User’s Manual

LEVELMASTER®, WORKSTATION

Table of contents

Getting started

Start of WORKSTATION

- Switch on power.
- During the start sequence the hardware will be checked automatically.
- Wait for windows to start up.
- Choose **Start** on the taskbar.
- Select **KSL450** under label **Program**, the program will start up with a predefined configuration **OR**
- Open a configuration file by choosing **Open** from the menu item **File**.
- Start the program by choosing **Start** from the menu item **File**.
- The program will start up in the *Bargraphs* window.

Stop of WORKSTATION

- Exit from the WORKSTATION by choosing **Exit** from the menu item **File**.

Stop of the computer

- Choose **Start** on the taskbar.
- Select **Shutdown** and choose Shutdown the computer and press Yes. Wait for the message: **It's now safe to turn off the computer.**

WARNING!
Do not turn off power before you have run the shutdown procedure. This may cause loss of information.

Installation procedures

An installation may be a CD or a complete set of diskettes containing both program or data, or it may be a program or a data update only.
The installation procedure to be used is written on the media.
A normal procedure is:

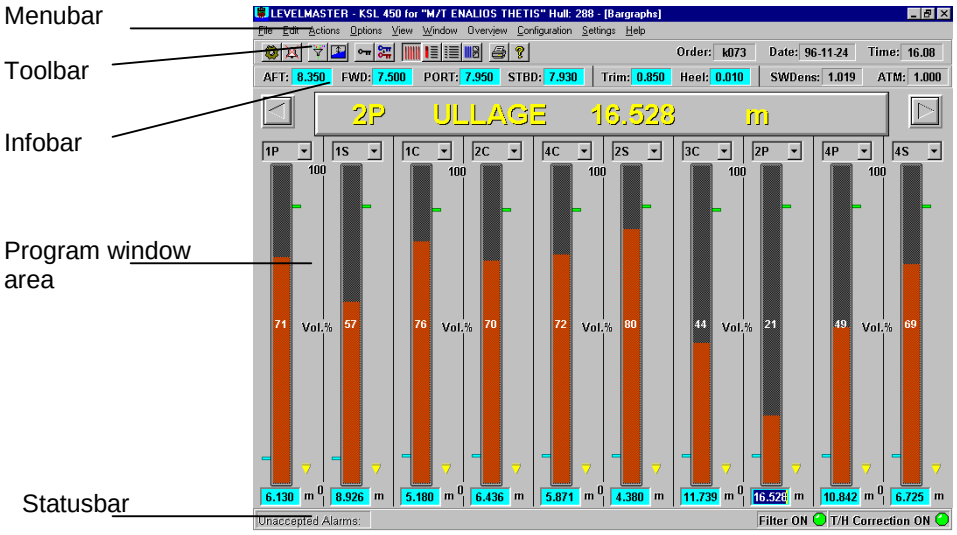
- Select **Start** on the taskbar.
- Choose Settings and activate the Control panel.
- Start Add/Remove programs.
- Choose Install to start the installation, and follow the given instructions.

Note! Uninstall any previously installed WORKSTATION (KSL450) program before installing a new one.

General

Picture window layout

The following figure shows the general layout of a picture window.



Menubar

To select a function from the menubar click with the mouse on the item or press Alt+the underscored letter. In some cases the function can also be activated directly by pressing the corresponding Ctrl sequence or function key shown below.

File

Stop	Ctrl+T	Stop the program and clear the picture area.
Start	Ctrl+R	Start the program.
New	Ctrl+N	Create a new configuration file.
Open	Ctrl+O	Open an existing configuration file.
Save	Ctrl+S	Save the current configuration to a file.
Save as	Ctrl+A	Save the current configuration to a file with a new name.
Clear		Clears all process values.
Clear Groups		Resets the compartment groups for all pages.
Print	Ctrl+P	Print..., see section *Print function*.
Print screen		Print the screen as shown.
Print Error Log		Print the Error Log.
Exit		Exit from the WORKSTATION (KSL450) program.

Edit

Undo	Ctrl+Z	Undo the last change you have made to a field
Redo	Ctrl+Q	Redo the last change.
Cut	Ctrl+X	Move the selected field to the clipboard area
Copy	Ctrl+C	Copy the selected field to the clipboard area
Paste	Ctrl+V	Copy from the clipboard area to the selected field

Actions

Accept	F6	Accept alarm for the selected object.
Accept all	Shift+F6	Accept alarms for all visible objects.
Auto	F5	Change to automatic mode for the selected object.
Reset Sensors		Reset status for all sensors.
Reset Filters		Reset all filters.
H8 Utility		Activates the H8 Utility.

