
Manual

LICAD 10



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LISEGA SE

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I. Important information about upgrading from version 10.0/10.2 to 10.3

If you have not already installed LICAD 10, you can ignore this section! No further adjustments need to be made.

Older versions of LICAD 10 must first be uninstalled.

Please note (summary):

- 1. Back up old project files**
 - 2. Delete older version**
 - 3. Install from 10.3**
 - 4. Convert old project files**
- Please read more here:**

I.1 Preparation

Before you install 10.3, you must create a backup copy of the project file from versions 10.0, 10.1 or 10.2. The project file contains the LICAD drawings. Further on it is necessary to note the current drawing number. The creation of so-called LBF files (LICAD backup files) is not necessary here.

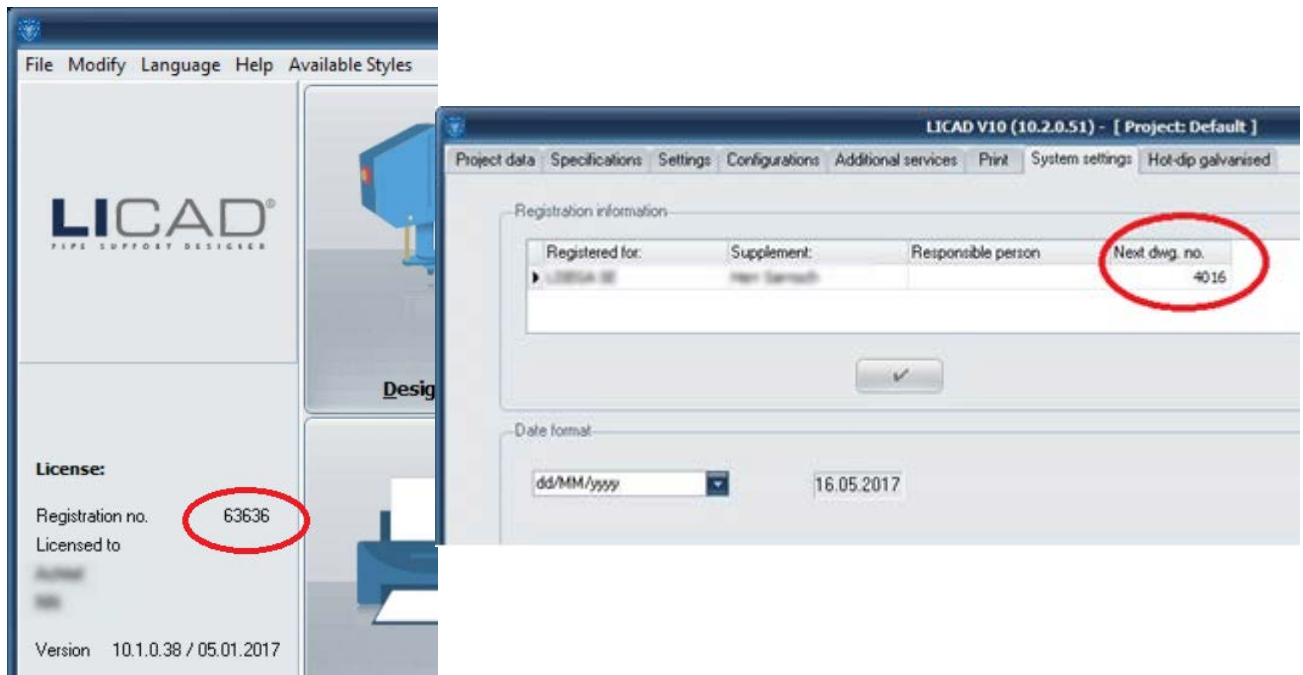
I.1.1 Create a backup project file with drawings

To do this, copy the project database (LICADV10xPRJDB.FDB) to another directory. The project database is located in this directory: c:\Users\Public\Documents\LISEGA\LICAD V10\
It is recommended to copy these data to a location which can also be used later for project management. For example: d:\data\LISEGA\LICAD V10\Projects\

I.1.2 Note current drawing number

The information about the registration key is required, as shown in the left-hand screenshot below.

It is also recommended to note the current drawing number for future use. Therefore open the Specifications - System settings, as shown in the right-hand screenshot below. Otherwise, the Program would report that the drawing number already existed.



I.2 Uninstall LICAD V10.0/10.1/10.2

Open the Windows System control panel and select programs and functions (or Apps and features Window10). Choose LICAD and uninstall (right-hand mouse button).

I.3 Install and run the new version

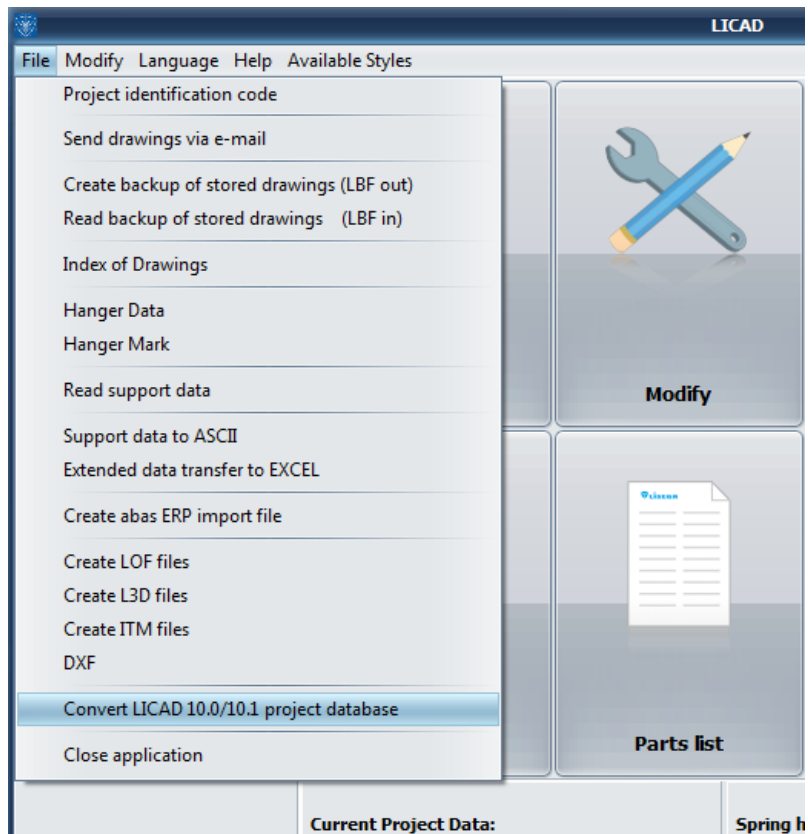
Run the program LICADV10_SETUP (V 10.3.0.xx).exe.

After the installation start LICADV10.EXE. The software will ask for the Registration key. If you no longer have the information for the registration, ask for the key at licad@de.liseqa.com. Please enter the number of the old registration key.

To reset the drawing number please refer to chapter Reset the drawing number.

I.3.1 Convert old project database into V10.3

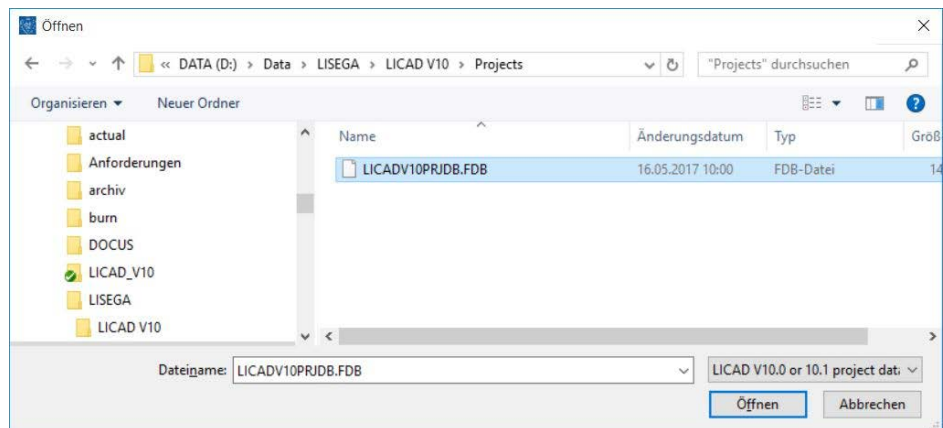
Please open from the main screen file menu and choose Convert LICAD 10.0/10.2 project database, as shown below.



Click to the CONVERT button



In the File open menu (as shown below), select the directory into which you previously copied the project backup file. (For example use: d:\data\LISEGA\LICAD V10\Projects\.)

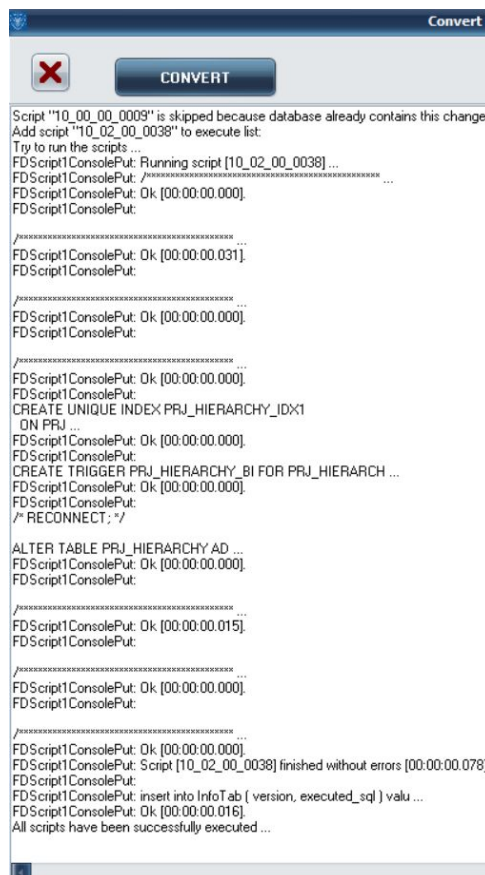


If the file LICADV10xPRJDB.FDB is visible click on it and choose 'Open'. After that, the database is converted and the last message should be there: All scripts have been successfully executed (as shown on the screen below).

As a result, a new project file LICADV103PRJDB.FDB has been created in the same directory.

To use the new project file with the converted drawings, open the Project menu on the main screen and select the backup directory you have used for the conversion before. (For example: d:\data\LISEGA\LICAD V10\Projects\.)

For more information, see chapter Project Management in the LICAD manual.



I.3.2 Reset the drawing number

The drawing number can then be updated again. To do so, open the Specifications System Preferences, as shown in the screenshot below.

LICAD V10 (10.2.0.52) - [Project: Default]

Project data Specs Settings Configurations Additional services Print System settings Hot-dip galvanized

Registration information

registered for:	Supplement:	Person responsible	Dwg. no.
I LUBICA SE	Her Sarnath		4016

✓

Date format

dd.mm.yyyy 01.06.2017

Please enter the number you have noted before in the red marked field. Press the button below (marked green) to save the information.

1 Introduction

1.1 An introduction to LICAD

By using the free of cost LICAD program you can considerably reduce project planning expenses and thereby cutback costs for the planning of supports for piping systems. With LICAD more than 90% of the normal support positions can be covered as standard cases.

The time-consuming and thereby cost-intensive work that used to come up in the form of preparing sketches, installation drawings and 'combing through' catalogues, can be considerably optimized by using LICAD.

The specific data of the support points (force, pipe diameter, travel, etc.) is entered with menu-controlled program guidance. A support configuration appropriate to local circumstances is selected by dialogue and by a symbolic representation of standard supports. Automatically LICAD carries out the selection and determination of components which are suitable for a given load in a support configuration. Further Intervention on the part of the operator is no longer required. The result is presented on the screen to the user in a scaled graphic form including a parts list indicating weights and materials and can be changed as required. Also a site plan can be filled if desired.

With the selection of variable spring and constant hangers, general guidelines for the selection of pipe supports (ASME, VGB, etc.) are automatically allowed for with the appropriate specifications of basic data.

All support positions dealt with are automatically saved by the program and can be called up and, if required, altered at any time. In addition to printing out drawings LICAD also supplies detailed as well as compiled materials lists. For later processing of the supports as a 3D graphics in CAD programs export functions can be used. Furthermore, various interfaces to major software vendors are available.

The basis of the program, a completely new development by LISEGA, forms a comprehensive data bank system of the LISEGA standard components catalogues (Standard Supports 2020). The program can be operated as desired in eleven languages: Chinese, English, French, German, Hungarian, Italian, Japanese, Polish, Portuguese, Russian or Spanish.

By constant further development of the program, in particular by taking customer requests into account, LISEGA is setting a standard for the future in the field of pipe support construction with the new LICAD version 10 program.

Frank Sarnoch
Zeven, November 2018

1.2 Software requirements

Microsoft Windows XP, Windows 7 or higher.

1.3 Installation, Start and Registration

NOTE: Updating existing LICAD 10 versions (refer chapter 6.10)!

Important: For installation you should have administrator rights on the computer.

Make sure that no anti-virus program blocks the installation program nor any utility installed and executed during installation!

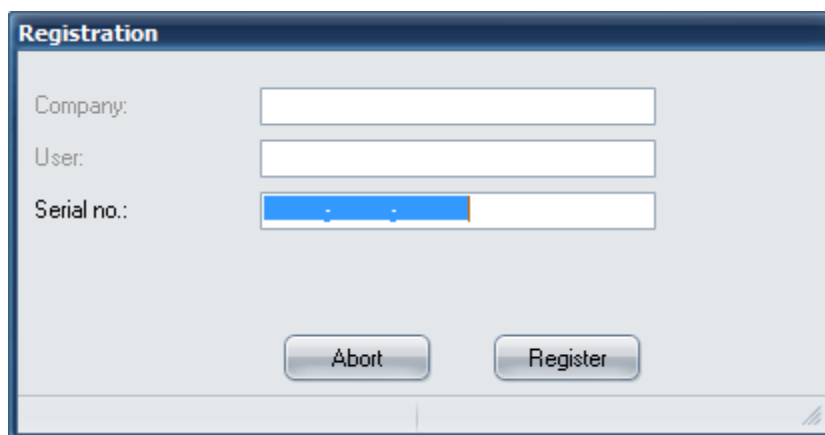
To install LICAD locally on the PC, start the program LICADV10_SETUP (V 10.x.x.x).exe.

Further variants are available for installation. Please read the detailed descriptions for this in the attachment (6.6).

Please follow the instructions on the screen for installation of the program.

Open the menu "Start - programs - LISEGA - LICAD" in the task bar.

On the initial program start, the following window appears:



The user information and the serial number are now requested.

Please use an individual serial number for each work station, as the drawing number follows from this. If you install LICAD on different computers using the same serial number, you will be given the same drawing number with different drawings.

You can obtain additional serial numbers free of charge from LISEGA.

Before you now start arranging pipe supports you should familiarize yourself with the program points "project administration" (project administration) and "project data" (project data).

1.4 Resetting the LICAD drawing number

It is necessary to reset the counter number of the LICAD drawing number if

- the program was reinstalled and existing drawings have to be considered
- the serial number was wrongly set through a system error

The first step is to determine the last drawing number assigned. Access the program point 'Contents' in LICAD and note the drawing with the highest number (e.g. 321-3-57500). Now switch in LICAD to the options 'System Settings' and overwrite the value in the Ser. No. field with, e.g., 322 (=321+1).

Project manager	DWG N°
	322

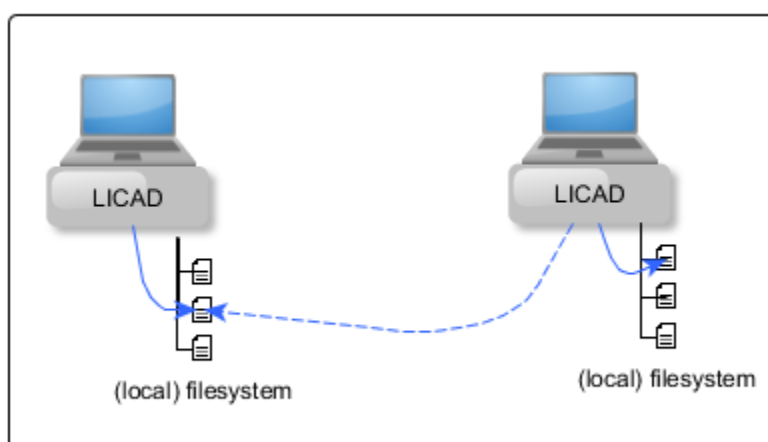
Click on the button below it to save it. The next new drawing would then be assigned, for example, the number 322-3-57500.

1.5 Instructions for sharing projects

For projects involving a number of users it should be ensured that each user is given his own personally allocated project file.

A network drive allows multiple users to access the same project file. However, simultaneous access is not possible.

The individual supports in the project files can be grouped together via an LBF file transfer in a so-called 'master project'.



Note: LICAD also supports multi-user operation with central project management. Such a setup is not included in the standard installation setup! Please contact us for further information on multi-user operation (mail to: licad@de.lisega.com)

2 Program description, main menu

2.1 The main menu screen

Figure 1 shows the LICAD main menu screen.

Working from this menu the individual programs can be called up by entering a letter.



Figure 1: LICAD main menu

Before the first drawing is prepared the specifications and other parameters (refer to 2.4 ff) first have to be set in the program. For this, click on the 'Specs' button in the main menu. On the screen that follows, using the cursor keys you can choose between the items Project Data, Specifications, Service, Settings, Configurations, Additional Services, Printing and System Settings.

2.2 Help menu

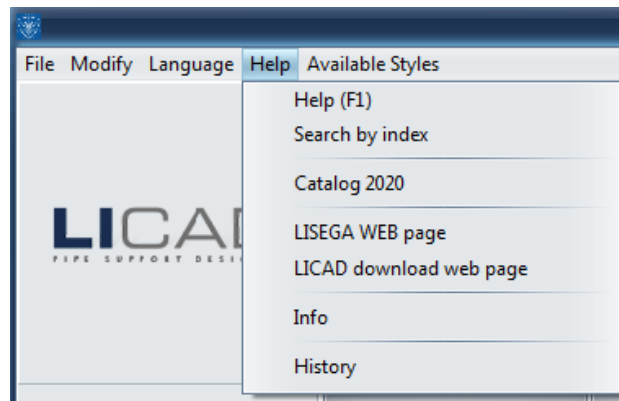


Figure 2: Help menu within main window

The Help menu (Figure 2) can be accessed from LICAD main window. Various information on software, the PDF catalog or the LISEGA website can be accessed here.

2.2.1 Help and Search via key word

By way of the menu point Help the table of contents of online help is accessed. Click on the desired heading to obtain further information.

Note: At every point in the program you can click on F1 to obtain context-related help

2.2.2 Catalog 2020

Insofar as the option to copy the LISEGA catalog on to the computer was selected on installation, the catalog can be opened by clicking on this menu point. The catalog is available as a PDF file and AcrobatReader is required to start it. AcrobatReader is Shareware and is on the CD or can be downloaded from the Internet under www.adobe.com

On later installation, the path for the LICAD PDF files should be made known. This is done via the LISEGA.INI file in the <LICAD installation directory>. The path must be entered there under the heading CATALOG for the corresponding language.

2.2.3 LISEGA WEB- and Download-Site

Under this heading we heartily invite you to a trip through our world of pipe supports.

With a click on the LICAD Download Site you can get information on the latest downloads

2.2.4 Info-Screen and About LICAD

If you need further information and would like to get in touch with LISEGA, you will find telephone numbers and addresses of the various company locations under 'Help - Info'.

Note: You can click on the LISEGA symbol in the main menu to open the same window.

Exact details of the LICAD version can be found under 'Help - via'. In the lower right-hand corner the revision number and date are displayed. This information is important for queries.

2.2.5 History

Since the publication of Version 8.0.0, all alterations to LICAD have been recorded in the HISTORY.HTML file. This file can be opened by way of the Internet browser.

2.3 Language choice

Setting of the menu language and the printer language is made working from the main menu. For this, select the menu point 'Language' in the menu line.

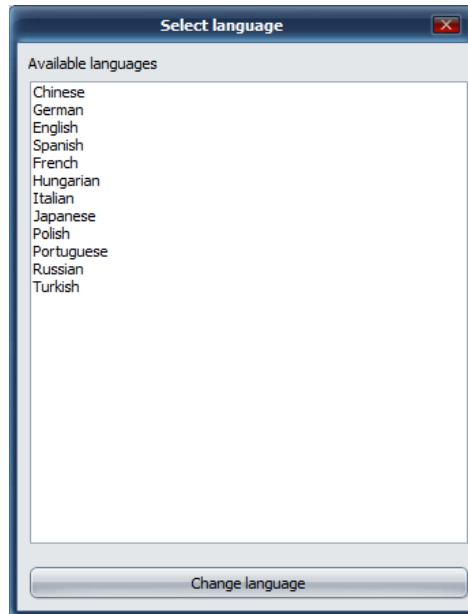


Figure 3: Auxiliary window for choosing the program language

The menu guidance can be done in eleven languages:

Chinese, English, French, German, Hungarian, Italian, Japanese, Polish, Portuguese, Russian, Spanish or Turkish

The printing language can be selected under the options Print - Language.

Note: Drawings and materials lists are always given out in the language set at the time. Drawings which have been saved can be printed out in any of the languages named above. Just make the appropriate setting before printing.

The menu languages are independent of the Windows system setting. The settings relating to countries are therefore to be modified under NT 4.0 if, for example, the menu is to appear in Polish but the country-related setting stands at Germany. This is not possible with Windows 95. The languages not supported by Windows are not listed in the selection. With Windows 7 although all languages are displayed but the corresponding languages have to be reloaded with Windows.

2.4 Project data

In addition to the drawing number, the specific project data should be entered for the administration of drawings and for the documentation.

The program adds the data entered in this mask to each additional drawing prepared and saves it.

The following data can be entered individually:

1. Name of ordering party
2. Designation of the facility
3. Designation of the system
4. Name of the person in charge of the project
5. Commission number of the ordering party
6. Customer's order number
7. A so-called heading space or free space. (This space can be freely defined and the appropriate entry can later be used as search criterion.)
8. Comments can be entered here together with space 10.
9. LISEGA order number

2.4.1 Clear hanger mark number

The program can check, on input, whether the hanger mark number already exists in the project. For this, the entry "checking of hanger mark number for uniqueness when generating new drawings" is to be found in the options ("project data").

The work screen allows considerably increased setting possibilities (input of pipe support data). Beside the above-mentioned possibilities, all possible variations of units can also be set.

The screenshot shows the LICAD V10 (10.0.0.20) interface for a project titled "Project for Demo purposes". The "Project data" tab is selected and highlighted with a red box. The interface contains several input fields for project information:

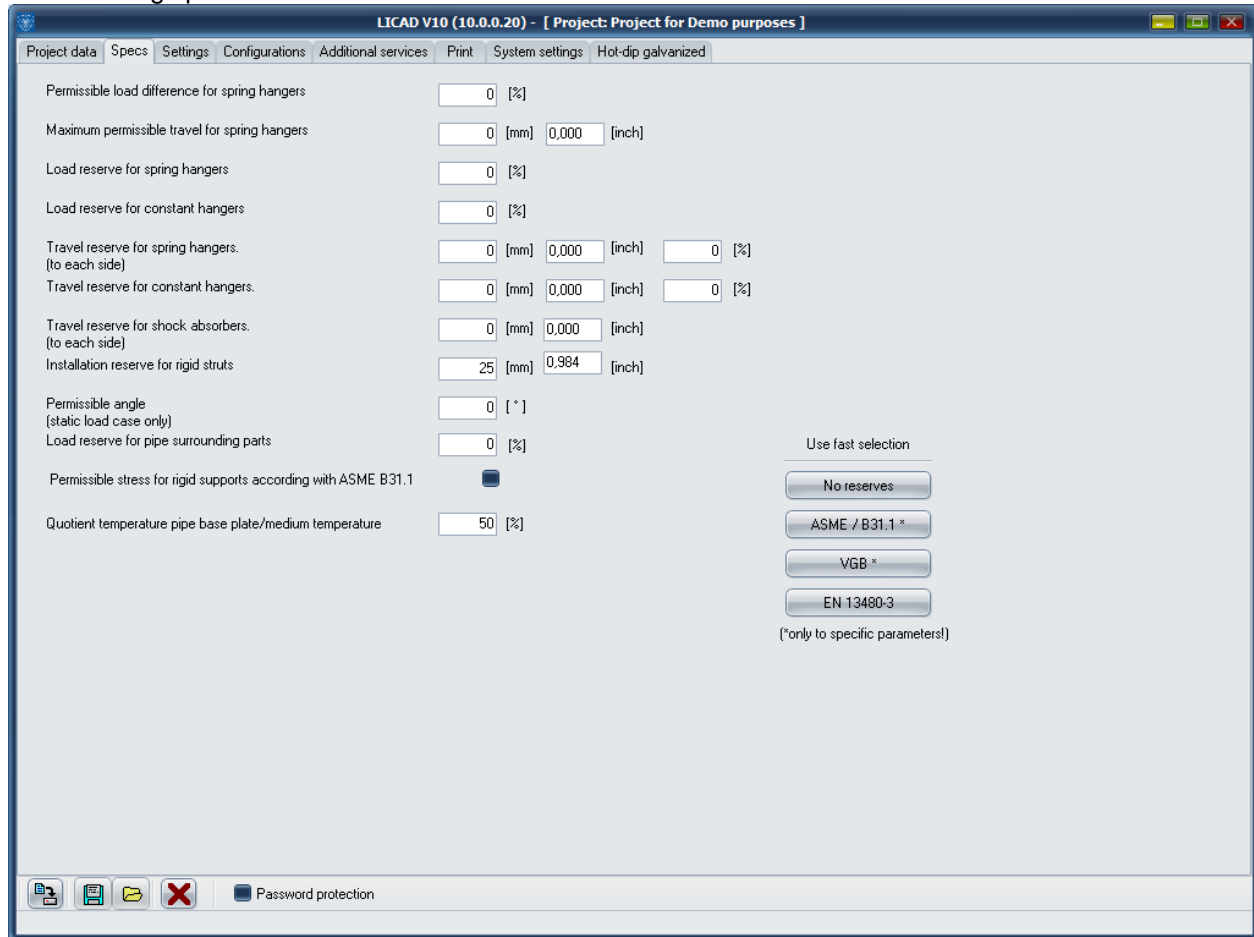
- Customer (who has ordered): ...
- Responsible person: Mr. Smith
- Plant number: ...
- LISEGA offer number: 154654 - 8 - 0 0
- System designation:
- Additional field in title block: Field title (123) and Field information (empty)
- Customer commission number: ...
- Further information fields: (two empty input boxes)
- Order number: ...

At the bottom, the "Project options" section is highlighted with a red box and contains a checked checkbox for "Check Hanger marker number on uniqueness when creating new drawings".

2.5 Specification data

On the screen shown below you specify the criteria according to which the functional components such as variable spring/constant hangers or snubbers are to be selected by the program. In addition, general basic conditions for the program are stipulated here.

The following specifications should be checked:



The specific VGB guidelines can be set with the VGB button.

For rigid supports, the selection of the support chain can be made additionally according to the ASME B31.1 guideline. If the option is set, the design is arranged according to the load grouping 'H/Normal' (see Appendix 7.3).

2.5.1 Permissible force difference between cold and warm position with variable spring hangers/variable supports

Variable spring hangers or variable supports are to be used when minor shifts of piping resulting from heat expansion are to be spanned and the additional reaction forces that thereby arise, caused by the spring travel, are structurally justifiable for the strength of the piping.

The difference between the cold and warm positions acts in the piping system as an additional reaction power on the point of attachment. This additional reaction power is limited in its size by the respective design regulations which apply. According to general guidelines the permissible deviation of force should not exceed 25%.

$$\Delta F = \frac{F_{\text{hot}} - F_{\text{cold}}}{F_{\text{hot}}} * 100\%$$

The difference in force is defined in the LICAD program as follows:

Should it not be possible to find a standard variable spring hanger due to the spring rates, then constant hangers are automatically selected by the program.

2.5.2 Maximum permissible range of movement for variable spring hangers

As already mentioned above, variable spring hangers are only used in piping construction within a certain working range. In addition to the difference in force a general travel limit can also be given for the use of variable spring hangers. If the total travel exceeds this limit then the program automatically selects a constant hanger.

(If the permissible range of movement is set at zero then only constant hangers are selected by the program.)

2.5.3 Load reserves for variable spring and constant hangers

The selection of constant hangers is made within the range of capacity. The operating load is within a range of between 40% and 100% of the respective rated load of the constant hanger. You can find additional information in the LISEGA catalogue.

For variable spring hangers, the given travel reserve always refers to a particular direction; for constant hangers the given travel reserve has absolute consideration.

When a load reserve is entered, the program checks whether a corresponding load variance can be taken on by the hanger selected and in the case of a change that the working space available is sufficient. If necessary the program automatically selects another hanger.

2.5.4 Travel reserve for variable spring and constant hangers

The program also checks, according to the load reserve, whether a larger working range of the piping might be acceptable for the type of hanger selected. In doing so LICAD checks whether in the case of an enlargement of the working range the permissible difference in force is not exceeded or whether a new hanger has to be selected due to the enlarged working space.

If, for example, with a travel of 30 mm a travel reserve of 10% is specified then the program checks whether the hanger can also be used with 33 mm.

For spring hangers the travel reserve entered corresponds in each case to a direction, for constant hangers the travel reserve is considered absolutely.

Always be sure that by entering a travel or load reserve simultaneously the possible selection of a hanger is narrowed down more and more and a correspondingly heavy hanger is selected.

There is an AND/OR link between the two selection criteria above (2.5.3 + 2.5.4) in case of constants. For spring hangers the relation is OR only.

2.5.5 The travel reserve for snubbers

Recommended travel reserve for snubbers : The travel reserve for snubbers is understood to be the position of the piston rod in relation to the end position. A safety clearance of 10 mm for the piston end position is recommended for the proper use of snubbers.

2.5.6 The installation reserve for rigid supports

Tolerances for the assembly dimension are allowed for in the selection of rigid supports by the size of the installation reserve.

2.5.7 Load reserve for pipe-surrounding components

Although not expressly required by the VGB guidelines, a load reserve when selecting is also taken into account for pipe clamps and clamp bases analogously to the spring and constant supports. There is not much sense in the rest of a support chain distributing a higher load if the pipe-surrounding component has already reached its limits.

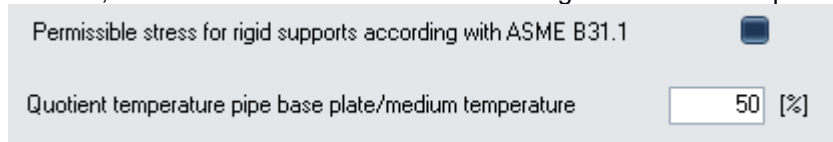
2.5.8 Pre-adjustments according to VGB, EN13480, ASME and Reset

To design the supports according to VGB, EN13480-3 or ASME guidelines, the VGB or ASME buttons on the page for options/specifications can be selected. The corresponding values are then set. In addition, it must be taken into account that the selection of clamps is limited in temperature in accordance with the requirements of the material. Moreover, the cold load is taken for the load input, and that the pipe surrounding components have to bear an additional load reserve. Both can be set on the options/ settings page.

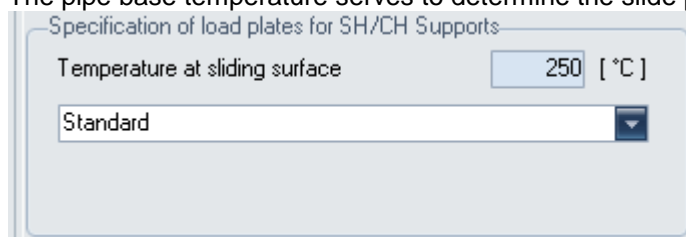
When selecting the reset button, all reserves are reset to zero. No further changes are made.

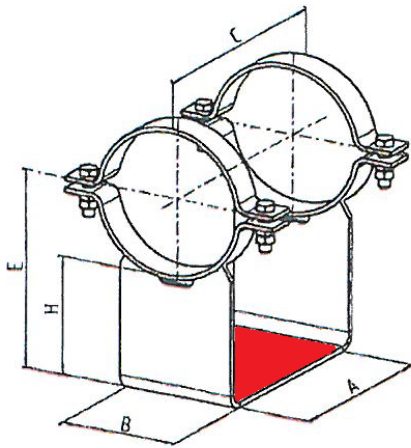
2.5.9 Quotient temperature of medium to that of base plate

This concerns the temperature deviation within a clamp base. The temperature decreases from the pipe downwards to the foot of the clamp base. In general the temperature falls by 50 %, but can vary. In addition, this relation can be altered via a changed value for the quotient.



The pipe base temperature serves to determine the slide plate.





Pipe base plate (red)

2.6 Adjustments

2.6.1 Hot/cold loads for variable spring hangers

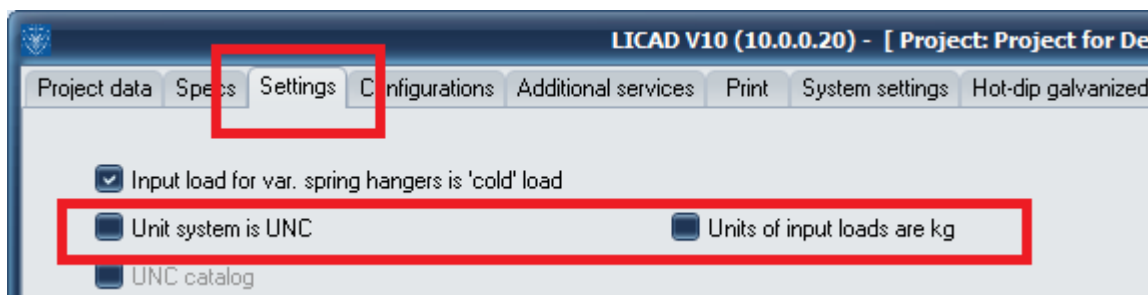
Whether the operating load or the cold load is entered is of special importance for the selection of variable spring hangers. LICAD calculates each opposite load case and puts these out in the drawing.

Furthermore, the preset load of the hanger is put out. The preset load consists of the cold load and the additional load of the component which encloses the pipe.

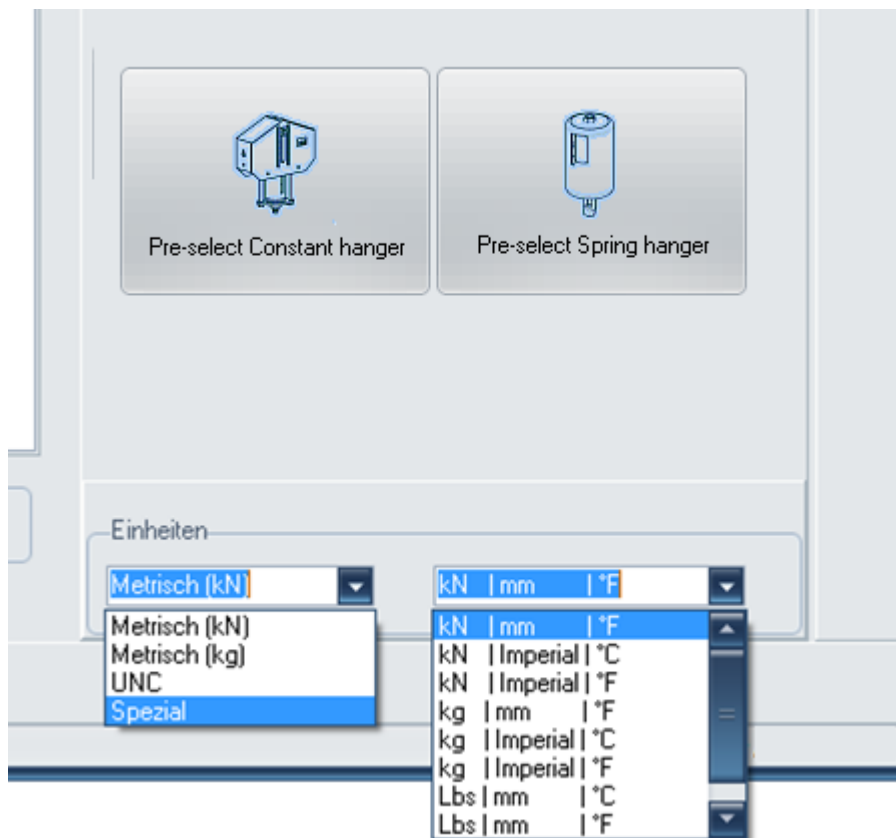
The preset load is made up of the cold and the additional loads. The additional load is calculated from the load chain parts situated below the hanger (incl. the pipe-surrounding components).

2.6.2 Selection of the units

LICAD distinguishes between two systems of units. One is the SI unit system, the other being the American system (**Imperial System**), which is based on inches and pounds. Deviating to the SI system, the temperatures are indicated in Celsius [°C]. With ID entries the American LISEGA catalog are selected by the program as a basis.



The work screen allows a much more enhanced adjustment (enter the pipesupport data). In addition to the options above, there is still the possibility to set of all possible variations of units.



2.6.3 Selection of catalogs

LICAD can calculate the load chains from LISEGA's metric and American (UNC) catalog independently of the units selected for input.

2.6.4 Entering the load in kg or kN

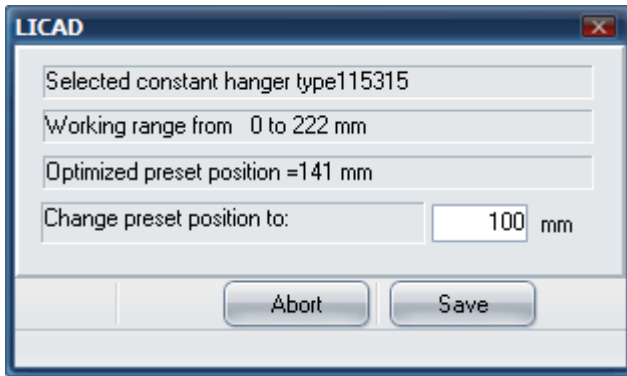
If desired the loads can also be entered in kilograms. Input values in (kg) are internally recalculated by a factor of 9.81 m/s^2 in (Newton). For technical reasons specific to the program the input space is defined as deca-kg.

2.6.5 Check hydro-load

With a *static stress* of supports, in addition to the operating load the *so-called hydro-load* can also be checked. In doing so the program checks whether the support selected will carry the specified water load with *preset* hangers. The permissible hydraulic load can be taken out from the table "[Maximum permissible load for statically determined components](#)" (Column HZ/emergency 80°C).

2.6.6 Preset blocking position for constant hangers

The preset position with constant hangers and constant supports can be specified by the user. The travel stop position can only be selected within the prescribed limits. The optimized travel stop position is indicated to the user.



This option is only available if the constant hanger type is selected beforehand by the user.

2.6.7 Welds

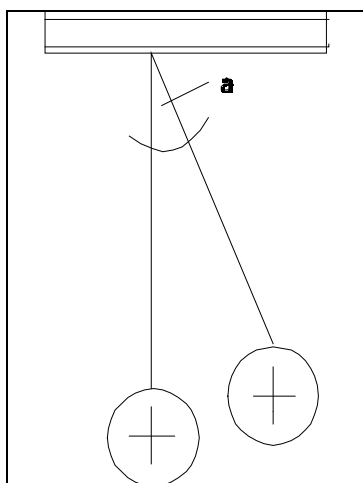
For the building attachment parts (product group 7), the weld thickness required for assembly are given by the program. This 'minimum weld thickness' is designed such that the permissible tensions are only exploited to 50% in favor of high safety. A force applied at 6° in the weld was taken as a basis for the design. The weld thicknesses can be changed later if you enter N.

