Users guide
Entis Pro version 2.60x for Windows 7
PREFACE

This manual describes how to operate the Entis Pro system. It has been written for the 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 Installation Guide Entis Pro.

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

Please do not hesitate to contact Honeywell Enraf or its representative if you require additional information. Refer also to the list of related documents in Appendix.

Legal aspects

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Enraf BV 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
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INTRODUCTION

Entis Pro is a unique Tank Inventory Management System developed for Windows 7 Professional. Interfaces at different system layers provides communication with almost any third party package.

The open architecture of Entis Pro combines the standard connectivity tools, such as OBDC and OLE.

Real Time Inventory

Entis Pro is a multi-tasking Windows 7 Professional application. Data is retrieved via dedicated Communication Interface Units (CIU’S) and processed through to the open Entis Pro database.

Different screens are available for inventory management, these include bar graphs, tabular data, iconized tanks, and a whole range of optional modules such as trending, report printing, and a what if...tank calculator.

Numerical & Graphical Display

The graphical displays provide a quick overview of tank data. The numerical displays can even 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.

Operation

Entis Pro is mouse driven and has a logical, easy to remember user interface. A change in colour in the tank display immediately informs the operator whether the tank is being filled or emptied.

Networking

The network facilities of Windows 7 Professional allow you to integrate Entis Pro into your plant’s networks. Both Local and wide-area networking are possible.

Alarm system

Entis Pro provides you with an array of programmable alarm set points. Privileged users can create their own alarms for all measured and calculated data. Alarms pop up when they occur.
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.

**Hot Standby & Redundancy Support**

The Entis Pro system can be enhanced for use in critical applications with hot standby and redundancy support. Redundancy support can even 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 automatically start and take over the lost functionality. During the automatic start, all gauge data will be rescanned and recalculated to ensure the reliability of data.

**OPC Server**

The Entis Pro system can act as an OPC Server between the Enraf field instruments and a host computer system having an OPC client interface. Entis Pro supports OPC Data Access 1.0 and 2.0.

The OPC client can create OPC groups containing Tank entities, subscribe on one or more data items, perform manual overwrites, enable/disable alarms and acknowledge alarms.
INTERFACE GUIDELINES

The EntisPro 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 EntisPro is a Windows application, there are a certain additional conventions used in EntisPro which will be described in this chapter.

This chapter describes also a basic set of rules in order to help the user to learn how to use Entis Pro.

Mouse/Keyboard interface

Each operation possible may be accomplished using either the pointing device (e.g. mouse, tracker ball, ect) or the keyboard. The short-cuts may be:

- buttons used to activate keyboard shortcut letters (identified by the underlined letter)
- tabs have no short-cut. Arrow keys are used to switch between tabs

Help

As with most Window applications, EntisPro supports the <F1> key for the display of the help manual. When the F1 key is pressed from any EntisPro window, the pdf version of the Entis Pro User Guide will be displayed.

The standard question mark button on the toolbar, serves as a short-cut to the pdf version of the Entis Pro Users guide

Data presentation

1. Measured data is always presented as green text on a black background
2. Calculated data, such as inventory data is presented as black text on a grey back ground
3. Measured data in alarm is shown as black on red back ground, and red on black back ground after the alarm has been acknowledged
4. Status information is always in yellow
5. ‘Stroked through’ data depicts invalid data
6. Units are shown in blue, when the setting is non default
Use of Colours

The following colour scheme’s have been used throughout the system:

<table>
<thead>
<tr>
<th>State</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product (moving up)</td>
<td>Blue  Black  Yellow</td>
</tr>
<tr>
<td>Product (moving down)</td>
<td>Brown  Black  Yellow</td>
</tr>
<tr>
<td>Product (static)</td>
<td>Grey  Black  Yellow</td>
</tr>
</tbody>
</table>

Bar graph

The following table shows the colour scheme for bar graphs:

<table>
<thead>
<tr>
<th>State</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>Blue (dark)</td>
</tr>
<tr>
<td>Product static</td>
<td>Grey</td>
</tr>
<tr>
<td>Product moving up</td>
<td>Blue</td>
</tr>
<tr>
<td>Product moving down</td>
<td>Brown</td>
</tr>
</tbody>
</table>

Alarm

The alarms feedback is provided by means of an icon for which the colouring schema is given in the following table:

<table>
<thead>
<tr>
<th>State</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm active (acknowledged)</td>
<td>Red</td>
</tr>
<tr>
<td>Alarm active (not acknowledged)</td>
<td>Red (moving waves)</td>
</tr>
</tbody>
</table>

Disabled alarms (disabled or non editable) are strike through.

An alarm is non-editable whenever the alarm is ‘private’ and the current user has no access rights.

Data Statuses

Each measured and calculated data can be displayed with a status sign. The statuses are shown in the following table:

<table>
<thead>
<tr>
<th>Sign</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>Data uncalibrated (not W&amp;M approved)</td>
</tr>
<tr>
<td>&amp;</td>
<td>Manual input</td>
</tr>
<tr>
<td>S</td>
<td>Stored data</td>
</tr>
<tr>
<td>?</td>
<td>Reduced accuracy</td>
</tr>
<tr>
<td>K</td>
<td>Automatic measurement killed</td>
</tr>
<tr>
<td>F</td>
<td>Measured data in fail. If possible the data is strike through</td>
</tr>
<tr>
<td>U</td>
<td>Un-initialized</td>
</tr>
<tr>
<td>^</td>
<td>Over Range</td>
</tr>
<tr>
<td>V</td>
<td>Under Range</td>
</tr>
</tbody>
</table>
Interface Guidelines

Edit boxes

The Edit box data is displayed according the following colour scheme:

<table>
<thead>
<tr>
<th>State</th>
<th>colour text</th>
<th>text background</th>
</tr>
</thead>
<tbody>
<tr>
<td>editable</td>
<td>black</td>
<td>white</td>
</tr>
<tr>
<td>editable but changed</td>
<td>black</td>
<td>yellow</td>
</tr>
<tr>
<td>editable must be changed</td>
<td>black</td>
<td>yellow</td>
</tr>
<tr>
<td>non-editable (disabled)</td>
<td>null (no text)</td>
<td>window background</td>
</tr>
<tr>
<td>non-editable tab</td>
<td>black</td>
<td>window background</td>
</tr>
</tbody>
</table>

**DEFINITION:** An edit box is marked changed, as soon as the user types a character in the edit box. If the entity is in failure, the text should be "******"

Standard buttons used

The following buttons are used:

- **Save**
  - Save all edits to disk and begin a new editing session

- **Close**
  - Prompts the user to save any uncommitted edits. If confirmed, the interim edits are saved and the window is removed.

- **OK**
  - Accepts all pending changes and removes the window.

- **Apply**
  - Accepts all pending changes, but does not remove the window.

- **Cancel**
  - Removes the window without saving the changes.

- **Print**
  - Starts the report printing
GROUP / TANK SELECTION

The Tank Explorer (Group/Tank selector) offers the operator exactly what he needs. The windows standard tree view, shows you all inventory data. All Groups and Tanks are shown clear and fast.

Whenever a window is started without selecting a group or tank name, no data is displayed. The group and tank controls are empty data area. The left tree control with entities is disabled for user selections. If a tank + group name were specified at start up then the window shows all its controls. Groups/tanks can be selected by means of the ‘Select Group/Tank’ window.