Options

Show Trim/Heel correction F8	Turn on or off presentation of trim & heel corrected readings. Correction status is indicated on the statusbar.
Show Filter ON F7	Turn on or off presentation of filtered readings. Filter status is indicated on the statusbar.

View Toggle to show or hide picture elements from the list.
Toolbar
Infobar
Statusbar

Window Choose a window from the list below.
1 Drafts, Trim & Heel
2 Single tank
3 Tank table
4 Bargraphs

Overview
Cargo... CTRL+G Open the cargo overview window.

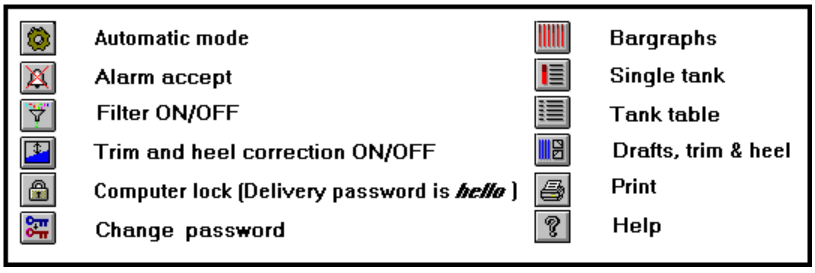
Configuration

Go Admin	Login as administrator.
Define	Configuration section.
Calibrate	Open the calibration window, see section *Calibration.*
Simulate	Enter simulation mode.
Change password	Change lock password.
Export Configuration	Export the current configuration to disk.

Settings

Help Open help dialog

Toolbar



Infobar

Statusbar

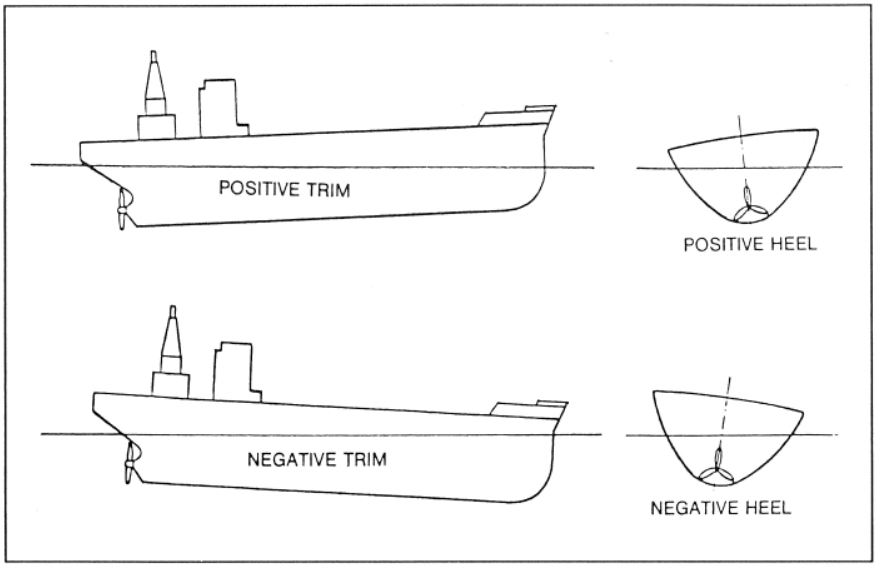
Trim and heel correction

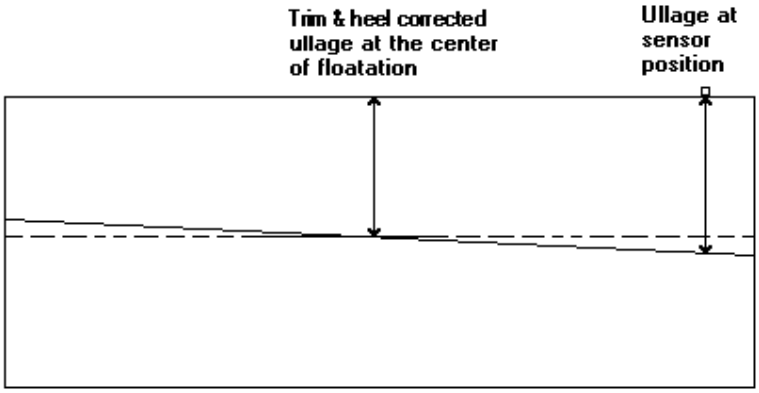
The possibility to turn off and on correction applies only to the presentation of levels and drafts. Internally, in the calculation of volume, the trim and heel correction is always applied regardless if correction is chosen or not. When the correction is off, the presented levels and drafts show the values at the sensor positions, and when it is on, the program calculates the expected levels at the centre of floatation, or in the case of drafts, at the predefined calculation point, see the section *Calibration*.