2.6.8 The angulation for pipe supports

2.6.8.1 Taking the pre-assembly angle into account

LICAD offers the possibility of having the angulation, which results from the movement between the cold position and the warm position of the pipe support (in relation to the point of attachment of the pipe support on the beam), checked for size. Figure 4 shows a diagrammatic example of the pre-assembly angle.

The program is based on the assumption that where a specified angle is exceeded (refer to Figure 4) as the result of excursion in the plane, the pipe support must be pre-fitted by half of the working range (in the horizontal or lateral direction). The angle is virtually reduced to one half by halving the range. If the angle is still too large in spite of the halving, the program stops with an appropriate message on the angle calculated and allows the user either to continue or to redesign the support.



a := pre-fitted angle or angulation

Figure 4: Pre-fitted angle for pipe supports

Note: The length for the calculation of the angle is determined from the distance between the points of the axis of rotation of the structural connection and the pin axis for the pipe clamp connection.

In the drawing the result is shown using so-called pre-fitted triangles. From these the total pipe movement is apparent on the one hand and on the other the direction in which and how much the pipe support has to be pre-fitted is given.

2.6.8.2 The appropriate critical angle for the presetting is to be entered here.

Permissible angulation and loads for weld-on brackets Type 35

Care must be taken that lateral deflection to the angle of displacement of the weld-on brackets is limited to 6°. The installation position must therefore be checked for the possibility of free movement on thermal expansion.

When the angle of displacement increases to 90°, the permissible loads are reduced by approx. 15% at constant welding-scum thickness.

2.6.9 Designation of coordinate axes

When LICAD was introduced LISEGA intentionally broke away from the conventional designation of the coordinate axes. As misunderstandings in the transfer of data arose in some countries as a result of varying axes designations, a way was sought to do justice to all users by a neutral designation of the axes.

The vertical axis is defined as positive upwards. The horizontal axis points into the screen (generally in

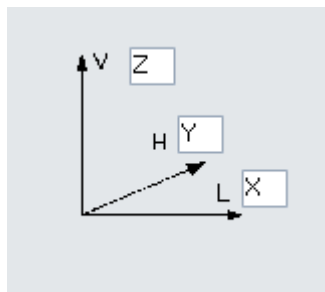


Figure 5: Input window for defining coordinate axes

the piping axis). The lateral axis is perpendicular to the other two axes and is positive towards the right.

But LICAD also offers the user the possibility of using his or her own designations for the coordinate axes. On the following screen each of the individual axes can be assigned two characters.

2.6.10 Reduced temperature range for clamps

In accordance with the VGB guidelines the permissible application ranges with regard to temperature must be limited in LICAD. The following values are thereby considered:

Temperatures	Material
up to 350°C/660°F	S235JR, S355J2
up to 500°C/930°F	16Mo3
up to 530°C/985°F	13CrMo4-5
up to 580°C/1075°F	10CrMo9-10
up to 650°C/1200°F	x10CeMoVNb9-1 (F91)

2.6.11 No consideration of low temperature clamp bases.

This option prevents selection of clamp bases designed for the temperature range up to 350°C/660°F (Material S235, S355). The idea behind this is that even at lower temperatures and comparatively smaller insulation thickness, clamp bases with higher installation dimensions can be selected.

2.6.12 Length of the threaded rods

It has proved expedient to limit the length of threaded rods for the transport of supports to sites. For design purposes the maximum length of threaded rods can therefore be limited to 2000 mm. 3000 mm is chosen as standard, 12 feet in UNC.

2.7 Configurations

2.7.1 Determination of load group for static components

The nominal load is used to determine the load group. For statically determined components in the product groups 1, 2, 4, 6 and 7, the nominal load corresponds to the max. adjustment load of the spring components such as spring and constant hangers. Selection is made according to the table for statically determined components, Catalog Page 0.5 or Appendix, Section **Fehler! Verweisquelle konnte nicht gefunden werden.**

2.7.2 Determination of load group for rigid supports

Determination of the load group for rigid supports is made according to the table for statically determined components, Catalog Page 0.5 or Appendix, Section 7.3, load case H 80°C. If B31.1 was selected, the design is made according to load case H. The max. permissible operating load (load case H) lies, when implemented as a rigid support, considerably higher than the nominal load and is adjusted to the load capacity of the connection thread.

Note: Should the smallest possible connection of a clamp be higher than the load group for the rods, the program will automatically increase the load group for the rods till the threaded connection fits the clamp.

2.7.3 Determination of load group for dynamic components

For dynamically determined components the specification of the nominal loads follows from the meaningful classification of the standardizable load spectrum. At the same time the nominal load corresponds here to the operating load for load case H (or level A/B in ASME). Selection is made according to the table for dynamically determined components, Catalog Page 0.5 or Appendix, Section.

Note: It should be noted that for extensions the permissible loads are reduced. The program automatically increases the load group if the permissible load is exceeded due to the extra length.

2.7.4 Building attachments

Similar to item, supports can also be designed without building attachments such as weld-on eye plates and clevises.

2.7.5 Special connection sizes

Pipe clamps and bearings are based on the LISEGA 2010 catalog (product group 4). This guarantees compatibility with the LISEGA construction kit system in relation to load groups and connection geometry. As in some cases with fume pipes, clamps with large pipe diameters cannot always be attached to hangers of a relatively small load group, it is still possible for the program to select appropriate clamps. These clamps are identified in the materials list as special components, since the connection geometry does not correspond to the standard.

2.7.6 Selection of two-bolt clamps

The option of two-bolt or three-bolt clamps is available to the user for the selection of supports. Supports are standardly designed with three-hole clamps (type 43). Type 42 clamps are then available when the support is to be designed without insulation.

2.7.7 Positioning of the pipe support in the operating position

The positioning of the pipe support in the operating and assembly position: depending on the design guidelines, the program should be informed as to whether the pipe support is to be vertically installed in the assembly or operating state. The pipe movements should be entered in such a way that the sense of direction from the assembly position refers to the operating position. The support length entered always refers to the vertical state.

2.7.8 Shock absorber extensions

As an option, dashpots can be designed with or without extensions.

(**Important:** in a design without extension the range of the required installation dimension is quite limited.)

2.7.9 Long variable spring hangers

In general, only variable hangers with spring travel up to 200 mm are considered by the program. This corresponds to the travel ranges 1, 2 and 3. If required, spring hangers with extra-long spring travel of 300 and 400 mm can be used. On installing this hanger one must however consider that the actual load deviation caused by additional friction in the hanger increases. It is therefore recommended that constant hangers be used for longer travel.

2.7.10 Seated constant and spring hangers incl. support or base plate

Seated constant or spring hangers are supplied with supports or base plates as standard. If so desired, these seated hangers can also be supplied without these components, whereby constant and spring hangers are seated directly on the housing.

Note: The independent support configurations for directly placed constant hangers in earlier LICAD versions have been withdrawn.

2.7.11 Selection of constant hanger design

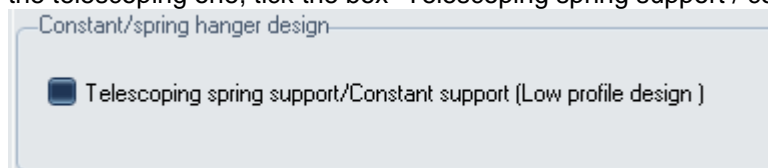
The respective design of the constant hanger must be determined when configuring of the support. This is done exclusively on the designer work screen when entering the loads.

To switch from the standard design Type 11 to the low-profile design Type 18, tick the “low profile” box.



2.7.12 Selection of spring supports

The respective design of spring support must be determined when configuring the support. This is done exclusively on the “designer” work screen when entering the loads. To switch from the standard design to the telescoping one, tick the box “Telescoping spring support / constant hanger low-profile design”.



2.7.13 Selection of constant supports

The respective design of constant support must be determined when configuring the support. This is done exclusively on the “designer” work screen when entering loads. To switch from standard design Type 16

to low-profile design Type 19, tick the box “Telescoping spring support / low-profile constant hanger design”.

2.8 Additional Services

2.8.1 Pre-assembly

Pre-assembly: On request the pipe supports can be pre-assembled by the manufacturer. This item is accordingly added to the materials list.

2.8.2 Presetting

Presetting: Variable spring hangers and variable supports can be prestressed and preset by the manufacturer on request. The corresponding information is added to the materials list.

2.8.3 Additional coating

Additional outer paint coat for clamps is based on LISEGA standard steel blasted and additional zinc dust primer.

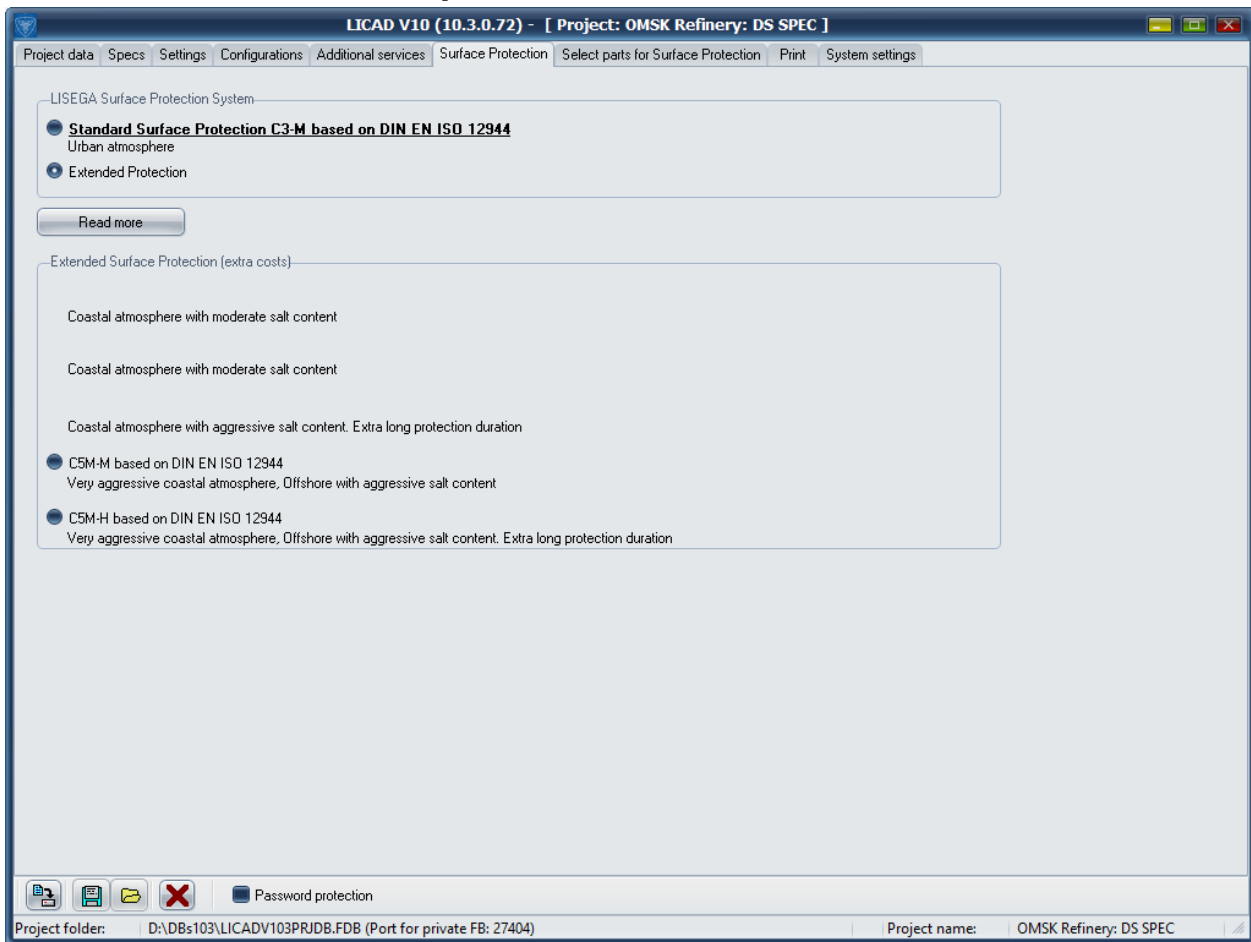
2.8.4 Further nameplate for spring or constant hanger

Spring or constant hangers can each be equipped with a further type plate. The constant hangers of the 11 series can also be supplied with a further load and travel scale.

2.8.5 Increased requirements design

Pipe supports can optionally be prepared in standard design or increased requirements engineering design. This is identified in the materials list by a different article number.

2.9 Extended surface protection



2.9.1 Standard surface protection

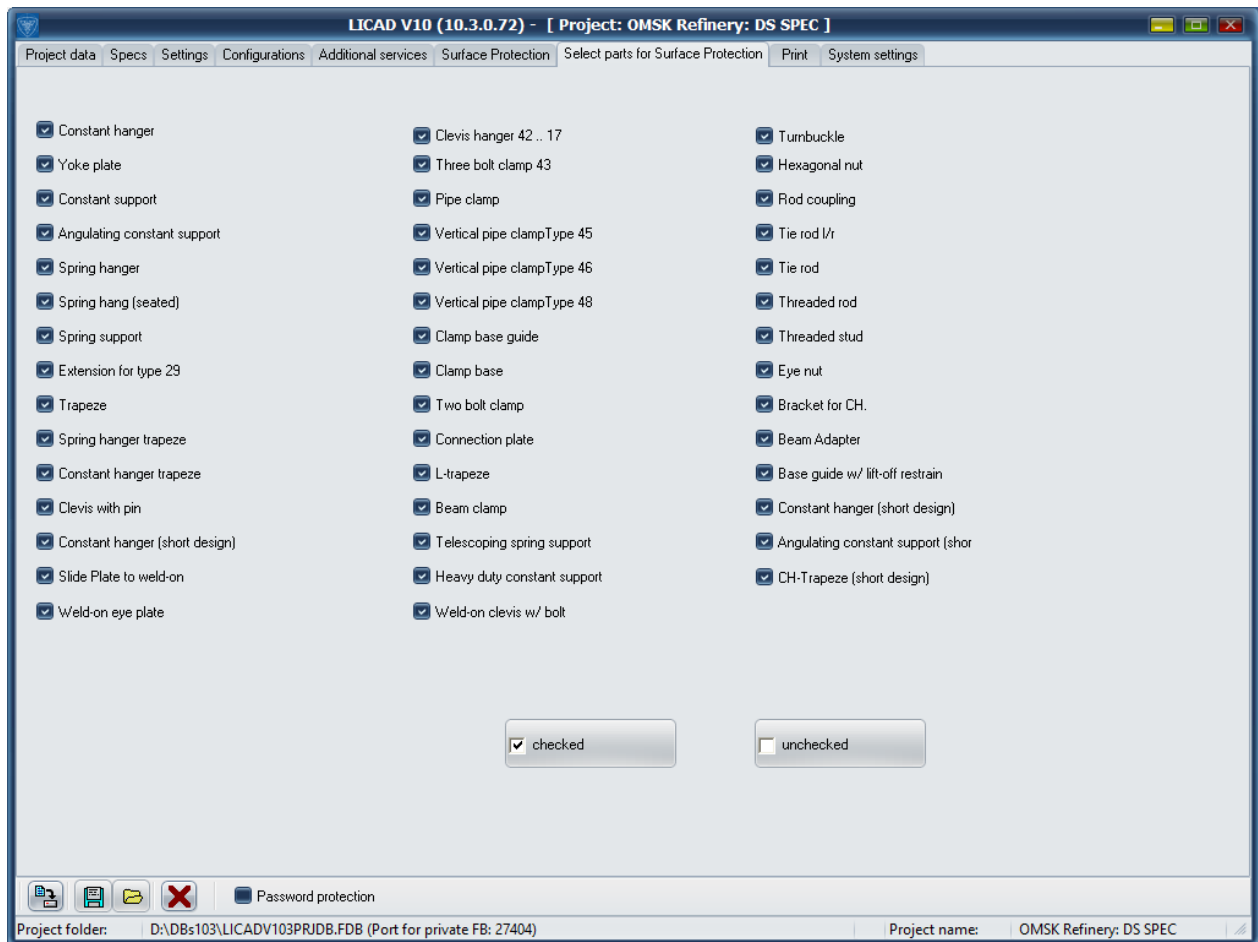
The LISEGA products are delivered with a standard surface protection (C3-M) in accordance with DIN EN ISO 12944. Further information about this can be found here in the appendix or in the program, if you press the button "Continue reading".

In addition to the standard surface protection, an extended surface protection can also be selected.

2.9.2 Hot-dip galvanized design

For extra surface protection a large part of the product groups 1, 2, 4 and 6 can also be hot-dip galvanized. If this option does not exist for a component within a load chain, this component will then be supplied as standard.

Over and above this, the user can select individual product groups to be hot-dip galvanized. (See following illustration)



2.9.3 C4-M based on DIN EN ISO 12944

This option can be selected if the mission is "moderate salinity coastal atmosphere".

2.9.4 C4-H based on DIN EN ISO 12944

This option can be selected if the use of "aggressive atmosphere coastal atmosphere. Extra long protection period "corresponds.

2.9.5 C5M-M based on DIN EN ISO 12944

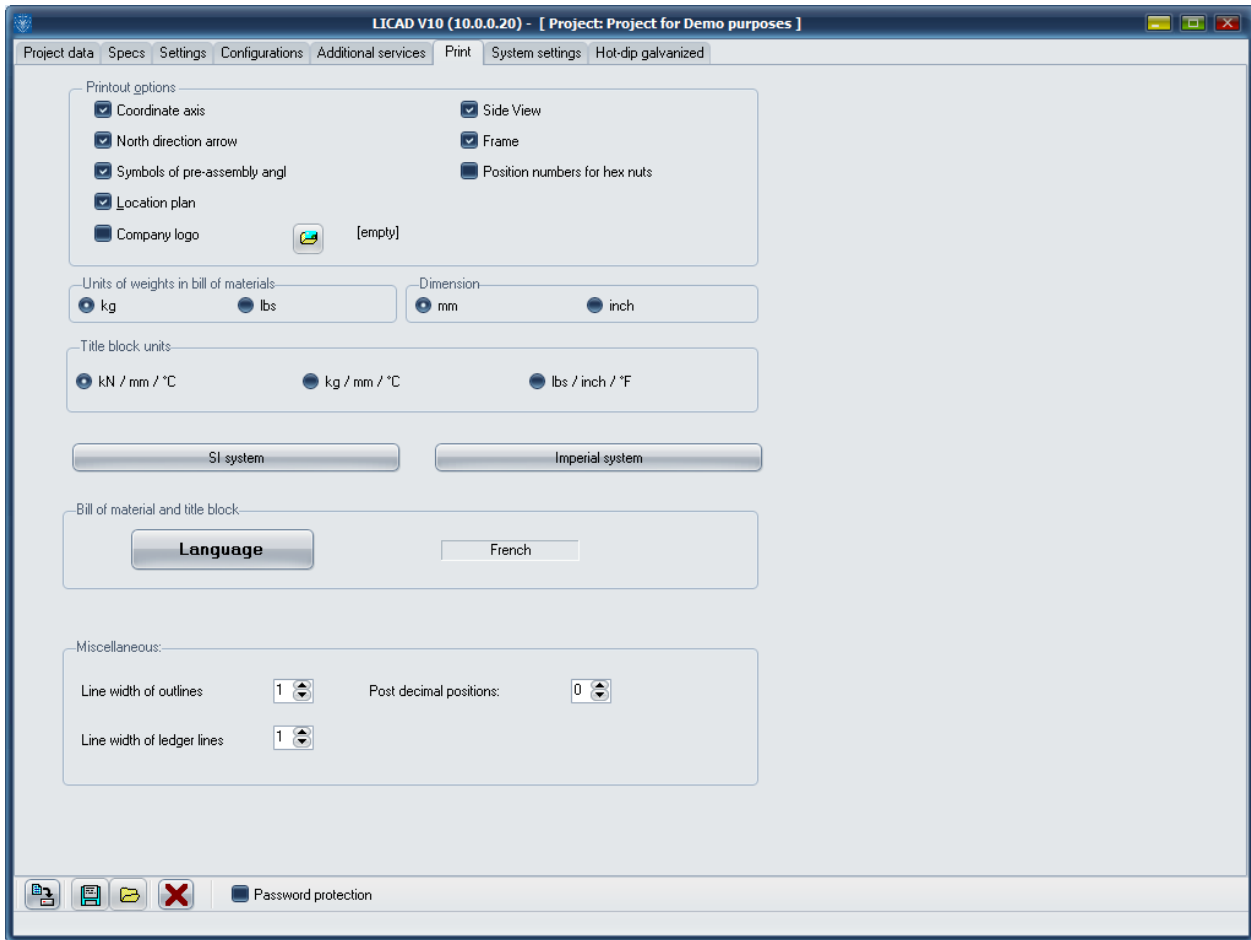
This option can be selected if the mission is "Very Aggressive Coastal Atmosphere, Offshore with Aggressive Salinity".

2.9.6 C5M-H based on DIN EN ISO 12944

This option can be selected if the mission is "Very Aggressive Coastal Atmosphere, Offshore with Aggressive Salinity. Extra long protection period "corresponds.

Note: The extended surface protection leads to an increase in the costs!

2.10 Printing



2.10.1 Printed picture options

2.10.1.1 Side view

The option “Side view” controls whether, when printing, a second view appears with the printout. This is however not available for all configurations.

2.10.1.2 Position numbers for hexagon nuts

No position numbers are allocated as standard to hexagon nuts in the graphics.

2.10.1.3 Location plan


If required the position of the pipe support can be identified in a building layout. The basic structure of the location plan corresponds to that of a conventional building.

In addition to identification of the building axes, the layout of the piping can also be given.

Marking the option only means that default-wise the plan is printed out. The entry can always be made as a matter of course. This option can also be changed afterwards.

2.10.1.4 Pre-setting symbols, coordinate cross and north point

If so desired, the pictograms can be printed out default-wise according to the location plan.

If a **company logo** is to be included in the print out, the corresponding option should be set. The desired graphic can be selected via the ‘Open Picture Dialog’ button . (Opening a Bitmap file, see 6.1)

2.10.1.5 Weight specifications in the parts list

The weights specified in the parts list can be given in kg or lbs as required, independently of the entries.

2.10.1.6 Units in the letter head

The specifications in the letter head can be given in various unit systems as required, independently of the entries.

2.10.1.7 Units of the dimensioning

The dimensioning of the drawing can be made in mm or inch independently of the units set for input.

2.10.1.8 Language for printing

Print-outs can be made in various languages independently of the menu language selected. The choice of languages depends not on the operation system but on the printer.

2.10.2 Line widths in drawings and places after the comma

The widths for the layout and auxiliary lines can be freely selected. A suitable value for the base line would be 2 or 3. The auxiliary lines should always be finer.

The places after the comma of the values for the pipe displacements can be adjusted to suit. For this, the values 0 (without following comma), 1 and 2 places after the comma are available.

2.11 System settings

The following program parameters can be set in the system settings field.

Font : For most program masks, individual fonts can be set.

Background color : For graphic representation of supports the background color can be changed. 'Current color of buttons' of the Windows settings is entered there as standard (mostly light grey). To copy the support as a graphic into another document the color of the background, e.g. on white, can be altered.

Languages selection : As described in 'Language control', only the languages supported by the relevant operation system are shown in LICAD. If all the available languages are to be shown, the switch for language selection must set on 'Show all available' and stored. The text display can however be incorrect in this case!

Language : The language for the program can be set here.

Ser. No. : This abbreviation stands for Serial LICAD drawing number.

This number can be amended by the user. Attention however; if the number is set back : if a corresponding number is already present in the current project path, then a serious error can occur. The drawing number is then to be set on the next free number.

'Project manager', 'addition' and 'registered for...' These entries can also be changed. Amend the entries; then store them with the 'Update entries' switch (Store with a tick below the window).

The type of lettering for the input fields in LICAD can be freely selected under 'Options - System settings' (**Fehler! Verweisquelle konnte nicht gefunden werden.**).

Note that not all fields are displayed if too large lettering is chosen.

Under 'Options - System settings' (**Fehler! Verweisquelle konnte nicht gefunden werden.**) the colour for the background to the graphics can be set. This is especially useful when supports graphics are to be copied into other programs with the aid of the clipboard.

2.12 Export and import of option-settings

Most settings in the options can be saved in a text file and also accessed again. For this, use the buttons 'File - save' and 'File - open'.

Note: Under certain circumstances it is a good idea for questions about a LICAD problem to include a corresponding file with the current settings.

2.13 Securing settings with a password

The values set in options can be secured using a password. For this, click on the button "Password security". Following this you are asked to enter a password not exceeding 10 characters. This must be repeated to confirm.

Note: Password security is optional and need not be activated!

After the button has been activated, changes can only be made by entering the correct password. The changes are rejected if a false entry is made. This applies both to new drawings and also to changes in drawings.

Background: It is quite normal for companies to lay down standards regarding the design of pipe supports. This applies especially to reserves, permissible load deviations etc. These values should not be altered by the user and may only be modified in exceptional cases in consultation with a supervisor.

Repeated clicking on the password button deactivates the protection.

3 Drawing up pipe supports

3.1 Entering data on pipe supports

3.1.1 Type of stress condition


In general, the **permissible loads for statically** determined parts and **permissible loads from dynamic** sources are differentiated for operational reasons. Dashpots and jointed supports as well as all parts in product group 3 in the LISEGA catalogue are designed for dynamic loads.

For roller bearings and pipe saddles (Product Group 5) a further program point, 'Cryogenics and bearings', is available in the main menu.

3.1.2 Static stress

Figure 6 shows the appropriate input screen for the SI unit system and for static stress.

The internal *LICAD Drawing No.* is displayed in the uppermost space. The first two numbers in this space are issued by the program and cannot be altered. The third part of the number is provided for a project or system number. The issuance of these numbers makes it possible to search faster within a project for drawings of a certain system. Following this the *Customer Drawing Number*, the *Hanger Mark Number* and the *Calculation Point Number* can be entered.

The letter following the space labeled *Load* refers to the specified load: hot or operating load **>>hot<<** or cold load **>>cold<<**. The setting is carried under 'Specifications' or can be altered via double click on the field in this screen or by clicking on buttons .

The program processes loads from 0.04 kN to 400 kN for static stresses with spring elements and to as much as 545 kN with rigid supports.

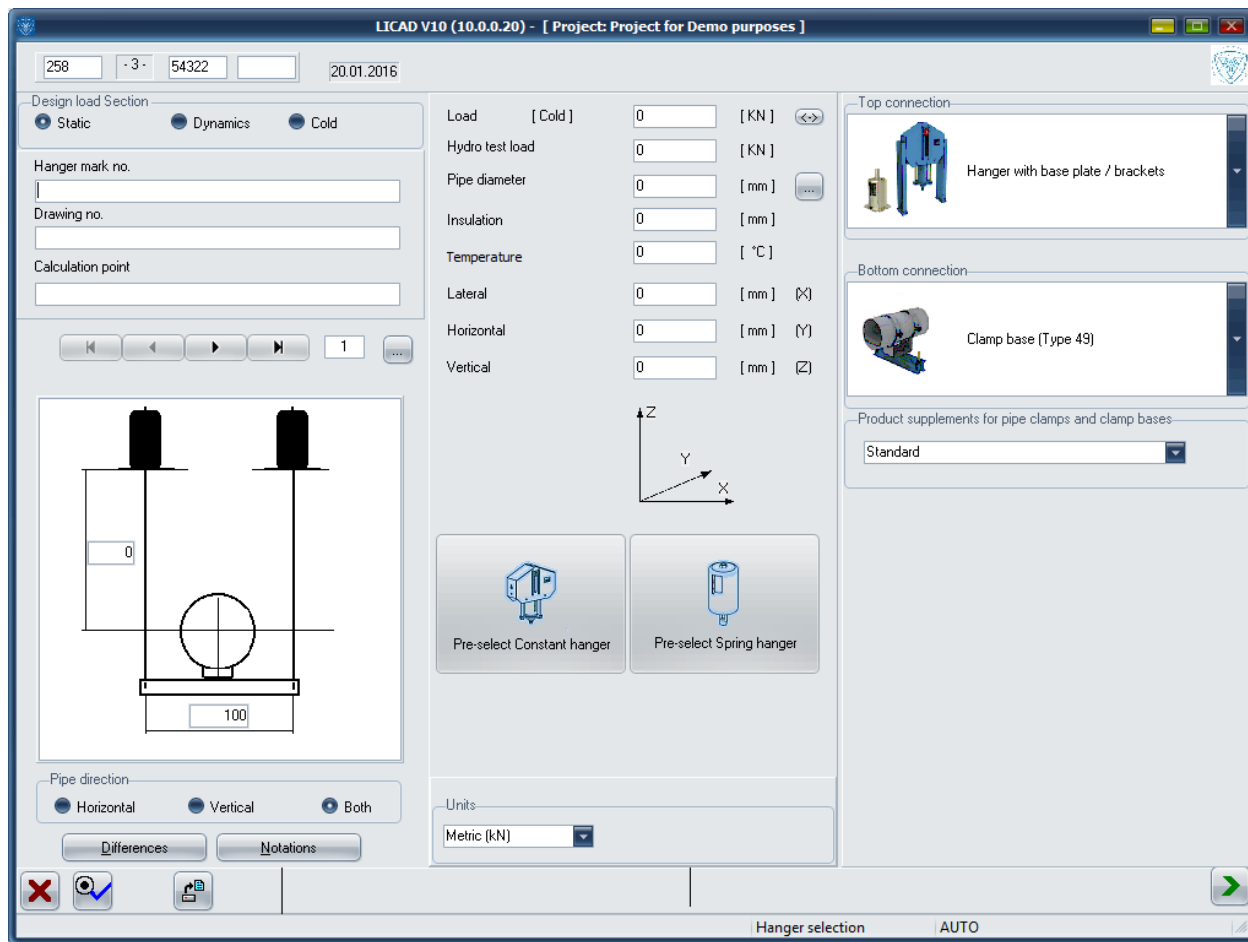



Figure 6: Mask for the input of pipe support data

The value for the *Pipe diameter* refers to the outer diameter of the pipe. Via a double click in this field or clicking on the button  a help screen with standard pipe diameters can be called up. Observe the following:

1. If the value entered is within the tolerance range indicated then LICAD assigns this value to the corresponding standard pipe diameter.
2. If the value is outside of the tolerance range then it is a special diameter. The consequence is that a clamp with the next higher rated diameter is selected. The clamp is labeled as a special article. The holding values of the special clamp correspond to the next higher catalog clamp. Analogously, this also goes for the weight and list price.

For trapeze supports with piping laid on, LICAD checks to make sure the insulation of the piping does not collide with the threaded parts or variable spring hangers or constant hangers leading alongside it. The minimum width of a trapeze or riser clamp is displayed on the screen.

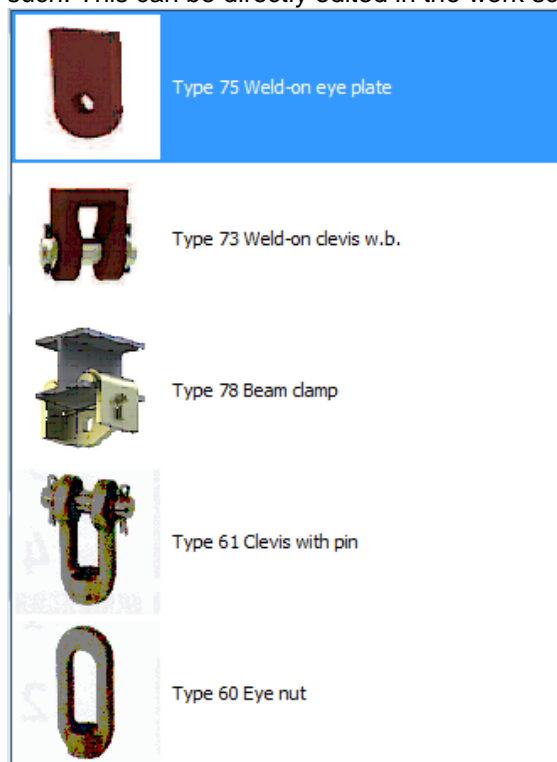
3.1.3 Lower Connection



The input for this setting was removed from the sub-menu “options”. The control for this is made via the option for the lower or upper connection in the work screen.

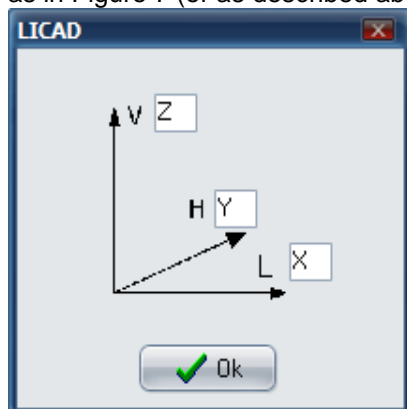
3.1.4 Top Connection

The setting “Without building connection” was removed from the “options” sub-menu, but not deleted as such. This can be directly edited in the work screen with the input data:




3.1.5 Definition of Pipe movements

The *Pipe movements* are entered in three directions. The axes of the directions of movement are defined as in Figure 7 (or as described above).



A resulting component is calculated from the three path components. The maximum total path is limited to 900 mm.

Support data can also be read in from files insofar as they are available. The file menu is opened via the 'Open File' button.  The file ending 'LIF' (LICAD Input File) is preset. The values deposited there are accordingly filled into the input fields of the mask. The values can however still be edited or supplemented.

The LIF files format corresponds to ASCII, the frame for a so-called INI file. An example of this can be found under chapter 7.3. These files can be made with PDMS or INTERGRAPH software.

Figure 7: Definition of the directions of movement

To enable the alternative input screen refer to Option settings – System setup.

3.1.6 Dynamic loads

Figure 8 shows the corresponding screen for dynamically stressed supports.

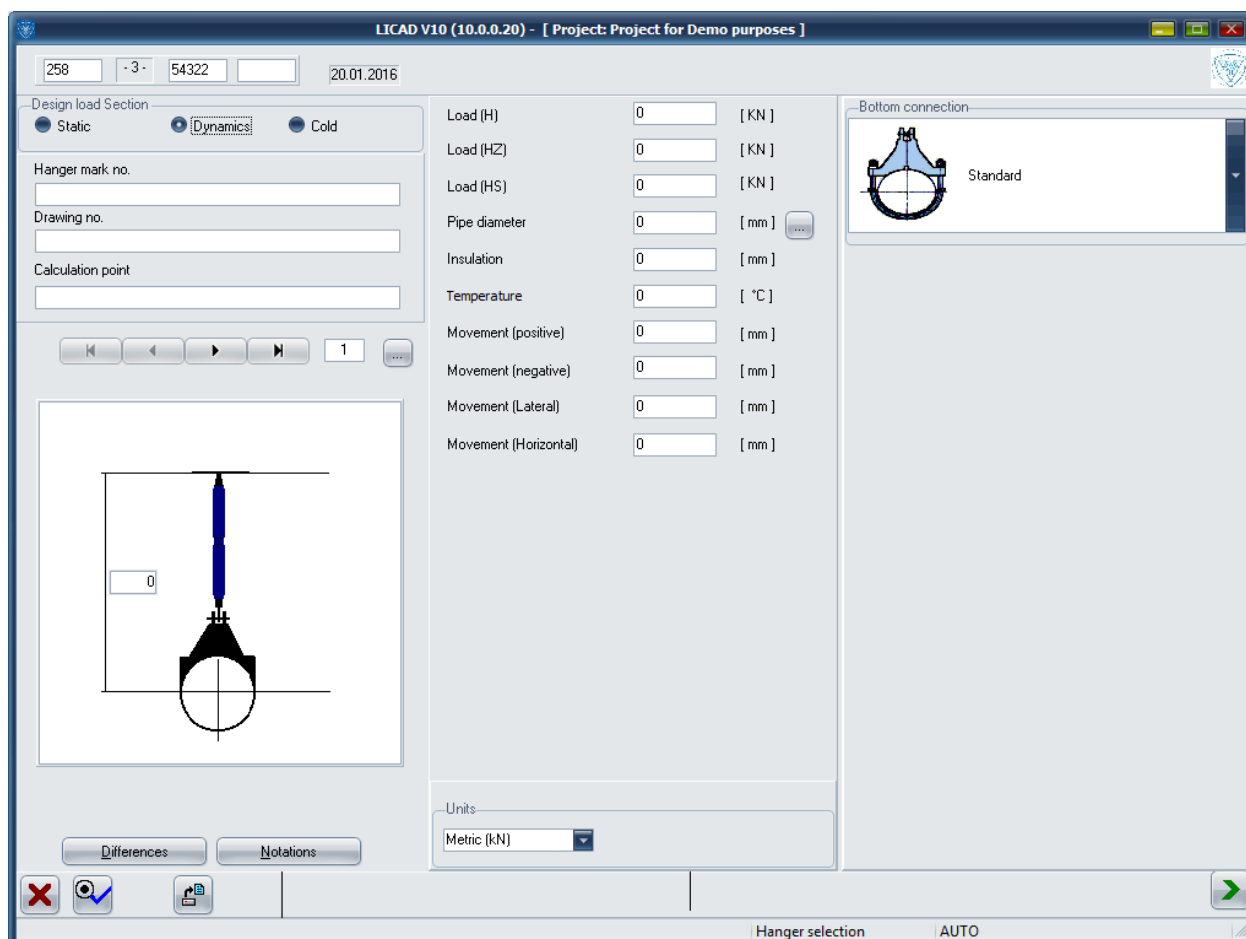


Figure 8: Mask for the input of dynamic nuclear pipe support data

The entries for the LICAD drawing number, the customer drawing number and the hanger mark number are to be done analogously to item 0.

For dynamic stress a maximum of 1000 kN for normal operation is permitted.

Snubbers and rigid supports as well as all components of product group 3 in the LISEGA catalog are designed for dynamic stress (See also Table 2 in Appendix 6.3).

With the *dynamic* components a distinction is made for the design of the size according to three load cases:

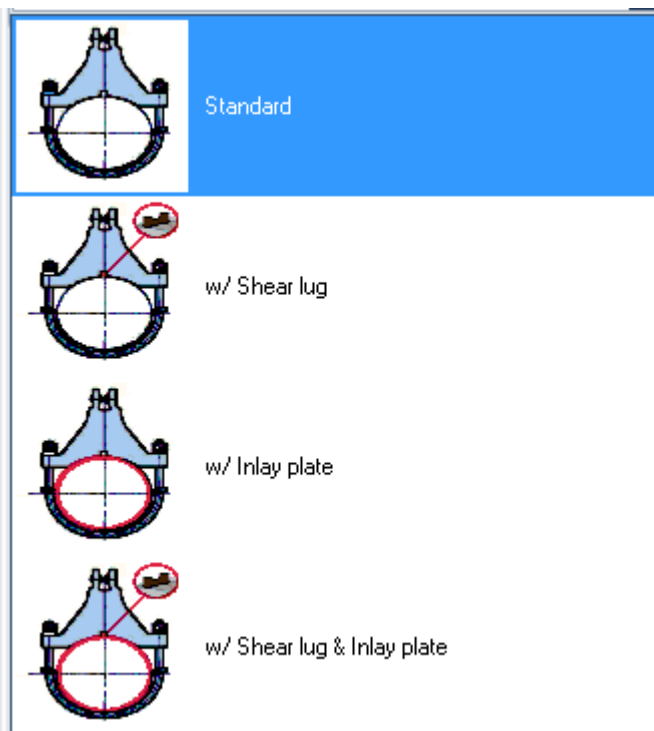
3. *Normal/Upset (H/Level A/B)*: This includes all dynamic loads which might arise from the operation of the facility including water hammer forces resulting from switching, an operational basic earthquake, etc..
4. *Case of emergency (HZ/Level C)*: This includes all dynamic loads which are outside of operation according to regulations, possibly a safety shutdown earthquake. After each such case a check of the entire pipe support is recommended.
5. *Case of damage (HS/Level D)*: Dynamic loads from cases of damage. At the specified loads the yielding point of the components is reached. Exchange of components is recommended in any such case.