Window layout

1. Name of selected Tank
2. All defined Tank groups
3. Possibility of 255 different pictures for all the tanks
Tank/group modes

The following modes are distinguished:

- Tank selection

  ![Tank selection](image)

  The tank selection is used for the gauge display. The tank combo box is visible. There is no group feedback.

- Group/tank selection

  ![Group/tank selection](image)

  The group name will only be displayed. A group can only be selected via the tree control icon. The tank selection is done via the combo box. The tank/group selection is used for the tank detail, tank view, tank calculator and gauge commands windows.

- Group selection

  ![Group selection](image)

  The group selection combo box is used for group and group totalizer windows.

- Group/tank selection

  ![Group/tank selection](image)

  In this case the group and tank selection can be done via two separate combo boxes. This selection mode is used for the Bar graph and the group view windows.

- Group/tank and View

  ![Group/tank and View](image)

  This selection is used in the Group detail window.
TOOLBAR

The toolbar is present on most of the Entis Pro windows. It offers a fast navigation tool for within Entis Pro.

Folder

Of course it is also possible to make your own Entis Pro folder, and arrange your desktop.
Status bar

The status bar includes the following display areas. The panes, appear in the following order:

W&M feedback

The W&M feedback is shown at the left side of the bar as a red seal with a small balance icon in the status bar.

This icon will be displayed in case of a W&M approved window.

This icon will be displayed in case of non W&M approved window.

Date & Time

The current system date and time is displayed as selected in the format specified in Windows 7 Professional.

Dimensions

Dimension changes are global.
This means that, within a task, all entities are displayed in the same dimension. Whenever a dimension differs from the default dimension, the dimension will be displayed in blue.

Option hiding

Options are greyed-out (disabled) when:
1. Necessary selections have not been made yet
2. The user has no access rights.
   Options are hidden whenever the option is not available

Warning messages

Messages about software or user errors will appear in a standard Windows warning message box.
In case these warnings are ignored, Enraf cannot be held responsible for the damages to the system or incorrect functioning of the system.
ALARM POP-UP

This window pops-up at the moment an alarm has been detected. It presents the user with information regarding the alarm and the interface to acknowledge alarms.

Apart from the sound signal, the system can play a spoken message whenever an alarm becomes active. In a network system an alarm acknowledgement is distributed to other systems.

Window layout

When an alarm is triggered, a pop window will appear in the middle of the operator screen. For maximum visibility the window is bright red with yellow text. The window will always be on top of all other windows, and will stay visible until all alarms are acknowledged.
1. Tank name causing the alarm
2. Type of alarm
3. Time & Date of alarm
4. Description referring to a safety procedure or a note from the operator
5. Button to silence the alarm sound
6. Type of Alarm
7. Button to acknowledge the alarm
8. List showing all unacknowledged alarms

**How to acknowledge an alarm**

Proceed as follows:

1. Click on the alarm you want to acknowledge from the unacknowledged alarm pane.
2. Click on the ‘Mute’ button to silence the sound.
3. Click on the ‘Ack’ button to acknowledge the alarm.
ALARM VIEW

The alarm view window provides the user with an overview of all active alarms of a single tank or a group of tanks.

Window layout

This window displays the following information:

1. Toolbar with group/tank information
2. Left pane with a tree control for group and tank selection
3. Right pane showing the alarm details
4. Status bar showing date and time

How to select the Alarm View window

Proceed as follows:

1. Click on the “Alarm View” icon
2. Select a group/tank from the tree view in the left pane. All active alarms will be displayed in the right pane
BARGRAPHER

The BarGraph task is one of the 3 different views Entis Pro offers. This window offers a unique view on where the actual inventory is stored for multiple tanks in a group. All bar graphs show relative inventory as TOV (Total Observed Volume), the tank moving status and all level Programmable Alarms (PAL’s).

Window layout

This window displays the following information:

1. Name of selected Group.
2. Size of bar indicates relative volume of Tank.
3. Colour of bar indicating the movement status of the Tank:
   - Blue = filling
   - Green = stationary
   - Brown = emptying
4. Arrow indicating status of all level related programmable alarms (PAL’s)
How to select a group

Proceed as follows:

1. Click on the ‘Group Bar Graphs’ 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. The selected group will be displayed in the combo box of the tool bar. Changing to another group can be done by the group combo box
4. Individual tanks can be selected from the combo box in the toolbar

If the ‘Group Bar Graph’ window is started from another window the group and tank of that window will be used.

If the ‘Group Bar Graph’ window is started from another window the group and tank of that window will be used.
CHANGE DIMENSIONS

Change Dimensions is one of the optional tasks available for Entis Pro. Change Dimensions is available from the toolbar after installation, and allows the user to convert the units into almost any other dimension. This task works for nearly all tasks, and is ideal for sites where it is required to convert between different customary units, like feet and inches, barrels and gallons, etc.

All Entis Pro windows indicate the use of non-standard units, by clearly marking said units as blue text. This prevents erroneous data interpretation.

Window layout

1. Unit setting different from standard database setting used by Entis Pro
2. Text with yellow background to indicate a changed setting
3. Drop down list box showing all possible settings for the selected dimension
4. Default command button which allows the user to switch back to the original settings with one mouse click
- Example of change into feet, inches & 16th's
- To emphasize, the dimension colour changed into blue
EVENT VIEWER

Entis Pro generates events and saves these events in an MS Access database. This file is located in the Entis Pro folder, under the Events subfolder. The Event viewer visualizes these database files.

The Event database is only per station. In case the user wants to see events from other stations he has to share the event databases.

The maximum number of events, which a file can contain, is 2500. When the number of events exceeds 2500, an new EventFile will be created with the name “Events.mdb”. The old file will be renamed and has the format Events (date) (time).mdb.

How to start the Event viewer

The Event viewer can be started from a shortcut on the desktop, or via the Start menu.

Window layout

This window displays the following main sections:

- **Events**
  - Sequence number of the event
- **Date/time**
  - occurrence of the event
- **Station**
  - Station name
- **User name**
  - Name of the logged in user
- **Task name**
  - Name of the task generating the event
- **Event type**
  - This can be a user action, alarm, alarm acknowledge, configuration or others
- **Source**
  - This can be the station name, CIU name or tank name
- **Description**
  - Detailed description of the event
Dynamic View

If the check box of the “Dynamic View” is active the data will be refreshed every five seconds. If the box is not active data will be static. This can be useful to analyse historical events.

Sorting the Events

When clicked on the column header the data will be sorted on that column and on the event column.

Selecting the Events

A record in the EventFile can be selected by clicking on the record with the mouse pointer.

Opening other EventFiles

When clicked on the Open icon the “Open Entis Pro File” dialog will be displayed. This is a standard OpenFile screen used as in Windows applications.

The user has the ability to open an EventFile other than the current EventFile in use by Entis Pro. Other files only will be generated by Entis Pro when the total records in the EventFile exceed the 2500.
Printing the Event files

When the PrintIcon is pressed the “Print” window will be displayed.

Print options:

- **Printer**
  - Properties, select the correct printer

- **Printer range**
  - All, all records in the EventFile will be printed. Selection, only highlighted records will be printed

- **Copies**
  - Select the number of Copies
GAUGE COMMAND

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

Which command and function is exactly available depends on the type of gauge, might also depend on the application.