There are several options for how trim and heel are given.

1. Measured with inclinometers.
2. Calculated from measured or manually entered drafts.
3. Entered manually.

Note! If you set trim and heel in manual mode, the correlation between drafts and trim/heel is broken.





Filter

It is possible to change the display of process values.
Choose **options** from the menubar or use the filter button on the toolbar to switch between filtered and unfiltered display.
The filter display mode is indicated on the statusbar.

Alarm

There are two types of alarms.

1. Sensor failure
A yellow background is displayed showing a sensor failure. In the Calibration picture the Gauged Input value is shown in alarm state (red). To accept, click on the Gauged Input value and press F6 (Accept).

2. Process alarm.
A level, temperature or a pressure has reached a predefined alarm limit.

- High high alarm (HHA) — A predefined high limit, which cannot be changed.
- High alarm (HA) — A user defined high limit.
- Low alarm (LA) — A user defined low limit.
- Low low alarm (LLA) — A predefined low limit, which cannot be changed.

Process alarms are shown on the statusbar until they are accepted. Process signals in alarm state are shown with red background and flashing until accepted.

To accept: click on the numeric process value and press F6 (Accept).

By clicking in the Unaccepted Alarms field you will be directed to a view where it is possible to accept the alarm.

Commands for accepting alarms is found in the *menubar* and *toolbar*.

If the optional *Alarm and relay unit, ARU 400* is connected, an audible signal will be given each time a new alarm or failure occurs, for further information see the section *Alarm and relay unit, ARU 400.*

NOTE:
It is only process alarms that can be confirmed on the slave computer.
Sensor failures (yellow background) can only be confirmed on the Master, not on the slave.
This is indicated by "SENSOR FAILURE - Check Master Station!" on the slave.

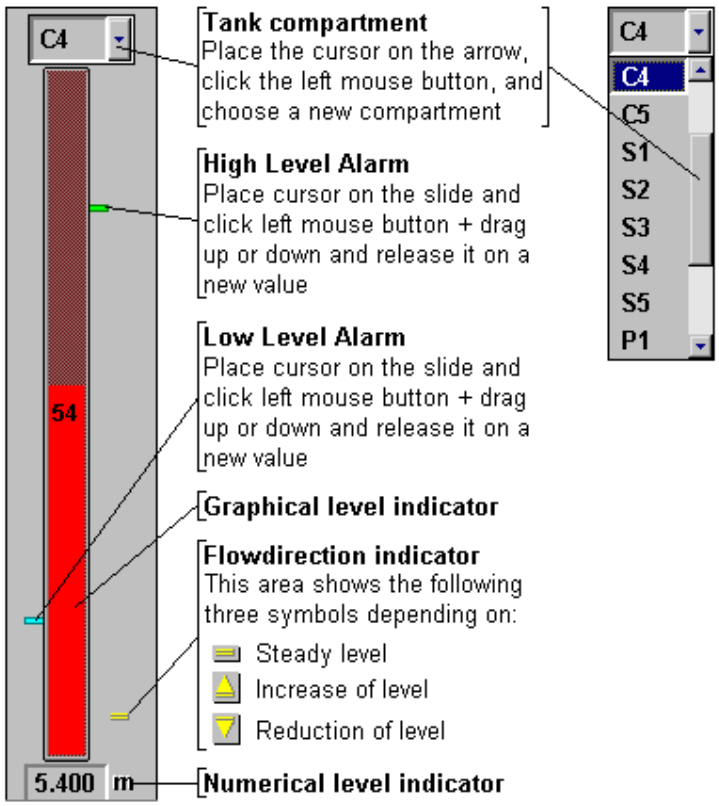
Manual/Auto

To set a process value (level, draft, trim, heel, ...) in manual mode, enter a value in the field or click with the mouse in the bargraph at the desired height. The manual mode is indicated by a light blue background color. To switch back to automatic mode again, position the cursor in the field and choose command **Auto** from the menubar or the toolbar.