Therefore, for design according to nuclear engineering criteria, three input fields are provided corresponding to the various load cases.

The selection of pipe diameter is to be done analogously to item 0. The permissible temperatures are limited to 350 C for nuclear engineering applications.

With *dynamically* stressed supports the screen changes with regard to the input of the pipe directions: instead of three path components the possible inputs reduce to a 'positive' and a 'negative' path component. '+' means lengthening of the snubber by the value entered and '-' means contraction in the snubber. Do *not* enter any negative values for dynamic stresses. Rigid supports are only selected when the path equals zero.

3.1.7 Shear lugs and Inlay plates



3.1.7.1 Shear lugs

The twist restraints ensure the positioning of the dynamic clamps in the expected direction of force and are practically unloaded. Even in a load case no lateral forces worth mentioning develop, as the friction forces at the contact surface of the piping under load ensure firm positioning. Due to the minimal forces to be absorbed, the weld seam stresses can be kept low, despite the small dimensions of the twist restraints. As a rule they lie 25 % below the yield strength / creep stress limit for load case H, in accordance with the DIN / ASME permissible values.

In the case of shear lugs, the material must be specified! The materials specified for shear lugs are available ex-stock and can be supplied at short notice. The customer holds responsibility for both the piping material on hand and the weld seam dimensions!

type number						7 th place	8 th place	material ①
1 st place	2 nd place	3 rd place	4 th place	5 th place	6 th place			
3	L	—	0	1 S235JR
		3 rd – 6 th places of pipe dampers				—	0	2 S355J2
		type numbers e.g.: 36 22 31				—	0	3 16Mo3
		2	2	3	1	—	0	4 13CrMo4-5
						—	0	5 10CrMo9-10
						—	0	6 X10CrMoVNb9-1

3.1.7.2 Inlay plates

For the support of austenitic pipe systems all LISEGA pipe clamps and clamp bases can be fitted with stainless steel inlay plates made from the material 1.4301 (X5CrNi18-10). These plates are to be ordered separately.

3.1.8 Pipe saddles & clamp bases for cold block (cryogenic) systems

The components in LISEGA product group 5 can be selected under this program item. These include:

- Roller bearings, type 51 to 53
- Pipe saddles, type 54
- Lift-off restraints, type 55
- Cold block clamp bases, type 56
- Stanchions, type 58
- U-bolts, type 40

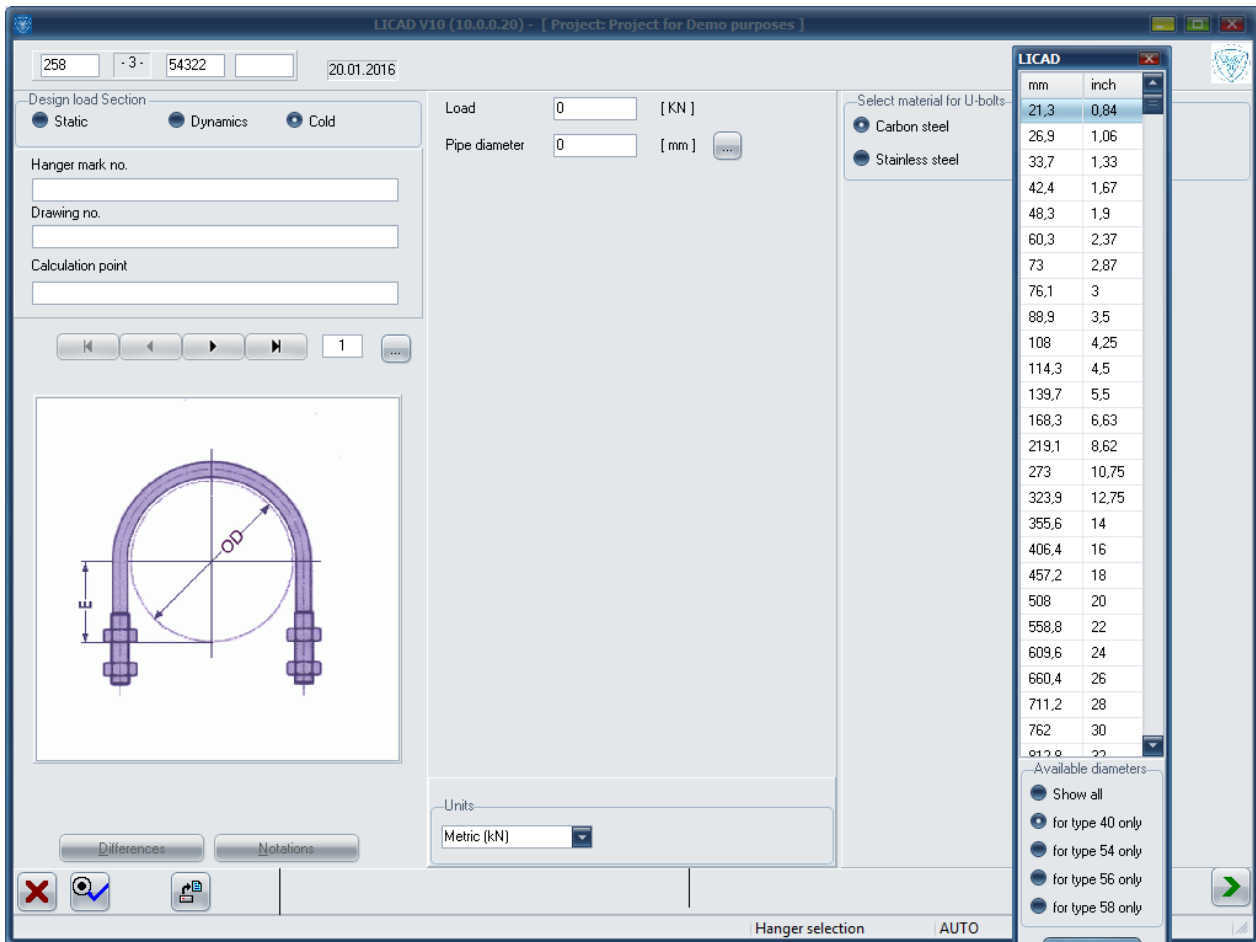


Figure 9: Entry mask for the design of pipe saddles and bearings

Note: Weld-on clamp bases type 57 can be selected under the static support configurations instead of standard clamp bases type 49.

Note: In contrast to the static and dynamic input screens, the pipe diameter must be entered exactly. It is recommended to use the values in the auxiliary table.

The input screen is to be used analogously to the static selection. In the first screen only the load and pipe diameter are required. The components or configuration are to be selected in the next screen. Further data must thereby be entered according to the configuration:

The material for U-bolts can be selected as in the catalog. The pipe diameter is required for the selection of clamp bases (configurations 2 to 6 0). A double cylinder roller bearing with or without lift-off restraint can also be additionally selected. The lift-off restraints are designed for LISEGA pipe saddles type 53.

To select pipe saddles (configurations 7-9 0) the radius must be indicated.

For cold block clamp bases the insulation thickness is required.

To select stanchions (configurations 11 to 16 0) the type of connection is to be indicated, besides the required installation height.

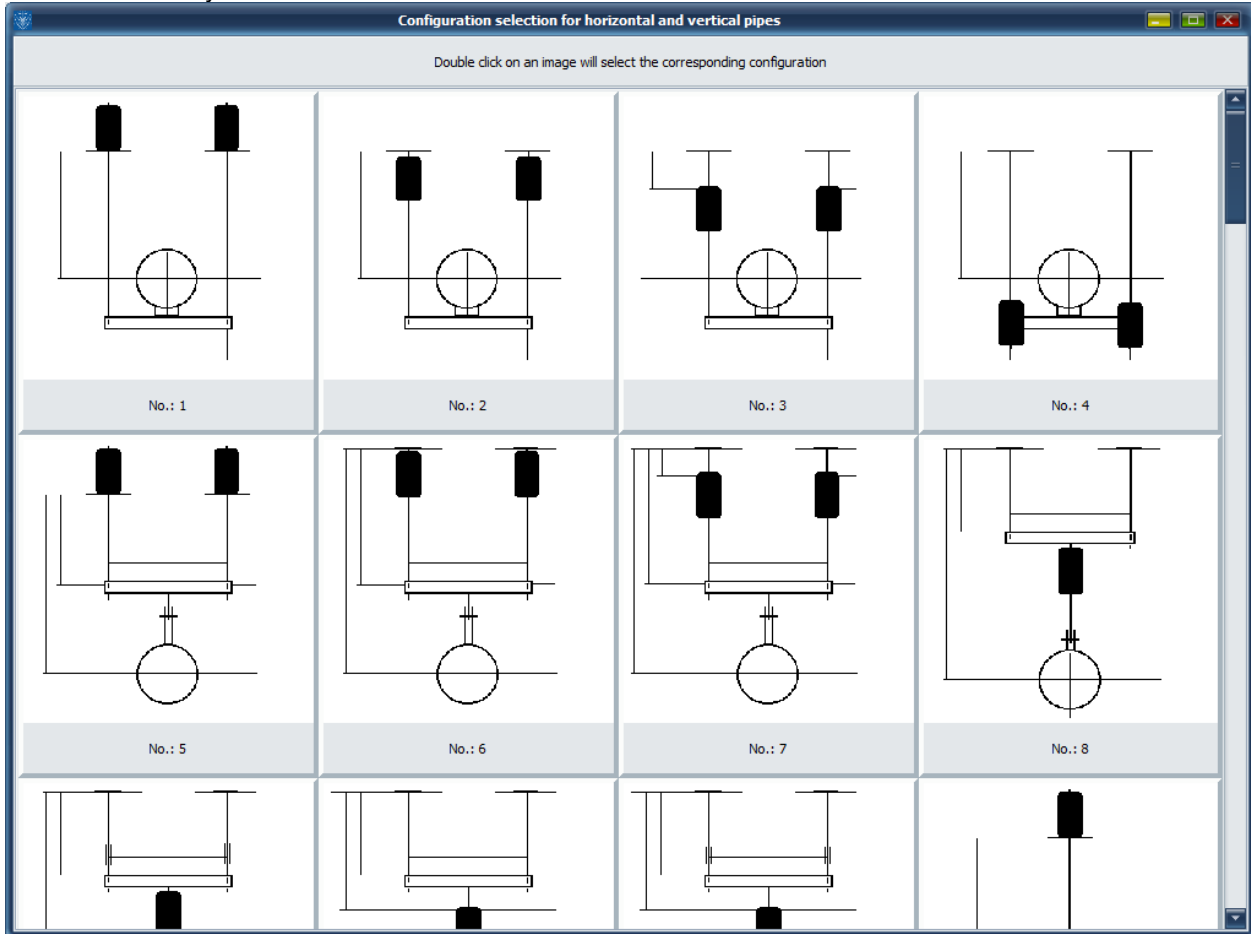
3.2 Selection of the support configuration

By entering the appropriate number the correspondingly suitable support configuration can be selected from a list of the commonest configurations. This is done via the navigation button or by entering a number.

Note: An overview of all available support configurations is obtained by clicking on the button next to the numbers field. Scroll down through the configurations in the screen that follows. Select a configuration by double-clicking - the screen is then closed.



After editing and saving, a revision number is to be entered. This is alphanumerical and can be freely edited. No revision of any kind is made.



Note: Pressing the END or RETURN key key or clicking on the picture gets the same result.

Note: The RETURN key has the same function on this screen as the tab key.

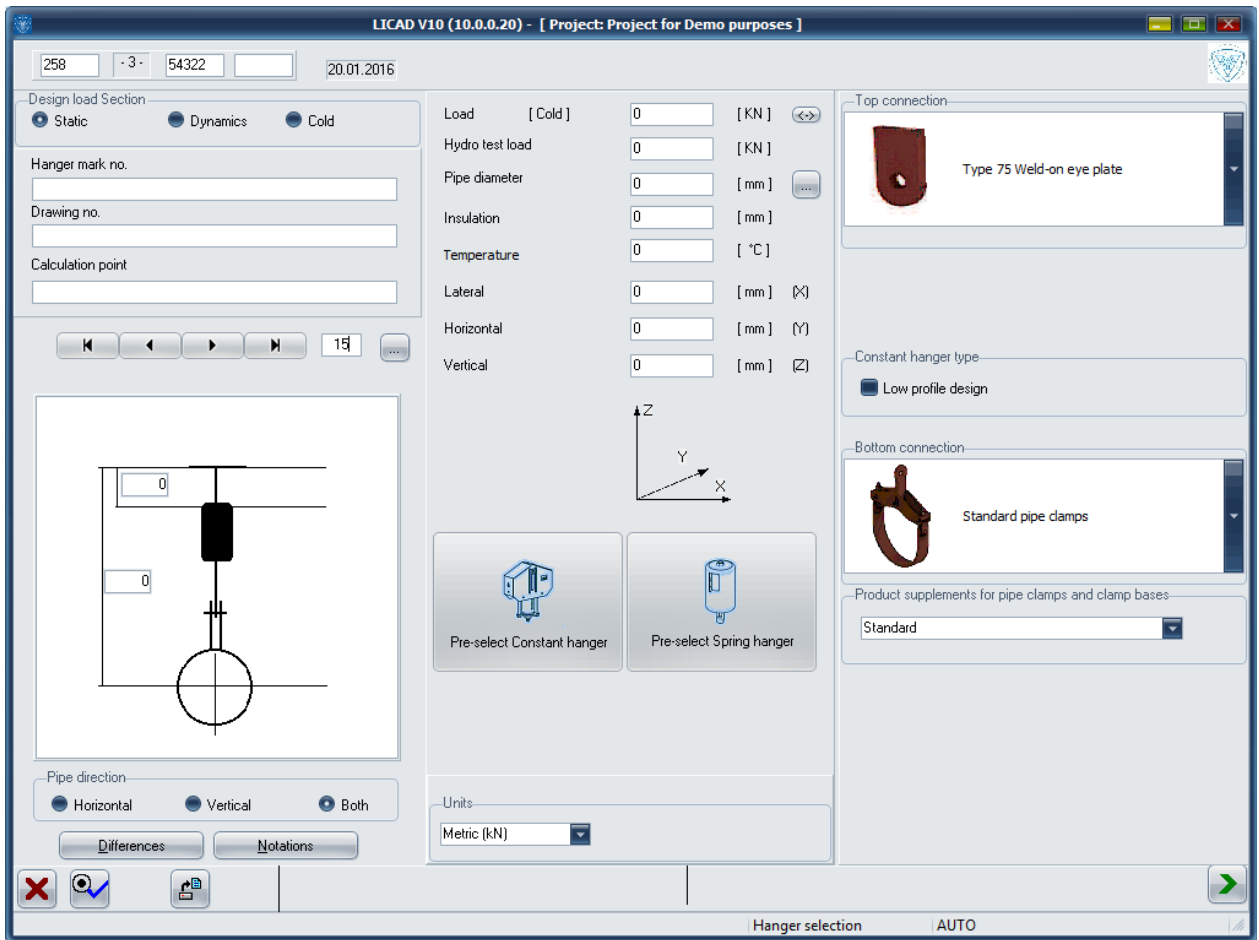
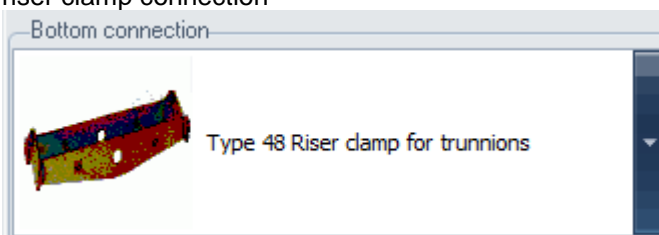
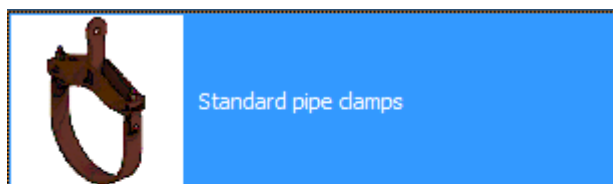


Figure 10: Display of pipe supports configuration

If further options are available for the configurations selected, they are displayed in the right side of the window (see Figure 103). These include the type of structural attachment, the type of horizontal pipe or riser clamp connection



or the final component , if no pipe-surrounding component is desired.



Weldon lugs



Weldon lugs for Elbows



Type 60 Eye nut

3.3 Entering elevation

After selecting a support the input screen for the elevations or elevation differences will then appear.

Now the type of structural attachment (weld-on eye plate, weld-on clevis or beam clamp) is first to be determined for the suspensions. The program standardly suggests type 75 (weld-on eye plate) as the solution with the most favourable price.

The elevation is entered either in *Elevation differences* or in *cotes*.

With specifications for the widths of trapezes or riser clamps the minimum and maximum sizes possible are displayed by the program. The minimum width is dependent on the pipe diameter and the insulation thickness entered.

If the heights are below the minimum installation dimension for the selected support configuration, a HELP screen displays the number of the entry field and the feasible minimum dimension.

The maximum installation dimensions are therefore also displayed for Shock absorbers, whereby the parameters *with* and *without extension* are differentiated.

The maximum values shown for rigid struts also contain over.lengths which, as far as the nominal load is concerned, are only available for reduced load values.

3.4 Specification of the type of hanger

Normally the program automatically selects the optimal variable spring or constant hanger using the performance data entered (load/path). But in order to be able also to meet special customer specifications, manual specification of a certain type of hanger is also possible. With this procedure only the specifications on load and path are checked by the program for compatibility with the hanger type. Values which might be specified for reserves are not taken into consideration.

Specification of the hanger is carried out on the same screen as for the elevations (Figure 20). Select the button 'hanger type' to denote the hanger and select the corresponding item number from the table.

LICAD	
25D21E	4,1
25D31E	2,1
251118	16,6
251218	8,3
251318	4,1
252118	33,3
252218	16,6
252318	8,3
253118	66,6
253218	33,3
253318	16,6
253418	11,1
253518	8,3
254118	133,3
254218	66,6
254318	33,3
254418	22,2
254518	16,6
255118	266,6
255218	133,3
255318	66,6
255418	44,4
255518	33,3
256118	533,3
256218	266,6
256318	133,3
256418	88,9
256518	66,6
257118	800
257218	400
257318	200
257418	133,3
257518	100
258118	1066,6
258218	533,3
258318	266,6
258418	177,8
258518	133,3

Ok



3.5 Alternative selection of clamp base

On the basis of the preset load and temperature, LICAD selects the most favorable pipe clamp base for the pipe diameter. If an insulation thickness is also preset, the program checks to make sure the insulation will not collide with the foot of the clamp base or even enclose it. In case of a problem, the program proposes an alternative selection of clamp base.

3.6 Selection of pipe supports

Using the installation heights supplied, LICAD assembles the components required in the support chain. For spring pipe supports, corresponding extensions Type 29 are employed.

Note: The use of Type 29 extensions is only possible if the spring hangers to be seated are selected with the 'PTFE slide plates' option (Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**).

Note: If the installation heights supplied are too low, LICAD will still select a support and correct the lower installation height correspondingly.

3.7 Graphic representation

After checking the values that have been entered a true to scale drawing will be displayed on the screen (Figure 116). The selection can either be confirmed or rejected.

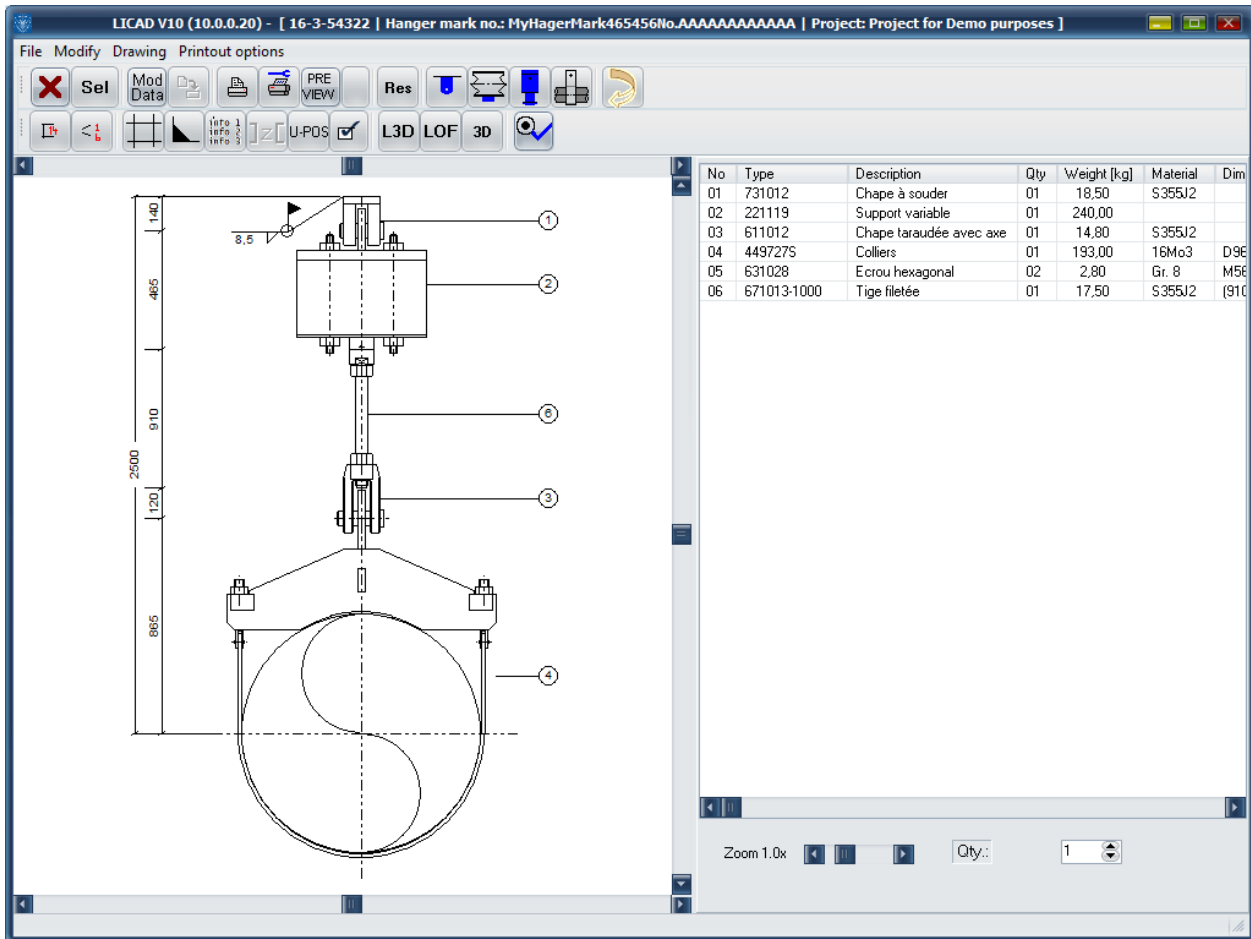


Figure 11: True to scale drawing of a pipe support

In addition to the drawing dimensioning, item numbers are displayed, as well as the parts lists that go with them, with article numbers and designations.

By clicking the right-hand mouse button the travel stop position, spring rate, load difference, the remaining travel are given and the welding thickness.

3.8 Display of current hanger data

By moving the mouse over the drawing and pressing the right-hand mouse button, a table appears with the current setting parameters for the support created. Beside the support data entered the following details are shown:

The hot and cold loads calculated

The blocking load

The actual load difference in spring hangers

The spring rate in spring hangers

The actual possible travel in spring and constant hangers

The blocking position

The effective travel resulting from the 3 travel components

The remaining travel reserves upwards or downwards

The recommended weld seam thickness for the building connection component

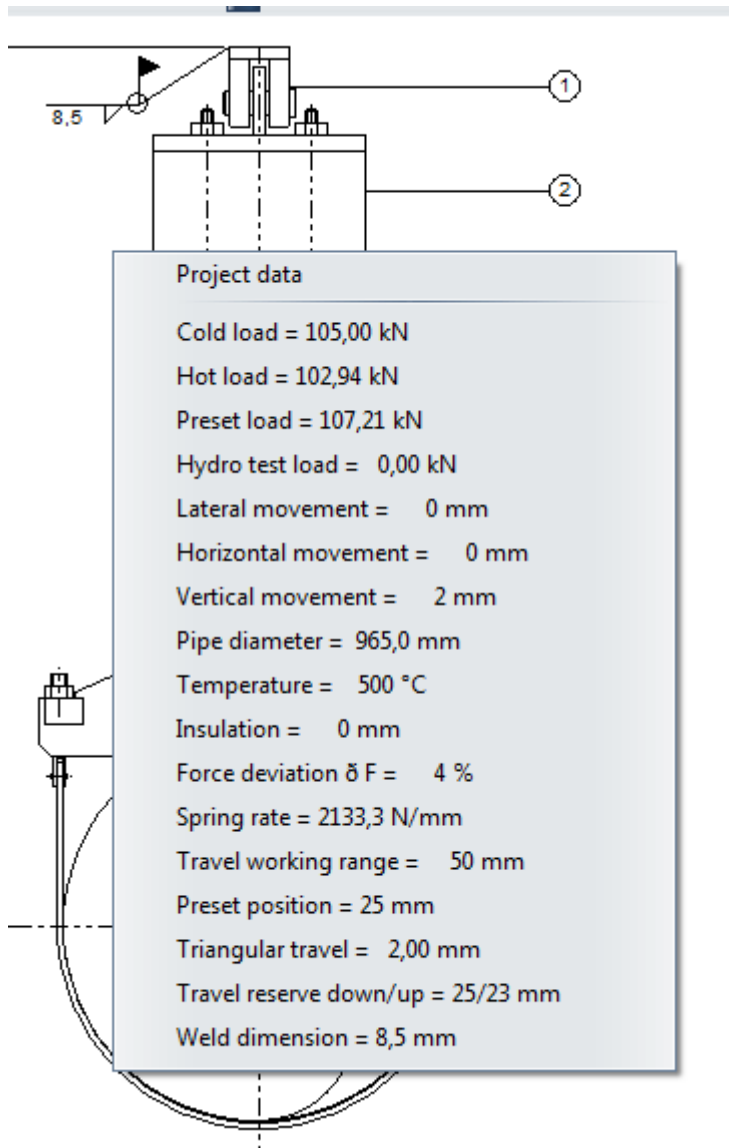


Figure 12: Popup menu with hanger data information



Figure 13: Section of graphics screen

3.9 Alternative Figures

Some components in the drawing can be rotated by entering a number for a second view. The structural attachment parts can be illustrated with the customer's sectional steel.

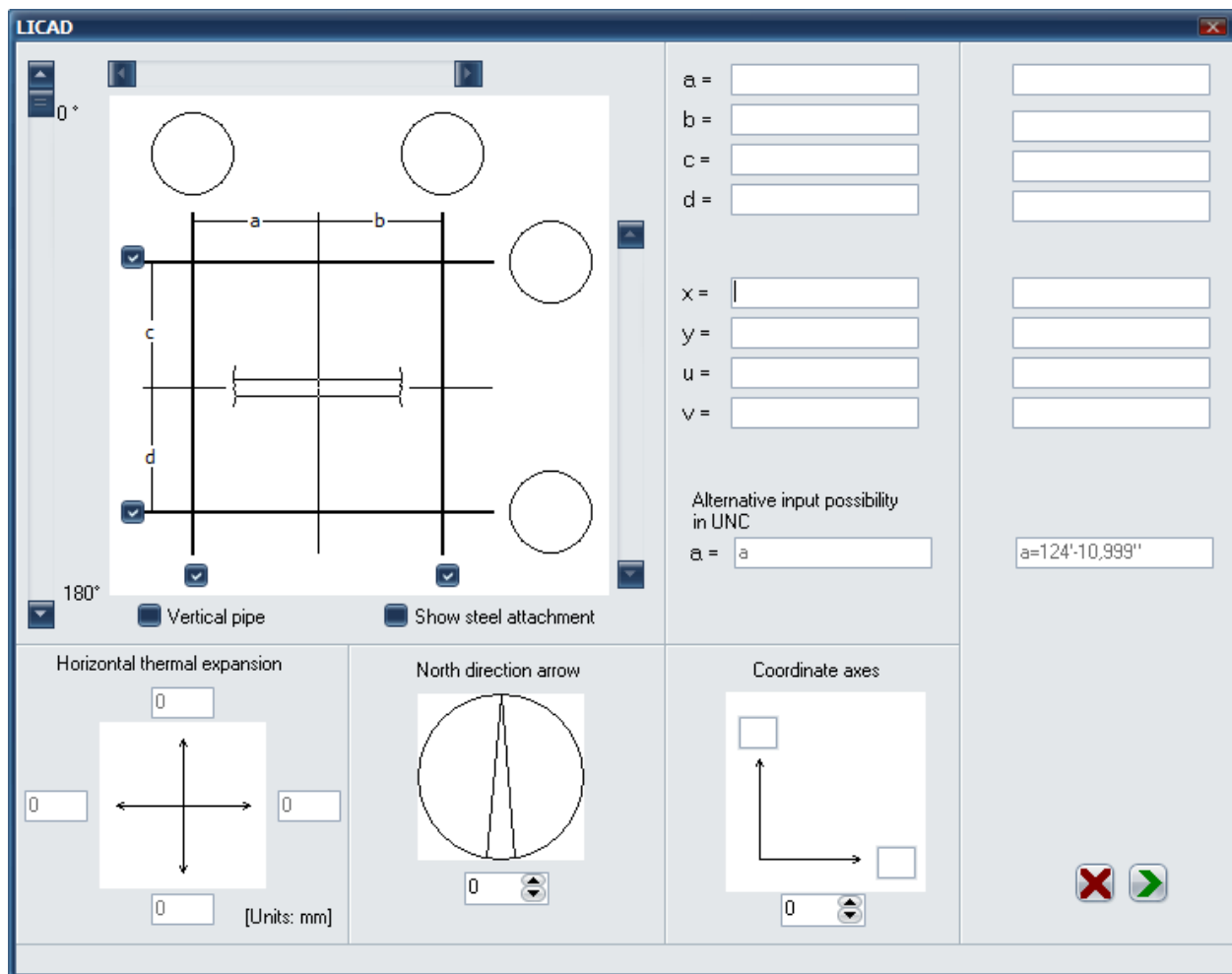
Use the button 'RES' if you wish to reset the modifications.

3.10 The location plan

In Figure 14 the position of the support in the site plan can be entered. The screen can be clicked in via the menu 'Processing - processing site plan'.

Five figures each can be assigned to the main directional axes of the building plan, furthermore, the position of

Figure 14: Location plan and schematic display of pipe axis

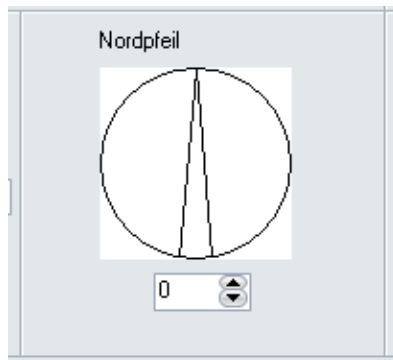


the pipe or clamp (PA), the position of the steel attachment (SA) and the corresponding angle can be set.

3.11 North arrow

Figure 15: Entry screen for north point

A north point can furthermore be defined for the drawing (Figure 15). This is printed beside the site plan insofar as it has been programmed into the options. The screen can be clicked in via the menu 'Processing - processing site plan'.



3.12 Changing weld seam thickness

As described under Section **Fehler! Verweisquelle konnte nicht gefunden werden.**, in LICAD the minimum weld seam thicknesses are supplied. This information can be edited via the menu point "Change weld seam", to be found in the „Edit“ menu.

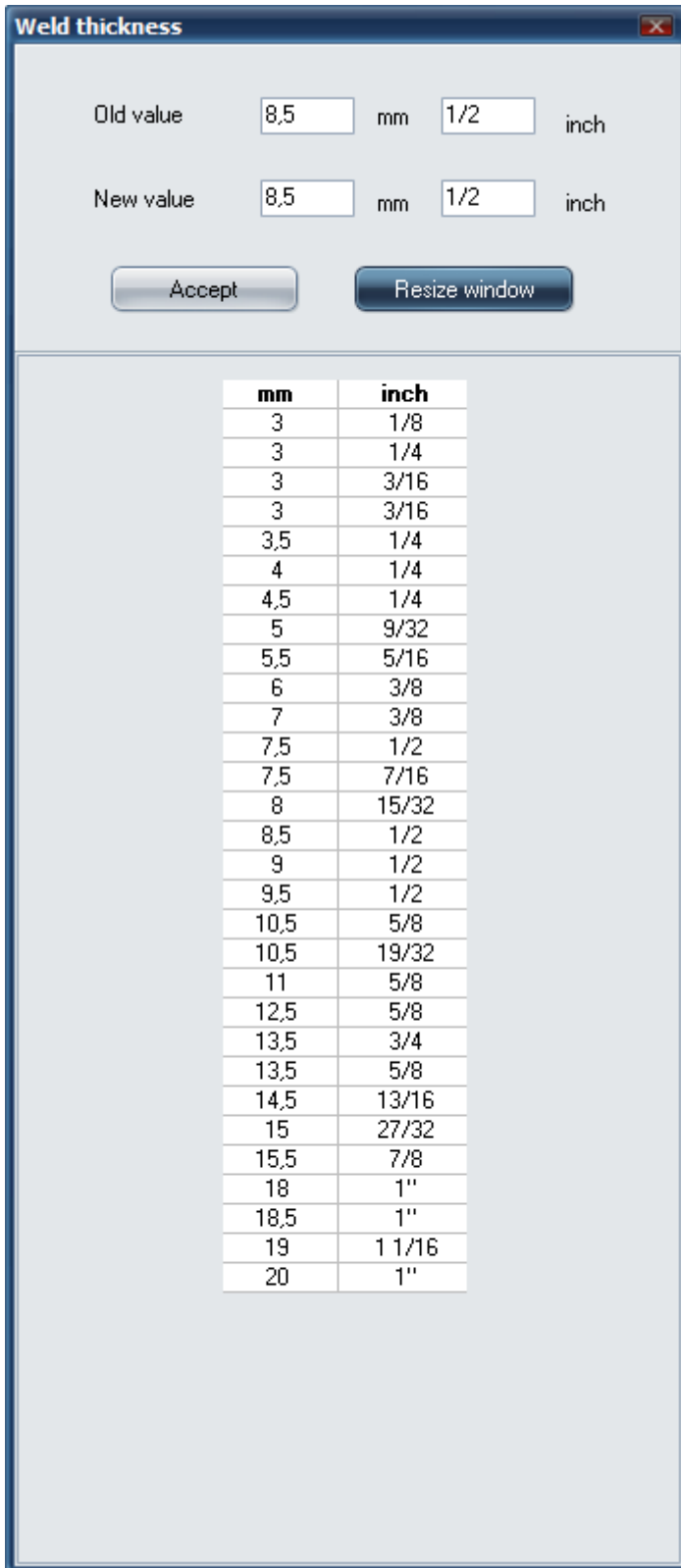


Figure 16: Changing weld seam thickness

3.13 3D Reference Coordinates

Under the menu 'Processing - 3D Reference Coordinates' call up the dialog as displayed in Figure 17. The input space 'Coordinates' has no significance for the normal use of the program. Reference coordinates based on the pipe centre are described only in the creation of 3D graphics (with the aid of the MDL application of Intergraph).

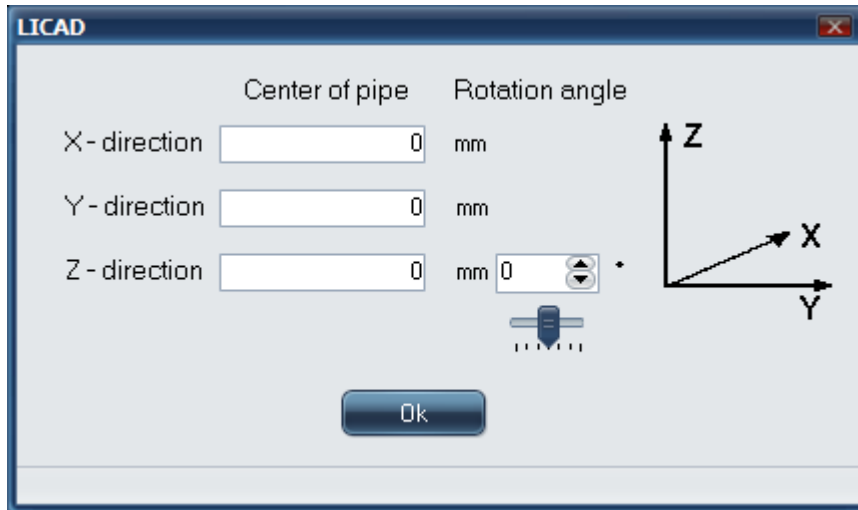


Figure 17: Entry screen for 3D Reference Coordinates

The table shown under the window can be displayed via the “Show table >>” button. Care must be taken that both the millimeter and inch details can be adequately modified.

3.14 Saving and printing out a drawing

Saving and printing out a drawing for program points following later. The drawing should be saved on completion of entries. This can be effected via the key combination Ctrl + S or via the button with the security symbol.

The drawing can be printed out at this point (Ctrl + P), checking the printer setting if necessary.

The drawings can as a matter of course be printed out later insofar as they have been saved.

3.15 Generation of 3D transfer files

For later processing of the support as a 3D graphic in the PDMS, MicroStation/PDS or SupportModeler programs, the files required can be generated from here. The corresponding functions can be accessed from the file menu (**Fehler! Verweisquelle konnte nicht gefunden werden.**) for the generation of LOF and L3D files.