It helps the Operator to know what gauge is installed and whether a particular function is available.

The Gauge Command Task of Entis Pro is ‘Gauge aware’. It shows the user an icon corresponding to the gauge type, and shows which functions are enabled.

Window layout

- First select the right tank
- Then select one of the available command tabs
- Click on the desired function
- And press Apply
How to issue a Dipping Command

Proceed as follows:

1. Click on the ‘Gauge Commands’ icon. The Dipping tab will be displayed as default.

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. The selected group will be displayed in the tool bar.

4. Individual tanks can be selected from the combo box in the tool bar or from the ‘Group/Tank’ window.

5. Select the command you want to issue from the check boxes:
   - **Density dip**  Select to execute a density dip. Only applies to 854 type gauges with 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
Two different displacer commands can be issued. Proceed as follows:

1. Click on the Displacer’ tab of the ‘Gauge Commands’ window
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. The selected group will be displayed in the tool bar
4. Individual tanks can be selected from the combo box in the tool bar or from the ‘Group/Tank’ window
5. Select the command you want to issue by means of the radio buttons:
   - **Test**: The level gauge will be set automatic 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
How to issue a Test gauge alarm

Proceed as follows:

1. Click on the ‘Test gauge alarm’ tab of the ‘Gauge Commands’ window
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. The selected group will be displayed in the tool bar
4. Individual tanks can be selected from the combo box in the tool bar or from the ‘Group/Tank’ window

- **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 Calibrate

Calibrate means that the tank has been accepted by W&M authorities for transfer. This Tab will only be enabled in case of W&M option has been purchased.

Proceed as follows:

1. Click on the ‘Calibrate’ tab of the ‘Gauge Commands’ window
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. The selected group will be displayed in the tool bar
4. Individual tanks can be selected from the combo box in the tool bar or from the ‘Group/Tank’ window
5. To calibrate one of the following entities of a gauge proceed as follows:
   - **Tank W&M Calibrated**  Click on the check box. The check boxes of all entities will now be enabled. Select the entities you want to calibrate

*When enabling this check box the tank entities will be shown. It will now be possible to select the W&M approved entities.*

*Calibrate is only allowed for a user with W&M privileges, un-calibrate is also allowed for a super user.*
How to cancel commands

Unlock

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

Command progress window

On successful execution of the following commands a progress window will be started and the “Dipping command accepted” reply is given.

In case the command is not executed the message “Dipping command failed” will be displayed.

On successful execution of a ‘Dipping’ or ‘Displacer’ command a progress window will be displayed. The tank name, current displacer position and dip type are displayed in the progress window.

Running dipping

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

Window layout

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

Title bar

Displays the selected tank name and the issued command

Displacer position

This group box shows:

Original The level at start up and the’ displacer position.
Actual The actual position of the displacer

Progress

Shows the progress bar

The dipping window can only be selected via the gauge command window.
Running Displacer

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

Window layout

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

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.

This window can only be started by Gauge Command window.
GROUP GAUGE COMMANDS

These commands can be used for example to ‘Block’ the displacer at a certain level, but also for testing alarm contacts remotely. Which command and function is exactly available depends on the type of gauge, might also depend on the application.

It helps the Operator to know what gauge is installed and whether a particular function is available.

The Gauge Command Task of Entis Pro is ‘Gauge aware’. It shows the user an icon corresponding to the gauge type, and shows which functions are enabled.

Window layout

- Select the right group
- Select one of the available command tab’s
- Click on the desired function
- And press Apply

After initiating a group command next to the group List box the tank numbers will be displayed one by one when the command is executed.

For a detailed description of the Gauge commands is given in the chapter Gauge Commands.
GAUGE DISPLAY

The Gauge Display is a compact window which allows the user to monitor the activity of the gauge on one Tank. As also this task can be run in multiple instances, the user can put as many on his desktop as he likes.

1. Drop down Listbox for tank selection.
   Direct access to the Tank & Group explorer button of Entis Pro
2. Level and status indication
3. Product temperature indication for the selected tank
4. The actual time to show the task is updating continuously
5. Icon showing W&M status of task

How to select a tank

Proceed as follows:

1. Click on the ‘Gauge Display’ icon. The window will be displayed
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. The selected group will be displayed in the tool bar
4. Individual tanks can be selected from the drop down list box in the tool bar or from the ‘Group/Tank’ window
GROUP DETAIL

The Group Detail task displays tank inventory data of multiple in Tanks in a tabular and grid format. Tanks are organized in rows, while the entities are displayed in columns just, like a spreadsheet.

In addition this window enables the user to make use of additional functionality such as the Alarm, and Delta column (Option) and the extended Description field. Dimensions are user-definable and displayed in the column header.

The user can create his preferred views via the Define View task.

Window layout

The window presents Tank data in spreadsheet format. Data displayed depends on the selected format. Spreadsheet data displays only live data. Both values and, if applicable, status are displayed. Row sorting by clicking the mouse on the column header is possible.

A user definable number of columns, measured from the first column, can be identified as fixed column. Fixed columns do not scroll horizontally.

1. Change to any group….just a mouse click!
2. How the data is displayed, depends on the selected view
3. You also can adjust the width of a column
4. Data can be sorted by clicking on the header of any column
5. Colour indication of the movement status
How to select a group detail

Proceed as follows:

1. Click on the ‘Group Detail’ 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. The selected group will be displayed in the combo box of the tool bar. Changing to another group can be done by the group combo box
4. Select the view. Changing to another View can be done by the view combo box

Alarm column (Option)

This column can be used to display user specified PAL's. It displays the alarm text of one or more PAL's as specified in “Set Alarms”. The order of the alarm texts in the column are determined by the order of the PAL's in the “Set Alarm window”.

The text and background colour are in accordance with the Entis Pro colour scheme. Each cell in the alarm column has a tooltip text. See example below.

Delta column (Option)

The Delta column displays the difference between the actual value and the start value. This feature will enable the 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 window. The column can be enabled via the Define View window.

A right mouse click on the delta tank entity gives the following menu:

- **Start tank**: when clicked on this field the delta calculation for the selected tank (row) will be started or restarted.
- **Stop tank**: when clicking on this field the delta calculation for the selected tank (row) will be stopped and blanked.

When the Delta column is available in Group Detail a right click on the Delta column header gives the following pop-up menu:

- **Start group**: When clicked on the field the calculation for a group of tanks is started.
- **Stop group**: When clicked on the field the calculation for a group of tanks is stopped and blanked.
- **Delta report**: The actual situation of the delta values will be printed.
- **Delta report and start group**: The actual status of the group will be printed and a new start will be initiated.
- **Delta report and stop group**: The actual status of the group will be printed and the delta values will be blanked.
Description column

This column enables the user to enter additional text in the Description field. The text can be entered by a left mouse click on the field. See example below. This field is only available on the Group Detail window.
GROUP TOTALIZER

The Group Totalizer offers an easy way to totalize and view the contents of a group of tanks.

Window layout

The basic window displays the following information:

1. Even the Change Dimension task can be used (if installed)
2. Bar graph indicating the total inventory stored in respect to the total storage capacity within the same group
3. Select the type of inventory you want to totalize. The combo box can be used to select another volume or mass entity. This can be either GOV, GSV, TGSV, Total Mass, TOV or AvailableTOV
How to select the Group Totalizer

Proceed as follows:

1. Click on the ‘Group Totalizer’ icon. This window will be displayed.

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. The selected group will be displayed in the tool bar.