Note! If a sensor is set in manual mode in the calibration picture, the corresponding level, draft, trim, ... is not automatically indicated as manual. This can be used to simulate a sensor signal in case of a sensor failure, but note, the manual indication will only show in the calibration picture.

Note! Auto is also used to reset the filter (Speed = 0).

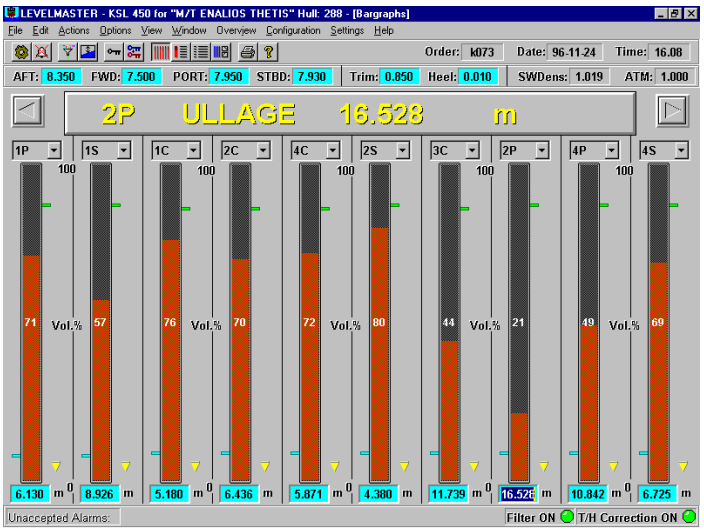
Bargraph example



Guide to the picture windows

Bargraphs

This window shows percent fillage of maximum volume and levels for all tanks.

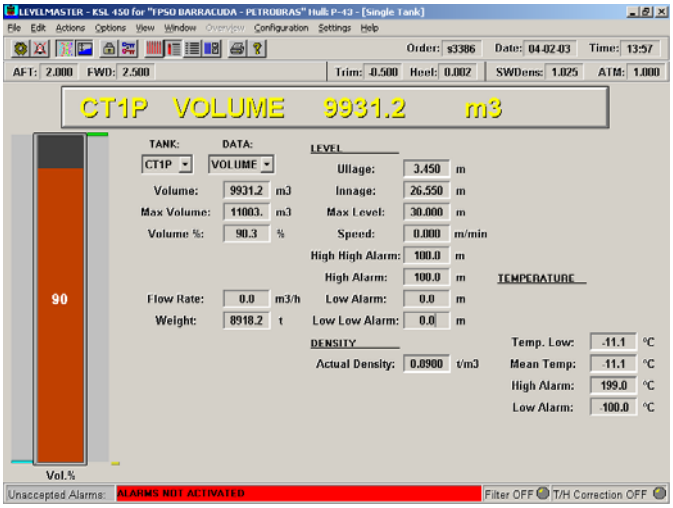


To select a tank use the TAB key or click with the mouse in the level field or tank code field, or click with the right mouse button in the bargraph. The selected tank is shown in the tank display. To shift to the next or previous set of bargraphs click the arrows to the right or left of the tank display.
It is possible for the user to define the displayed tank for each bargraph. Click in the tank code field, and a list of all tanks will be shown. Select a tank for the bargraph.

COMMON BACKGROUND COLORS FOR NUMERIC FIELDS:
Grey is normal, no alarms, and automatic mode.
Yellow indicates a sensor failure alarm.
Flashing Red indicates an unaccepted process alarm, listed at the Unaccepted Alarms field in the Statusbar.
Stable Red indicates an accepted process alarm, it will go grey when within limits.
Light Blue indicates a manual input.
Dark Blue indicates selected field for manual input.