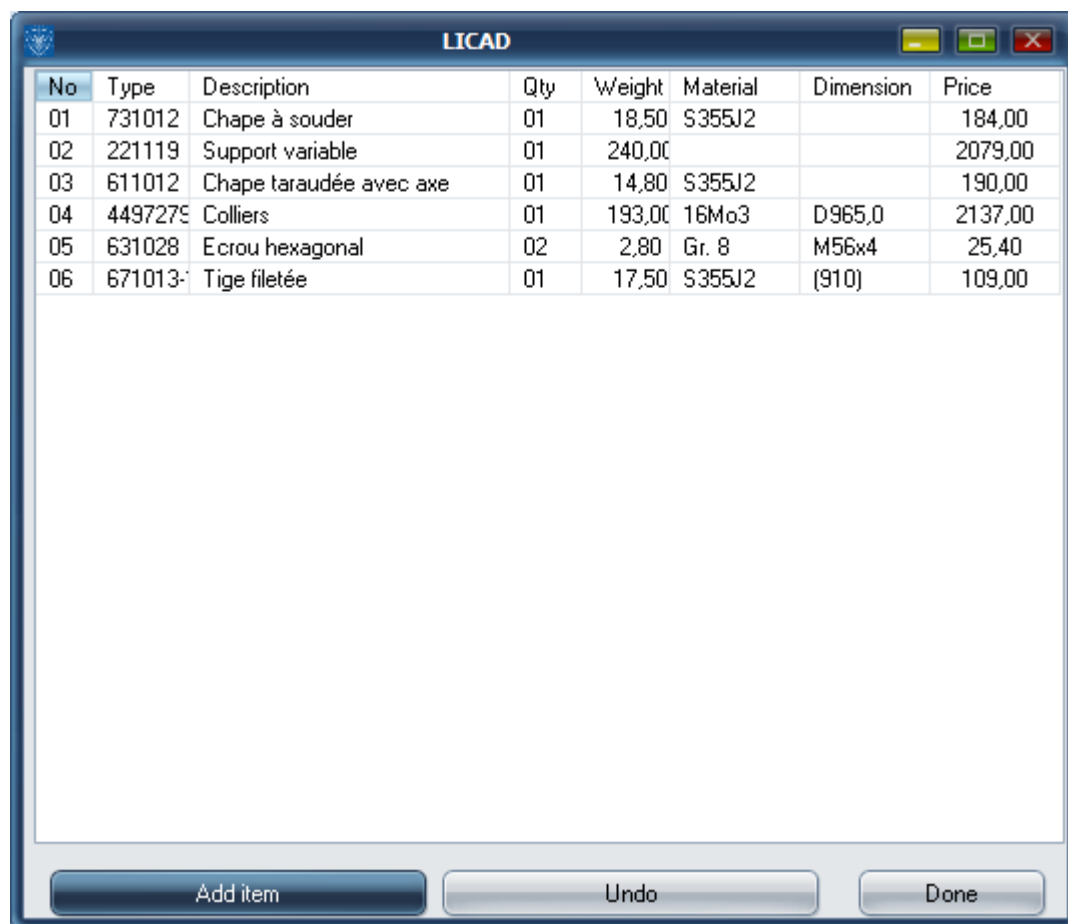
An exact description of this can be found further down in this manual in the chapter ‘3D display of supports in PDS (MicroStation)’ and ‘3D display of supports in PDMS’.

4 Additional programs

4.1 Supplementing a parts list

In order to supplement the parts list of a drawing with additional articles choose button 'Modify' from the main menu and double click to the bill of material (BOM).

The items of the standard supports will be displayed at the top of the screen and at the bottom of the screen the supplemented items. The number of items is limited to 10 per drawing.



No	Type	Description	Qty	Weight	Material	Dimension	Price
01	731012	Chape à souder	01	18,50	S355J2		184,00
02	221119	Support variable	01	240,00			2079,00
03	611012	Chape taraudée avec axe	01	14,80	S355J2		190,00
04	449727	Colliers	01	193,00	16Mo3	D965,0	2137,00
05	631028	Ecrou hexagonal	02	2,80	Gr. 8	M56x4	25,40
06	671013	Tige filetée	01	17,50	S355J2	(910)	109,00

Figure 18: Supplementing parts lists

4.1.1 Completion of parts list during the drawing process

Double click on the parts list, in picture 23, to open a new window. Here further positions can be added to the parts list. Use the button "New Positions" to add up to 10 lines. The respective last line may be deleted by pressing "Undo". Button "Finished" closes the window and the drawing may be printed. The added positions will be saved with the drawing.

4.2 Revising drawings

Saved drawings can later be loaded from the data bank into the program or altered.

A drawing to be altered should be called up with the appropriate LICAD drawing no. (which you can, for example, have displayed with the directory). An alteration is labeled by the program with the revision number. A modification can be signaled by the program via a modified revision number.

Important: No backup copies are automatically made by the program. So for this reason you should first copy the original drawing on a disk or make a backup copy with 'Copying drawings'.

Figure 19 shows the appropriate mask.

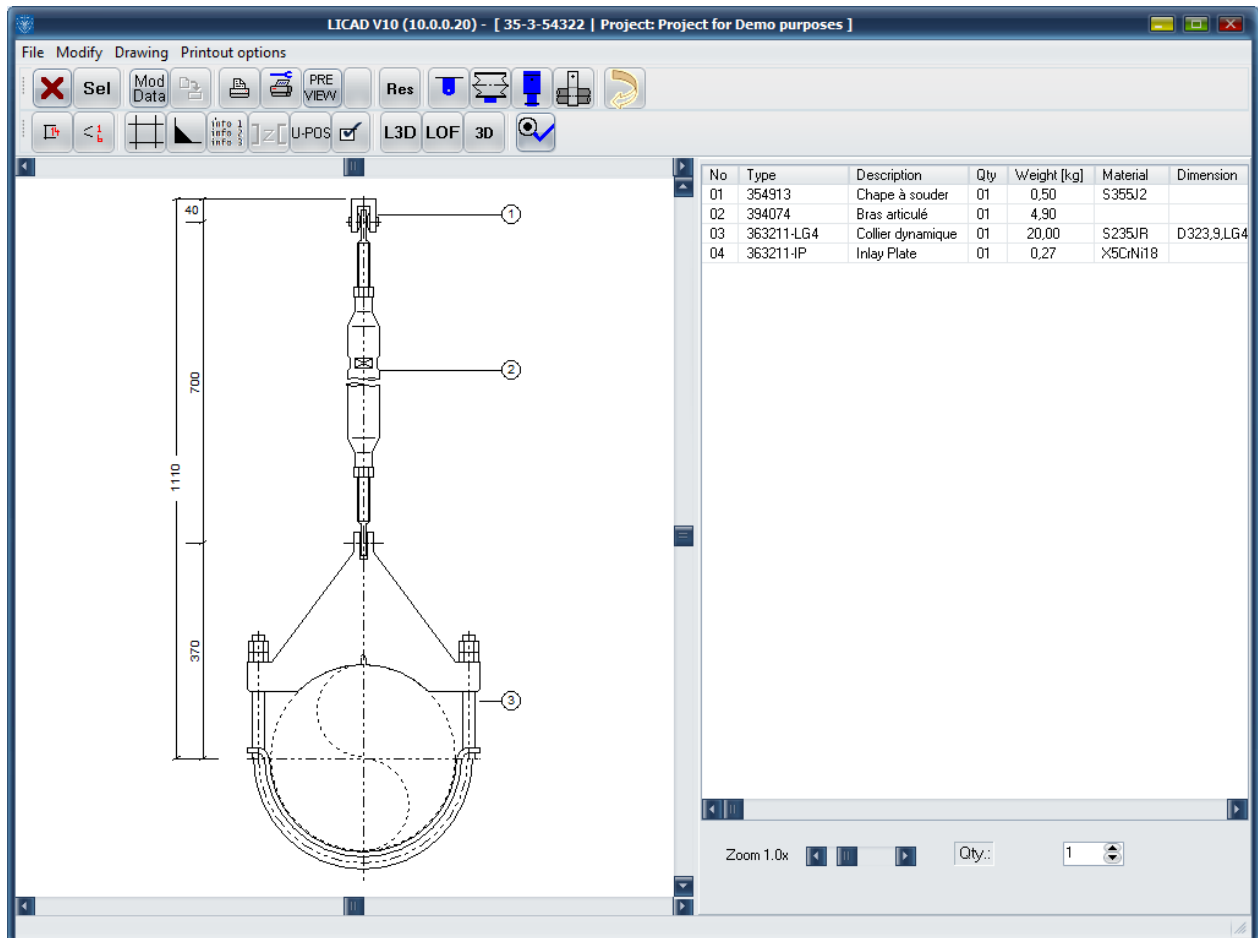
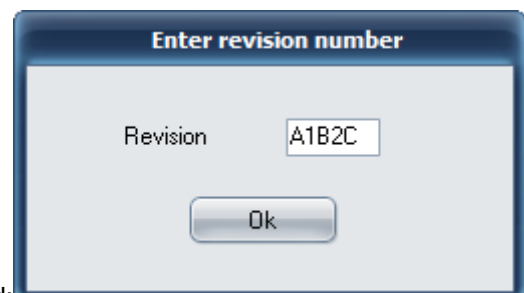


Figure 19: Example for calling up a drawing for revision

The configuration of the support can also of course be changed.

Under the menu 'Modify', tools for copying individual drawing components are available. The parts list or the drawing is transferred to the intermediate tray and can be copied from there into text programs. The background color of the graphic can be altered via 'Options - System Settings'.



After changing and saving, a revision number can be entered:

Entry of a revision number is not obligatory.

The revision number is alpha-numerical and can be freely edited.

The revision number is not checked by the program.

4.3 Further menu points

Under the "Edit" menu, tools for copying

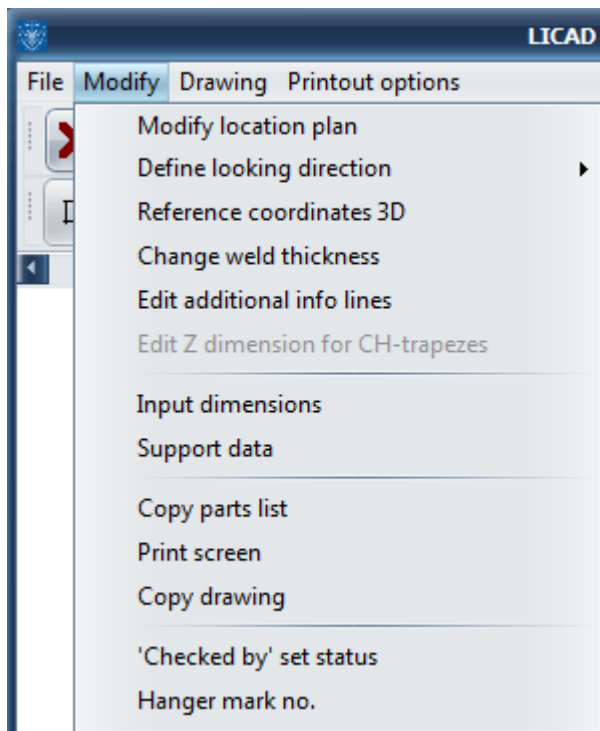


Fig. 36: Tool components for copying

individual drawing components (as a picture) are available. The parts list or drawing is transferred to the clipboard and from there can be copied, for example, into text programs. The background color of the graphic can be altered under "Options" - system settings.

4.4 Individual selection of hangers and pipe clamps/bearings

Variable spring and constant hangers or pipe bearings/clamps can also be selected individually by the program. After calling up the program 'Catalog' in the main menu Figure 20 will appear.

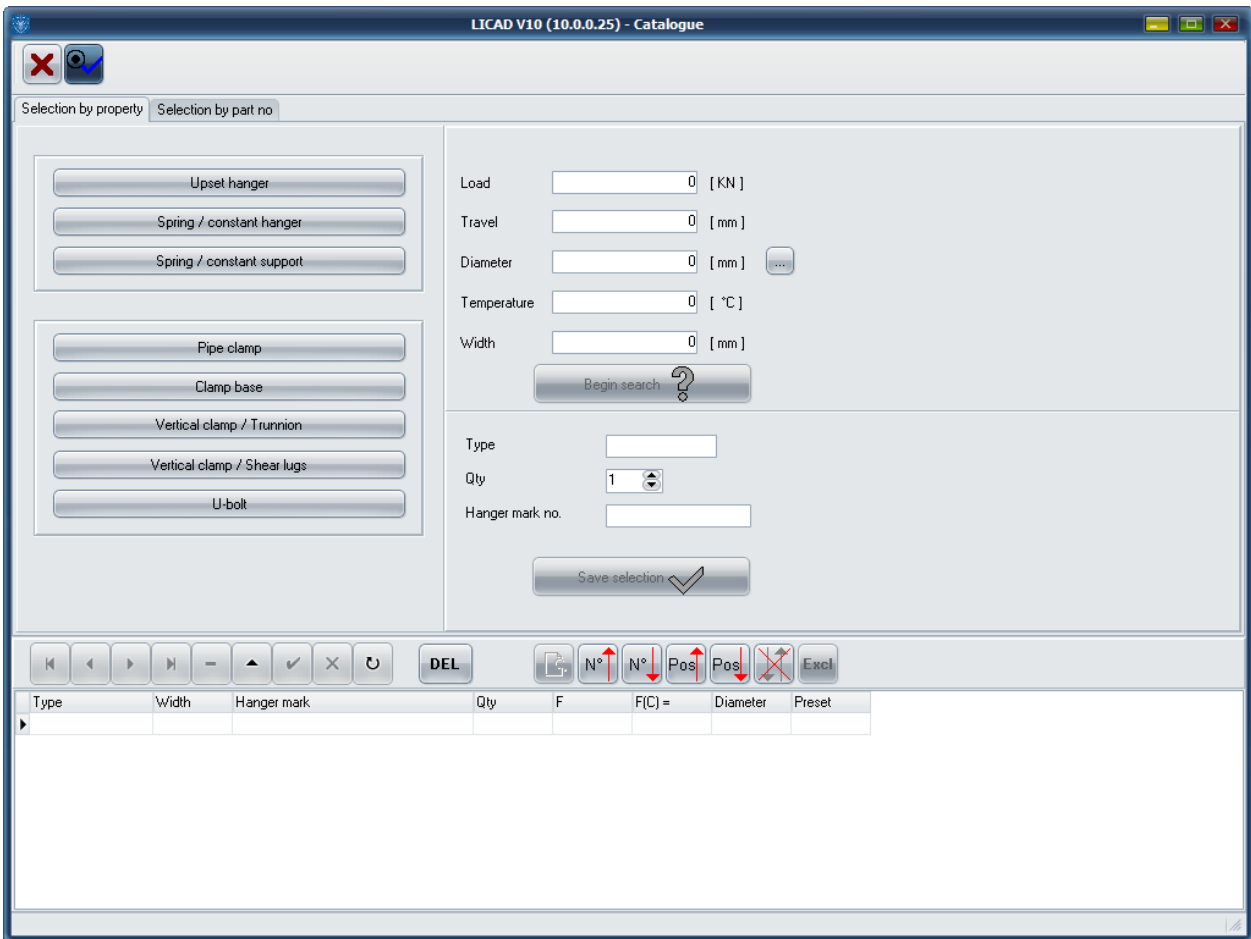
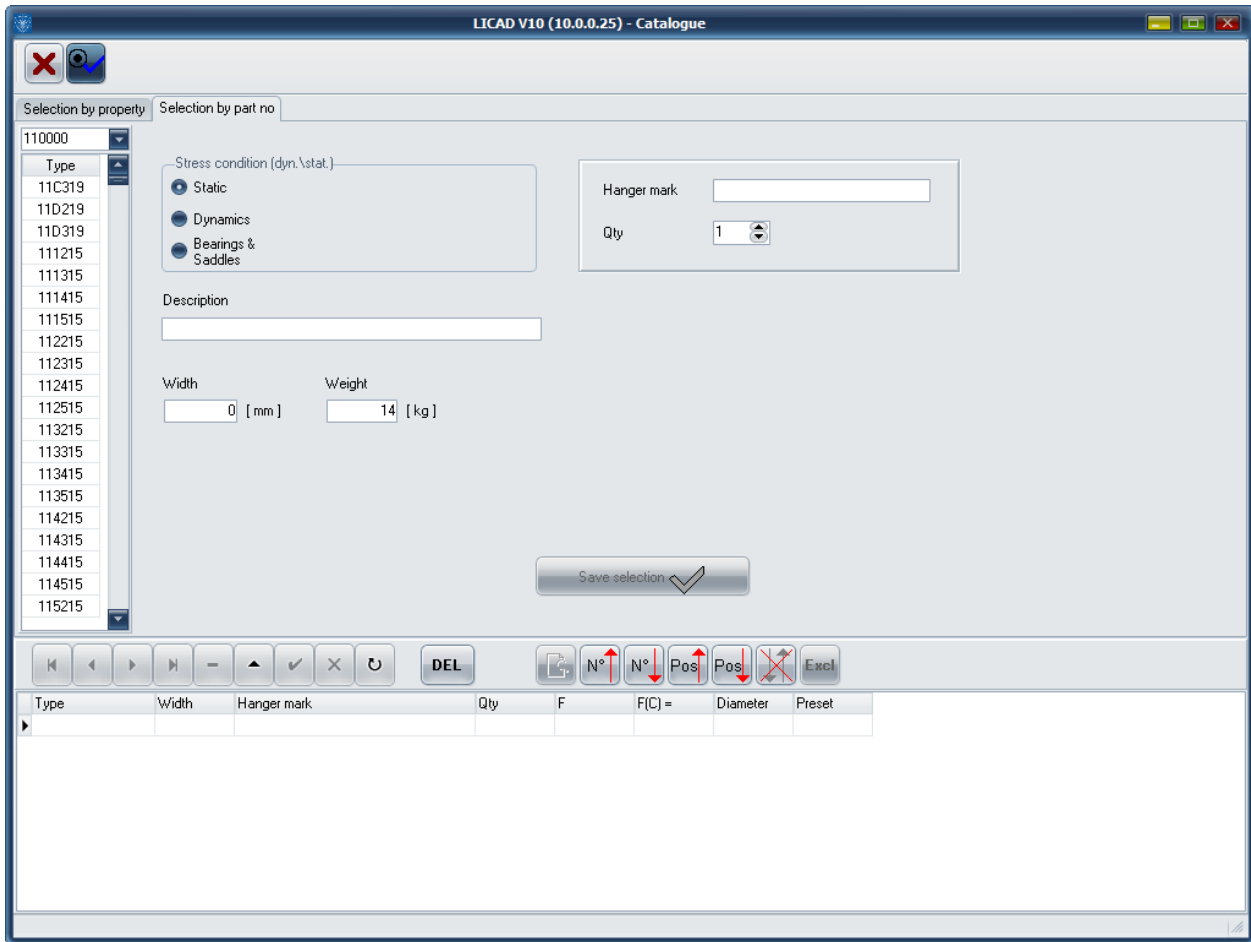


Figure 20: Menu screen for the selection of individual items

Before selecting parts the specification data should be determined.

If a new list is to be drawn up then delete list with the 'DEL' button. Otherwise, additional articles can be added to the existing list.

The article chosen will be indicated by the program. If required enter a hanger mark number and the desired number of pieces for this article.



With the 'Further Catalog parts' button you can select the rest of the catalog parts (**Fehler! Verweisquelle konnte nicht gefunden werden.**). In the left upper window you can pre-select the LISEGA product groups.

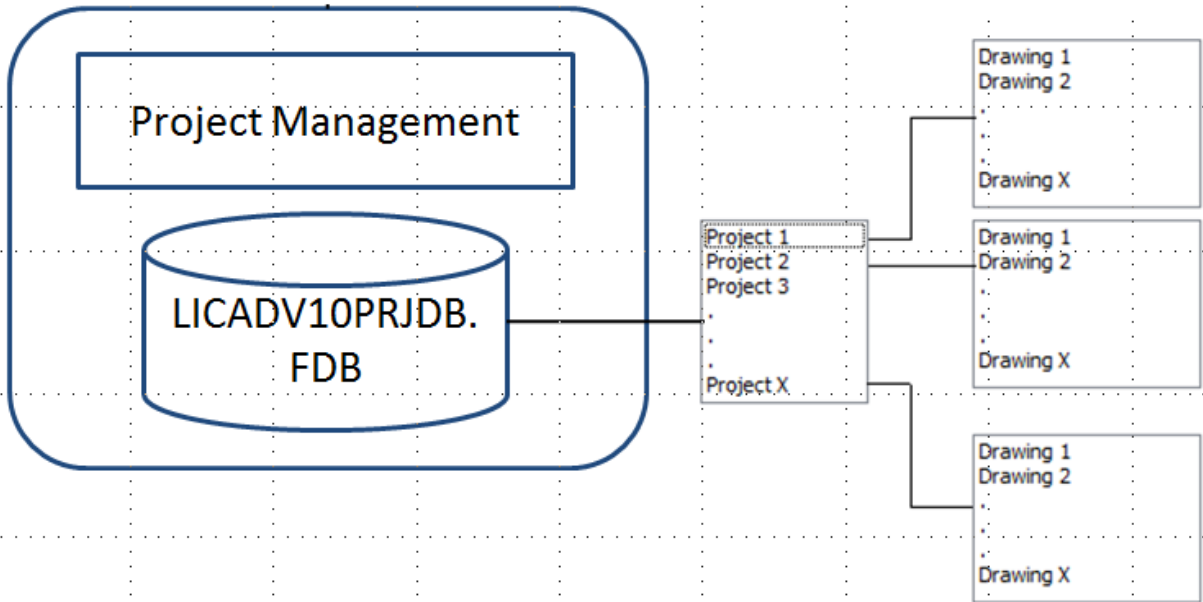
If a new table is to be created, the old table must first be deleted with the 'Del' button; otherwise, further articles can be added to the existing list.

To print the complete parts list change to the 'Print' button. The contents of the table can be seen via the 'Page Preview / Print' button. As an option, the table can be sorted according to position or article numbers and worked on via the 'MOD' button.

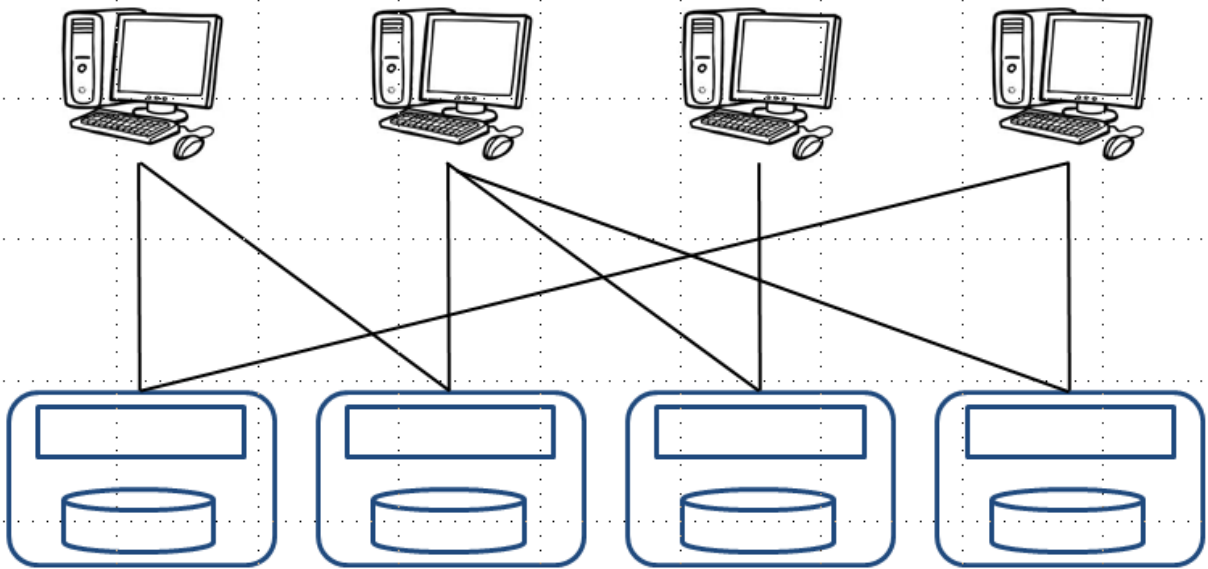
4.5 Project administration

4.5.1 Project file and project structure

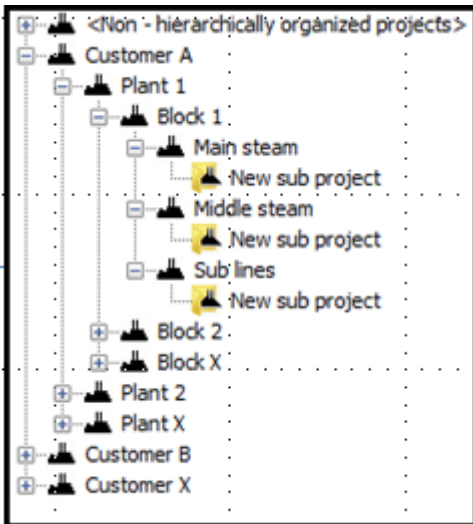
The drawings of pipe supports created with LICAD are stored in a project file. Multiple project files can be created. These can be local or on the network. Several projects can be created in one project file. This can be done according to a hierarchy. See below.



A project file with project structure.

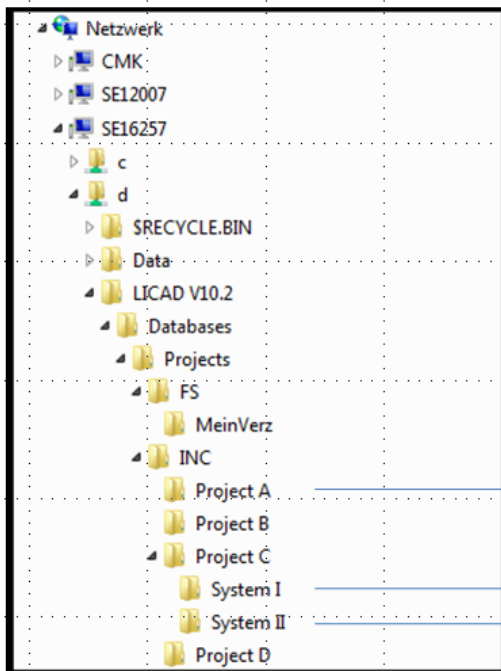


Possible links between different workstations, each with a project file.

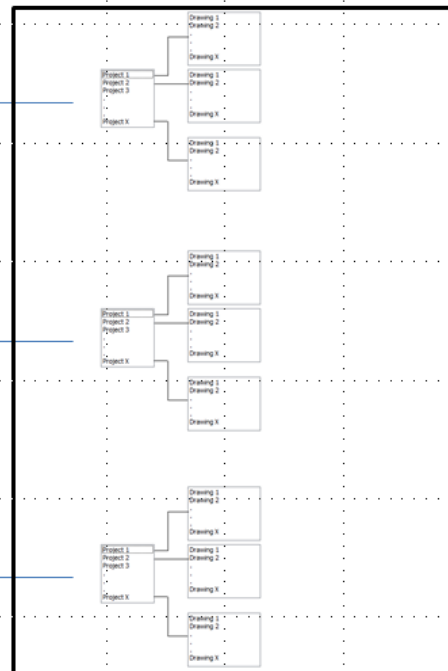


Projects can be created in a hierarchy structure within a project file.

Net/Drive level



Database level



Possible scenario of different project files on a network drive and shown with related projects.

4.5.2 Changing the project file and projects

The project management menu is accessed from the main screen. After calling the program, the current project is displayed under Selected project directory. The Database Explorer tab is active. Change the project file in that way, use the left explorer window you change to a directory where a file LICADV102PRJDB.FDB is stored. The corresponding projects are displayed in the middle window. The corresponding drawings and descriptions are listed in the right-hand windows.

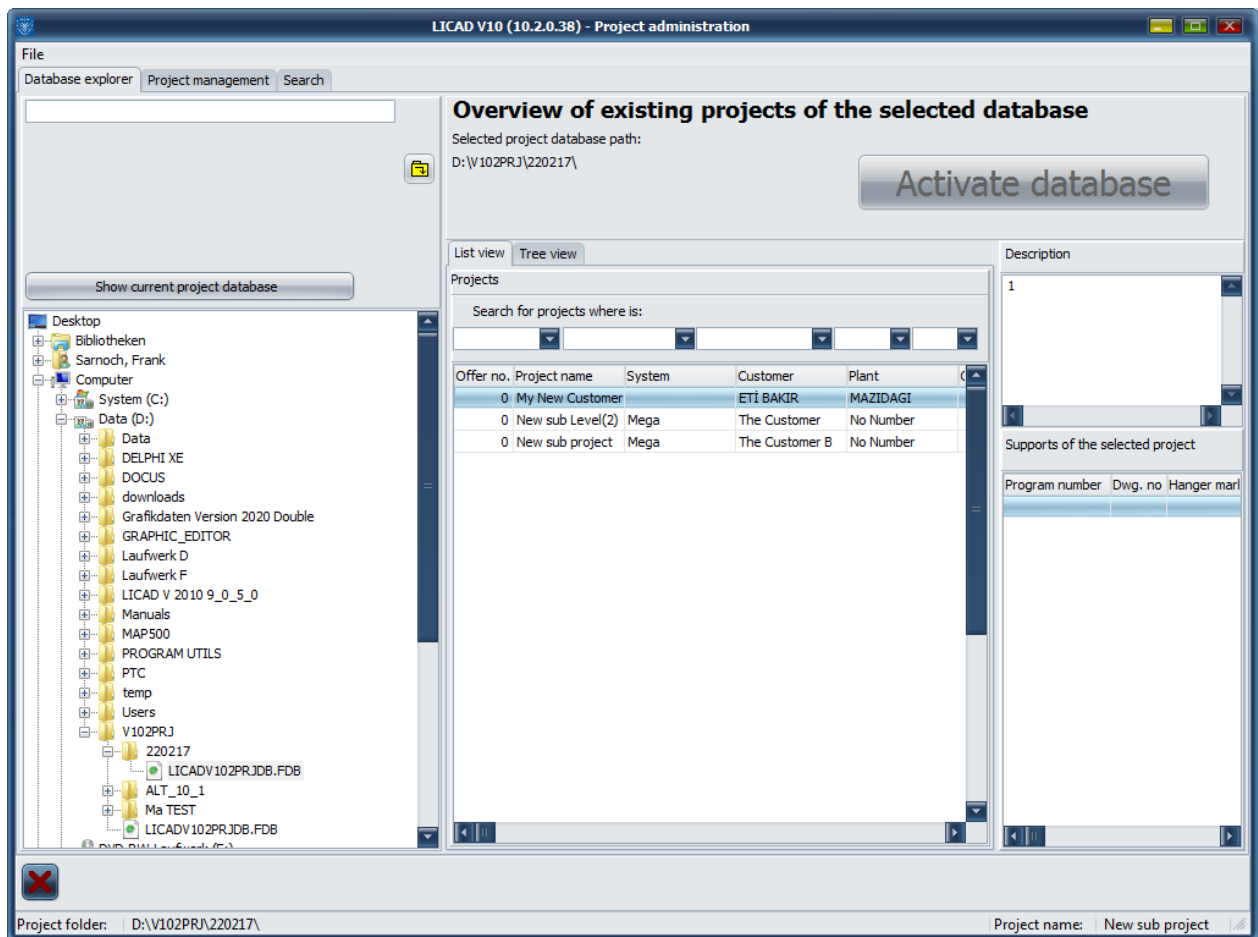
How to change the projects:

4.5.2.1 Changing the project file and the project

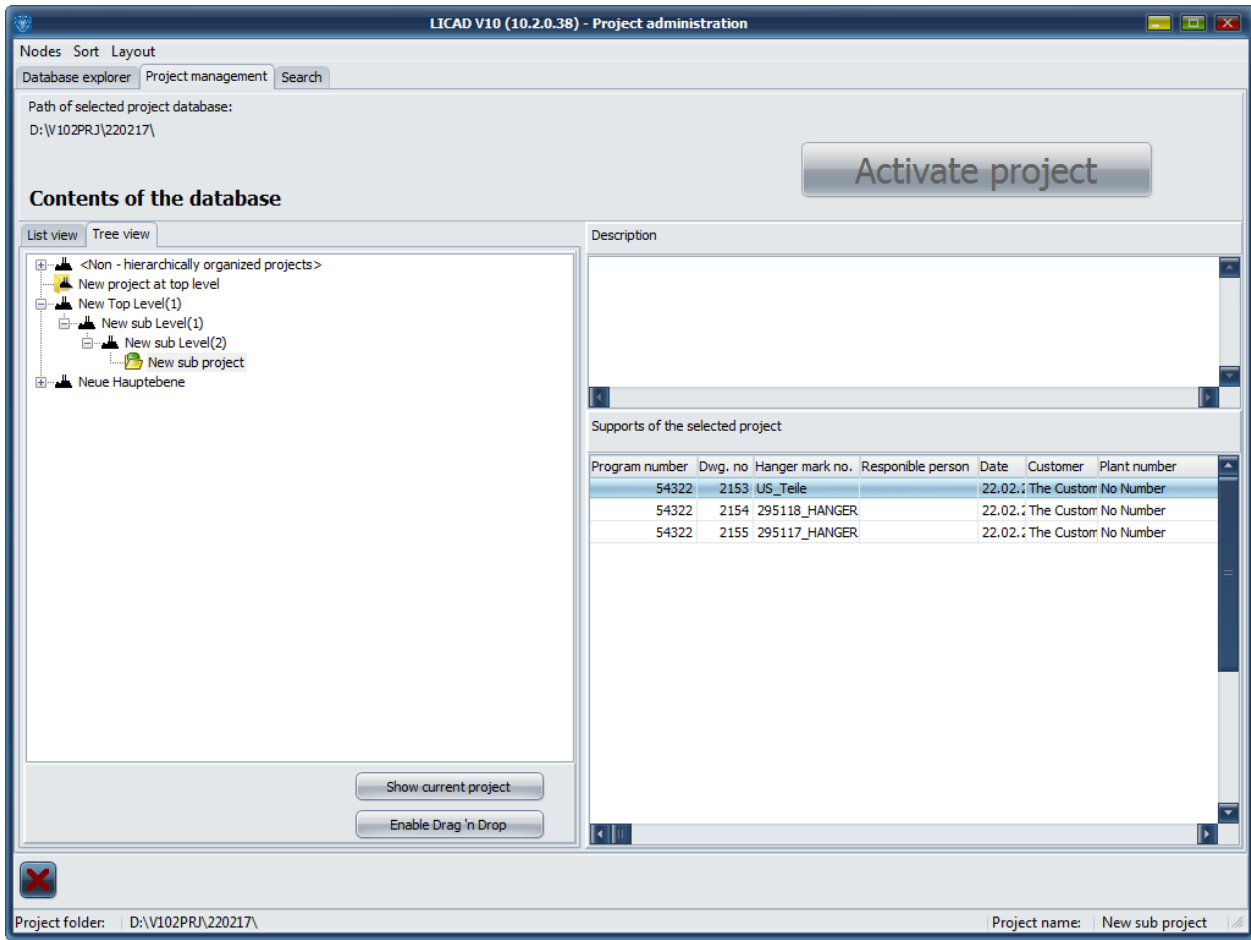
In the left pane select the path and then click to enable project file. Switch to the project management tab. (View for selecting project management). Select the project from the List View or Tree View, and then click to Enable Project.

4.5.2.2 Change project only

Switch to the project manager's tab. (View for selecting project management). Select the project from the List View or Tree View, and then click to Enable Project.



View for the selection of the project file



View for selecting project management

Information on creating, changing and deleting projects can be found here:

4.5.3 Manage Projects - Create

Switch to the project manager's tab. (View for selecting project management). Switch to List view and select Add in the project menu. On the screen that follows, enter the information that you believe is necessary.

Note: It is not absolutely necessary to create a project.

4.5.3.1 Method using tree view, create hierarchy

Switch to the project manager's tab. (View for selecting project management). Switch to tree view. Click with the mouse in the left window and press the right mouse button. Select Add Top level node from the context menu and enter a name for node, e.g. the customer name. Now click to the node point and press the right mouse button again. Select Add Sub-Level Nodes and enter a name for the node, e.g. the name of a plant. You can repeat the last step as desired.

As the last step, select from the context menu Add project at current node. On the next screen, enter the information that you believe is necessary. See screen above.

Note: It is not absolutely necessary to create a tree structure.

4.5.4 Creating a project file

In the Project window, select Database Explorer. Change to an already existing directory or create a new directory using the right mouse button. Use the mouse to point to the directory where you want to serve as a project file and select New Project Database File with the right mouse button. Note: The file name is fixed and cannot be changed.

4.5.5 Manage Projects - Change

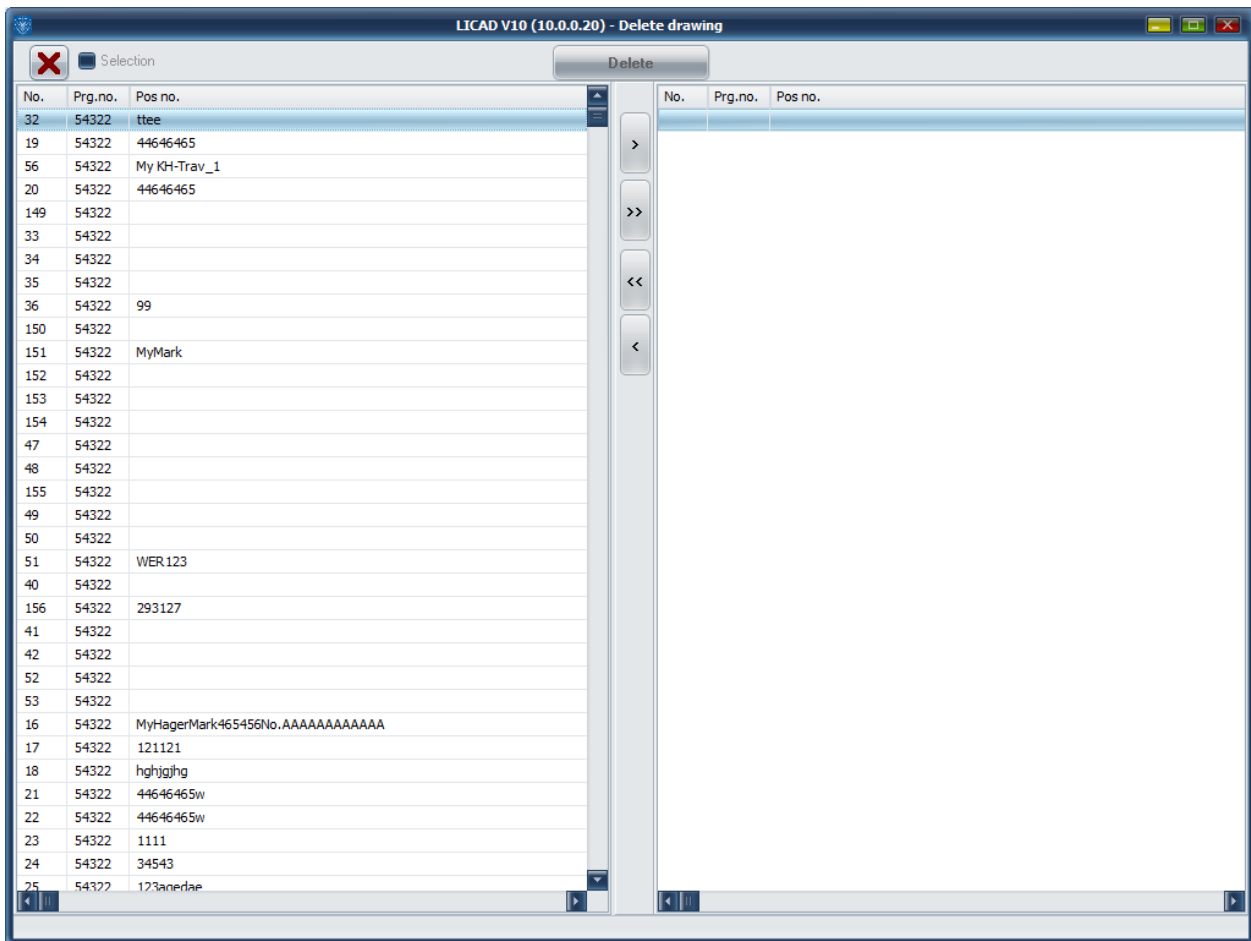
Turn on the project management tab. Select one of the two views (TreeView or ListView), use the mouse to select the project you want to change, and select Modify using the right mouse button.

4.6 Deleting drawings

This program point can be found in the main screen under the menu 'Edit - Delete drawings'.

Select one or more drawings from the left-hand window (use the 'Shift' and/or 'Ctrl' buttons for multiple marking) and shift these with the aid of the '>>' button to the right-hand window.

Each deletion must be individually confirmed or enter 'A' if all drawings are to be deleted with confirmation request. The sub-item number and the system designation that go with them are also displayed as a means of checking. The deleted drawing numbers are blocked by the program for further use.



4.7 Determining number of drawings

The number of drawings in a project is displayed in the status bar of diverse selection windows, as exemplified in the next screen.

