[Tank]_Common	MassCalcType
141	MassCalcType	[Tank]_Common	MassCalcTypeStatus
70	MassVap	[Tank]_Common	MassVap
71	MassVapStatus	[Tank]_Common	MassVapStatus
3	MovingStatus	[Tank]_Common	Tank_MovingStatus
62	NSV	[Tank]_Common	NSV
63	NSVStatus	[Tank]_Common	NSVStatus
238	NSW	[Tank]_Common	NSW
239	NSWStatus	[Tank]_Common	NSWStatus
1066	OtherTankId	[Tank]_Common	
260	ProductTC	[Tank]_Common	ProductTC
261	ProductTCStatus	[Tank]_Common	ProductTCStatus
32	SedAndWater	[Tank]_Common	SedAndWater
143	SedAndWaterStatus	[Tank]_Common	SedAndWaterStatus
191	SedAndWaterVolStatus	[Tank]_Common	SedAndWaterVolStatus
2	TankStatus	[Tank]_Common	TankStatus
936	TCAL	[Tank]_Common	TCAL
	TNSW	[Tank]_Common	TNSW
	TNSWStatus	[Tank]_Common	TNSWStatus
118	TObs	[Tank]_Common	TObs
119	TObsStatus	[Tank]_Common	TObsStatus
196	Ullage	[Tank]_Common	Ullage
197	UllageStatus	[Tank]_Common	UllageStatus
304	VaporWeight	[Tank]_Common	VaporWeight
305	VaporWeightStatus	[Tank]_Common	VaporWeightStatus

140	VolumeCorrections	[Tank]_Common	VolumeCorrections
306	WCF	[Tank]_Common	WCF
307	WCFStatus	[Tank]_Common	WCFStatus

The following points were available in R121.1 but for various reasons not available in R130.1 anymore.

EntityID	Entity	SCADA Point name	Param
200	Alarms	[Tank]_Common	Alarms
	CAL	[Tank]_Common	CAL
	CIUPGeneralConfigurationCRC	[Tank]_Common	CIUPGeneralConfigurationCRC
	CombinedVolumeCorrections	[Tank]_Common	CombinedVolumeCorrections
	CommAndConfStatus	[Tank]_Common	CommAndConfStatus
-	DynamicTankStatus	[Tank]_Common	DynamicTankStatus
-	FlowStatus	[Tank]_Common	FlowStatus
-	MassAndVolumeCorrections	[Tank]_Common	MassAndVolumeCorrections
94	TankConfigurationCRC	[Tank]_Common	TankConfigurationCRC

Note: Since ENTIS R121.2 some points have been renamed. In most, the leading character c has been removed e.g. cProductLevel is now presented as ProductLevel. For more details on all changes, see the ENTIS Software Change Note (ETDOC-X616-en-R130.1) included in the installation media of ENTIS.

Appendix A: Calculation Method Relation With Entities

In the case of Manual Overwrite and What If calculation, it is important to understand that the entities- Reference density, Sample density, Sample temperature and Liquid density can be classified as ‘Inputs’, ‘Outputs’ or ‘None’ depending on the Calculation method.

For Manual overwrite and What If calculation, the above Entities classified as

1. ‘Inputs’ can be edited.
2. ‘Outputs’ cannot be edited
3. ‘None’ should not be edited.

Calculation Method	Product Code	Input/Output direction				
		Reference Density	Sample Density	Sample Temp.	Conc. %	Liquid Density (@ Tprod)
API Ch 11.1-04 T23/24	A,B,C,D	output	input	input	none	output
API Ch 11.1-04 T53/54	A,B,C,D	output	input	input	none	output
API Ch 11.1-04 T5/6	A,B,C,D	output	input	input	none	output
API Ch 11.1-04 T59/60	A,B,C,D	output	input	input	none	output
API Ch 11.2.4-07 T23/24	A,B,C,D,E	output	input	input	none	output
API Ch 11.2.4-07 T53/54	A,B,C,D,E	output	input	input	none	output
API Ch 11.2.4-07 T59/60	A,B,C,D,E	output	input	input	none	output
ASTM D1250-80 T23/24	A,B,C,D	output	input	input	none	output
ASTM D1250-80 T53/54	A,B,C,D	output	input	input	none	output
ASTM D1250-80 T5/6	A,B,C,D	output	input	input	none	output
ASTM D1250-80 T59/60	A,B,C,D	output	input	input	none	output
ASTM D1555M-2016	BE…PX	output	none	none	none	output
ASTM D1555M-2016	14-17 (CH1, CH2)	output	input	input	none	output
ASTM D1555-2016	BE…PX	output	none	none	none	output
ASTM D1555-2016	14-17 (CH1, CH2)	output	input	input	none	output
ASTM D4311-04 T1	none	input	none	none	none	output
ASTM D4311-04 T2	none	input	none	none	none	output
ASTM D4311-15	none	input	none	none	none	output
ASTM D4311-83/90 T1	none	input	none	none	none	output
ASTM D4311-83/90 T2	none	input	none	none	none	output