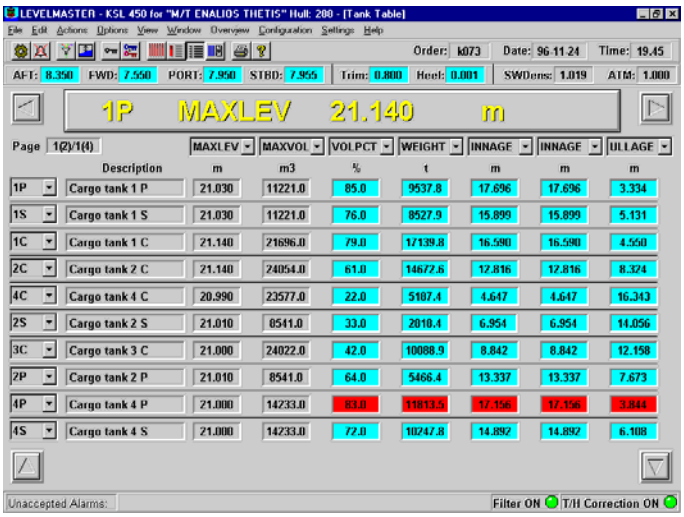
Single tank

This window shows all available information for one tank at the time. Select a tank in the tank field and specify a data item in the data field. The data item will be shown in the tank display. For an explanation of various items, see the *Glossary* section.



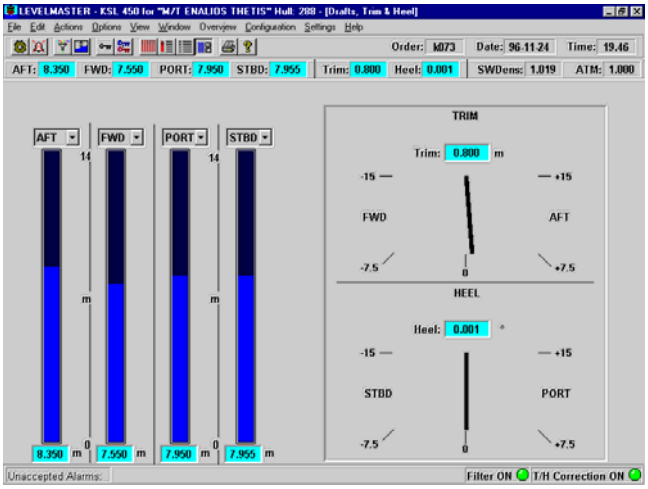
Tank table

The tank table window lists all tanks with all available information. Use the four arrows in the corners of the picture area to scroll up/ down and left/right. It is possible to change the data that is presented in the columns. Click with the mouse in the column label and a list of available data items is shown. Select an item from the list. For an explanation of various items, see the *Glossary* section.