No.	Prg.no.	Pos no.
5	63719	LP202001_LP202002
16	54322	MyHagerMark465456No.AAAAAAAAAAAAA
17	54322	121121
18	54322	hghjgjhg
19	54322	44646465
20	54322	44646465
21	54322	44646465w
22	54322	44646465w
23	54322	1111
24	54322	34543
25	54322	123aqedae
26	54322	111ss
27	54322	
28	54322	
29	54322	KH18
30	54322	
31	54322	
32	54322	ttee
33	54322	
34	54322	
35	54322	
36	54322	99
37	54322	
38	54322	12w
39	54322	
40	54322	
41	54322	
42	54322	
43	54322	
44	54322	
45	54322	TYP769
46	54322	

Number of records: 214

Figure 21: Display of number of drawings

4.8 Backup and copy drawings

With the program item 'Create backup of stored drawings' three functions are basically made possible: The *saving* of drawings, or preparing drawings for an electronic order or transferring them to another LICAD user.

The program is called up from the main screen under the menu 'File - Create backup of stored drawings'.

Note: Special attention is drawn to the possibility of electronic ordering.

On transfer, supplements to the parts lists are also copied into the security file together with the drawings data from the current project directory.

Save data at regular intervals. Unfortunately computers tend to crash at unexpected moments!

The drawing data are stored in one archive file. How does the procedure works: the relevant drawings must first be selected from the left-hand selection window and put in the window on the right. The target directory for securing data is to be determined in the directory window. A file name is to be entered after

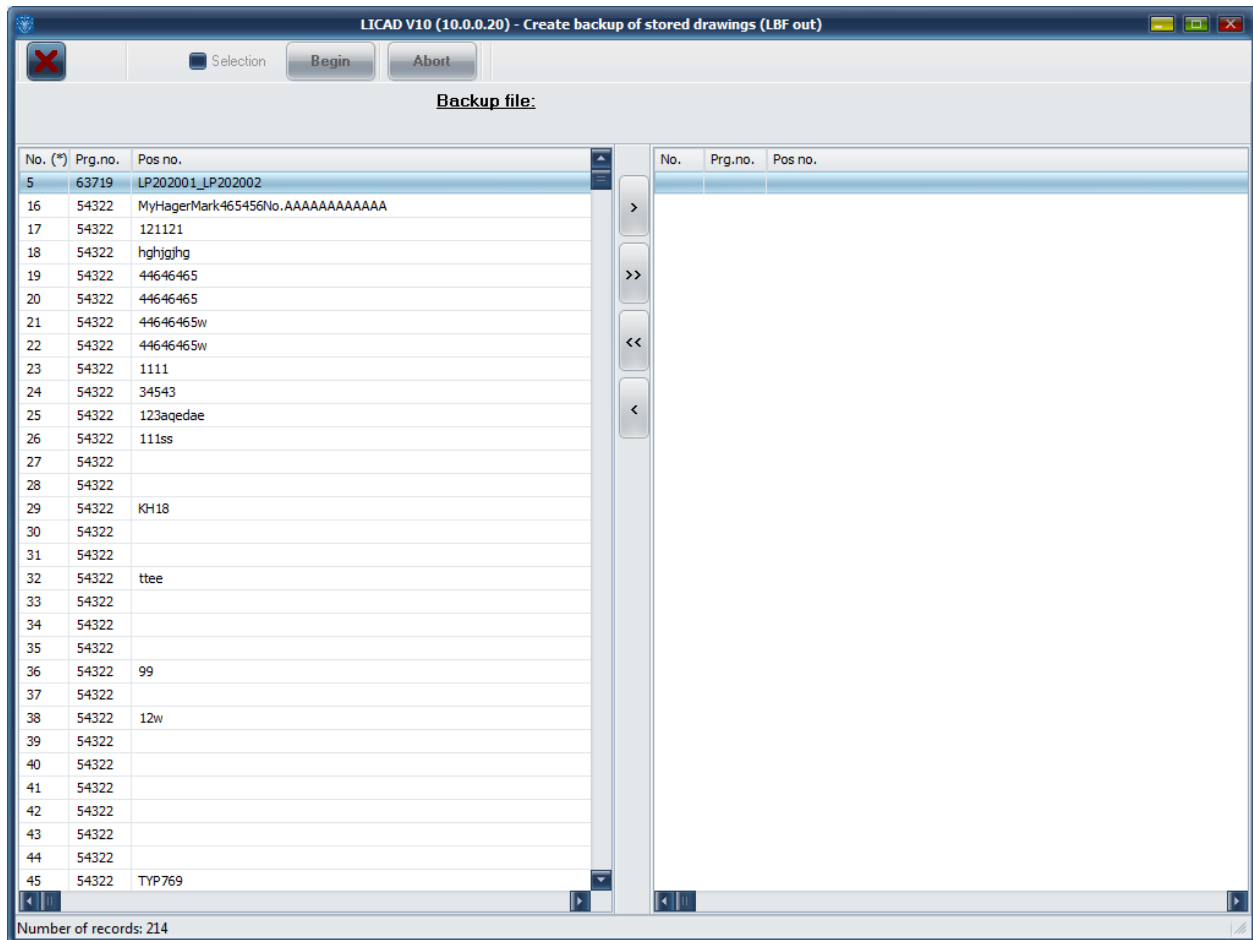


Figure 22: Screen for saving data

pressing the 'Begin' button. The file will get the ending LBF automatically.

4.9 Reading in backed drawings

To feed back (saved) drawings select the appropriate directory and archive file (*.LBF). Check to see whether old drawing numbers (possibly with a higher revision number) could be overwritten. All or only part of the drawings can be fed back from the archive.

It does not matter from which LICAD user the drawings come. The content of the archive can be looked at with the relevant program item. First check the current project directory.

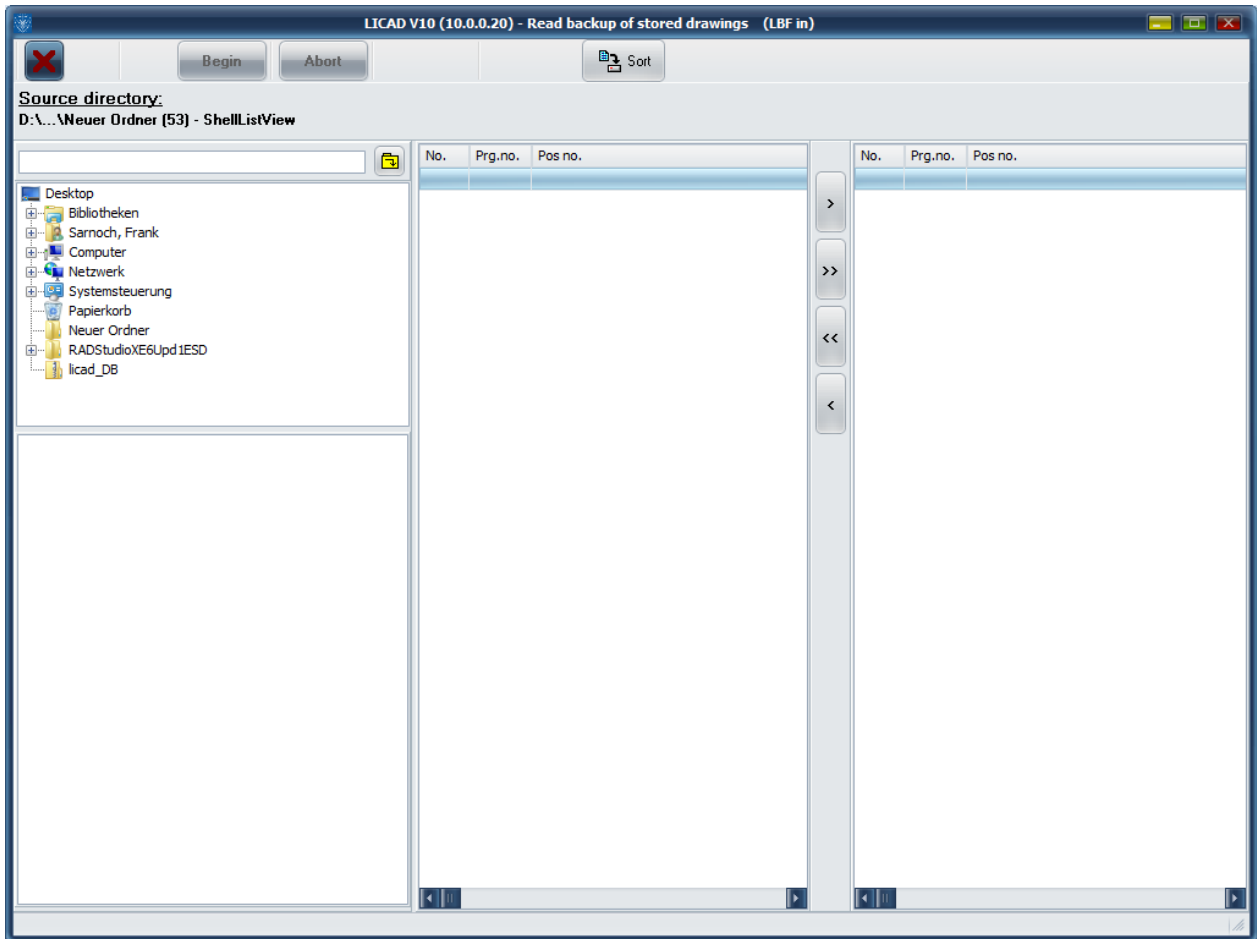


Figure 23: Control screen for reading back stored drawings

In the lower left-hand window a selection of archive data appears with the ending '*.LBF'. To have drawings from an archive file displayed, click on an LBF file and it will be shown in the middle window.

4.10 Sending drawings by e-mail

Drawings can be send by e-mail, if a mail program is installed, using the MAPI interface (e.g.. MS-Outlook or MS-Outlook Express) .

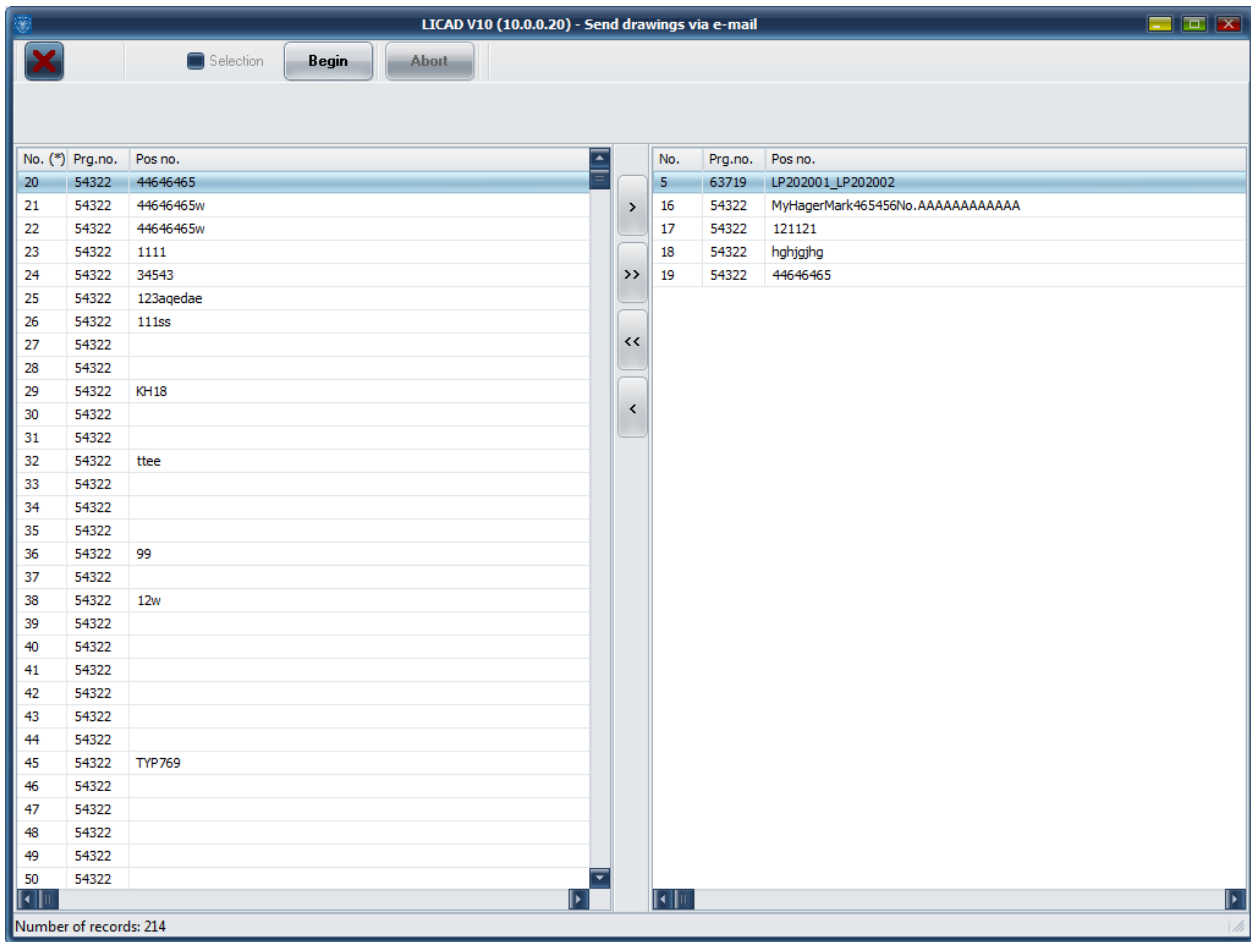


Figure 24: Sending drawings by e-mail

Select the drawings as usual that are to be sent, then press 'Start' button. The drawings selected are thereby stored and transferred as attachments to the e-mail program. The window for sending a new message is opened automatically. Enter the receiver here. In the e-mail text this list of the transferred drawings is issued automatically.

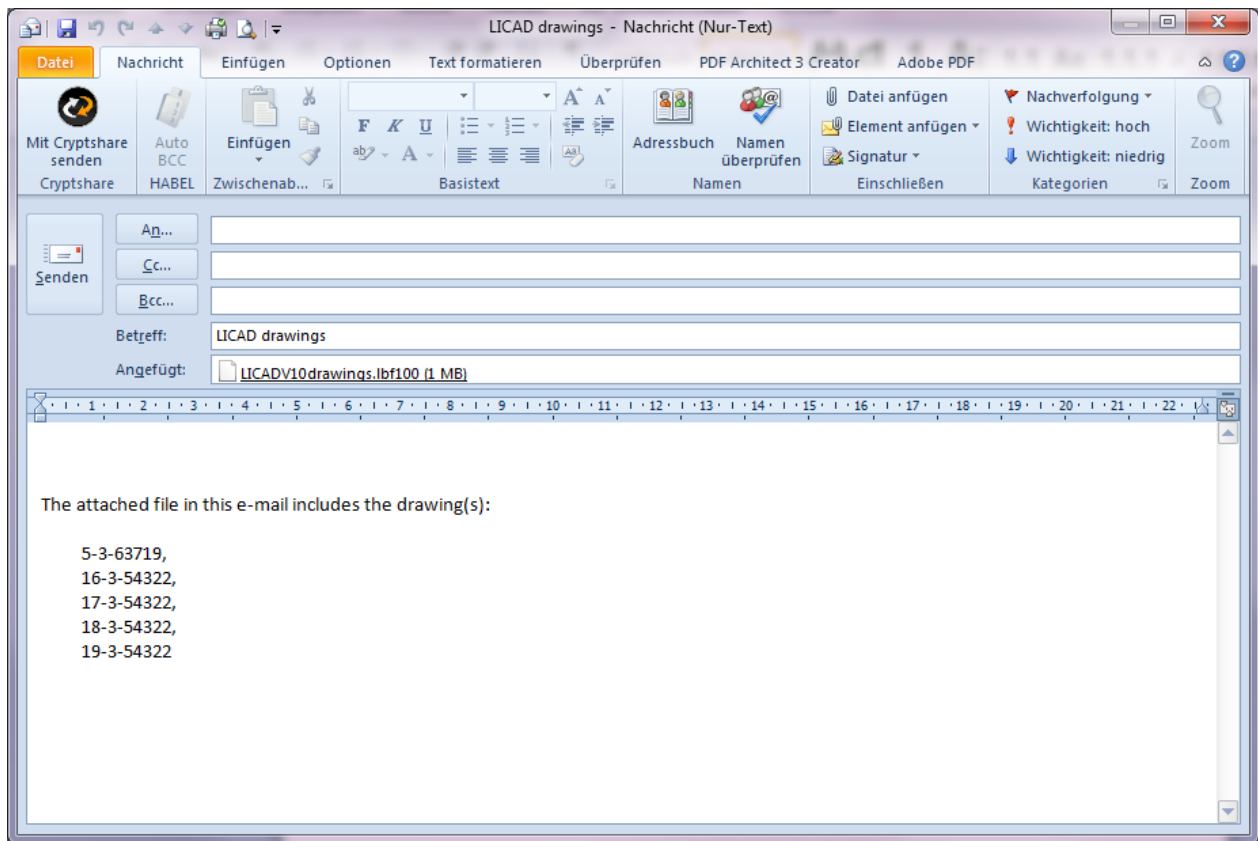


Figure 25: 'Send e-mail' window of the mail program

4.11 Selection of drawings

The program is called up from 'Main screen- File menu - Select drawings'.

The selection of drawings aims to simplify drawing management. Seven different parameters can be set according to Figure 26. The search process starts via the 'GO' button. The drawing selection is stored via the 'Save' button.

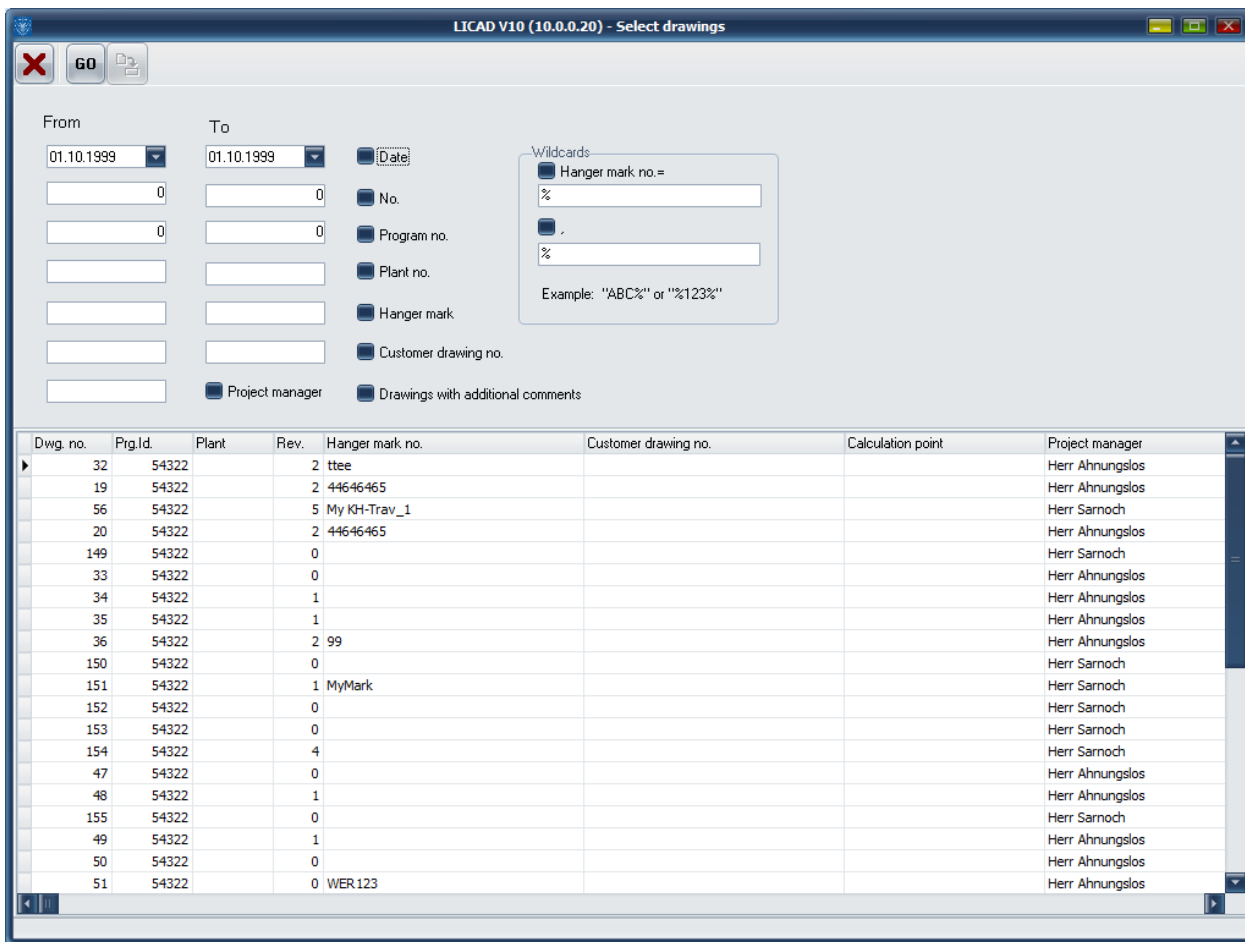


Figure 26: Screen for drawing selection

The stored selection can be activated in the other programs by checking on the selection field (see picture below).

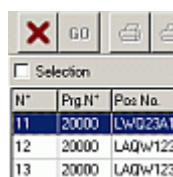


Figure 27: Activating the drawing selection

LICAD notes the setting of the selection field. If the option is activated in a program part, it stays active till it is switched off again. At the start of the program the stored setting is reactivated. At the end, the last setting is stored.

For searching so-called place holders or wild cards can be used. For example, the entry **ABC%** would filter all drawings with the combination “**ABC**”. Or **%A0%** would filter all drawings having an A at the second place and an **0** at the third.

4.12 Importing pipe support data

Support arrangements can also be created automatically if a corresponding EXCEL tables or text files list with data are available. For this, the program ‘Import supports data’ is accessed from the main menu. The following window then appears:

Note: The Alias Company’s IsoGen program and Sigma company’s Pipe2 make special export data available which can be read directly here.

The reading program module is accessed from the main window by way of the menu entry 'Read in support data' in the file menu. After that the following window appears:

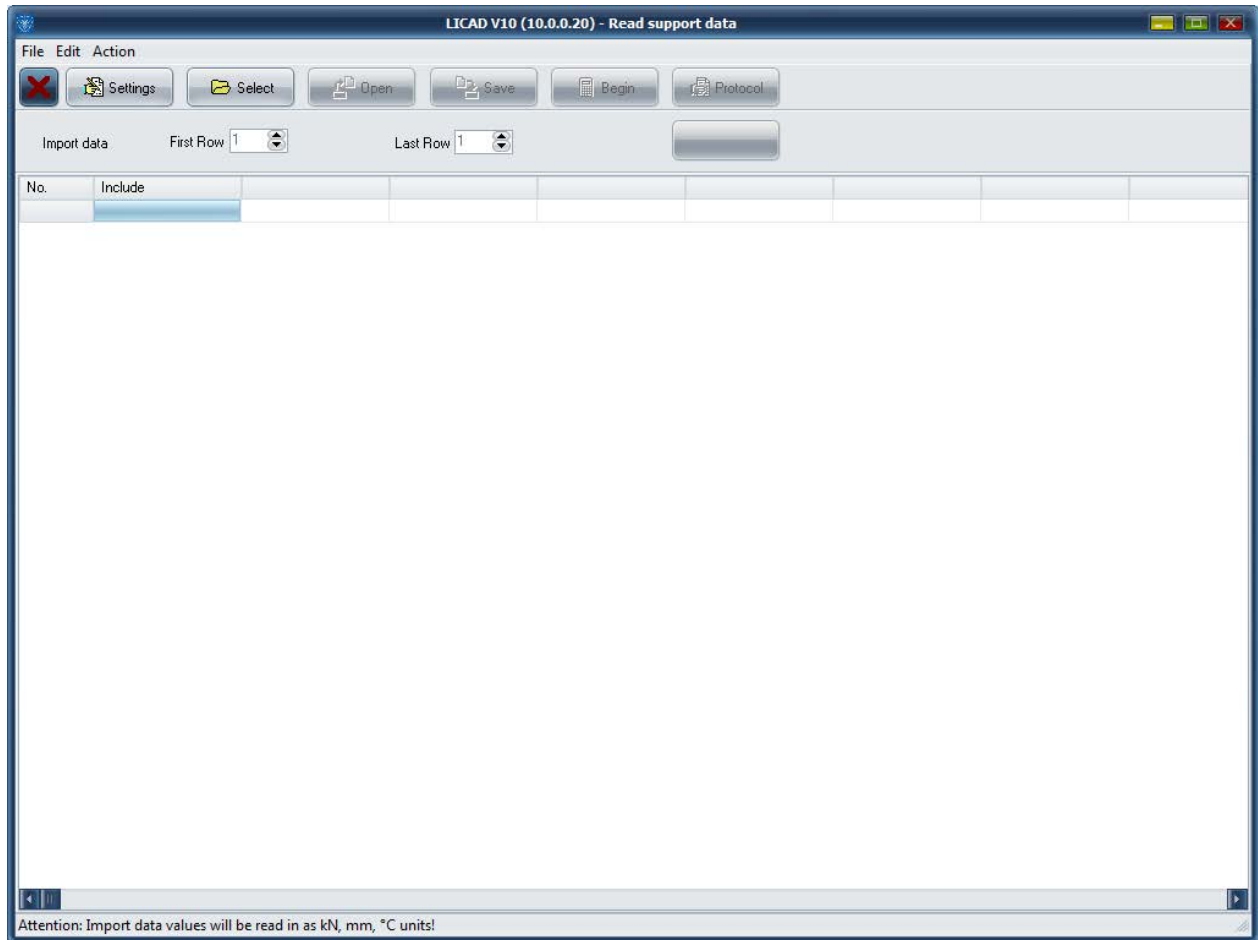


Figure 28: Importing configuration data from an Excel table

4.12.1 Five steps are required to import supports data

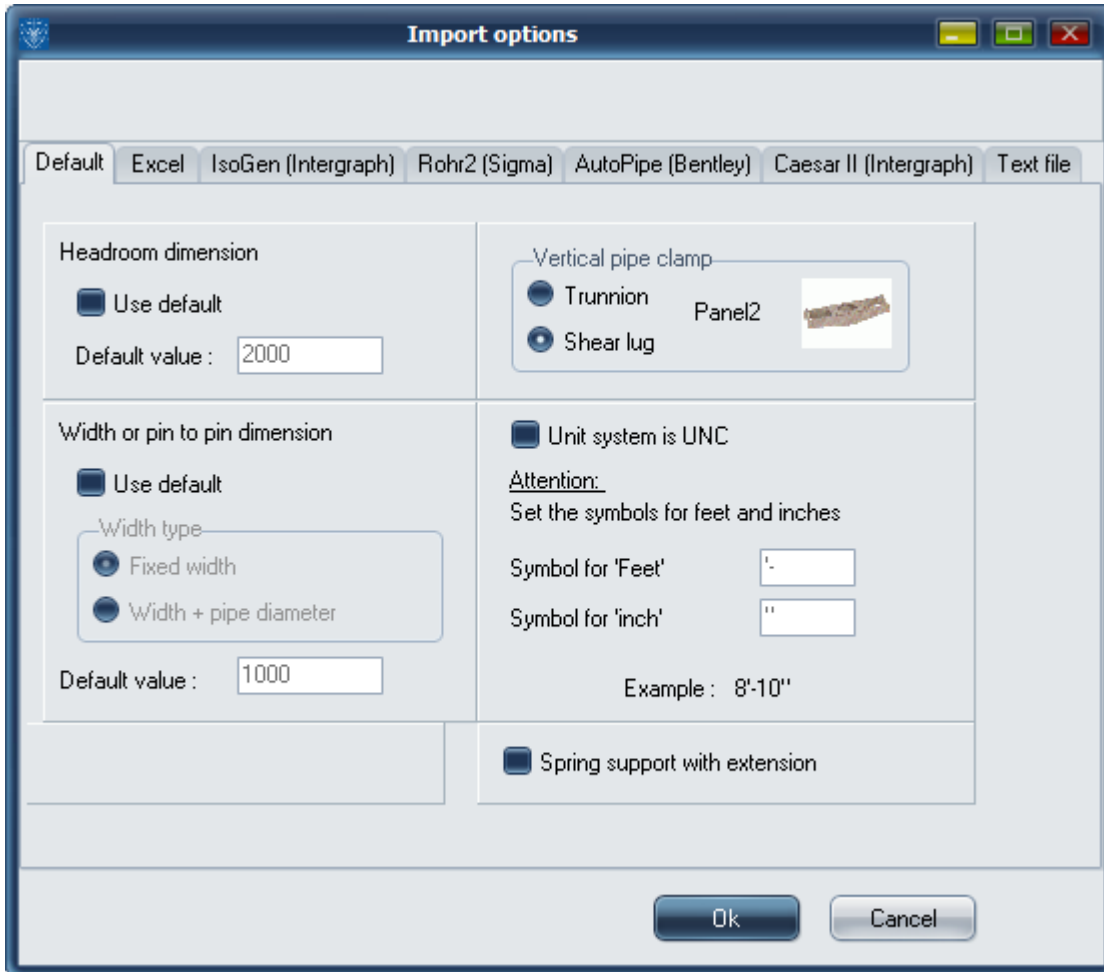
1st step: The settings for the import procedure are to be made in the settings windows. This window is reached via the 'Settings' button (see Figure 28).

2nd step: A file containing the relevant data must be opened via the 'Load' button. If the import settings, available via the 'Settings' button have not yet been made, the settings window first appears. If it is an Excel file, Excel will be started up and the worksheet shown (Excel must be available on the PC).

IMPORTANT: A column with the support configurations is to be defined. These must conform according to section 6.2 in the manual. The changes can be stored, if required. EXCEL must however remain open till the import is completed.

3rd step: The input field for 'First Row', determine the number of rows from which the data is to be entered. Let the program also know the last line to be imported.

4th step: The column headings must be defined. For this, click on the respective headline of a column. From the drop down window then appearing, select a corresponding input (e.g. load, temperature, etc). Not all columns need be defined. It is sufficient if the essential data are available for the design of a support (such as load, pipe diameter, temperature, 'z' travel, support configuration and installation height). The allocation of field names proceeds automatically for Pipe2 or IsoGen export files.



Note:

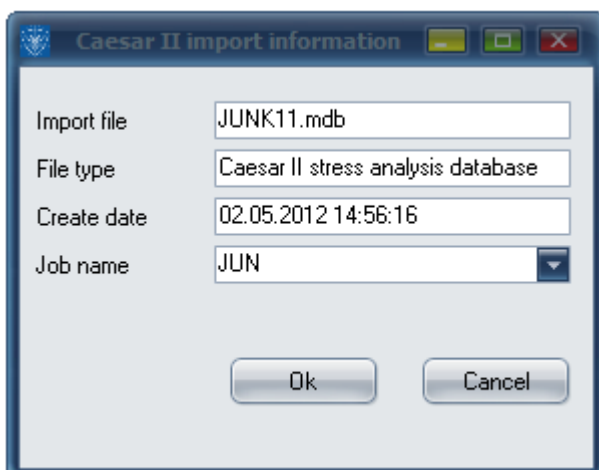
For riser clamps, a selection care be made between trunnions and shear lugs

Note: For the structural attachment, Type 75 is preset, as far as this is not defined in the table.

Note: The column headings defined by the user can be stored in a file for subsequent use (see below).

Note: The column headings defined by the user can be stored in a file for later use (see below).

5 th step: With the 'Start' button, the calculation of the supports using the selected data is started. If problems arise during calculation they are recorded. After this a mask with the import protocol is automatically accessed if errors or warnings are noted.



Via the 'Info' button, the LICAD drawing numbers for the imported data are shown. Further, incorrectly applied drawings can be filtered out with the help of an error code number. Drawings with an error code number can be correspondingly corrected via the button 'Modify' in the main window.

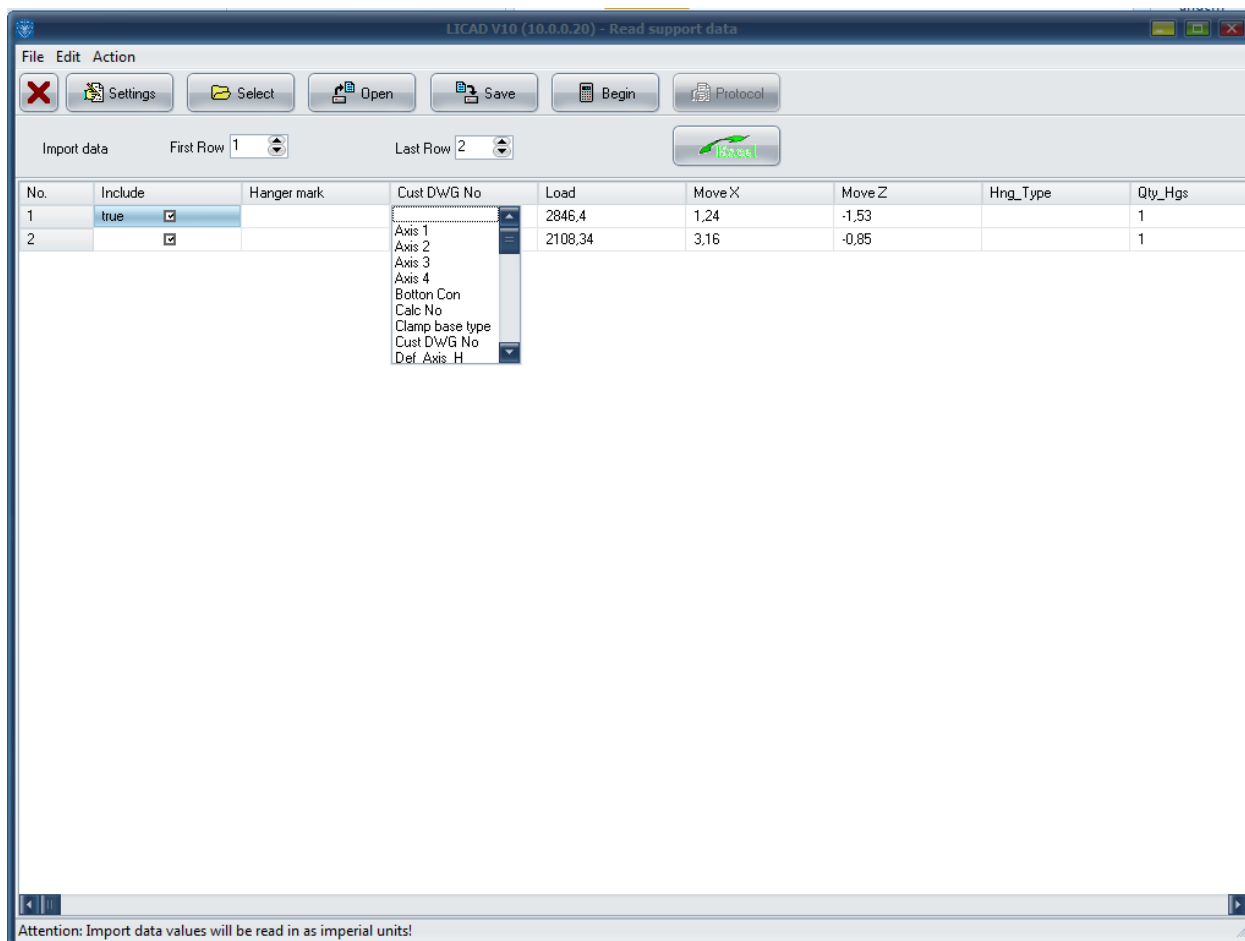


Figure 29: Arranging Excel columns in the LICAD data fields

4.12.2 Storing and loading selection of column headings

The definition of column headings can be stored in a file. For this, click on the button 'Store selection' and choose a name for the file in the file save menu then appearing. The ending 'LFG' will be automatically added to the file name.

To download a file with information on the column headings, the button 'Open selection' is provided.

IMPORTANT: An installation height (ELEV X) and an installation difference (DIM X) can be used simultaneously as column headings. Then the installation differences are first taken over. If data are also available for the installation heights of a support, these are automatically applied. In this way it is possible to export data from LICAD via the 'Support data on ASCII' program and subsequently re-import it here ('File transfer from LICAD 7').

The settings of the technical specifications for the selection of supports are to be made before the import.

4.12.3 Meaning of abbreviations for the column headings:

Axis 1 Marking of 1 axis in location plan (max. 5 places)

Axis 2	Marking of 2 axis in location plan (max. 5 places)
Axis 3	Marking of 3 axis in location plan (max. 5 places)
Axis 4	Marking of 4 axis in location plan (max. 5 places)
Bottom Con	Lower connection part, if the support is designed without a clamp. (0,60, 61, 74, 63, 73, 75)
CalcNo	Number of the Calculation point (max. 32 digits)
Config. No.	Number of support configuration (see manual, 7.2) Start with "S" for static supports, e.g. S13 Start with "Y" for dynamic supports, e.g. Y01 Start with "C" for so-called cold supports (C01 = U-bolt)
Cust DWG No	Customer drawing number (up to 25 digits)
Cust. DWG No.	Customer drawing number (max. 25 places)
DIM 1	Difference installation height (one or more differences are needed according to the configuration)
DIM 2	
DIM 3	
DIM 4	
Dist A	Location plan: Distance between 1. axis and centre of pipe
Dist B	Location plan: Distance between 2. axis and centre of pipe
Dist C	Location plan: Distance between 3. axis and centre of pipe
Dist D	Location plan: Distance between 4. axis and centre of pipe
Drawing N°	LICAD drawing number (e.g. for taking over data from another LICAD version)
Elev 1/L	1st height notation, or lefthand notation in double structural attachment.
Elev 2/R	2nd height notation, or righthand notation in double structural attachment
Elev 3	
Elev 4	
Elev 5	
Hanger mark	Hanger mark number (max. 32 digits)
Hng_Type	Specification of the type of hanger (Input of a six-digit hanger type number, but limited to Type 11, 21 or 39. Other types are determined by the hanger configuration.)
Hydro load	Test load e.g. for hydro static test
Insul	Pipe insulation thickness
Load	Cold or hot load (depends to specification settings)
Move X	Pipe movement into pipe direction
Move Y	Pipe movement laterally to pipe direction
Move Z	Pipe movement in vertical direction
Pipe	Pipe diameter
Qty	Qty. of supports
Rot_X_Vect	Rotation round high axis for PDS transfer
Rot_Y_Vect	Rotation round high axis for PDS transfer
Rot_Z_Turn	Rotation round high axis for PDS transfer
Temp	Temperature
Temp2-Temp9	Additional Temperature values used in CAESAR II only
Top Con	Structural attachment type (73, 74, 75, 76, 78 if option 'Selection with connection parts to building structure' is set, otherwise 60, 61, 63)
V_Cl_Type	Vertical pipe clamps (Type 46, 48) . Type 46 encase type 45 too.
Width	Pin to pin dimension of Trapezes or riser clamps
X_Coor	Reference point pipe connection for PDS transfer
Y_Coor	
Z_Coor	(X_Coor, Y_Coor, Z_Coor are required for the transfer of supports to PDS or SmartPlant3D)
Stanchion Feet att	(V)ertical load / (S)liding / (F)ixed allowed
Clamp base type	input either 49 or 57
Load_Axial_h	
Load_Axial_l	
Type 11/25 feet/plate	Input Y or N (Allowed Yes / No)
Delta_X_Pipe	Difference between two note point used for CAESAR II only
Delta_Y_Pipe	Difference between two note point used for CAESAR II only
Delta_Z_Pipe	Difference between two note point used for CAESAR II only
Qty_Hgs	One or two spring hanger elements used for CAESAR II only

FDIFF	Permissible load deviation for springs
BEWEGBER	Max. permissible movement for springs
Def_Axis_H	Definition of local coordinate - horizontal
Def_Axis_L	Definition of local coordinate – lateral
Def_Axis_V	Definition of local coordinate - vertical

Attention : The values taken over are treated as SI or UNC units depending on the setting in the import options.