4. Other groups can be selected from the combo box in the tool bar or from the ‘Group/Tank’ window.
GROUP VIEW

The Group View task is a task, which displays a group of Tanks with smaller pictures. All the pictures include a small bar graph indicating product and water level. The colour of the bar graph indicates the moving status of the tank. A signal horn will pop up on the tank, whenever an alarm is active on the relevant tank. The Tank pictures are configurable per Tank. More that 250 different Tank shapes are possible. If required, the user can add customized pictures.

Window layout

The window size depends on number of visible tanks. A max of 3 rows of 5 tanks are displayed in a window. Above 15 tanks a vertical scroll bar is added.

1. Just select another group from the dropdown box
2. From here you can select a tank, and then issue any Entis Pro command from the toolbar
3. Simple Pictures show the tank status
4. With every tank actual TOV is displayed
How to select the Group View window

Proceed as follows:

1. Click on the ‘Group View’ icon. The window will be displayed.
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. The selected group will be displayed in the tool bar.
4. Individual tanks can be selected from the combo box in the tool bar or from the ‘Group/Tank’ window.
HISTORICAL TRENDING

Historical Trending helps you to create graphs of historical tank inventory data. Historical Trending utilizes the Log files made by Entis Pro, and creates a 6 pen graph out of these files of any of the measured or inventory data. Historical trending makes use of stored logging files.

Window layout

1. A separate Y-axis for each pen allows you to plot 6 individual data sets in the same graph
2. A cursor helps you pinpoint a value exactly and accurately
3. Just select the start date and time...
4. …and the stop date & time
5. You can simultaneously see different tanks and different entities
How to select the Historical Trending window

Proceed as follows:
1. Click on the ‘Historical Trending’ icon
2. Click on the tree icon at the left side in the toolbar. Select a group. This group will be displayed in the toolbar
3. Select the ‘Begin’ and ‘End’ date and time by using the two drop down combo boxes
4. Click on one of the check boxes
5. Click on the ‘Tank field’ and select
6. Click on the ‘Entity field’ and select

Printing

Printing of trends can be done by pasting the screen to the clipboard.

Whenever an entity has no data available the plot is interrupted.

Browse

This is standard Windows dialog box will be displayed. Another Entis Pro station in the network and/or directory where log files are located can be selected.
On request, a log of all tanks or of a group of tanks can be saved to the database. The saved tanks and data will be stored as “Tank Inventory History”. If a file name is given, that name will be used to store the data in. If no filename is given, the name will be generated and contain the date and time of creation.

For each log request a single database file will be made.

- The stored tank records will contain all fields (including the verification signature)
- A filename will be generated containing the date and time and type records logged (tank records or groups). If the filename already exists then the filename will be extended with a sequence number to keep the file name unique
LOG ON

Entis Pro keeps track of all users and activities of said users. This additional security layer of Entis Pro enables the user to log on and off, without restarting the Entis Pro, as would be required when changing users in Windows 7 Professional.

Access is simple; just right click on the key in the system tray in the lower right corner of the screen. Enter your name and password.

Log-on procedure

Proceed as follows:

1. Initiate the Log-on process by clicking on the icon in system tray (= left most tray of taskbar).
   i. A crossed out key, indicating there is no user logged in.

2. Left clicking the icon, causes the system to show the name of the logged on user. Right clicking the icon, cause the system to show the Entis Pro log-on/log-off menu

3. Enter your name and password. While entering the password, the user-interface shows a ‘*’ character for each typed character.

4. In case of a correct password this icon will be displayed in system tray
(= left most tray of taskbar). A Golden key means you are logged in.

A user is automatically logged-off when no mouse or keyboard actions are detected within a configurable time frame (5 minutes).
MANUAL OVERWRITE

This window enables the user to manually overwrite tank data. The ‘Manual Overwrite’ window 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 been killed.

This window supports basically three actions:
- kill an entity (stop the scan)
- resurrect an entity (start the scan)
- enter manual data for an entity

Window 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.
Manual Overwrite

Entity pane

The entity overwrite area consists of four fields. These are:

- **Entity name**: This field shows the selected entity.
- **Killed**: This check box indicates whether the entity is killed. Marked means killed. This check box is not present by every tank entity.
- **Current value**: This column may contain a mix of data entry fields, combo boxes and check boxes depending on the entity being displayed. The entity value will be shown if:
  - the entity status is set to manual
  - the entity does not have status
  In all other cases, the entity value will be blanked.
- **Dimension**: Shows the current dimension.

How to Manual Overwrite

2. Click on the tree icon at the left side 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.
6. Click on the ‘Killed’ check box of the selected entity in the right pane. ‘\√’ means killed.
   The ‘Current value’ field will be enabled.
7. Click on the ‘Current value’ field.
8. Clear the field.
9. Enter the manual value.
10. Click on apply.

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.

The entities Dobs, Tobs 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, Dobs and Tobs must be edited as a pair.
When data of an entity has been changed but not saved (Apply) and another entity or tank is being selected then a pop up windows requests the user what is required: either cancel the changed data or apply it.

The GSV calculation type combo box only shows the calculation types that support the Product Reference Temperature that has been configured for the selected tank. The Product Reference Temperature cannot be overwritten manually but must be configured in the CIU Plus with Ensite Pro.

The entities GSV Calc type and Product Code have a close relation. When a GSV Calc type is selected that does not support the currently selected Product Code, a pop-up message will advice other valid choices for the Product Code. The other way around, when a Product Code is selected that does not support the currently selected GSV calculation type, a pop-up message will advice other valid choices for the GSV Calculation type. If the advice is ignored, the GSV calculation type will change to “Undefined” after applying the manual overwrite. For diagnostic purpose, a tooltip text on the GSV Calculation type column in the Group Detail task reveals the GSV calculation type code when an “Undefined” combination of GSV Calculation type, Product Code and Product Reference Temperature has been configured.

### How to cancel 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 cancel a manual overwrite
5. Select the entity from the 'All Entities' pane
6. Click on the ‘Killed’ check box of the selected entity in the right pane. Untagged means killed
REAL TIME TRENDING

Real Time trending is an optional task which helps you to visualize any of the inventory data with Entis Pro. Real Time Trending plots as much as 6 individual, independent, data lines as real time graphs.

A total of 5000 individual points can be kept in memory for 6 individual tracks. Of each pen 100 points can be viewed simultaneously.

Window layout

How to select the Real Time Trending window

Proceed as follows:

1. Click on the ‘Real Time Trending’ icon
2. Click on the tree icon at the left site in the toolbar. Select a group. This group will be displayed in the toolbar
3. Select the ‘New trend’ icon in the toolbar. New Trend window will pop-up
4. Select Real-time if a real-time trend-file has to be made
5. Select Restore is a previously stored real-time trend-file is to be viewed
6. Select the ‘Interval’ (min 10s) and ‘Range’ by using the two drop down combo boxes
7. Click on one of the check boxes
8. Click on the ‘Tank field’ and select
9. Click on the ‘Entity field’ and select
REPORT PRINTING

The Report Manager makes it possible to print out customized reports. Entis Pro allows you to make your own templates and customize the Entis Pro printouts.