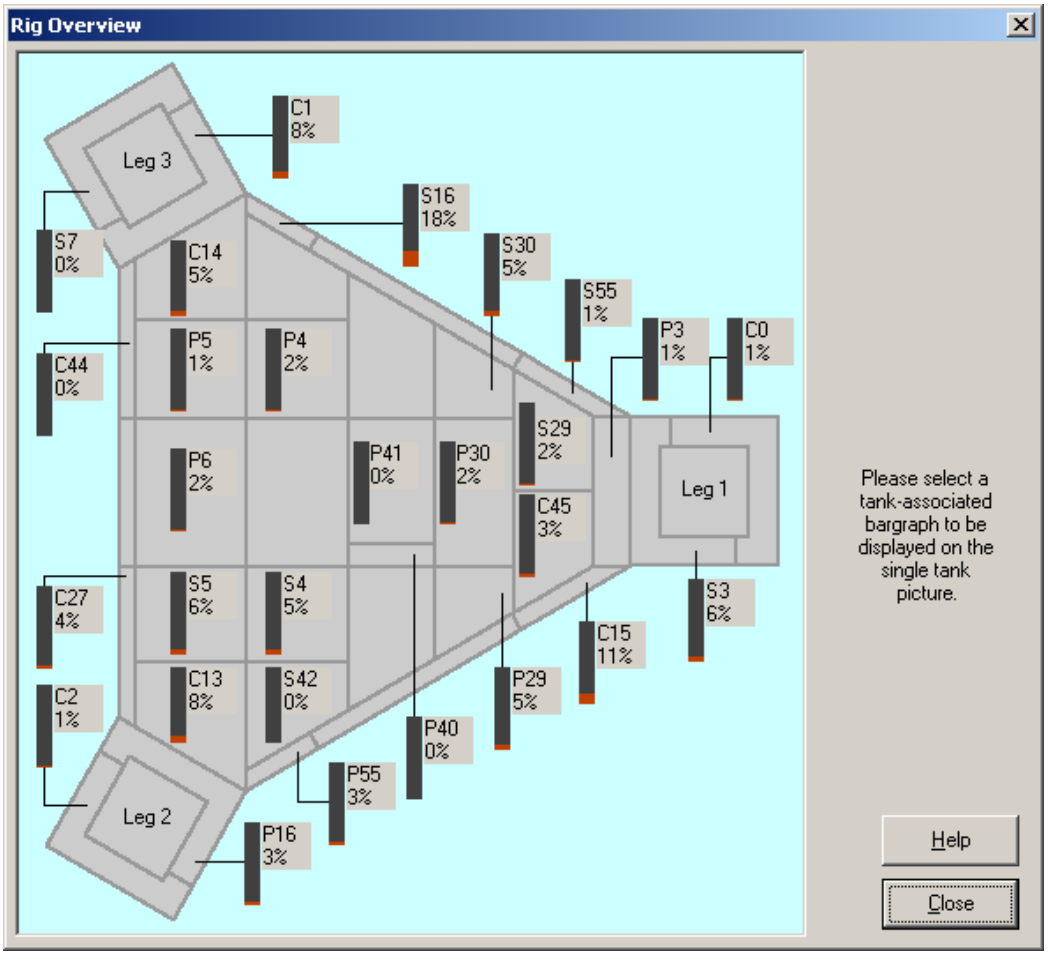
Drafts, Trim & Heel

The window shows drafts and actual trim and heel values. To change the order in which drafts are shown, click the bargraph name field and select from the list. For an explanation of various items, see the *Glossary* section.



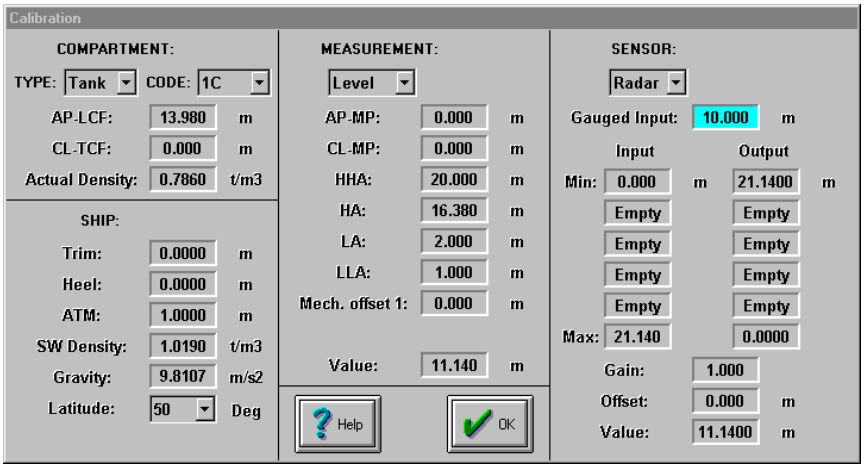
Cargo overview

The window is activated through the menu item **Overview** or via the keys CTLR+G. It shows in a graphical form all cargo tanks with percent fillage. When a tank is selected the *Single tank* window is shown for the chosen tank. An alarm is indicated by a flashing red tank, but it cannot be accepted in this picture. To accept an alarm, first select the tank with a mouse click to go to the *Single tank* window, then accept the alarm in normal way. If the mouse pointer is placed in a tank, the tank code will be shown after a while. The cargo overview window is closed by activating the Close button.