4.12.4 Import settings

Details of the riser clamps and installation heights to be used as standard, if these are not yet known, can be supplied here.

Note: The use of standard installation heights enables the calculation of a support, which would be impossible if the dimensions were not available.

It is also possible now to import data in the SI or UNC system independently of the setting of the unit system in Options (LICAD main menu). The setting is now made directly here.

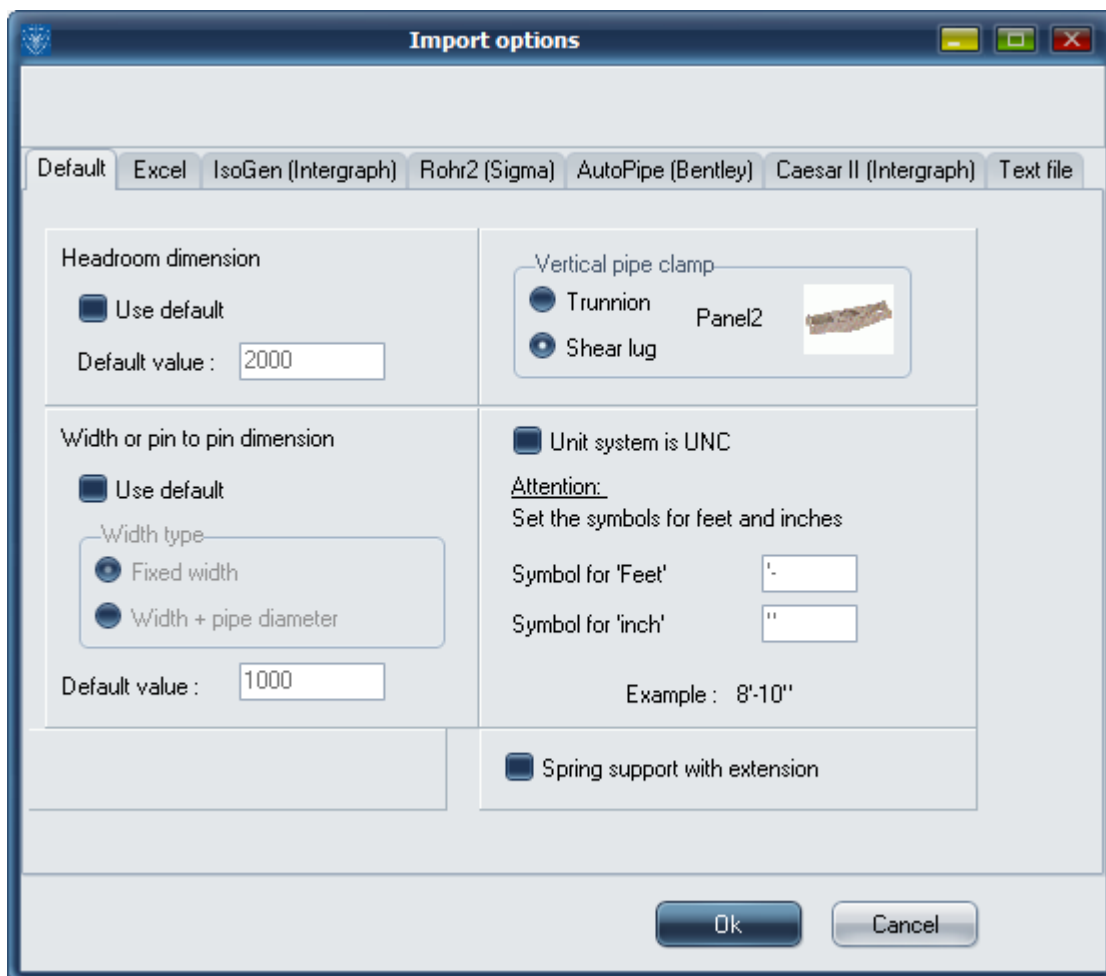
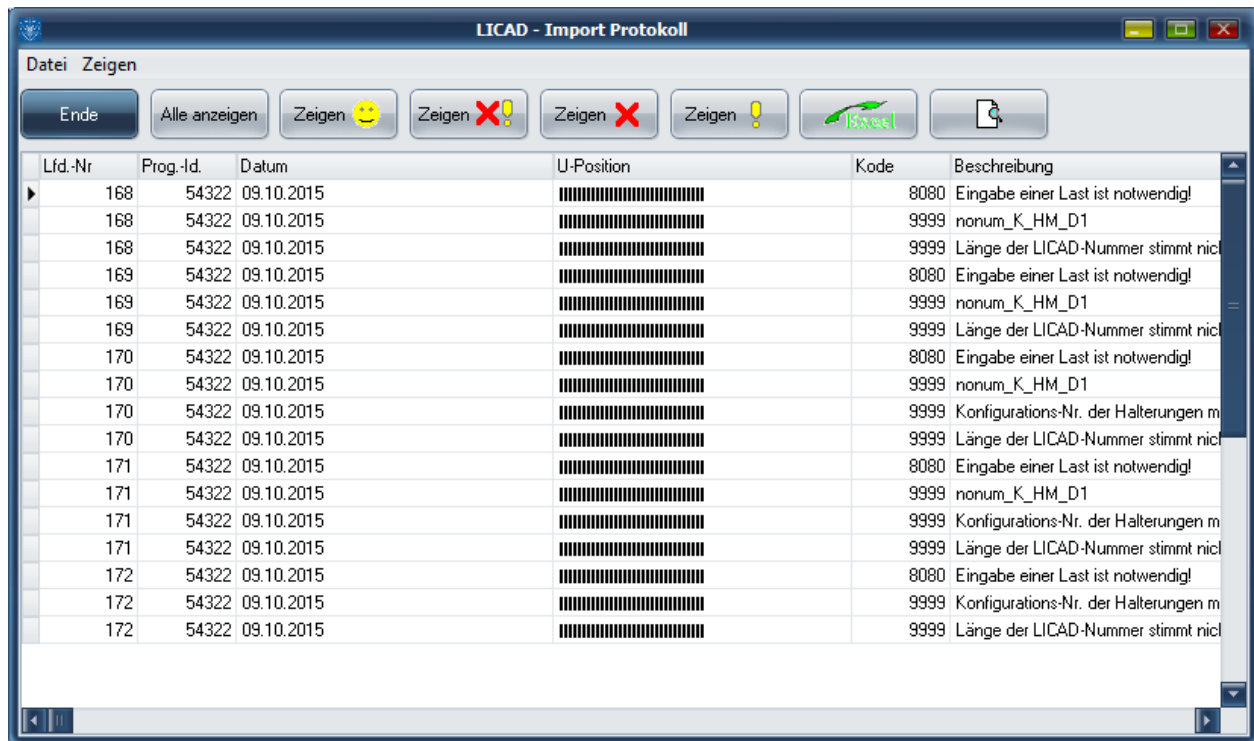


Figure 30: Support data Import Setup screen

For Excel and text files, the setting can be made here as to whether the first line contains the field names. If this option is marked and the first line contains the correct field names, LICAD allocates the field names automatically to the columns. If LICAD comes across an unknown field name it will report this correspondingly.

4.12.5 Reading in UNC units

If you have activated the setting 'Unit system is UNC' in the options, two further input fields appear, with the aid of which the symbols for the foot and inch units can be stipulated. The symbol system, as it is applied in LICAD, is preset.



The import routine can recognize the UNC data in the following formats :

Format	calculated value
<whole number ><symbol for foot units> <real number><inch symbol>	consisting of foot and inch value
<whole number ><symbol for foot units> <real number><inch symbol>	consisting only of foot value
<real number><inch symbol>	consisting only of inch value
<real number>	consisting only of inch value

It can be seen from the table above that the import routine can automatically import different formats. Through the possibility of the free definition of the unit symbols it should under normal circumstances always be possible to import UNC units.

4.12.6 Import protocol of data

The import protocol can be accessed manually via the 'Info' button. On the screen, the information to be displayed can be selected. This is made with the buttons 'Display everything', 'Display errors & warnings', 'Display errors only', 'Display only warning' or 'Display correct imports'.

The Excel button serves, as in many other programs, to export the data displayed to Excel.

The 'Print preview' button shows the protocol in a print preview, where printouts can as usual be made.

4.13 Entering input data on supports into a text or EXCEL file

The following program window can be accessed via the button 'Support data on ASCII.'

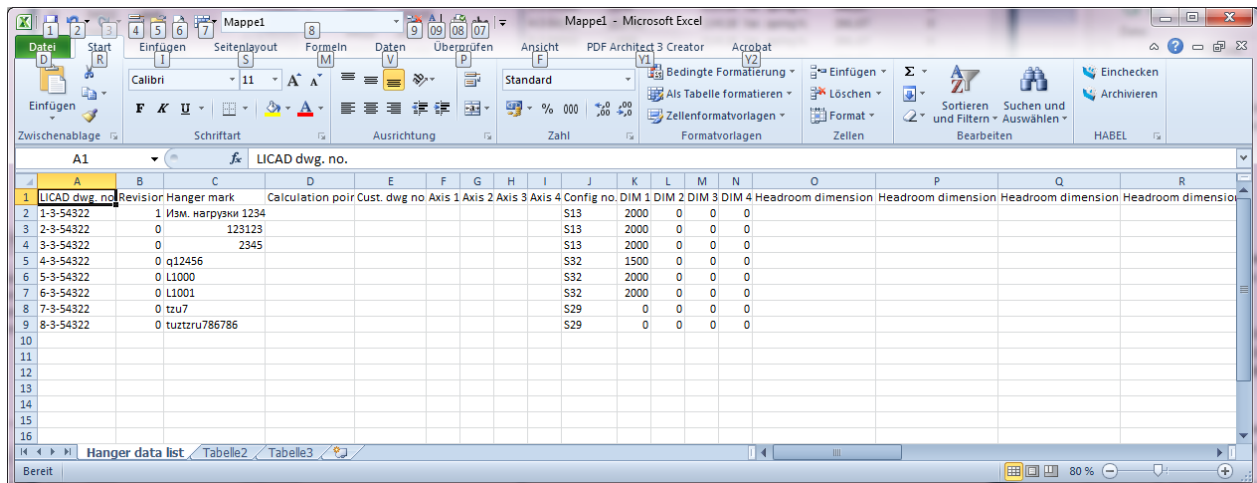
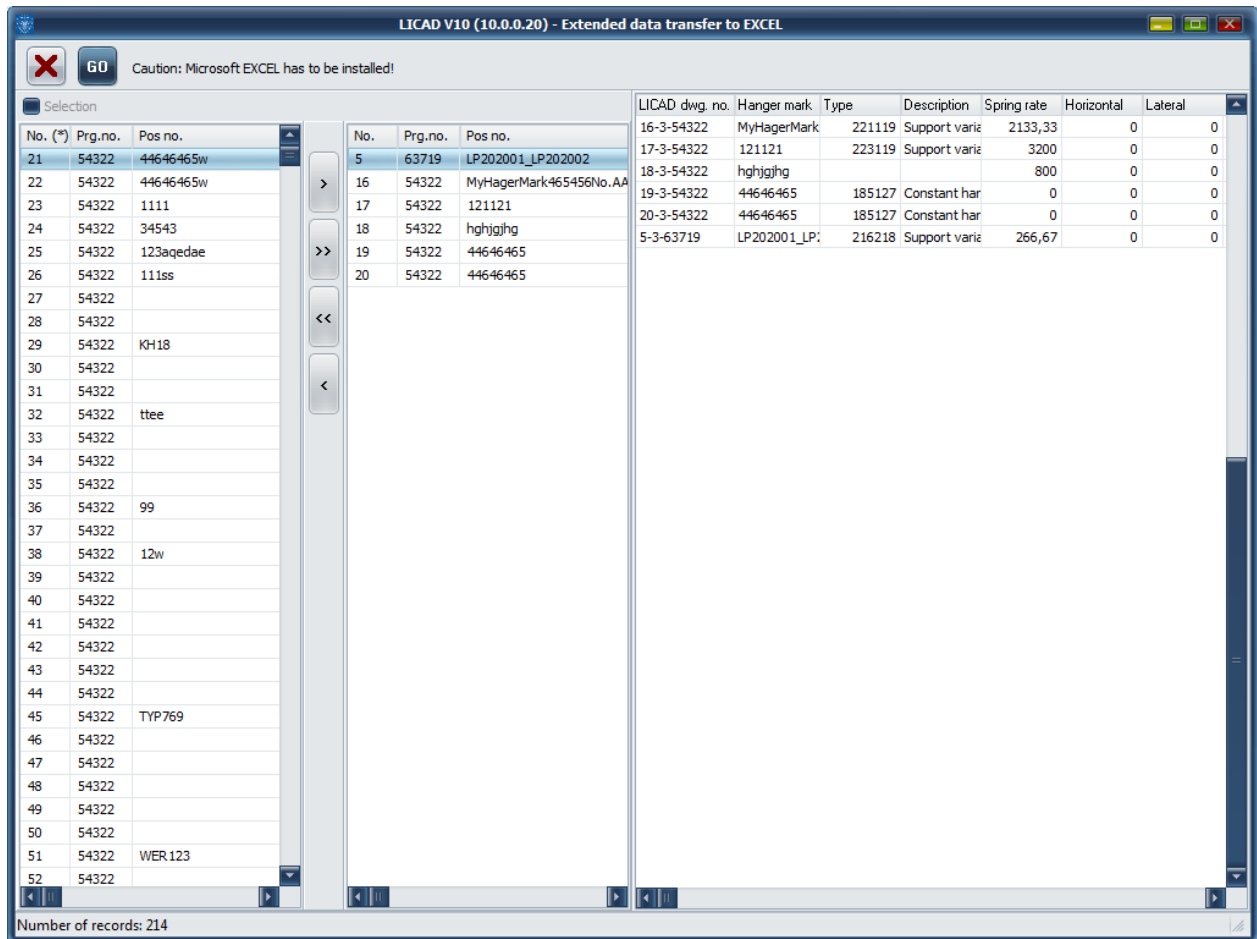


Figure 31 : Exporting configuration data to Excel or a text file

This program point does nothing more than write the data put in by the user into a file. This file can be used among other things to copy LICAD drawings. For this, the program point 'Import support data' can be employed. Further, the file can be used to fill existing project tables with relevant information on the supports.

To create a text or EXCEL file a selection must first be made of the LICAD drawings (via the 'Selection' button). The corresponding data are displayed in the window. Next, the TXT or EXCL button is selected, then a name assigned to the file in the file dialog.

Note: To use the data for a copy of drawings, the settings for the options should also be secured so that they can be entered again correspondingly later.

4.14 Alteration of project data of existing drawings according to the stacking procedure

The project data (preset in the options) are stored with every drawing. This program item can be accessed for the simultaneous amendment of several drawings. Open the editing menu on the main screen and select 'Altering project data'. The corresponding screen mask is structured as follows :

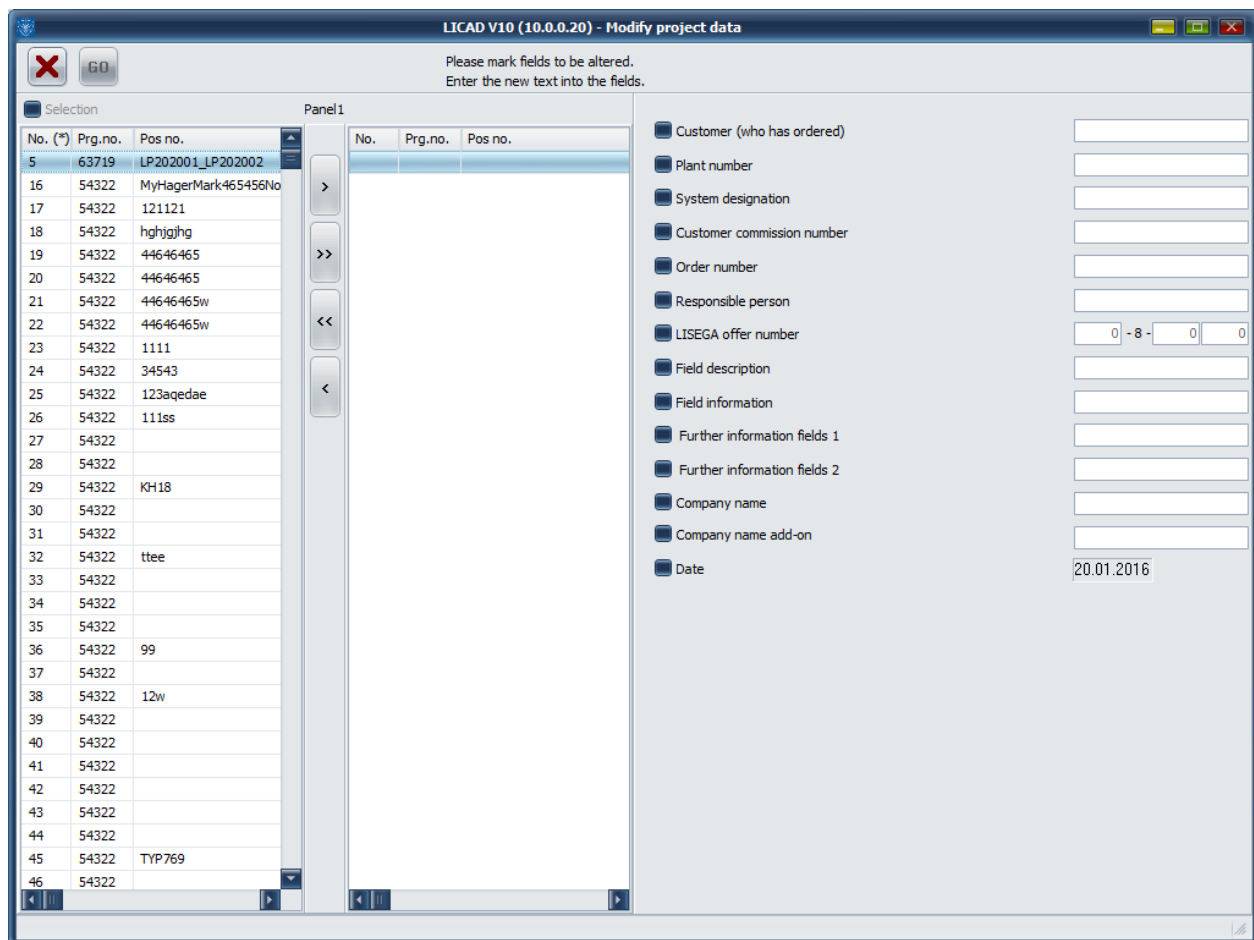


Figure 32: Altering project data in stored drawings

Functioning: Select the drawings to be amended from the left-hand window. Mark the fields to be amended with a new entry and enter the new text into the corresponding field. Only the marked fields are amended. Important: the drawings are irreversibly amended with the new values.

4.15 Make a security copy if necessary of the corresponding project. See also Section 4.7 'Determining number of drawings'

The number of drawings in a project is displayed in the status bar of diverse selection windows, as exemplified in the next screen.

No.	Prg.no.	Pos no.
5	63719	LP202001_LP202002
16	54322	MyHagerMark465456No.AAAAAAAAAAAAA
17	54322	121121
18	54322	hghjgjh
19	54322	44646465
20	54322	44646465
21	54322	44646465w
22	54322	44646465w
23	54322	1111
24	54322	34543
25	54322	123aqedae
26	54322	111ss
27	54322	
28	54322	
29	54322	KH18
30	54322	
31	54322	
32	54322	ttee
33	54322	
34	54322	
35	54322	
36	54322	99
37	54322	
38	54322	12w
39	54322	
40	54322	
41	54322	
42	54322	
43	54322	
44	54322	
45	54322	TYP769
46	54322	

Number of records: 214

Figure 21: Display of number of drawings

Backup and copy drawings’.

The entries for individual drawings can, however, also be amended under the item ‘Altering drawings’.

4.16 Deletion of supplementary services

In options, additional services such as preassembly, extra coating of pipe-surrounding components or blocking of spring hangers can be preset. The bills of material are supplemented with the corresponding

positions. If for any reason these services are no longer required, the relevant positions can be deleted from the individual drawings at this program item.

Open the 'Edit' menu on the main screen and select 'Delete of additional feats'.

The corresponding screen mask is arranged as follows:

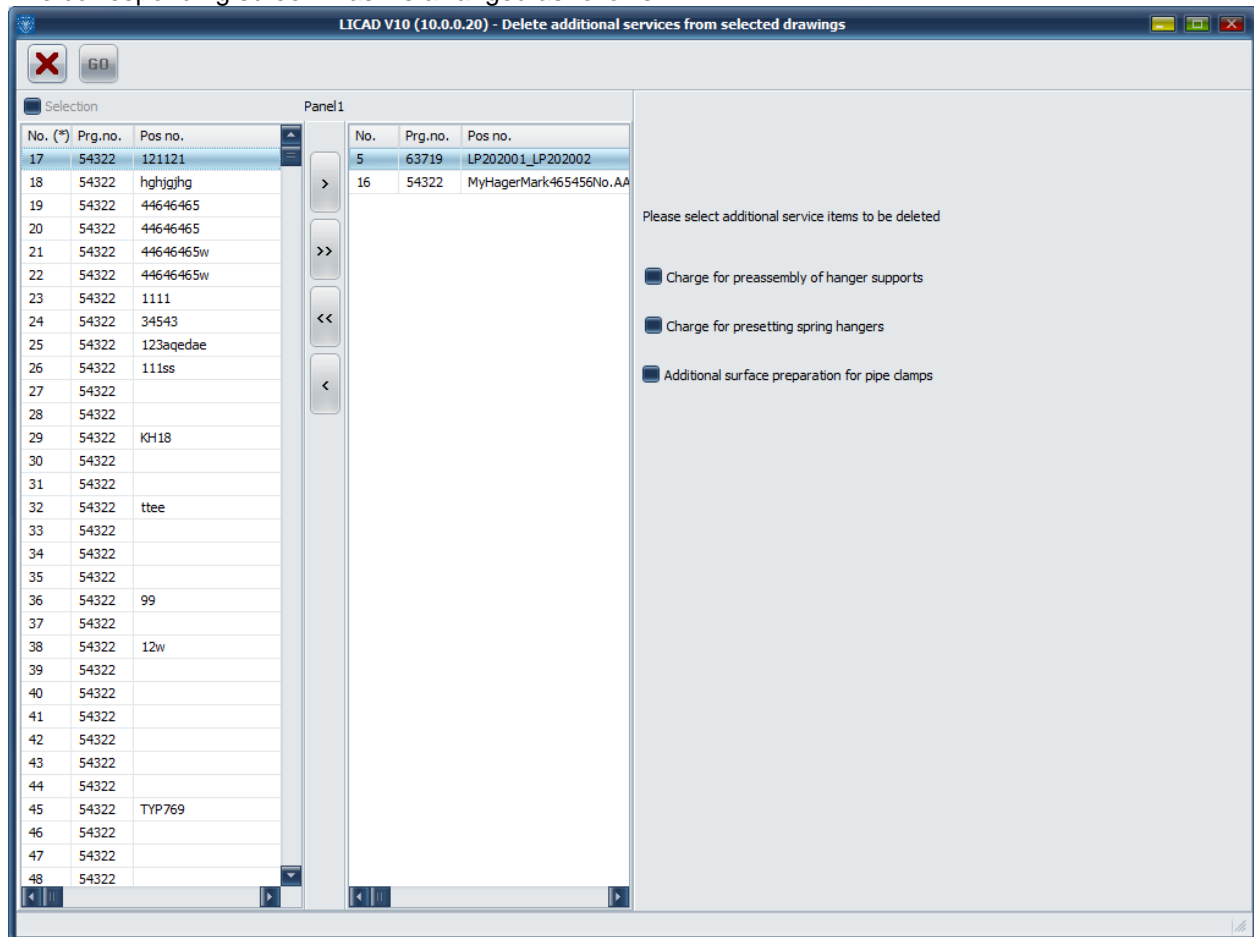


Figure 33: Deleting additional services in stored drawings

Method of function: Select the drawings to be altered from the left-hand windows, then mark the positions to be deleted from the bills of materials.

Important: The positions are deleted irreversibly !

If necessary, make a security copy of the relevant project. See 'Creating a security copy' in this respect.

Additional services can also, however, be deleted or newly entered at the item 'Altering drawings'.

4.17 Add additional feats

As shown before in options, additional services such as preassembly, extra coating of pipe-surrounding components or blocking of spring hangers can be preset. The bills of material are supplemented with the corresponding positions.

If for any reason these services were not set in the options, the relevant positions can be added to every individual drawing at this program item.

Open the 'Edit' menu on the main screen and select 'Add additional feats'.

Dwg. no.	Prg.Id.	Plant	Rev.	Hanger mark no.	Calculation point	Customer drawing no.	Project manager
5	63719		1	LP202001_LP202002			Herr Ahnungslos
16	54322		A109B	MyHagerMark465456No.AAAAAAAAAAAAA		MyCustomerDrawingNumber01	Herr Ahnungslos
17	54322			121121			Herr Ahnungslos
18	54322			hghjgjh			Herr Ahnungslos
19	54322		123A5	44646465			Herr Ahnungslos
20	54322		ABCDE	44646465			Herr Ahnungslos
21	54322			44646465w			Herr Ahnungslos
22	54322			44646465w			Herr Ahnungslos
23	54322			1111			Herr Ahnungslos
24	54322			34543			Herr Ahnungslos
25	54322			123aqedae			Herr Ahnungslos
26	54322			111ss			Herr Ahnungslos
27	54322						Herr Ahnungslos
28	54322						Herr Ahnungslos
29	54322			KH18			Herr Ahnungslos
30	54322						Herr Ahnungslos
31	54322						Herr Ahnungslos
32	54322			ttee			Herr Ahnungslos
33	54322						Herr Ahnungslos
34	54322						Herr Ahnungslos
35	54322		A1B2C				Herr Ahnungslos
36	54322		zz	99			Herr Ahnungslos
37	54322		1				Herr Ahnungslos
38	54322			12w			Herr Ahnungslos
39	54322						Herr Ahnungslos
40	54322						Herr Ahnungslos
41	54322						Herr Ahnungslos
42	54322						Herr Ahnungslos
43	54322						Herr Ahnungslos
44	54322						Herr Ahnungslos
45	54322			TYP769			Herr Ahnungslos
46	54322						Herr Ahnungslos
47	54322						Herr Ahnungslos
48	54322						Herr Ahnungslos

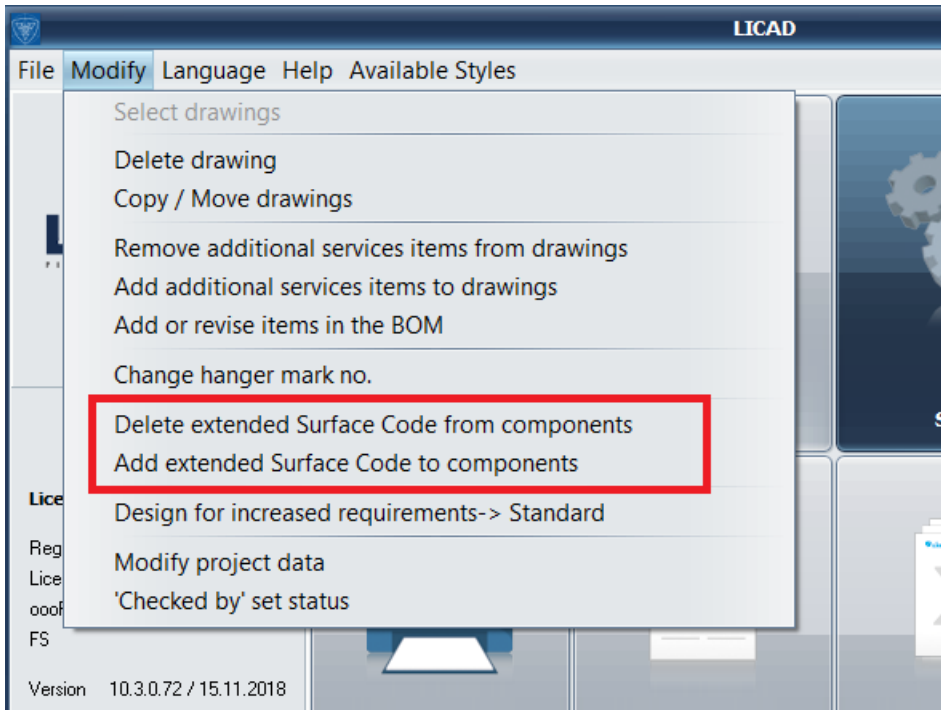
Number of records: 50

Figure 34: Example of a listing of drawing

The corresponding screen mask is arranged as picture 48.

4.18 Change the surface protection

According to the LISEGA surface protection system, the settings for already existing drawings can be subsequently changed. In the Modify menu of the main screen, two programs are provided for this purpose:



If an increased surface protection system has already been selected (<> C3M), then this can only be reset to C3M. Following this, another surface protection system can be selected.

Note: The background to these steps is that the BOM needs to be cleaned up of additional entries, and also certain part numbers may change depending on the surface protection system chosen. Certain combinations with additional services can be excluded.

4.19 Index of drawings

Both drawings saved on the hard disk as well as those on a diskette can be displayed optionally on the screen or through the printer. The data of the current project path will be displayed.

In addition to the LICAD drawing number the program shows the drawing's revision number, facility designation, date prepared, sub-item number as well as who prepared it (refer to example in Figure 34). The current working directory is shown in the screen label.

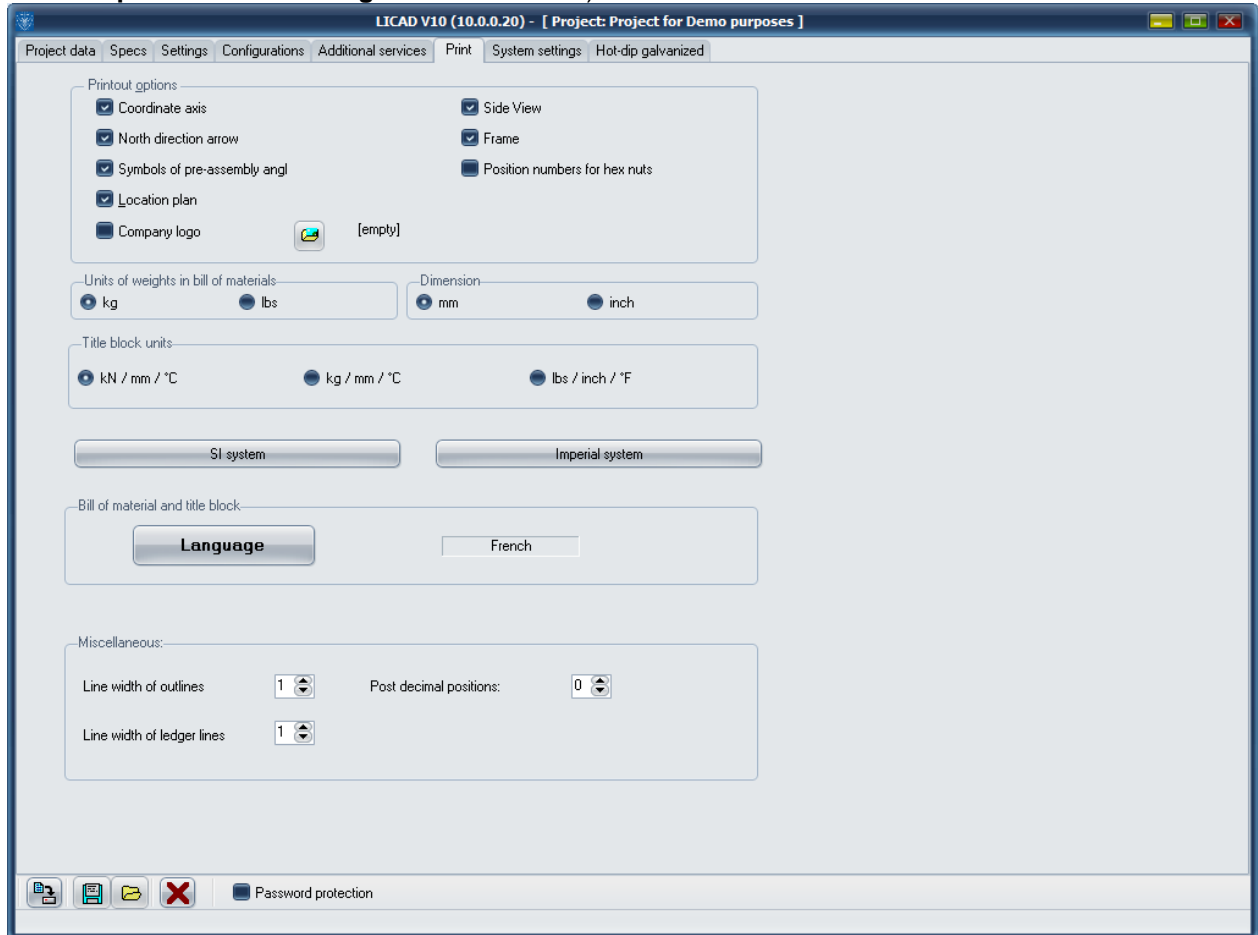
As an option, the list can be displayed clearly sorted according to position numbers, drawing numbers, or date. Clicking once again on the same column heading reverses the sorting sequence (sorted upwards / downwards)

4.20 Printing out drawings

Drawings which have been saved can be printed out either individually or in a so-called batch procedure.

Select one or more drawings from the left-hand window (use the 'Shift' and/or 'Ctrl' buttons for multiple marking) and shift these with the aid of the '>>' button to the right-hand window.

In the menu print options, different components can be altered for print-out, for example with or without a frame, with or without a site plan. These print options can also be preset under 'Options - print (**Fehler! Verweisquelle konnte nicht gefunden werden.**)'.



In addition, the units for dimensioning, the parts list and the title block data can be set under 'Options - Print'.

4.21 Printing out individual parts lists

Instead of complete drawings individual parts lists can also be put out by the program. In these lists the article numbers, designations, sizes, weights and materials are listed. In addition, the entry data is put out along with these items.

The entries can be made as described under 4.19. Instead of the materials the list prices can also be calculated and put out by the program (as described under item **Fehler! Verweisquelle konnte nicht gefunden werden.**).

4.22 Printing out complete parts lists

The materials list of all or individual supports can be compiled with this program item to a complete parts list.

The list is issued according to article numbers and contains designations, numbers, weights, prices, as well as total weight and total price.

The entry screen is structured analogously to Figure 35. Selection is also to be made as described under program item 4.19.

The lists can however also be exported to a text file or Excel worksheet file. In this way the parts list information can be further processed in other programs.

LICAD V10 (10.0.0.20) - Summary of parts list

GO [Print] [Printer] TXT Excl Preview Index of dwgs.

Selection

Nr. (*)	Prg.-Nr.	Pos Nr.	Nr.	Prg.-Nr.	Pos Nr.	Typ	Description	Anzahl	Weight
22	54322	44646465w	5	63719	LP202001_LP202002	185127	Constant hanger (lo	3	288
23	54322	1111	16	54322	MyHagerMark465456No.,AA	216218	Var. spring hanger	1	40
24	54322	34543	17	54322	121121	221119	Var. spring hanger	1	240
25	54322	123aqadae	18	54322	hghjgjhg	223119	Var. spring hanger	1	360
26	54322	111ss	19	54322	44646465	433219	Three bolt clamp	3	48
27	54322		20	54322	44646465	442413	Pipe clamp	2	12
28	54322		21	54322	44646465w	449727S	Pipe clamp	1	193
29	54322	KH18				449729	Pipe clamp	1	316
30	54322					605912	Eye nut	3	2,4
31	54322					606912	Eye nut	1	1,2
32	54322	ttee				611012	Clevis with pin	1	14,8
33	54322					613012	Clevis with pin	1	24,4
34	54322					616912	Clevis with pin	3	5,4
35	54322					631028	Hexagonal nut	2	1,4
36	54322	99				633028	Hexagonal nut	2	2,25
37	54322					635928	Hexagonal nut	6	0,33
38	54322	12w				636928	Hexagonal nut	4	0,44
39	54322					663013-1500	Tie rod	1	39,3
40	54322					671013-1000	Threaded rod	1	17,5
41	54322					675413	Threaded rod	3	13,05
42	54322					676113	Threaded stud	1	0,42
43	54322					676413	Threaded rod	1	7,05
44	54322					676413	Threaded rod	1	7,05
45	54322	TYP769				731012	Weld-on clevis w.b.	1	18,5
46	54322					733012	Weld-on clevis w.b.	1	37
47	54322					735913	Weld-on clevis w.b.	3	6,3
48	54322					756112	Weld-on eye plate	3	2,5
49	54322					772413	Connection plate	1	27
50	54322								
51	54322	WER123							
52	54322								
53	54322								

Gewicht Total: [kg]
1725,29

Number of records: 214

Figure 35: Summary of bills of material

4.22.1 Description of buttons

Press the 'Go' button to start the sorting and accumulation for the drawings selected.

The 'Print' button serves to print the list directly. The printer can be selected or print settings made with the aid of the 'Printer setup' button.

Via the 'Preview' button the list is displayed as a print preview and can be seen as a whole; press the button with the printer symbol to start printing.

With the aid of the TXT button the content of the list can be stored in a text file (can be edited with an ASCII editor) for further editing, or the content can be transferred directly to Microsoft Excel via the 'Excel' button, whereby Excel is started from LICAD, if necessary.

The list will be sorted according to article numbers and contains designations, number, weights and prices as well as the total weight and total price. A report of the compiled drawings is put out on another sheet.

The input screen is structured analogously to **Fehler! Verweisquelle konnte nicht gefunden werden..**. The entries are to be made as described under program item 4.19.

Note: So-called QuickReport files can be opened and viewed via the QReport Editor. These files can be generated under program points xx and yy (diverse lists).

With the aid of the TXT button, the contents of the list in a text file (which can be worked on with an ASCII Editor) can be saved for the purpose of further processing.

Via the 'EXCL' button the contents can also be transferred directly to Microsoft Excel, Excel is started from LICAD automatically.

4.23 Printing out lists sorted according to hanger mark no.

With this program, item lists sorted according to hanger marks are produced. Line by line they give the total price and total weight of pipe supports. In addition, the hangers which are included in an item are also indicated. Selection is made as described under Point 4.19. The button functions are described under Point 4.21.1.

The selected drawings of the total list price and total weight of the individual supports are summarized line by line. In addition, the program also lists the supports contained in one position.

Note: So-called QuickReport files can be opened and viewed via the QReport Editor. Refer to chapter Fehler! Verweisquelle konnte nicht gefunden werden..