Entis Pro uses the proven and well-known Crystal Report printing engine. You can adapt all the report to the company style, and combine information from the Entis Pro inventory database with data from your own company resources.

Reporting can be done in two ways:
- Automatic by use of the EntisPro schedule
- Manually by the user

Window layout

The Report printing window consists of four main parts:
- The required type of report
- The tank/group combo boxes
- The template combo box
- The time group box
Type of report

Select one of the record types by clicking on one of the radio buttons. The type of report can be pre-selected when the taskbar is called from a group or a tank oriented display.

The following Options are enabled depending on 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 relevant available templates

**Start log**  This combo box enables the user to scroll through the logs. The logs are date and time oriented (last log on top). As default the ‘Start’ combo box indicates the ‘actual’ date and time

**Stop log**  This combo box enables the user to scrolling through the logs. The logs are date and time oriented (last log on top)

**Interval**  Start time; interval (days, hours, minutes)

How to select Report Printing

1. Click on the ‘Report Printing’ icon.
2. Click on one of the radio buttons
3. Select a Tank or Group
4. Select a Template
5. Select a Start, Stop or Interval time. In case a report is to be made of a previous stored log file in another then the default directory, the browse button can be used to select this directory
6. Click on Print

For all report types -Stop- and -Interval- can be disabled, except for ‘delta log reports’.

If the user enters first the start-time and then sets the interval, the system will automatically find the appropriate 'stop'-log date and time. If the exact log is not available, the next log file will be shown.

If the user enters first the stop-time and then the interval time, then system will automatically find the appropriate 'start'-log date and time. If the exact log is not available, the previous log file will be selected.
Report Printing

Command buttons

Prints the selected report

Print

Shows a preview of the selected print on screen

Preview

Selection of ‘Print Setup’ window.
This is a standard Windows dialog box will be displayed.

This standard Windows dialog box will be displayed. Log files located in another directory can be selected for report printing.
Templates

The format of a printout is defined by means of templates. Templates are made in a program called Crystal report. The user can create customized templates. For this purpose you can purchase the Crystal Report package or request Enraf or their representatives to make templates.

Report Templates

Example of a group detail printout.
Tank Detail

Example of a tank detail printout.
## Delta log report

Example of a delta log printout.

### Example of a delta log printout.

<table>
<thead>
<tr>
<th>Date</th>
<th>Start</th>
<th>Stop</th>
<th>Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 days 0 hours 4 minutes 5 seconds</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When the height of the difference is less than 1 meter the delta values are always uncalibrated.

Checking on minimum batch size and/or minimum inventory is required. If size or inventory is too small, an appropriate message is to be printed.
Event printing

Events are presented in a list form, specific for the different types of events (i.e. operator, tank, system, etc)

<table>
<thead>
<tr>
<th>Event</th>
<th>Status</th>
<th>UserName</th>
<th>TaskName</th>
<th>EventType</th>
<th>Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event 1</td>
<td>2020-05-25 10:00</td>
<td>Name1</td>
<td>Task1</td>
<td>Event1</td>
<td>Source1</td>
<td>Description1</td>
</tr>
</tbody>
</table>

Configuration printout

There are different types of configurations, i.e. All, tank, system, network, etc.
**SCHEDULER**

The scheduler enables the user to execute one or more commands at a predetermined date and time.

The user interface consists of two dialog boxes. These boxes allow the user to view, add, edit or delete time scheduled requests. Scheduling can be done on basis of:

- A fixed day every week
- A fixed day every month
- A specified time of the day
- Lifetime of the schedule (permanent or once)

**Window layout**

This window provides the user with an overview of the scheduled task names, when to run information, description to explain the scheduled task and status of the last execution.

![Scheduler Window](image)

**Buttons**

On activation this combo button a menu appears containing all the tasks that can be scheduled.

- Report Printing
- Logging
- Gauge Commands
- Group Gauge Commands (optional)

After selecting one of these tasks the ‘Scheduler’ window will appear.
This button is used to select scheduling parameters belonging to the selected scheduled program. The “Scheduler” window will be activated. This button is only enabled after selecting a scheduled program.

First select one of the displayed task in the main window before clicking on the Delete button.

How to schedule New reports

1. Click on the ‘Scheduler icon’. This window will be displayed
2. Click on the ‘New’ button
3. Select the one of the following three tasks:
   - ‘Entis Pro Report printing’
   - ‘Schedule Entis Pro Logging’
   - ‘Entis pro Gauge commands’
4. The Schedule window will now be displayed

Schedule Entis Pro Report Printing
- Enter the ‘Description’

Report Printing
- This field enables the user to add a description to explain the scheduled task

Every Week On
- Select the day of the week the programmed task must start.
And Every Month On Day
- Select the day of the month the programmed task must start.

Start At
- Enter the time at which the programmed task must start

Lifetime
- Select:
  - Once: The programmed schedule will automatically be deleted after execution
  - Permanent: The programed schedule will be repeated
Scheduler

**Settings**

Click on settings. This button enables in access to:

- Report Printing window
- Gauge command window

For details see the *report Printing* or *Gauge command* section.

**How to Edit the scheduler**

The following tasks can be Edit

- Report Printing
- Logging
- Gauge commands

![Edit]

1. Click on the ‘Scheduler icon’. This window will be displayed
2. Select the Scheduled program by click on the icon of the scheduled program
3. Click on the ‘Edit’ button. The ‘Schedule Entis Pro’ window will appear. If required edit the settings displayed in this window
4. Click on ‘Settings’ if you want to edit in the settings of the scheduled report
5. For details see the *Report Printing* or *Gauge command* section
6. Enter the values you want to edit
7. Click on ‘Apply’

**How to Delete a scheduled report**

![Delete]

1. Click on the ‘Scheduler icon’. This window will be displayed
2. Select the Scheduled program by click on the icon of the scheduled program
3. Click on the ‘Delete’ button. A message will pop up and ask whether you are sure
4. Yes means delete
The Alarm handling is one of the most important features of Entis Pro. With the Alarm Setup task the user can program alarms in Entis Pro. The Entis Pro alarm facility enables the user to set alarms on any measured and calculated data. During inactive periods tanks can be set in leak detection. The alarms pop up the moment they are transgressed, in the ‘Acknowledge Alarm’ window.

At choice an audible alarm can be configured to alert the operator. Alarms and acknowledgment are recorded and logged together with all tank events, for later review and analysis. Alarms can be set on individual tanks or a group of tanks.

### Setting of Alarms

Any operator can be privileged to set his own alarms. This is normally the responsibility of the Supervisor (see also ‘UserPriviliges’). Via the ‘SetAlarms’ task the operator can set an alarm on any of the tanks available at his station. It is even possible to set an alarm on a whole group of tanks. The alarm can be linked to any of measured entities (like product level), but also on any of the calculated entities (like flow, but also on flow for example).