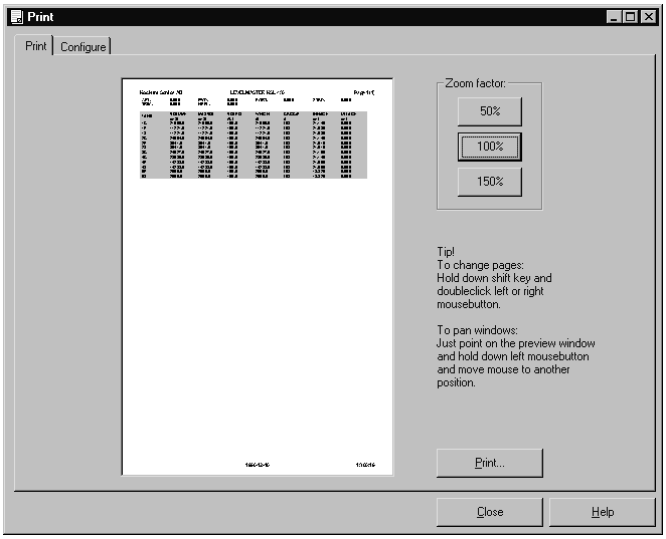
Calibration

The calibration window is selected from the menu item **Configuration.** It shows the different stages how the sensor input is converted into a process value. Select the type of object in the left part, and a process value in the middle part. The sensor information will be shown in the right part of the picture.
The input/output table can be used to compensate for a nonlinear sensor response. The gain and offset parameters is useful for minor adjustments of the linearized sensor signal.
For an explanation of various items, see the *Glossary* section.

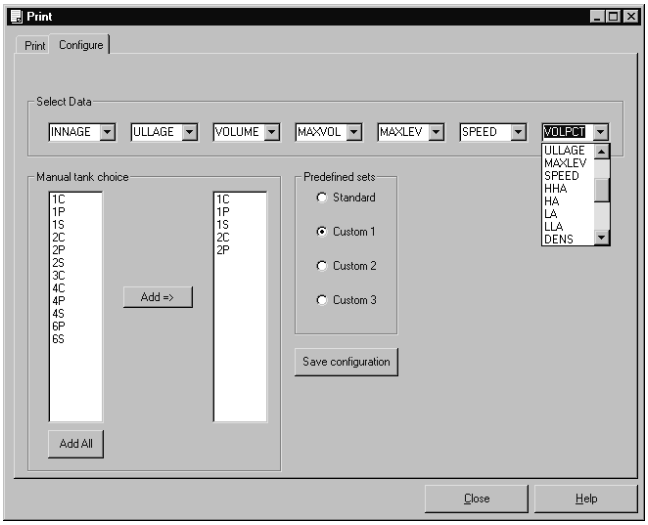


Print function

The print function is activated from the toolbar or the menubar. The program first displays a preview window, which lets the user zoom and view the report before printing. Select the **Print** button to print the report, or choose **Configure** to change the layout of the report, see figures below.



There are four different report configurations: One standard, which cannot be changed, and three user defined custom sets. To change one of the custom sets, first choose the set, then select the tanks you wish to include and the different tank data attributes you wish to have as columns. To save the configuration: choose **Save configuration.**



Optional external devices

Alarm and relay unit ARU 400

The alarm and relay unit serves as an information panel and a supervising unit for alarms and failures in the LEVELMASTER®, system. In its basic configuration it provides audible and visual indication of alarm states. It also provides one relay contact closure, for the connection of other external equipment.
An alarm is accepted by pressing the **RESET** button on the alarm panel, or by sending an alarm accept command via the communication line, which is done each time an alarm is accepted in the system.
An additional benefit from using the ARU 400 is that it supervises the system. The unit must be triggered at fixed intervals via the communication line. If this "live" signal is not received, due to any critical hardware or software failure in the system, the **SYSTEM FAILURE** alarm will be activated.

Figure: Alarm panel in the ARU 400.

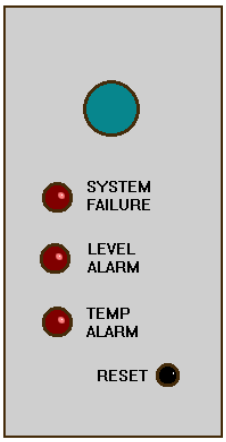
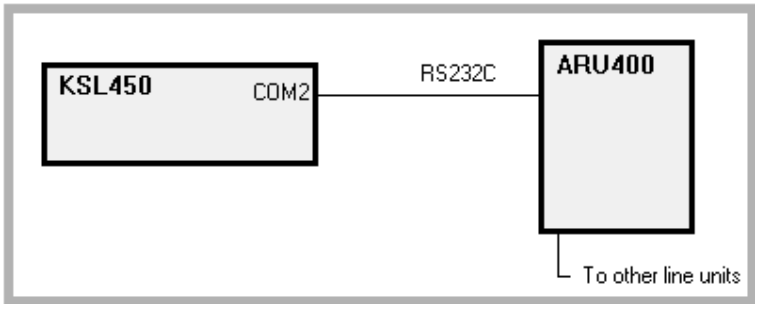
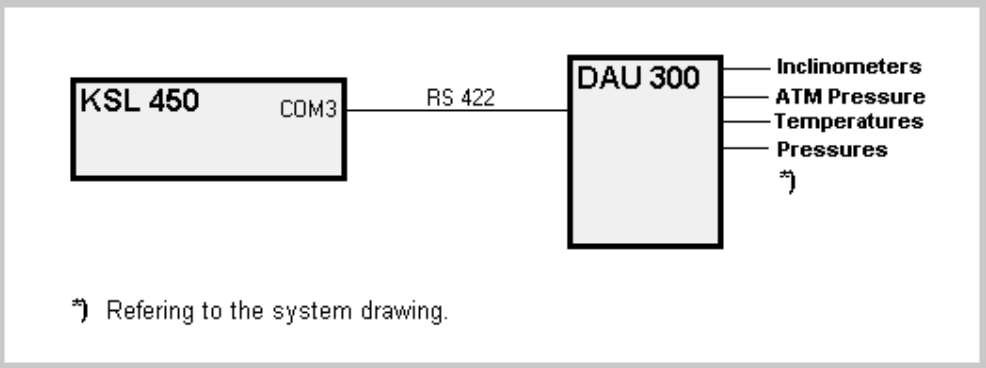