ASTM D4311-96 T1	none	input	none	none	none	output
ASTM D4311M-15	none	input	none	none	none	output
ASTM IP-52 T23/24	A,B,C,D,E	output	input	input	none	output
ASTM IP-52 T53/54	A,B,C,D,E	output	input	input	none	output
Concentration	none	output	none	none	input[1]	output
CTL Table	none	output	input	input	none	output
DCF method	none	input/output	input	input	none	output
Density Table	none	output	none	none	none	output
Manual entry of CTL	none	input/output	none	none	none	output
No GSV calculation	none	none	none	none	none	output
TCF method	none	output	none	none	none	output
EN15940(2019)	none	output	input	input	none	output
NBR15639(2016)	none	input/output[2]	input[3]	input	input/output[4]	output
SGS(2021)	Ammonia	output	input	input	none	output

Reference Density Overwrite

In some cases, according to standards, Reference Density is shown as an output. In order to enter/change the Dref value, a indirect entry can be made using Sampled Dentisy and Sampled Temperature.

ENTIS will automatically do this input of the Reference Density:

- Sample Density = Desired Reference Density
- Sample Temperature = Reference temperature (Tref)

This is applicable to the following calculation tables:

1) Concentration input can be in mass or volume percentage, depending on the definition of the custom concentration table loaded.
2) When reference density is input, concentration input is ignored. When mass concentration is input, reference density is output.
3) When no reference density or mass concentration is input, sample density and temperature can be input to calculate reference density, mass, and volume concentration.
4) When no reference density or mass concentration is input, sample density and temperature can be input to calculate reference density, mass, and volume concentration.

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- API Ch 11.1-04 T5/6
- API Ch 11.1-04 T23/24
- API Ch 11.1-04 T53/54
- API Ch 11.1-04 T59/60
- ASTM D1250-80 T5/6
- ASTM D1250-80 T23/24
- ASTM D1250-80 T53/54
- ASTM D1250-80 T59/60
- API Ch 11.2.4-07 T23/24
- API Ch 11.2.4-07 T53/54
- API Ch 11.2.4-07 T59/60
- ASTM IP-52 T23/24, ASTM IP-52 T53/54
- EN15940(2019)
- SGS(2021)
- NBR15639(2016)

Appendix B: User Level Restrictions

The created users' roles and level can be set when in Manager level in Experion Station. These roles (levels) will define which features of ENTIS and Experion are accessible.

The following table lists these restrictions for the features and pages relevant to ENTIS.

Role Level	Enabled Pages	Disabled Pages	Disabled functions	Enabled functions
View Only	• Group View • Tank Detail • Group Detail • Movement Main • Profiles – View • Totalizers • Reports • Help • Alarms view • Trends view	• Gauge commands • Manual overwrite • Profiles - Create • Whatif • Manage tasks	• Edit Deltas • Manage Views • Manage Groups • Manage Filters • Edit Totalizers • Delete Files • Create Reports • Schedule Tasks • Edit Settings • Edit Settings Alarms • Edit Tank Comment • Export data • Movement Actions • Movement Config • Experion Alarms • Experion Trends create • Experion Settings	
Ack Only	*Same as View Only	*Same as View Only	*Same as View Only	*Same as View Only
Operator	• Group View • Tank Detail • Group Detail • Gauge commands • Manual overwrite • Profiles - Create • Whatif • Manage tasks • Movement Main • Profiles – View • Totalizers • Reports • Help • Experion Alarms view • Experion Trends view		• Edit Settings • Delete Files • Experion Alarms • Experion Server Settings	• Edit Deltas • Manage Views • Manage Groups • Manage Filters • Edit Totalizers • Create Reports • Schedule Tasks • Edit Settings Alarms • Edit Tank Comment • Export data • Movement Actions • Movement Config • Experion Trends create
Supervisor	*Same as Operator	*Same as Operator	• Experion Server Settings	• Edit Deltas • Manage Views • Manage Groups • Manage Filters • Edit Totalizers

				• Delete Files • Create Reports • Schedule Tasks • Edit Settings • Edit Settings Alarms • Edit Tank Comment • Export data • Movement Actions • Movement Config • Experion Alarms • Experion Trends create
Engineer	*Same as Supervisor	*Same as Supervisor	*Same as Supervisor	*Same as Supervisor
Manager	*Same as Engineer	*Same as Engineer		• Edit Deltas • Manage Views • Manage Groups • Manage Filters • Edit Totalizers • Delete Files • Create Reports • Schedule Tasks • Edit Settings • Edit Settings Alarms • Edit Tank Comment • Export data • Movement Actions • Movement Config • Experion Alarms • Experion Server Settings

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