### Window layout

1. This tab shows all ‘Programmable alarms. The other tab shows all Gauge Alarms
2. You can see all the details of all the alarms set on the selected tank
3. Select any or multiple tanks from any of the Tank Groups
**Alarm Classes and Types**

Entis Pro supports two classes of configurable alarms:

- PAL’s or programmable Alarms, and
- GAL’s or Gauge Alarms

GAL's can directly be linked to an alarm setting from the gauge itself. PAL’s can be linked to any of the measured or calculated entities. There are five different types of alarms:

- HighHigh
- High
- Low
- LowLow
- Leak
- No valid data

A HighHigh or High alarm will be triggered when the value of the linked entity exceeds the set point. Likewise, a Low or LowLow alarm will be triggered when the value is lower than the relevant set point. Leak alarms will generate an alarm if the value deviates (‘drifts’) from the set point (stored value). For all types also the hysteresis can be set individually.

**How to set a New Alarm**

Proceed as follows:

1. Click on the ‘Set Alarm’ icon to select the window
2. Select a group from the left pane
3. Select the tank name. The selected tank/group name will be displayed in the tool bar
4. Click on New. The ‘New PAL Alarm’ window pops up with the ‘Settings’ tab as default
Settings tab

This tab allows the user to enter the following settings:

<table>
<thead>
<tr>
<th>Entity</th>
<th>Select a measured or calculated entity through the drop-down combo box.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Select the type of alarm through the drop down combo.</td>
</tr>
<tr>
<td>Set point / threshold</td>
<td>Enter the set point for the selected entity.</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>Enter the Hysteresis value.</td>
</tr>
<tr>
<td>Description</td>
<td>Enter a description related to the programmed alarm. For all PAL alarms the user can add a message which will be displayed in the alarm pop-up window. This feature can be used to make references to alarm procedures or for identifying the batch alarms.</td>
</tr>
<tr>
<td>Extension</td>
<td>This field will only available in case the OPC option is purchased.</td>
</tr>
<tr>
<td>Alarm text</td>
<td>Enter a text related to the programmed alarm (PAL's only). This text will be displayed in the Alarm column of the Group Detail window.</td>
</tr>
<tr>
<td>Enable</td>
<td>An alarm can be ‘Enabled’ or ‘Disabled’. Only enabled alarms are operational.</td>
</tr>
<tr>
<td>Alarm lifetime</td>
<td>Alarms can be programmed to be ‘once’ or ‘permanent’. Alarm settings that are configured as ‘once’ will automatically be disabled once the alarm is triggered. The alarm set point can later be ‘re-used’ simply by enabling it again. Choose: Once, Permanent</td>
</tr>
<tr>
<td>Access rights</td>
<td>Alarms can either be private or public. Private alarms can only be changed by the ‘owner’. Public alarms can be changed by any authorized user. Critical alarms like overfill alarms will normally be programmed as being private by the Supervisor, while operational alarms used during transfers are normally set to be ‘public’, so other operators can change them. Public alarm settings can be changed by all operators. Choose: Private, Public</td>
</tr>
</tbody>
</table>

Whenever a leak alarm is being enabled, the current entity value becomes the new Alarm setting.
Sound tab

Entis Pro supports the use of sound cards on the PC. This allows the user to select an appropriate alarm sound or even a voice message. All sound can be programmed to be run either once, or to be cycled with a programmable repetition rate.

In the case of multiple unacknowledged alarms, Entis Pro will play all the individual sound files sequentially. This prevents the operator from focussing on the last alarm only. The sound tabs for a PAL/GAL's are identical.

How to select a Sound

Click on the Sound tab and proceed as follows:

**Browse**

Use this button to search for sound clips in the Media directory. Here you can link sound files with every individual alarm.

**Sound file**

Displays the name of the selected sound file

Click on this button to play the selected sound

Clicking on this button shuts down the media file you are playing

**Repetition**

Sound files can be played once only, or they will be played sequentially. Choose:

- **None** The sound will be played once
- **Once** The sound will be played twice
- **Permanent** The sound will be played continuously with an interval
- **Interval** The interval time is specified in the spin box with the up-down controls.
**Alarm handling over the network**

In networked Entis Pro systems it is possible to program the alarm profile per station. This allows the Supervisor to select PC’s where it is not desired to generate alarm pop-ups or alarm sounds.

**Network tab**

This window displays a list of available network stations. A selection can be made on which the PAL/GAL should appear.

![Network tab screenshot](image)

**How to Add an alarm to a network station**

Proceed as follows:

1. Click on the station in the ‘Available list’ you want to add the alarm too

2. Click on this button to add the alarm to the ‘Selected list’

**How to Remove an alarm from a network station**

Proceed as follows:

1. Click on the station in the ‘Selected list’ you want to remove the alarm from

2. Click on this button to remove the alarm from the ‘Selected list’
Gauge Alarm

This tab provides you with a list of all available Gauge alarms (GAL). These alarms are directly linked to alarms in the level gauge. The set point and Hysteresis are programmed directly on the gauge, and hence cannot be changed from Entis Pro.

Overview of all programmed Gauge Alarms

How to edit an alarm

The edit procedure can be used for PAL and GAL alarms. For a GAL only a limited number of items can be edited. The items which cannot be edited are greyed out. Proceed as follows:

1. Click on the ‘Set Alarm’ icon. The Set Alarm window will be displayed
2. Select a group/tank from the tree view in the left pane
3. Select the PAL or GAL tab
4. Click on the ‘Edit’ button. The ‘Edit PAL Alarm’ dialog box will be displayed. An alarm can be selected by clicking on the line of the alarm. A selected alarm will be highlighted

The ‘Edit Alarm’ and the ‘New Alarm’ dialog boxes are identical. Changes can be carried out in the Settings, Sound and Network tabs by clicking on the data entry fields and entering or selecting data.

The ‘Edit GAL’ dialog box can only be used to change or enter a description and to enable or disable the alarm. The Sound and Network tab are available for editing GAL’s.
How to delete an alarm

Proceed as follows:

1. Click on the ‘Set Alarm’ icon. The Set Alarm window will be displayed
2. Select a group/tank from the tree view in the left pane. The selected tank and group name will be displayed in the toolbar
3. Select the alarm you want to delete in the right pane
4. Click on the Delete button
5. Confirm

Alarm Visualization

This screen pops up the moment you get an alarm

Data in alarms is always displayed in red

The pointers indicate where the level alarms are set. A signal horn indicates an active alarm
PAL extension for OPC

Entis Pro allows the user to define multiple PALs of the same “alarm type” on an entity of a tank. An OPC client cannot address all such alarms of a tank unless an extra PAL extension is used. In case OPC is enabled each PAL gets an extra OPC Extension. This is to make a distinction between multiple PALs of the same PAL type on the same entity of a tank.

Settings tab for OPC

Only when OPC is enabled in the license key then an extra entry field becomes visible in the window “Edit PAL Alarm” tab “Settings”. This “Extension”: entry field supports the following characteristics:

- Minimum length is 1 character. Allowed characters: 0 – 9  a – z  A – Z  - (dash)  _ (underscore).
  The characters are not case sensitive; however the letters will be displayed as they were entered in upper and lower case.
Set Alarm window with OPC

The window “Set alarms” gets an extra column called “Extension”. This column shows for each PAL the extension text.

The user can enter a new or edit an existing PAL extension. The new or renewed PAL extension will be accepted by the system if the PAL extension is unique for the selected alarm type of the selected entity of the selected tank (and the string is not empty). If the string is not unique then a proper warning will be generated and the new/edited PAL will not be accepted.

When a PAL is set on a group of tanks and OPC is enabled in the license key, then the software checks that the specified extension is unique for all involved tanks. If not a warning will be generated.