Figure: Connection of the ARU 400 to WORKSTATION (KSL450)



Data acquisition unit DAU 300

The DAU 300 unit is an analogue to digital converter for measuring 4- 20 mA sensor signals. The DAU 300 communicates with the WORKSTATION via a RS 422 line. There can be up to 24 sensors connected to one unit and several DAU 300 can be connected to the same RS 422 line.
The cabinet is fitted with a power supply and as an option, zener-barriers can be mounted as an interface to sensors in hazardous area.



Glossary

Actual density
Density (in air) at the actual temperature, (t/m3). The corresponding short label is DENS.

AFT
Code for aft draft sensor. The shown value is at the sensor location or at a defined calculation point, depending on if trim&heel correction is chosen or not.

ATM
Atmospheric pressure.

Click
To press and release the left mouse button.

DENS
Density (in air) of the liquid at the actual temperature, (t/m3). The corresponding full label is Actual density. In automatic mode, the density could be measured, retrieved from stored measurement or calculated form default values (mean of Min & Max).

Double-click
To press and release the left mouse button twice in rapid succession.

Drag
Press and hold down the left mouse button while moving the mouse.

FLOWR
Flow rate, positive when filling the tank (m3/hour).

FWD
Code for fore draft sensor. The shown value is at the sensor location or at a defined calculation point, depending on if trim&heel correction is chosen or not.

HA
High alarm limit, user defined.

HEEL
The heel is positive when the inclination is towards the port side.

HHA
High high alarm limit, predefined and cannot be changed.

INNAGE
Distance from the lowest point in the tank to the surface of the liquid..

LA
Low alarm limit, user defined.

LLA
Low low alarm limit, predefined and cannot be changed.

MAXLEV
Maximum level (innage or ullage) of the tank.

MAXVOL
Maximum volume of the tank.

MTEMP
Mean cargo temperature in degree Celsius.

Order
Reference to the configuration file.

PHA
Alterable high alarm for inert gas pressure.

PLA
Alterable low alarm for inert gas pressure.

PORT
Code for port draft sensor. The shown value is at the sensor location or at the defined calculation point, depending on if trim&heel correction is chosen or not.

PRESS
Measured inert gas pressure, if applicable.

SPEED
Change of innage per minute. The shown value is filtered.

STBD
Code for starboard draft sensor. The shown value is at the sensor location or at the defined calculation point, depending on if trim&heel correction is chosen or not.

SWDens
Sea water density, (t/m3).

TEMPHI
Temperature measurement at the upper part of the tank.

TEMPLO
Temperature measurement at the lower part of the tank.

TEMPMI
Temperature measurement at the mid part of the tank.

THA
Alterable high alarm limit for temperature measurement.

TLA
Alterable low alarm limit for temperature measurement.

TRIM
The difference between drafts at AP and FP. Trim is positive when the inclination is towards the aft.

ULLAGE
Distance from the ullage plug to the surface of the liquid.

WEIGHT
Calculated apparent weight in air at actual temperature as given by the actual density and volume.

VOLPCT
Actual volume as percent of maximum volume.

VOLUME
Calculated volume for the tank at actual temperature. The calculation uses trim and heel to correct the level.