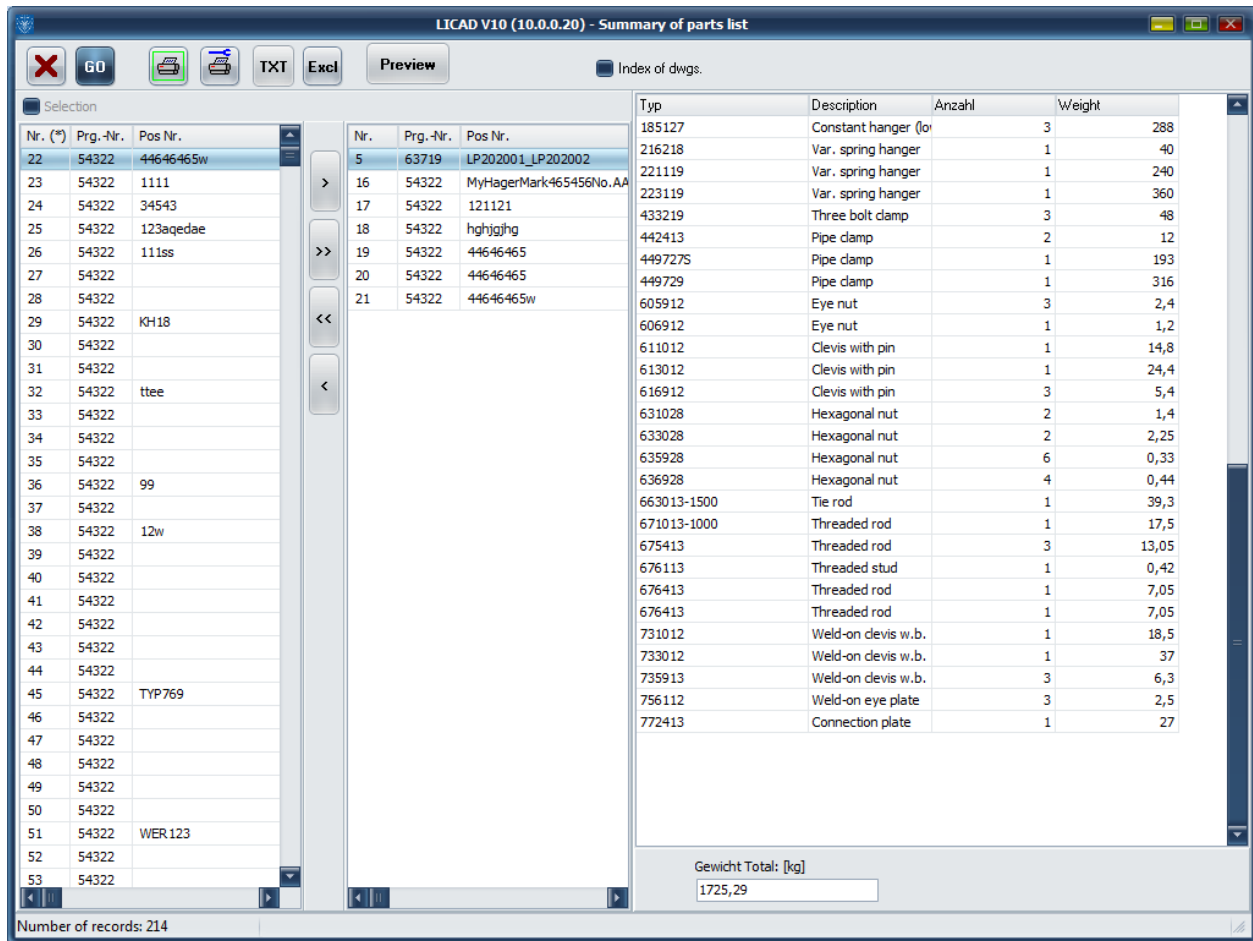


Figure 36: Creating a hanger mark list

4.24 Printing out adjustment lists

The technical information of the hangers are printed out for each support. Information about the total weight and price are included.

The program is called up from the 'Main screen' via the button 'hanger data'.

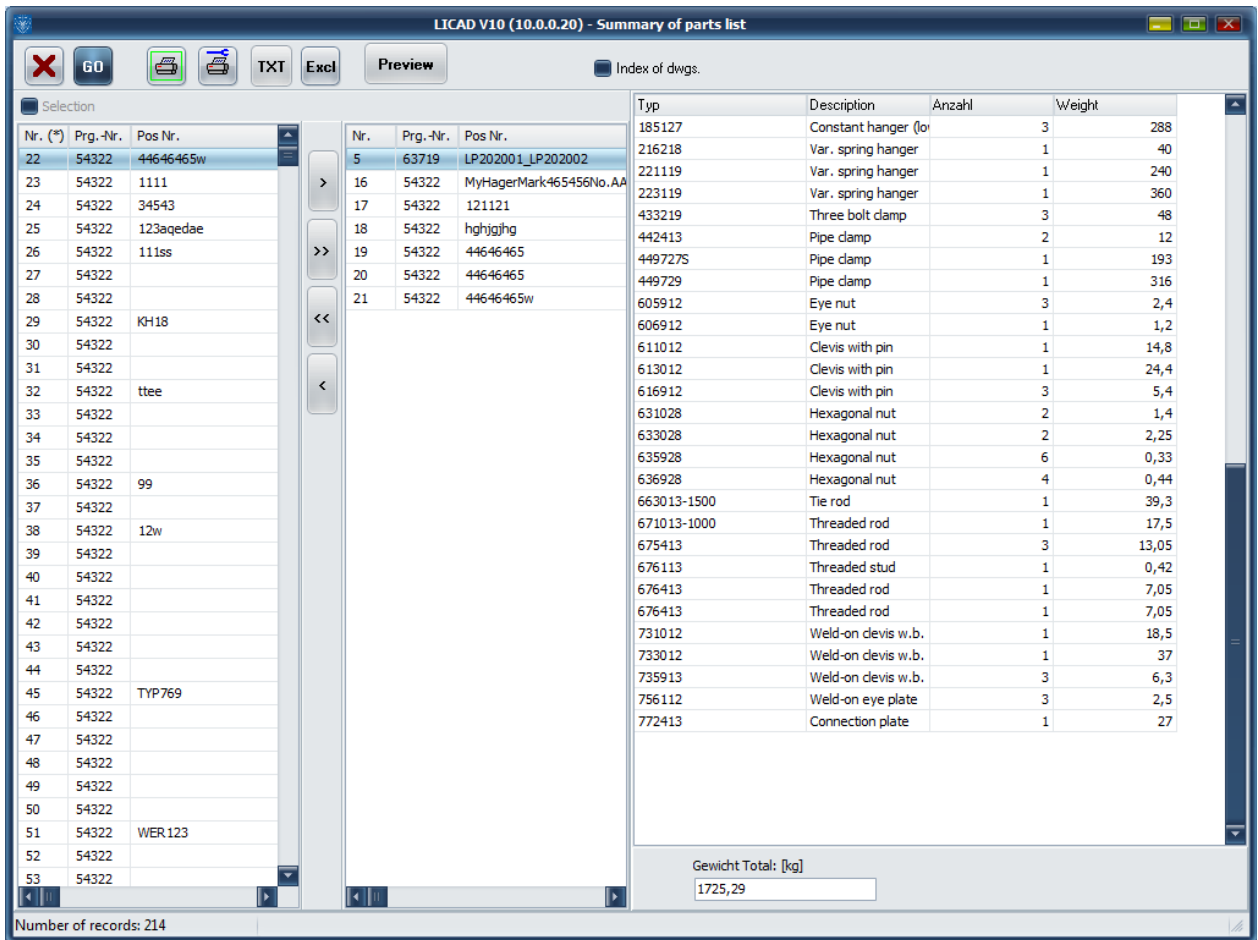


Figure 37: Creating hanger data list

The entries can be made as described under 4.19. A preview will be created via the button 'Print' (Figure 37).

Hanger list													
LICAD Dwg. n°	Hanger mark	Type	Description	Spring Rate	Horizontal	Lateral	Vertical	Blocking	F (H)	F (B)	Count	Weight/Total	Prets/Total
16-3-4322	M/Hager/Mark465456No_AAAA AAAAAAA 121121	221119	Var. spring hanger	2133.33	0	0	2	25	102.94	107.21	1	485.20	4711.70
17-3-4322		223119	Var. spring hanger	3200	0	0	0	44	223.8	223.8	1	778.95	6222.00
19-3-4322	44646465	185127	Constant hanger (low design)	0	0	0	44	59	0	15.21	1	119.36	83.40
20-3-4322	44646465	185127	Constant hanger (low design)	0	0	0	44	59	0	15.21	2	119.36	83.40
21-3-4322	44646465w	185127	Constant hanger (low design)	0	0	0	44	59	0	15.21	1	119.36	83.40
22-3-4322	44646465w	185127	Constant hanger (low design)	0	0	0	44	59	0	15.21	1	119.36	83.40
5-3-43719	LP202001_LP202002	216218	Var. spring hanger	266.67	0	0	22	41	18.54	24.41	1	51.64	313.35
												1780.23	11580.65

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Figure 38: An example for a hanger data list

Only drawing with variable spring hangers or with constant hangers will be taken into account.

Note: So-called QuickReport files can be opened and viewed via the QReport Editor. Refer to chapter Fehler! Verweisquelle konnte nicht gefunden werden..

5 Additional sub-programs (interfaces)

5.1 ASCII-/DXF interfaces export

With this software interface drawings and parts lists can be transferred to other programs. To this aim, three files are set up and put in the LICAD in any directory. The program is accessed via the DXF button from the main screen.

The selection of drawings proceeds as described under Point 4.19. The selection of the target directory is made from the righthand window. If required, a new directory can be set up here. For this, enter the name of the directory to be created in the lower righthand entry field and click on the button lying to the right or press the Return key after entering the new directory name.

The drawings are exported in the so-called DXF format. Besides the support drawing, the bill of material and other components can be transferred in DXF format (see below).

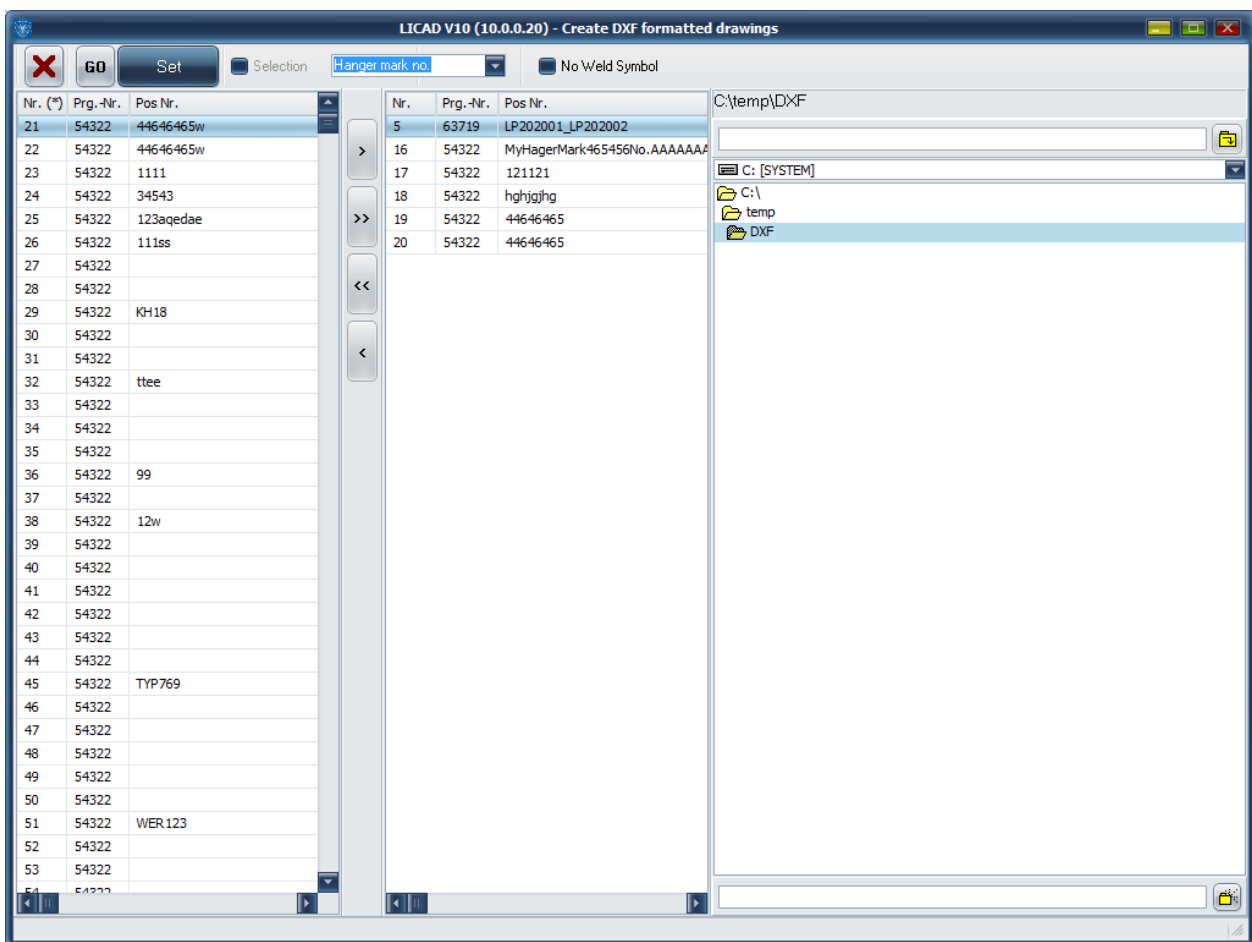


Figure 39: Exporting graphics

The file objects are unscaled, i.e., they are on a scale of 1:1.

Note: The insertion point of the graphic can be altered via the X/Y coordinates.

The file name consists of two parts. The file name can be formed either from the LICAD drawing number or the support number. (The first part is formed of the five-digit counting number of the drawing plus the last three numbers of the LICAD program number. As a second part, the so-called extension, '.DXF', '.STL' or '.TEC' is added.) The parts list (ending '.STL') and the technical reference data file (ending '.TEC') are set up in the ASCII format and can be processed with a word-processing editor.

The following files are created for each drawing

- DXF: contains the graphic
- TEC: contains all technical attributes of a drawing
- STL: parts list, without headings
- TXT: as STL, but with headings

Whether an STL or TXT file is created depends on settings for DXF export.

Before the DXF file is set up, the values for the *Layer*, *Color* and *Text Height* can be set in the 'DXF.CFG' file.

In the options box a number of components can be activated that are transferred to the CAD system as graphic elements with the DXF file. If the 'Use options' box is set, the bill of material is also transferred in

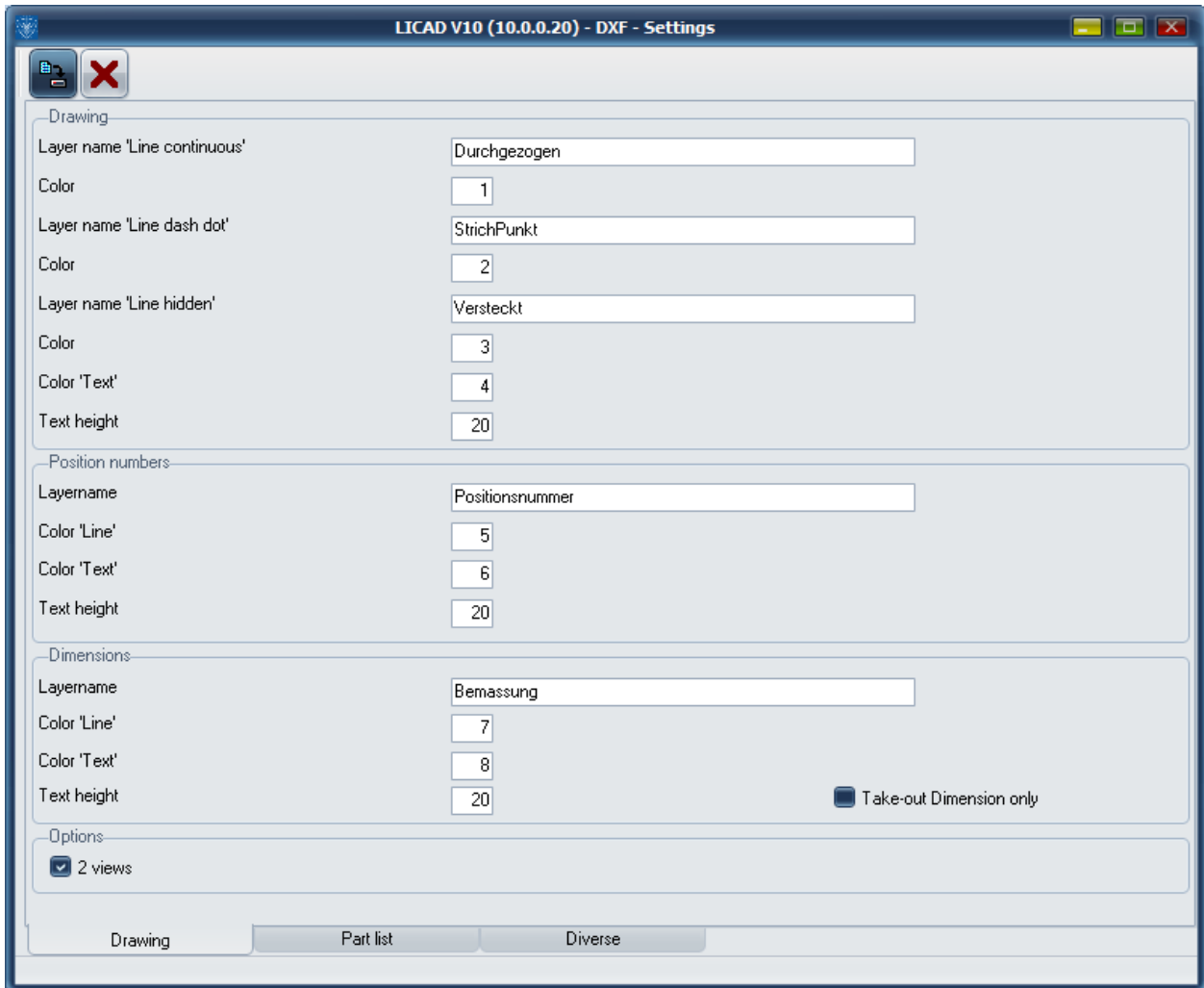


Figure 40: Settings for the **DXF-Export**

any case.

All inputs must be set for the DXF transfer ! If inputs are missing, the program will notify the user accordingly.

Note: Via the switch 'Only total installation height' it can be decided whether the dimensioning of the support is to be provided with or without the individual components.

5.2 3D-representation of supports in MicroStation

In cooperation with the company Intergraph (Deutschland) GmbH a possibility has been created to represent three-dimensionally supports produced by LICAD in the CAD system MicroStation.

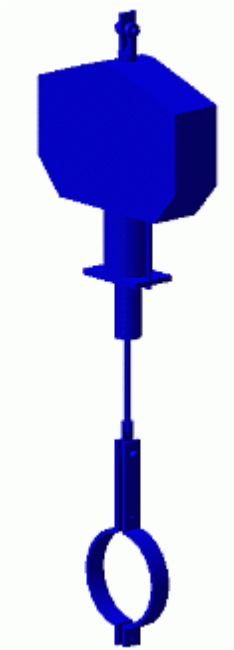
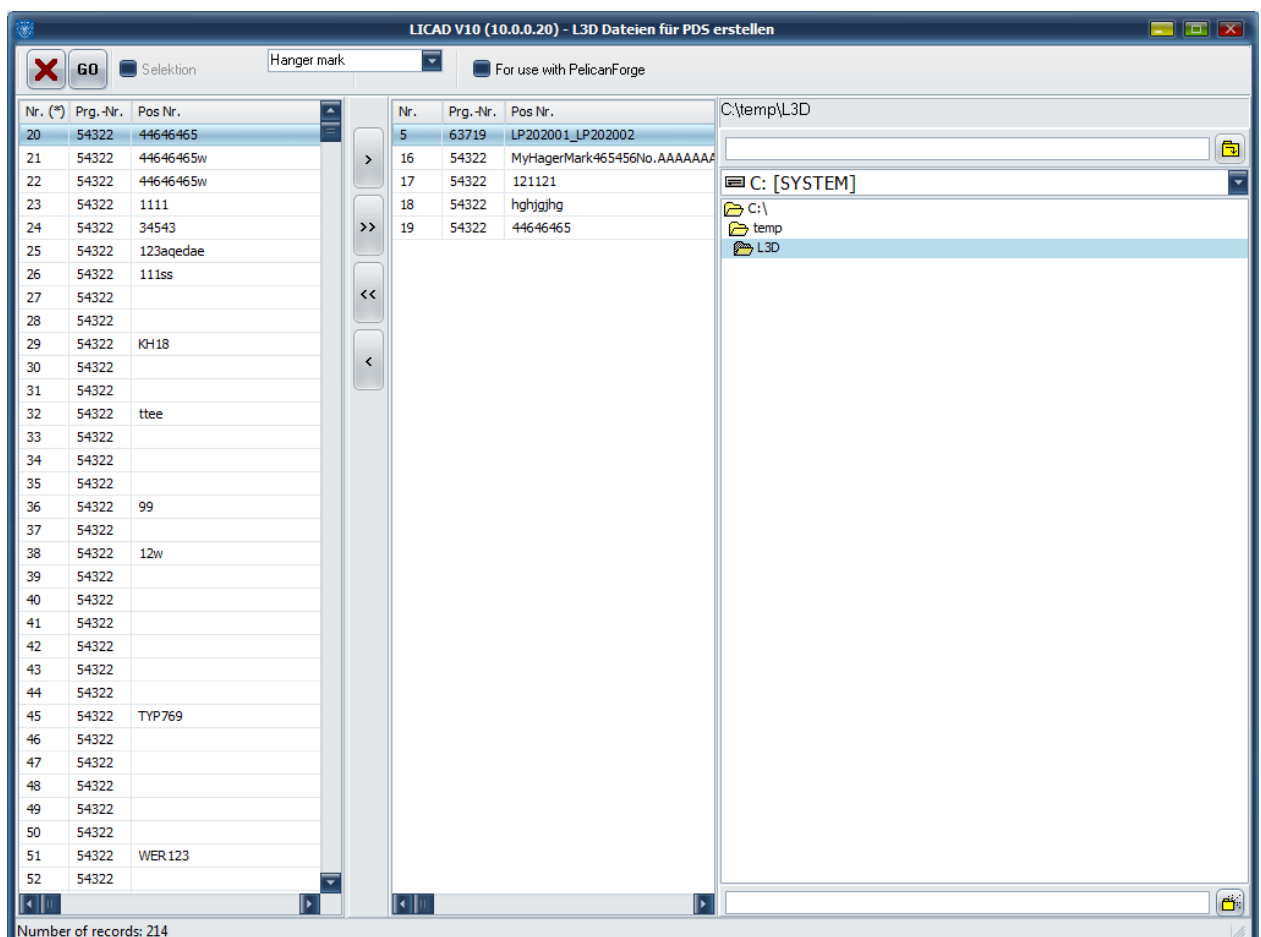


Figure 41: Example of a support in PDS

For this, the IL 3 module is to be additionally installed. This is can be directly downloaded from the LISEGA website.



The files PDS/VERS2010/IL3V2010D.MA or PDS/VERS2010/IL3V2010E.MA are the module in German or English.

One of these files is to be copied into the directory USTATION/MDLAPPS (or both). Please take further information from the information file IL3_E.DOC.

The transfer of information from LICAD to MicroStation is made via so-called L3D files. The program item relating to the creation of L3D files can be found in the file menu on the main screen. The procedure is the same as under 4.19. Press the 'Go' button to create L3D files.

Note: The transfer files can also be generated directly after creation in the design result window (Point xx) by accessing the file menu.

The 'MDL Applications' window in MicroStation is to be opened. (Load the IL3 module IL3V2010D or IL3V2010E.)

In the window then appearing (see Figure 43) press the button 'Import LICAD supports'.

Figure 43: Main mask of the IL 3 module

In the Dialog window that appears you can select a number of drawings and then import them together. Please pay attention that the drawings to be imported are present in the lower list 'Selected drawings'. If necessary, switch to the directory with the L3D files created under LICAD beforehand. To transfer the desired drawings to the lower list, select the corresponding L3D file from the upper left-hand list and press the 'Add' button at the bottom right or make a double click on the L3D file in the upper list.

The import starts when you press the 'Done' button.

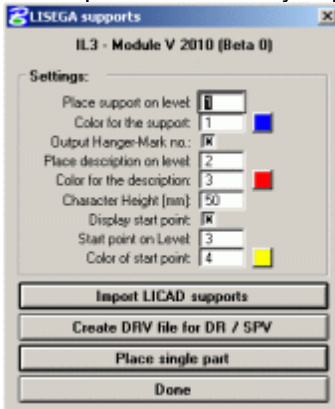


Figure 44: IL3 module file selection window

A listing of an L3D file is shown in the appendix (see section 0).

5.2.1 Connection to Intergraph Design or Smart Plant Review

With the aid of the button 'Create DRV file for DR / SPV' in the IL3 module, a DRV file is generated. In this way it is possible to select a support in the Design or Smart Plant Review programs and view the relevant support data.

In this way the relevant information from the maker can be displayed in the Design Review and SmartPlant Review programs together with the selected supports.

Note : A support is put together as a cell. Additional attributes are allocated to this cell which then make the creation of a DRV file possible. If the cell is dismantled, the attributes are deleted. No information is therefore available for the support in Design or Smart Plant Review.

5.2.2 Placing a single component

Press the button of the same name in the start mask (see Figure 45) of the IL3 module; you come to the following input screen :

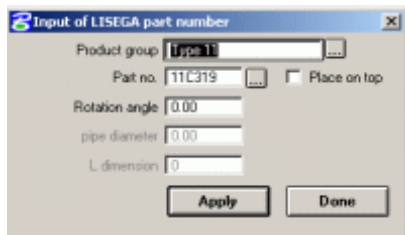


Figure 45: Single component selection in the IL3 module

Here you can select the component to be displayed or enter it directly into the 'Article number' field. The options are opened or closed according to the component.

Note : Components inserted in this way are not considered in the creation of a DRV file.

5.2.3 Settings in the IL3 module

It can be determined on what level the support, the hanger mark number and the starting point (the centre of pipe at the clamp) are to be drawn. The color can also be set separately. For the hanger mark number and the starting point it can also be determined whether they are to be drawn at all.

The settings made are noted by the module in the file ' IL3V2010.CFG'. This file is normally stored in the directory where the module files IL3V2010D.MA or IL3V2010E.MA are located. Via MicroStation you can determine configuration variable 'IL3CFGDIR' or environment variable 'IL3CFGIR' on another directory.

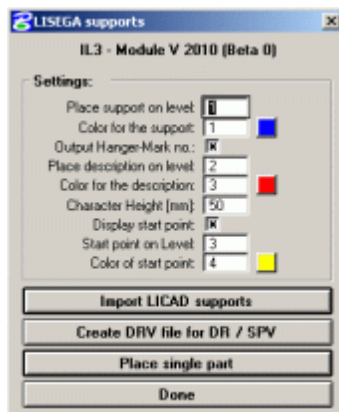


Figure 46: Main mask of the IL 3 module

5.3 3D-representation of supports in PDMS

For the CAD system 'PDMS' by AVEVA an interface has been developed which permits the three-dimensional representation of supports.

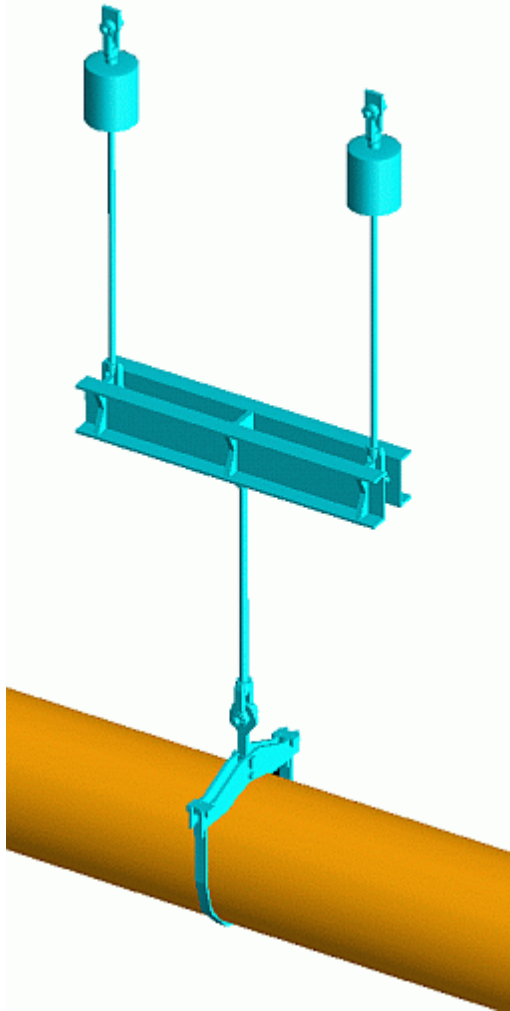


Figure 47: Support example in PDMS

This interface consists of a LISEGA catalog (included in the CD under /PDMS or can be directly downloaded from the LISEGA website) and so-called LOF/PML files which are created by LICAD and must be read into PDMS.

The catalog on the CD has been revised and bears the version 2. The first generation catalog is contained in this, so by updating to Version 2 the information in the old catalog is not lost.

To benefit from the new catalog the option should be set on Version 2. In this case, files are created with the ending LOF (LISEGA output file).

The procedure for installation of the catalog under PDMS can be found in the provided DOC files.

Note: The transfer files can also be generated directly after creation in the design result windows (Point xx) by accessing the file menu.

The creation of PML files is to be carried out analogously to point 5.2 in the manual.

5.4 Interfaces to the SupportModeler™ (Pelican Forge)

A very convenient possibility of planning supports interactively into a 3D model is offered by the LICAD interfaces to the SupportModeler Software from Pelican Forge. The SupportModeler has interfaces to Intergraph PDS as well as Bentley PlantSpace Design Series.

5.4.1 Placing supports via the L3D interface into the SupportModeler.

To place a LISEGA support, a 'Logical Support' must first be generated. The LISEGA library must be downloaded and activated. Open an L3D file from the 'Component|Place LISEGA Assembly...' menu. The L3D files must be generated beforehand via LICAD.

Other descriptions can be found in the help file 'SupportModeler for PDS User Guide.pdf' in the chapter 'Placing LISEGA Assemblies from LICAD'.

5.4.2 Interface LICAD - SupportModeler (External Sizing Program)

Supports can be placed directly into a SupportModeler model via the 'External Sizing Program' interface. For this, the LICADV10.EXE program is required in the LICAD directory. Furthermore, ITM files must be additionally installed in the SupportModeler libraries. These tasks are taken over by the setup program located either on the website or on the CD, provided that LICAD as well as SupportModeler are already installed in the computer. A list of the files installed can be found below.

Procedure for generation of LISEGA supports

An existing project is opened in the SupportModeler. The LISEGA catalogs and SM_LISEGA_PRJ library are loaded via the SupportModeler menu 'Component|Add/Remove Vendor Libraries...'. Finally, select the 'sm_liseqa_2020' from the Library-Lookup window.

To place a support, a new support point must first be determined via 'New Support' and then a 'Logical Support' generated with the 'Pipe (and Steel)' option (accessible from the SupportModeler menu via the 'Place component' button). Select the entry '8. Run LICAD_SM.EXE' from the 'Category Lookup' window.

Eight different support variations can be selected from the components window:

- 1_Hanger hori
- 2_Hanger vert
- 3_Rigid Rod
- 4_Pipe Support
- 5_Rigi Strut
- 6_Shock Absorber
- 7_E-Bar
- 8_Roller_Saddle

The number of entry possibilities varies according to the type selected. The units displayed depend on the key-in units set in the project options.

If you enter the relevant values in the prompts window, this data will be noted by the SupportModeler in a data base. After this, click on the 'place' button. If necessary, select 'Pipe and Steel' from the Auto Placement menu and fix the installation point of the support. The LICAD window then appears. The fields with height notations are already filled and correspond to the beam connection points selected in the model as well as to the pipe midpoint. The data for load, pipe diameter, etc. are also taken over, if required, recalculated in SI or imperial units. The units set in LICAD_SM are independent of the SupportModeler settings. The adjustment possibilities are described further below.

Values such as support numbers, structural attachments, etc., can be supplemented or modified in the various LICAD window panels. Access is also available here to the whole range of LICAD options.

The support selected in LICAD is placed directly in the SupportModeler model on completion of the settings. Possible messages concerning 'incompatible connections' during generation of the drawing should be ignored by the user.

Working with different units

On installation of the LICAD interfaces, the driver files were so devised that when using the SM_LISEGA_US_2020 catalog in LICAD they are preset in imperial units.

Insofar as the SM_LISEGA_2010 catalog with metric threaded components is used, SI units are preset in LICAD. These presettings can be altered by the user in the files PARENT_SM_LISEGA_2020.ITM or PARENT_SM_LISEGA_US_2020.ITM

For this, the so-called OBJ-UNITS must be altered:

PROMPTS

```
-----  
'Metric Unit Setting  
OBJ_LEN_UNITS,           String  , MILLIMETERS  
OBJ_FORCE_UNITS,         String  , KILONEWTONS  
OBJ_TEMP_UNITS,          String  , DEG C  
  
'Imperial Unit Setting  
OBJ_LEN_UNITS,           String  , INCHES  
OBJ_FORCE_UNITS,         String  , POUNDSF  
OBJ_TEMP_UNITS,          String  , DEG F
```

Note: An apostrophe set at the start of a line makes the program ignore that line.

Files installed:

Important prerequisites for installation are: LICAD 10.2 or higher and the SupportModeler for PDS, Version 7.2 or higher, must already be installed. After successful installation the following subdirectories exist under the installation directory </Programme/SupMod/Lib/>:

```
.. /SM_LISEGA_2020  
.. /SM_LISEGA_US_2020  
.. /SM_LISEGA_2020/bmp  
.. /SM_LISEGA_US_2020/bmp  
.. /SM_LISEGA_PRJ
```

The 'SM_LISEGA_2020' and 'SM_LISEGA_US_2020' directories contain the LISEGA standard catalog 2020 and LISEGA standard catalog 2020 US. Insofar as these directories were available before installation the latest directories were entered there during installation. We recommend transfer of the files on hand during installation. In addition, the files required for the interface to LICAD (PARENT_SM_LISEGA_2020.ITM, 1_Hanger hori.ITM, 2_Hanger vert.ITM ...) are installed there.

The relevant pictures are placed in ../bmp subdirectories.

Temporary files with the ending 'ITM' are placed in the ../SM_LISEGA_PRJ. They can be deleted by the user.

The creation of PML files is to be carried out analogously to point 7.10 in the manual.

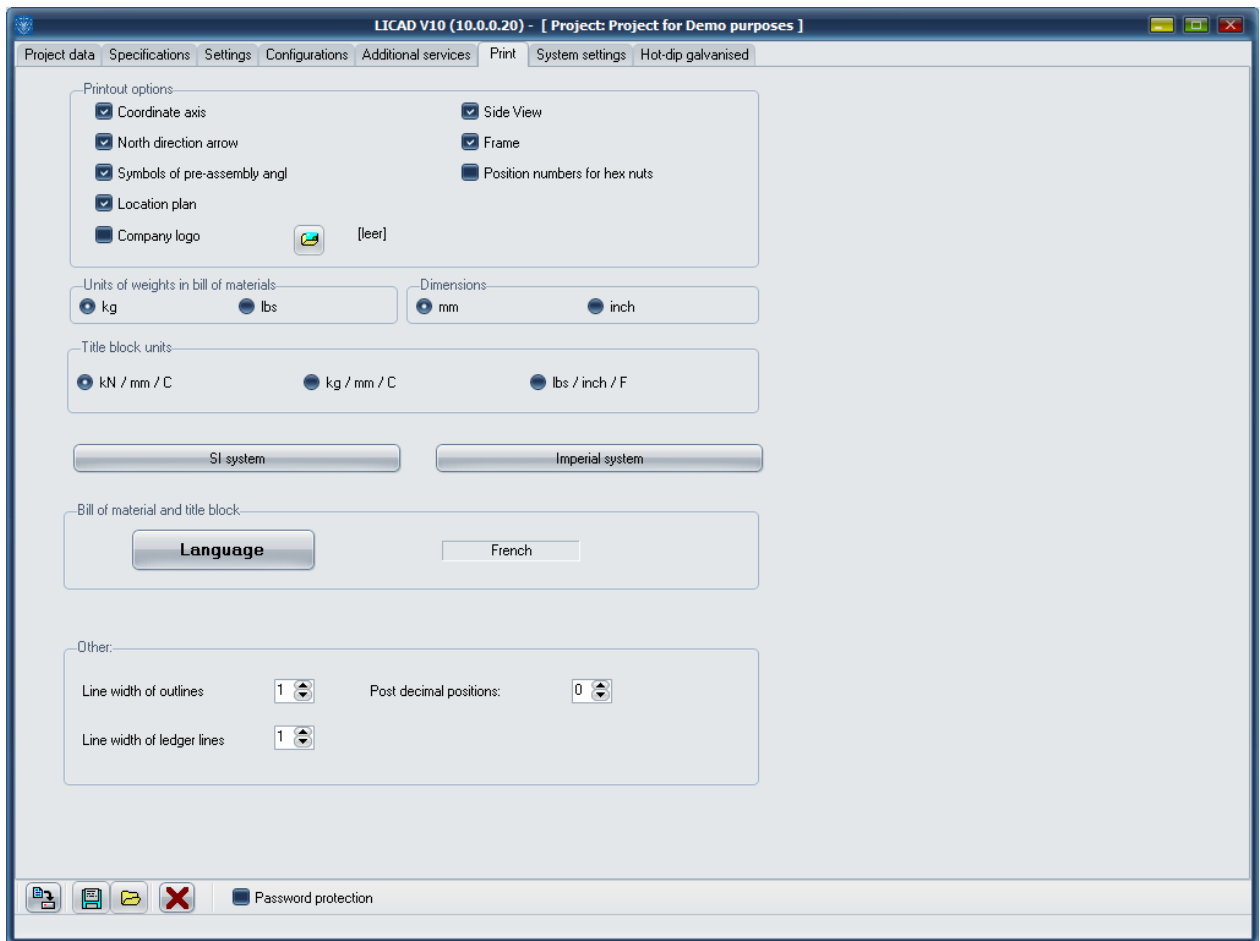


Figure 48: Option – Print – Setting Window

6 Appendix

6.1 Insertion of one's own company emblem

LICAD requires any files in Bitmap format for the so-called customer logos. These can be created and worked on with, for example, the MicroSoft Paint program.

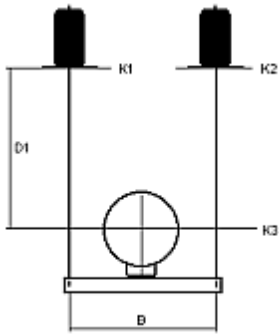
Users are free to choose the name and size of the file. The size of the graphic should however have a side ratio (breadth to height) of 1 : 4. This can be tested in Paint via the menu Picture - Attribute!

Note: The number of colours should be limited to 16.

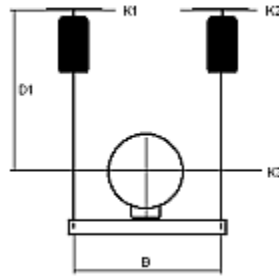
To include the logo in LICAD, call up the 'Option - Print' after starting the program (Figure 48). In the field 'printed picture' options, click on the button and look for the corresponding file name of the bitmap in the open dialog. The printing of the logo is activated by setting the switch 'company logo'.