Some examples:

- Tank 34 may have two low alarms set on entity Product level. In this case the OPC extension text must be different for these 2 PALs
- Tank 34 may have two low alarms set, one on Product level and one on GOV. Now the OPC extensions for these two PALs may be identical!
- Tank 34 and Tank 35 may each have a high PAL on Product level. Also in this case identical texts in the OPC Extensions are permitted
TANK CALCULATOR

The Entis Pro Tank Calculator is a so-called ‘What if calculator’. A calculator that allows you not only to calculate inventory but one that goes much farther.

Window layout

1. The page contains three tabbed pages, with resp. Start, delta and stop data
2. The name of the selected Tank
3. The name of the stored Product
4. All measured and inventory data
5. A bitmap of the Tank
6. Ambient temperature and used CTSh factor
7. Flow and calculated time to fill/empty
8. Entry fields for density sample data
9. Calculated reference density
10. Calculated Total mass
How to use the calculator

1. Start the Tank Calculator from the toolbar of any of the Entis Pro screens
2. First select a Group/Tank and hit the button
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

Example

You can calculate the Gross Observed Volume for a given product level

1. Start by entering the product level. As you see, the background will turn yellow to indicate that you’ve changed the contents
2. The Total Observed Volume (TOV) field will now become greyed out, to indicate you can’t enter data anymore

The moment you entered the data above, the command buttons at the bottom left corner of the window were enabled. Hit ‘Calc. Stop’ and the ‘Stop Page’ will be calculated by adding the Delta quantities to the ‘Start Page’. If you hit the ‘Calc. Start’ then the ‘Start’ inventory will be calculated by subtracting the delta from the stop inventory.

This indicates that you now can calculate the new inventory. Just click on the button and let the calculator do the work!

Some examples, of what you can calculate:

- Calculate the TOV for a given level
- Calculate the Reference Density for a product sample given a certain temperature and observed density, or visa versa
- Calculate the Level in any given Tank responding to a certain volume
However, the Tank Calculator has also the capabilities to simulate batch transfers. This allows you to transfer a virtual quantity into or out of one of your storage tanks.

For example:

- You can check what the new level would be when given a certain volume you want to transfer into one of your tanks
- Or you could calculate how long a certain transfer would take, either at the actual flow rate, or at any given flow rate
- You could calculate where to set alarms, so it could warn you at 90% of a transfer

All these calculations are possible via the three tabbed pages. You simply enter the data on the desired page, hit the ‘calculate’ button, and go to the desired page to view the result.

Another example:
1. Here, you enter the level of product you want to transfer

2. Press the ‘calculate Stop’ button, and the calculator will calculate the new inventory based on the data that was on the stop page

3. So, hit the tab of the Stop page, and you can view the results. It is also possible to change some of the product properties

This feature allows you to recalculate inventory data for completely different products, as stored in the tank at that time.

- For example you can change the Product code
- Or the type of volume correction used

**The GSV Calculation type, Product Code and/or Product Reference Temperature in the “Show Details” dialog have a close relation. In the select lists of the GSV Calculation type only the black items are supported for the currently selected Product Code and Product Reference Temperature. The red items are not supported in combination with the current settings of the other two values. It is possible to select a red item but in order to have valid calculations, you will have to change one or both of the other values until all three entries are black.**
Alarms

After each calculation (start & stop) all calculated values are compared against set alarm thresholds.

If alarm conditions are detected, they will be indicated in the relevant page (start or stop). The background colour of the TAB becomes ‘red’.

The tank icon indicates the ‘alarm icon’

The foreground colour of the related value becomes also ‘red’.

Show details

The show detail form has 5 tabs for:

- Product
- Vapour
- Roof
- Tank Shell
- Mass calculation

Once details have been changed the button background will become yellow.

The actual tank value will be recalculated with the new details. The resulting values are written into the start and stop page (all deltas will become 0).

All modified fields will have a yellow background, until the contents are recalculated.
TANK DETAIL

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

The screen provides an excellent overview of all relevant data and is updated continuously.

The Tank Detail window can be opened multiple times to show different tanks. Via the Change dimensions task it is possible to swap over to other unit settings via a simple click in the toolbar.

Data presentation

1. Measured data is always presented as green text on a black background
2. Calculated data, such as inventory data is presented as black text on a grey background
3. Measured data in alarm is shown as black on red, and red on black after the alarm has been acknowledged
4. Status information is always in yellow
5. ‘Stroked through’ data depicts invalid data
6. Units are shown in blue, when the setting is non default

Window layout

The tank detail window consists of three two main parts:

- **Toolbar**
  The toolbar shows a tree view icon at the left hand site. The drop down box allows you to choose and view another tank in the same group. Tooltips are available for tank oriented task

- **Graphical pane**
  Display of entities (measured and calculated) belonging to the selected tank. The time to fill is calculated from available TOV/flow TOV. The time to empty is calculated from available room/flow TOV
Tank detail window for fixed roof tanks

This window selection is based on tanks with no corrections.
Tank detail window for fixed & floating roof tanks

The window selection is based on tanks with S&W and floating roof corrections.
Tank detail window for spheres

The window selection is based on tanks with vapour room corrections (gas volume calculations).

How to select the Tank Detail window

Proceed as follows:

1. Click on the ‘Tank Detail’ window
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. The selected group will be displayed in the tool bar
4. Individual tanks can be selected from the drop down combo box in the tool bar or from the ‘Group/Tank’ window
TANK VIEW

TankView is a task that shows a graphical picture for one particular tank. The screen provides an instantaneous graphical view of a tank and is updated continuously. The TankView window can be opened multiple times to show different tanks. Via the Change dimensions task it is possible to swap over to other unit settings via a simple click in the toolbar.

Window layout

1. Name of selected tank
2. Name of product stored in the selected tank
3. Exclamation icon emphasizing special status of Tank inventory
4. Bargraph indicating product level, water level, moving status and alarm indicators
5. User configurable Tank pictures
How to select the Tank View window

Proceed as follows:

1. Click on the ‘Tank View’ window

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. The selected group will be displayed in the tool bar

4. Individual tanks can be selected from the drop down combo box in the tool bar or from the ‘Group/Tank’ window
APPENDIX

Commands definition

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<td>Density dip</td>
<td>Used to measure the average density value. The 854 level gauge is commanded to start a density measurement. The density measurement (optional in the 854 servo gauge) offers the user the possibility move the displacer through the product in the tank and to determine the density at 10 equidistant points. After completion of the command the average density is calculated.</td>
</tr>
<tr>
<td>Water dip</td>
<td>Used to measure the water level. The displacer of the level gauge moves through the product in the tank until the product water interface is detected. As soon as the water level is measured the displacer is raised again until the product level is detected.</td>
</tr>
<tr>
<td>Lock test</td>
<td>Used to raise the displacer until the upper motor limit switch setting in the servo gauge is reached. Optionally an automatic ‘Unlock’ command can be executed when the displacer has reached the specified level.</td>
</tr>
<tr>
<td>Verify calibration</td>
<td>The Calibrate command performs a test by moving up the displacer until it meets the ‘calibration stop’ of the gauge (above the motor limit switch high).</td>
</tr>
</tbody>
</table>
| Unlock       | This command is used to return the displacer to the product level. One of the following active commands can be cancelled:  
  • Block  
  • Density dip  
  • Lock  
  • Verify calibration  
  • Water dip |
### Alarm definitions

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<th>Type</th>
<th>Description</th>
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<td><strong>PAL</strong></td>
<td>Programmable alarm. Acts on measured and calculated entities of the Tank &amp; Inventory data. It is also possible to define a PAL's for a group of tanks. The PAL status is determined on basis of the entities value, alarm set point and hysteresis.</td>
</tr>
<tr>
<td><strong>GAL</strong></td>
<td>Gauge alarms. These are generated by programed alarm settings in a field instrument or by an external contact connected to the field instrument. The GAL's cannot be removed, but can be disabled. On disabling a warning message appears. These alarms can generate a: Fail, High or Low.</td>
</tr>
<tr>
<td><strong>AAL</strong></td>
<td>Age alarm. The system periodically checks the tanks records time stamp against the system clock. If the difference exceeds a predefined value, the data are considered to be out-of-age and an AGE alarm is generated. Age is checked on a per tank basis, AAL's are generated for each tank separately.</td>
</tr>
</tbody>
</table>
| **CAL** | Communication alarm. This alarm can be generated by:  
- CIU Prime, if communication with gauge fails.  
- CIU Prime, if field port fails  
- CIU Plus, if communication with field port to CIU Prime fails.  
- CIU Plus, if communication with host port fails.  
In case of a hot standby link a communication alarm with information about the activation of link will be included. |
| **NAL** | Network alarm. This alarm is generated by all stations which encounter a network alarm. If applicable the network alarm includes information about the activation of a hot-standby link. |
| **SAL** | Signature alarm. This alarm is generated by:  
- CIU Prime: if CRC over gauge configuration is not correct  
- CIU Prime general configuration is not correct  
- CIU Plus: if CRC over CIU Prime tank configuration is not correct  
- CIU Plus general configuration is not correct  
- CIU Plus tank configuration is not correct. |
| **HAL** | Hot-standby alarm. This alarm is generated in case the functionality of the active CIU Prime or CIU Plus is not fully operational. |

### Alarm status

An alarm is always in one of the following states:
- inactive
- active
- secondary
- fail

Independent of the above mentioned state any alarm (also CAL/AAL/SAL/NAL alarms) can be in an acknowledged or non-acknowledged state.

### Alarm avalanche prevention

This means that in the unlikely event of equipment failure, i.e. communication or network failures not an avalanche of alarms is generated. Entis Pro will generate just one CAL or NAL. All data affected by the communication failure will be marked invalid (strike trough).

### Station profile

This is a list containing the stations on which a PAL/ GAL should appear. The user can select any station provided that he has log-on rights on the station and the tank is visible on that station.
Calculation definitions

Sets of data are treated as inter-related. The following inter-relations are known:

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<td><strong>TOV</strong></td>
<td>TOV is calculated from Level. Water volume is calculated from water level. <strong>Examples:</strong> When Level is changed TOV will be disabled. When Water volume is changed Water level will be disabled.</td>
</tr>
<tr>
<td><strong>GOV</strong></td>
<td>GOV is calculated from: Water Volume and TOV. <strong>Examples:</strong> When GOV is changed, TOV is emptied. Water volume stays when TOV is changed; GOV is emptied. Water volume stays.</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>Reference Density is calculated from: (Obs. Density &amp; Obs. Temp.) <strong>Examples:</strong> When Obs. Density is changed the Reference density is disabled. Obs. Temperature has also to be changed. <strong>Remark:</strong> A change in hydrometer correction is only accepted when Obs. Density and Obs. Temperature is changed.</td>
</tr>
<tr>
<td><strong>CTL</strong></td>
<td>CTL is calculated from: Ref. Density and Product temperature. <strong>Example:</strong> If Product temperature is changed then CTL will be emptied, the Ref. Density can still be changed. <strong>Remark:</strong> CTL can only manually be changed when the product code M.</td>
</tr>
<tr>
<td><strong>GSV</strong></td>
<td>GSV is calculated from: CTL; GOV; <strong>Example:</strong> If GSV is changed then GOV is emptied CTL stays. If next the GOV is changed then CTL is disabled.</td>
</tr>
<tr>
<td><strong>NSV</strong></td>
<td>NSV is calculated from: GSV; S&amp;W; <strong>Example:</strong> If NSV is changed then GSV is emptied S&amp;W stays. If next GSV is changed S&amp;W is disabled IF next S&amp;W is changed GSV is disabled.</td>
</tr>
<tr>
<td><strong>Liquid Mass</strong></td>
<td>Liquid Mass is calculated from: NSV; Reference Density; <strong>Example:</strong> If Liquid Mass is changed then NSV is emptied; Reference Density stays. If next NSV is changed; Reference Density is disabled. If next Reference Density is changed; NSV is disabled.</td>
</tr>
<tr>
<td><strong>Vapour Mass</strong></td>
<td>Vapour Mass is calculated from: Vapour pressure; Vapour Temperature and is related to TOV. <strong>Example:</strong> If Vapour Pressure is changed Vapour Mass is disabled; Vapour temperature stays. <strong>Remark:</strong> If Vapour calculation is not enabled the Vapour Mass is being fixed on 0. Vapour pressure and vapour temperature are disabled for entering, but shown in case they are measured.</td>
</tr>
<tr>
<td><strong>Vapour temp</strong></td>
<td>If Vapour temperature is changed Vapour Mass is disabled; Vapour pressure stays. If TOV is changed Vapour mass is disabled.</td>
</tr>
<tr>
<td><strong>Total Mass</strong></td>
<td>Total Mass is calculated from: Liquid Mass; Vapour Mass; <strong>Example:</strong> If Total Mass is changed both Vapour mass and Liquid Mass are disabled.</td>
</tr>
<tr>
<td><strong>Available product</strong></td>
<td>Available product and Available room are calculated from TOV. <strong>Example:</strong> Available product and Available room are emptied whenever the TOV is changed or emptied. <strong>Remark:</strong> Available product and Available room cannot be changed by the user.</td>
</tr>
<tr>
<td><strong>Time to fill/empty</strong></td>
<td>Time to Fill is calculated from TOV and Flow Calculation of ‘time to fill/empty’ will be based on either (depending on available information): • actual flow • manual flow (if entered) • flow into the tank is considered to be ‘positive’ • flow out of the tank is considered to be ‘negative’ • ‘empty’ equals ‘Available TOV’ = 0 • ‘full’ equals ‘Available Room’ + ‘Available TOV’ • if delta quantity is known, then the time to transfer batch’ will be calculated &amp; shown • direction of flow will be indicated by the flow icon.</td>
</tr>
<tr>
<td><strong>Ambient temp</strong></td>
<td>Ambient Temperature is used by the CIU+. Whenever ambient temperature is entered TOV is emptied. Whenever an entity is in fail, the edit box will display ‘******’. A tooltip will display an error code.</td>
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RELATED DOCUMENTS

Configuration manual Entis Pro
Installation Guide Entis Pro
45E Host communication manual
Instruction manual series 880 CIU Prime
Instruction manual series 880 CIU Plus
Instruction manual CIU Prime type 880 (CIU emulation)
Instruction manual ModbusTM Protocol
Instruction manual Ensite Pro configuration tool
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