6.2 The supports configurations (symbols)

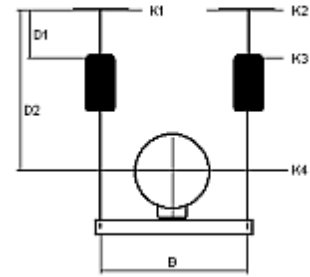
6.2.1 Configurations in the static field



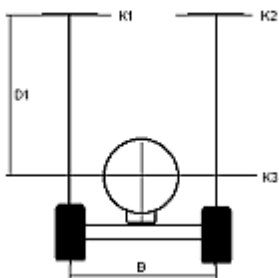
Nr. 01



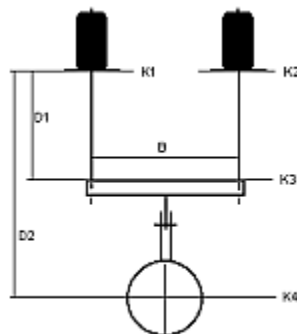
Nr. 02



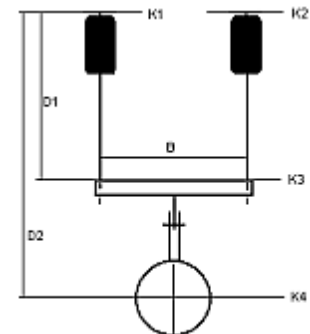
Nr. 03



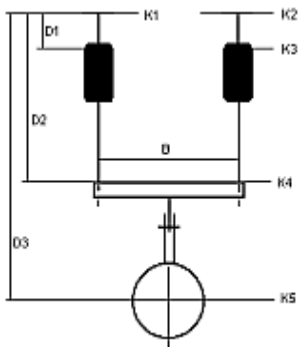
Nr. 04



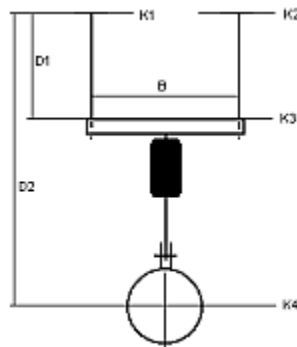
Nr. 05



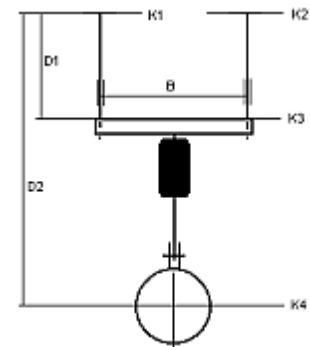
Nr. 06



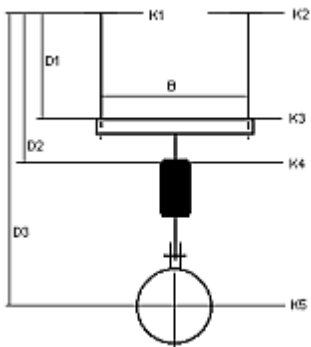
Nr. 07



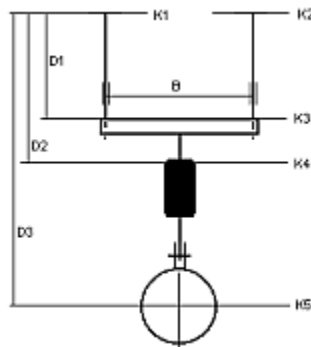
Nr. 08



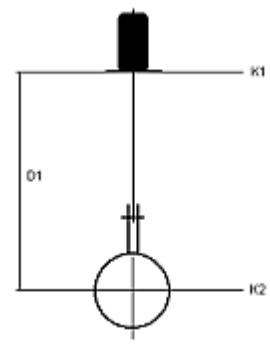
Nr. 09



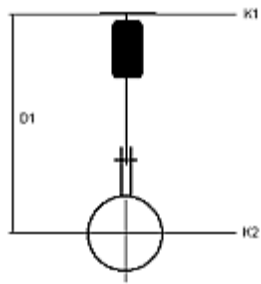
Nr. 10



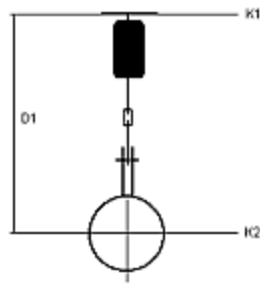
Nr. 11



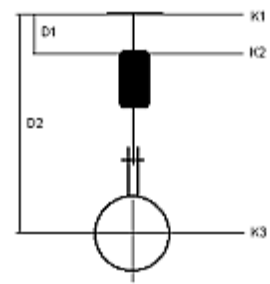
Nr. 12



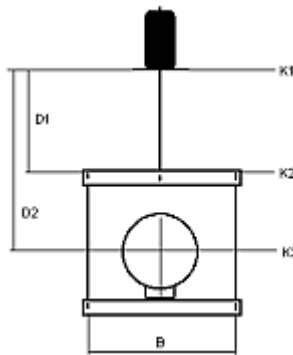
Nr. 13



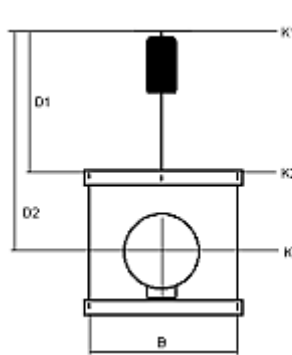
Nr. 14



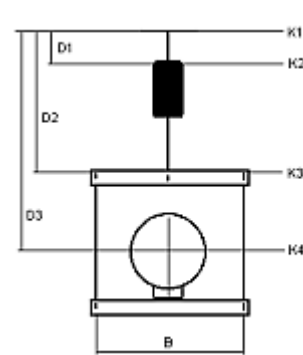
Nr. 15



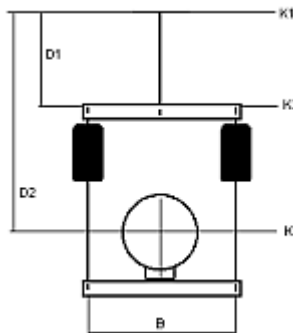
Nr. 16



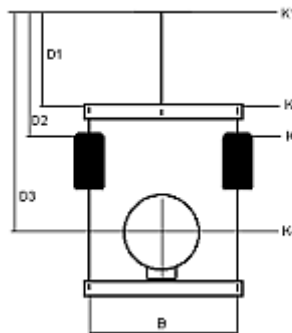
Nr. 17



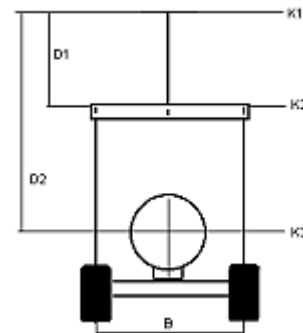
Nr. 18



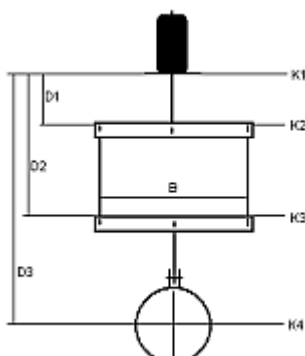
Nr. 19



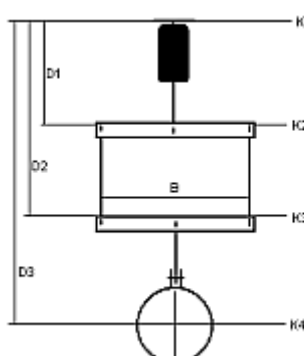
Nr. 20



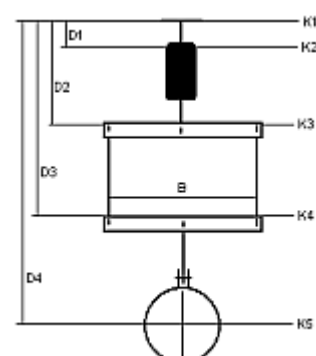
Nr. 21



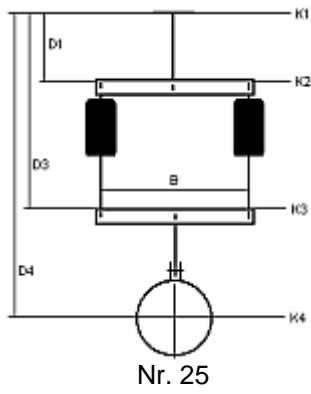
Nr. 22



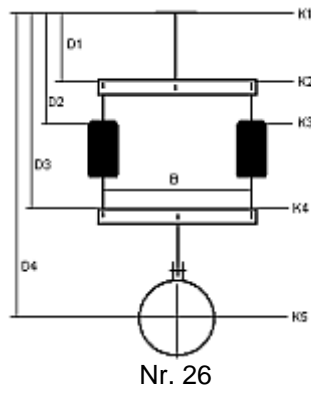
Nr. 23



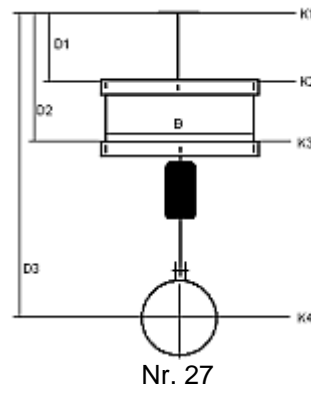
Nr. 24



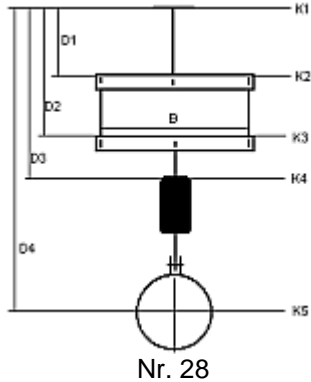
Nr. 25



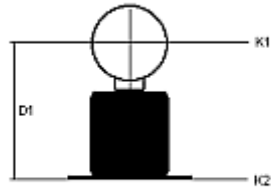
Nr. 26



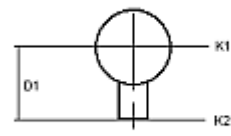
Nr. 27



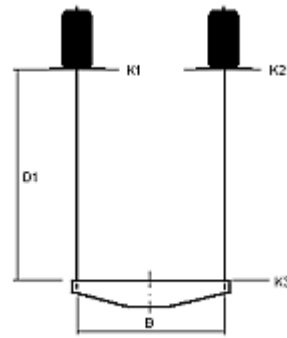
Nr. 28



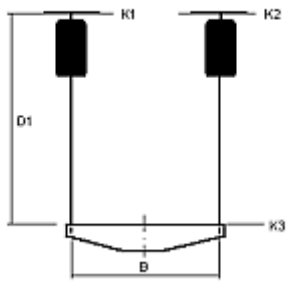
Nr. 29



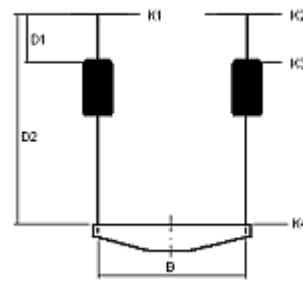
Nr. 30 *1



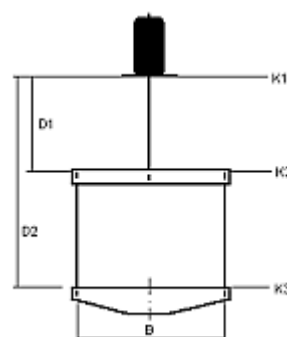
Nr. 31



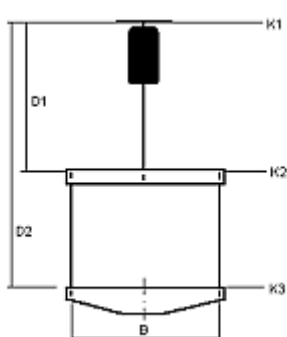
Nr. 32



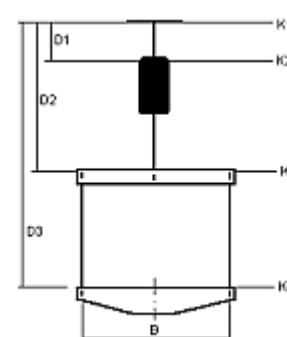
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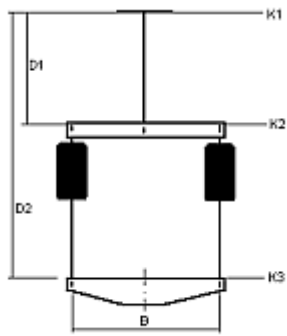
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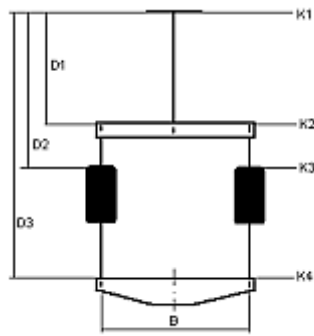
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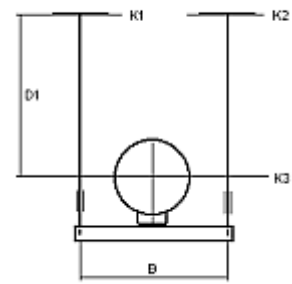
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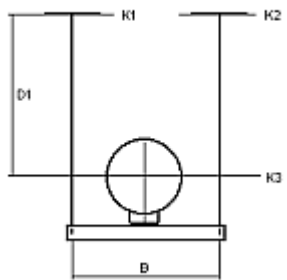
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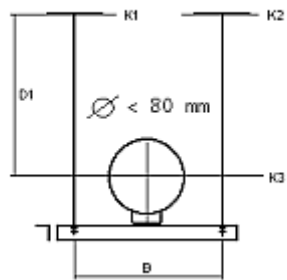
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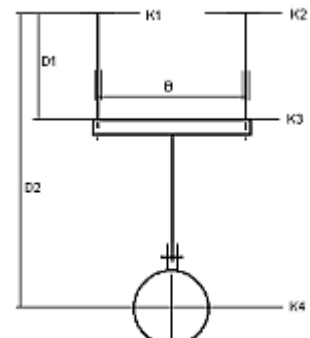
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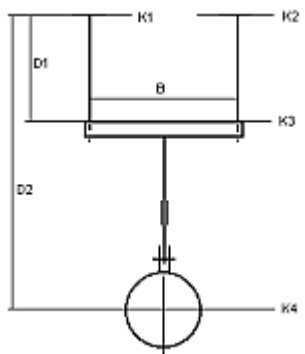
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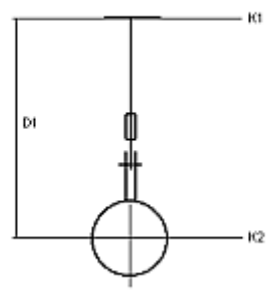
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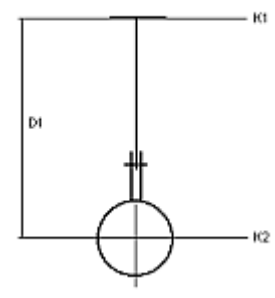
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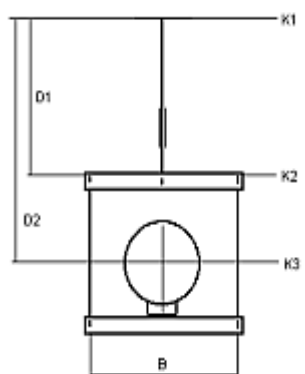
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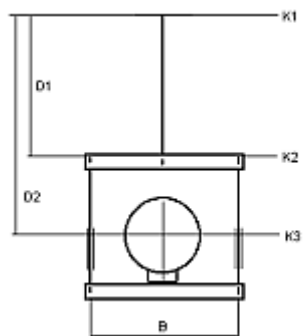
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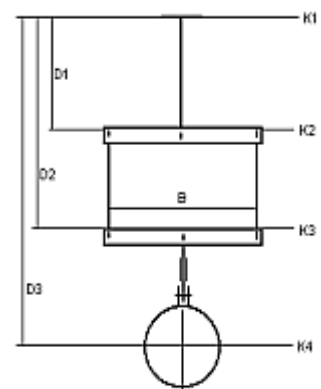
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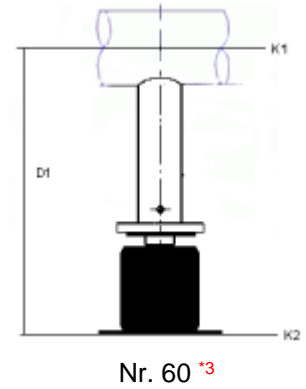
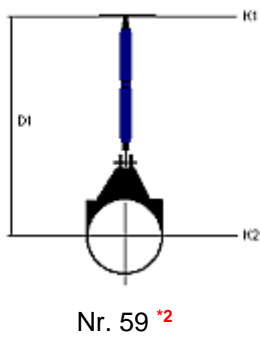
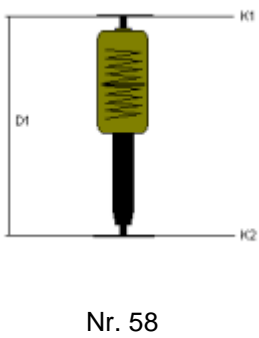
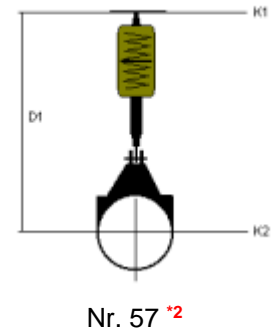
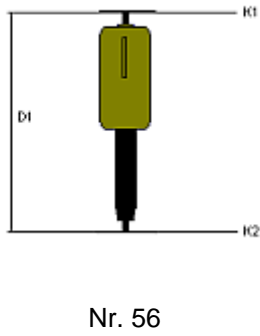
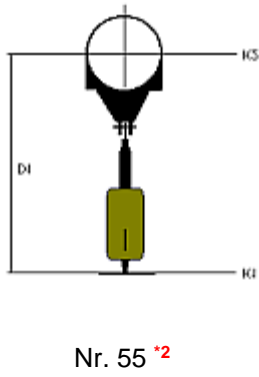
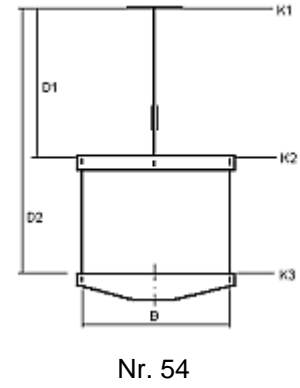
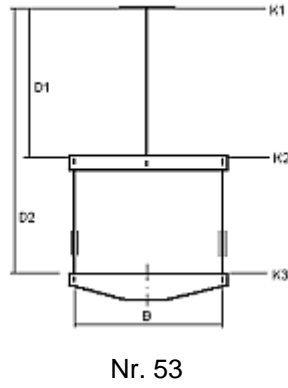
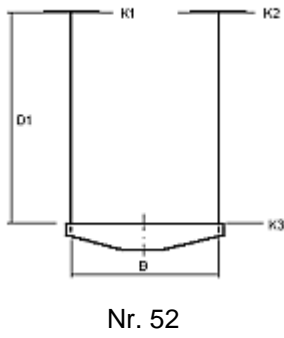
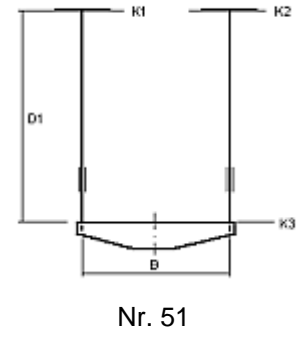
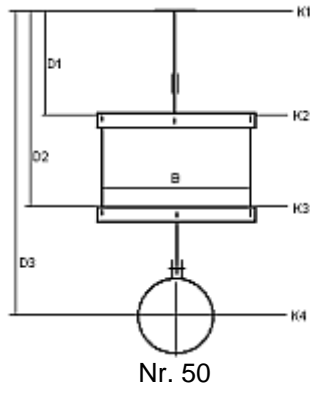
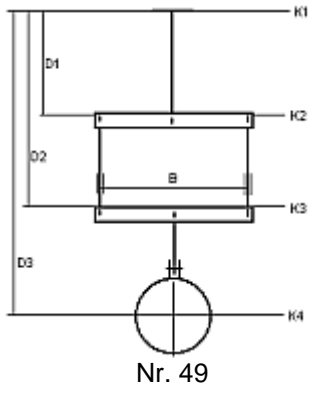
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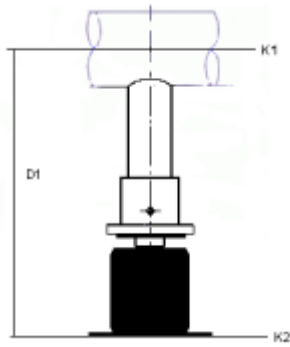


Nr. 47

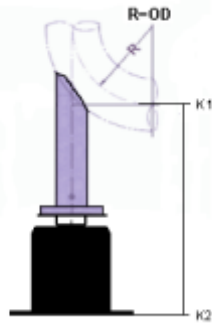


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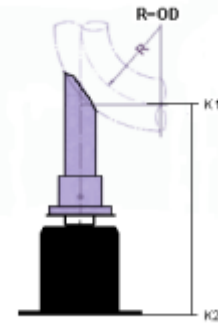




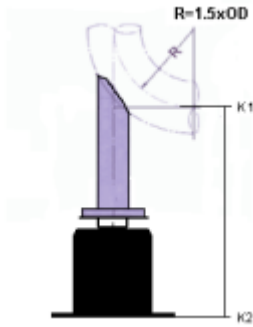
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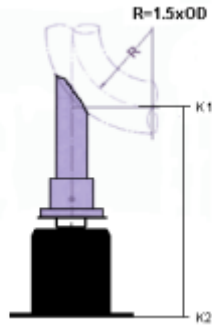
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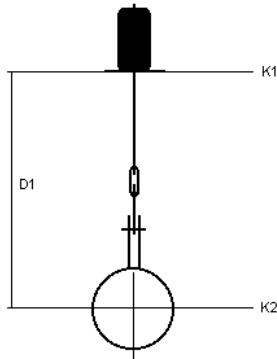
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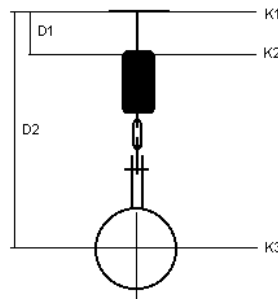
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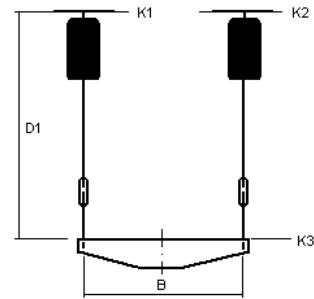
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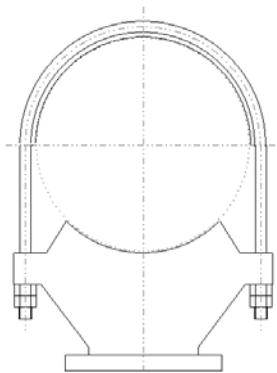
Nr. 66



Nr. 67



Nr. 68



Nr. 68

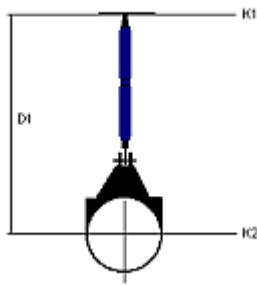
*1) In addition, for clamp base Type 49, lift-off restraints, lateral guides, or even lateral guides combined with lift-off-restraints can be selected. For lateral guides, the fields for the beam profiles and max. permissible lateral forces, or the lifting forces for lift-off restraints, must be filled out.

*2) Dynamic pipe clamps as hanger clamps: The permissible loads are calculated for dynamic operation. In special cases these dynamic pipe clamps are exposed to permanent static stress. In this case the permissible loads are reduced according to the table section, 'Error! Reference source could not be found'.

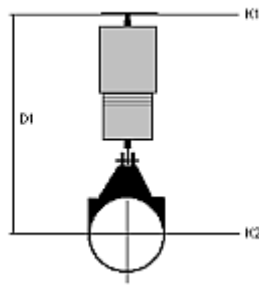
If the dynamic pipe clamps are exclusively subjected to pressure loads, the permissible loads are not reduced.

*3) These configurations are only permissible for vertical travel/loads.

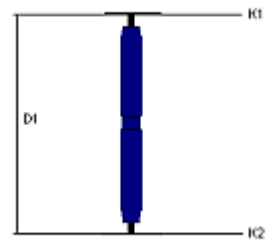
6.2.2 Configurations in the dynamic field



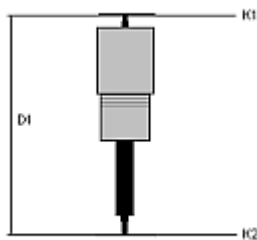
No. 01



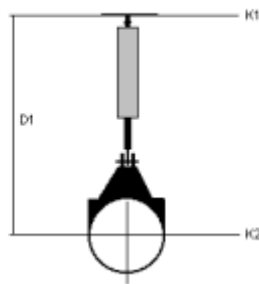
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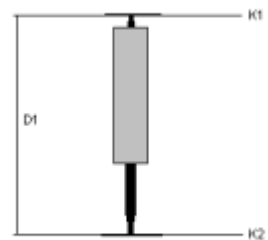
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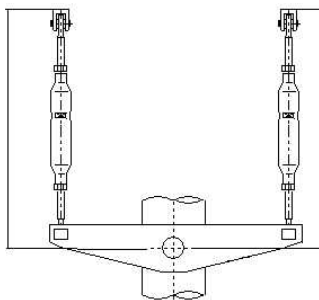
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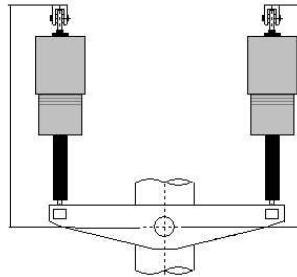
No. 05



No. 06

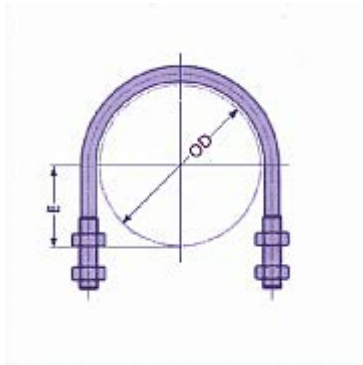


No. 07



No. 08

6.2.3 Configurations in pipe saddle and pipe bearing fields



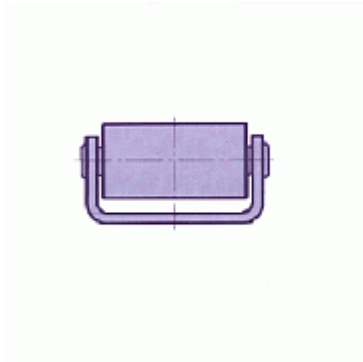
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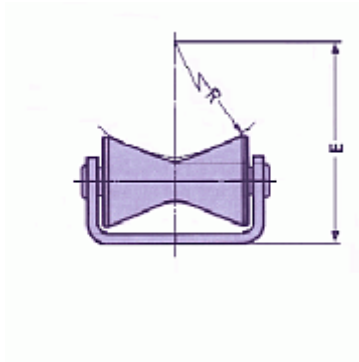
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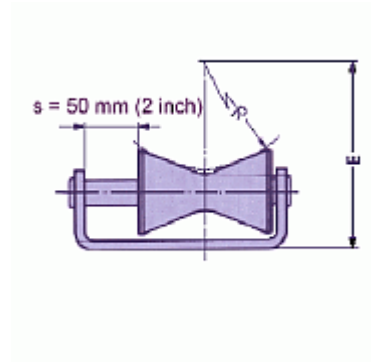
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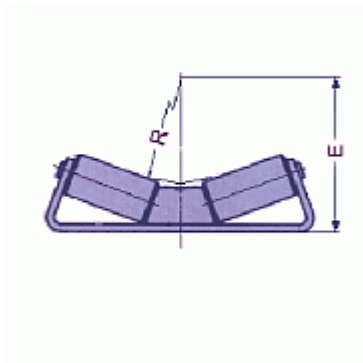
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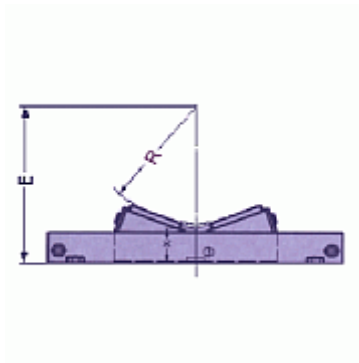
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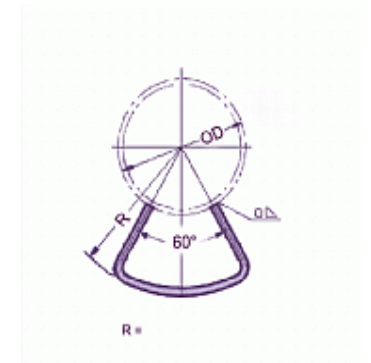
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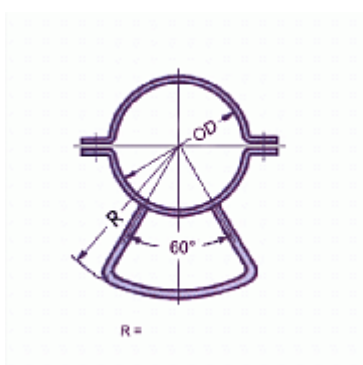
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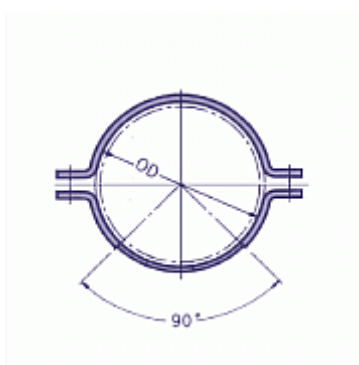
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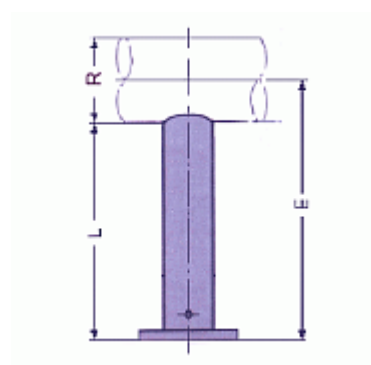
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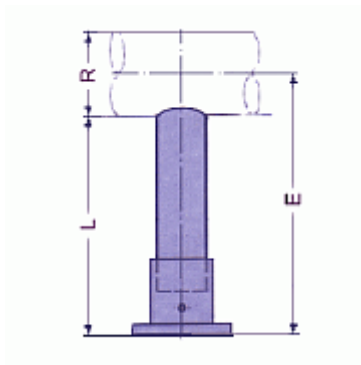
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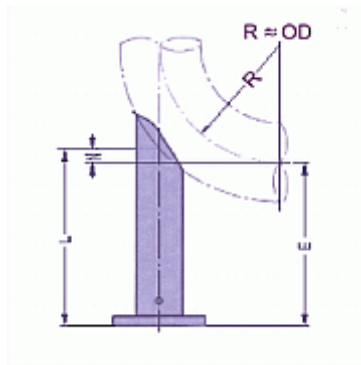
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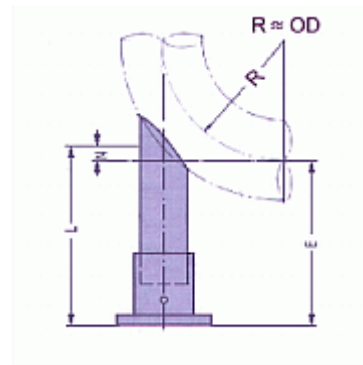
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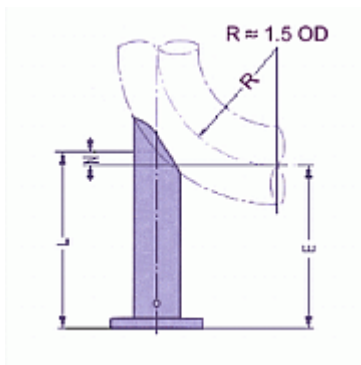
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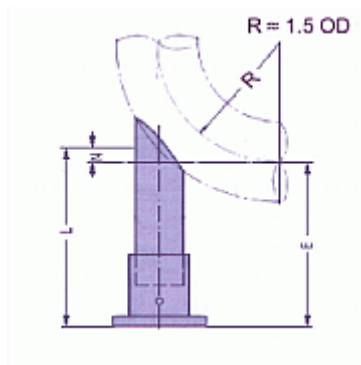
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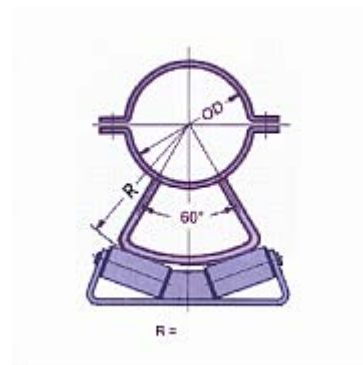
No. 15 *4



No. 16 *4



No. 17



No. 18

*4) For pipe supports Type 58, the type of load must be entered: vertical load only, sliding or fixed anchor.

6.3 LISEGA sectioning of load groups

LISEGA LOAD GROUPS	Normal Operation			Disturbed Condition		Faulted Condition	
	Nominal	H / Normal	Upset	HZ/Emergency		HS / Faulted	
		80°C	150°C	80°C	150°C	80°C	150°C
C	0,31	0,8	0,7	1,1	1,0	1,4	1,3
D	0,62	2,5	2,2	3,3	2,9	4,3	3,8
1	1,25	4,2	3,7	5,6	5,0	7,2	6,4
2	2,5	6,7	6	9	8	13,3	12
3	5	11,3	10,1	15	13,4	22,2	20
4	10	23,3	20,9	31	27,8	41	37
5	20	34	30	46	41	61	55
6	40	56	50	74	66	96	86
7	60	83	74	108	97	140	126
8	80	114	102	150	135	195	175
9	100	151	135	196	176	255	230
10	160	222	199	295	265	381	343
20	200	297	266	395	355	512	461
30	240	340	305	452	406	585	526
40	300	380	340	505	450	650	585
50	400	490	440	650	585	840	755

Table 1: LISEGA Load group sectioning - Static stress

LISEGA- LOADGROUPS	Normal/Upset Level A/B		Emergency Level C		Faulted Level D	
	80°C	150°C	80°C	150°C	80°C	150°C
1	3	2,9	4,0	3,8	5,2	5,0
2	4	3,9	5,3	5,1	6,9	6,7
3	8	7,5	10,6	9,7	13,7	12,6
4	18	16,5	23,9	22,0	31,0	28,5
5	46	44,0	61,0	58,5	77,0	74,5
6	100	94,5	141,0	127,0	180,0	162,0
7	200	175,0	267,0	239,0	336,0	301,0
8	350	339,0	472,0	423,0	655,0	588,0
9	550	535,0	735,0	715,0	935,0	910,0

Table 2: LISEGA Load group sectioning - Dynamic stress


6.4 Dynamic pipe clamps as hanger clamps

pipe temperature	permiss. permanent tension stress
up to 350°C	100%
351°C – 450°C	100%
451°C – 500°C	80%
501°C – 510°C	80%
511°C – 530°C	65%
531°C – 560°C	55%
561°C – 580°C	65%
581°C – 600°C	60%

These specifications relate to the creep strength dependent on time in the 200,000 hr range at temperature $\geq 450^\circ\text{C}$.


Figure 1: Reduced permissible loads due to permanent tensile (static) stress


6.5 Title block description of a LICAD drawing

The Calculation Note Number 0003		
My Hanger Mark Number 0001		
Input F(C) = 15,00 kN F(H) = 13,86 kN F(C) = 15,20 kN F(P) = 15,20 kN F(Hy) = 19,00 kN Later. = 2 mm Horz. = 6 mm vert. = 5 mm Ø OD = 323,9 mm Insul = 100 mm Temp. = 450 °C δ F = 10 % Spring rate = 266,7 N/mm Tot Tvl = 50 mm Preset = 31 mm eff. Weg = 5,01 mm Tvl res dn/up = 19/26 mm	Customer : REMCO Podolsk Plant / System : No information needed Any system P.O. N° : 90001-00001 Bestell-Nr. : BSTNR: 0099 Eigener Titel Eintag Project manager 18.12.2015 Herr Schulze	
		LISEGA Offer N° : 105-8-45003 258 LICAD Dwg.- N° Rev 222-3-54322 Infotext 1 Infotext 2 LISEGA SE Herr Sarnoch Drawing N° : My Drawing Number 00002 Checked:

The Calculation Note Number 0003		Calculation point number
My Hanger Mark Number 0001		Hanger mark number
Input F(C) = 15,00 kN F(H) = 13,86 kN F(C) = 15,20 kN F(P) = 15,20 kN F(Hy) = 19,00 kN		a) Input load (e.g. cold) b) Calculated hot load c) Calculated cold load d) Preset load e) Hydro test load
Later. = 2 mm Horz. = 6 mm vert. = 5 mm		Pipe movement (input)
Ø OD = 323,9 mm Insul = 100 mm Temp. = 450 °C		Pipe data
δ F = 10 % Spring rate = 266,7 N/mm Tot Tvl = 50 mm Preset = 31 mm eff. Weg = 5,01 mm Tvl res dn/up = 19/26 mm		Load deviation, spring rate, working range of hanger, preset position, total movement as result of l-, h- and v- movements, travelreserve top and bottom

03

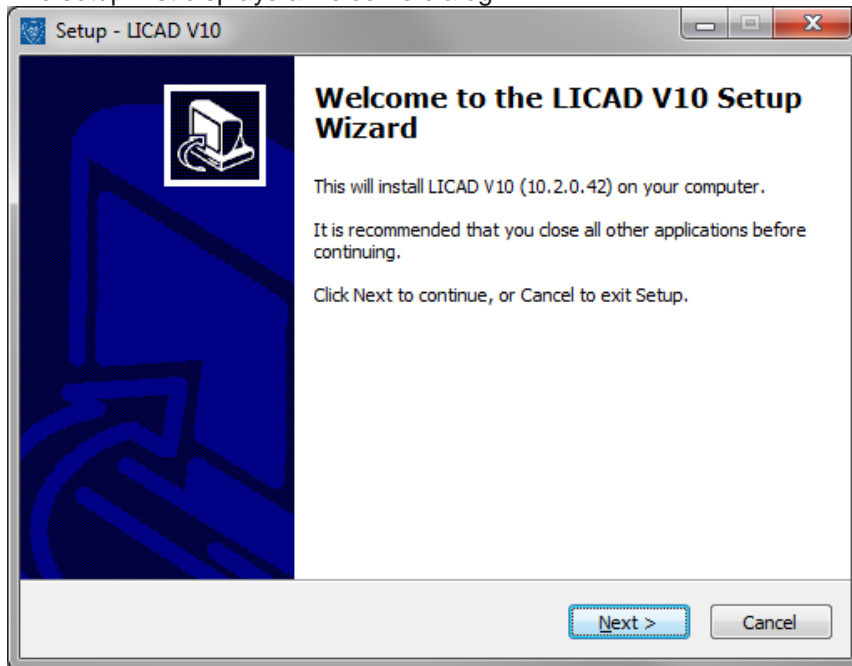
	Space for company logo
Customer : REMCO Podolsk	Customer name
Plant / System : No information needed	Plant name
Any system P.O. N° : 90001-00001	System designation
Bestell-Nr. : BSTNR: 0099	Customer commission number
Eigener Titel Eintag	Order number
Project manager 18.12.2015 Herr Schulze	Additional space for further input

	
LISEGA Offer N° : 105-8-45003 258	Additional information fields
LICAD Dwg.- N° Rev 222-3-54322	Customer drawing number
Infotext 1 Infotext 2 LISEGA SE Herr Sarnoch Drawing N° : My Drawing Number 00002	Checked by / date
Checked: _____	

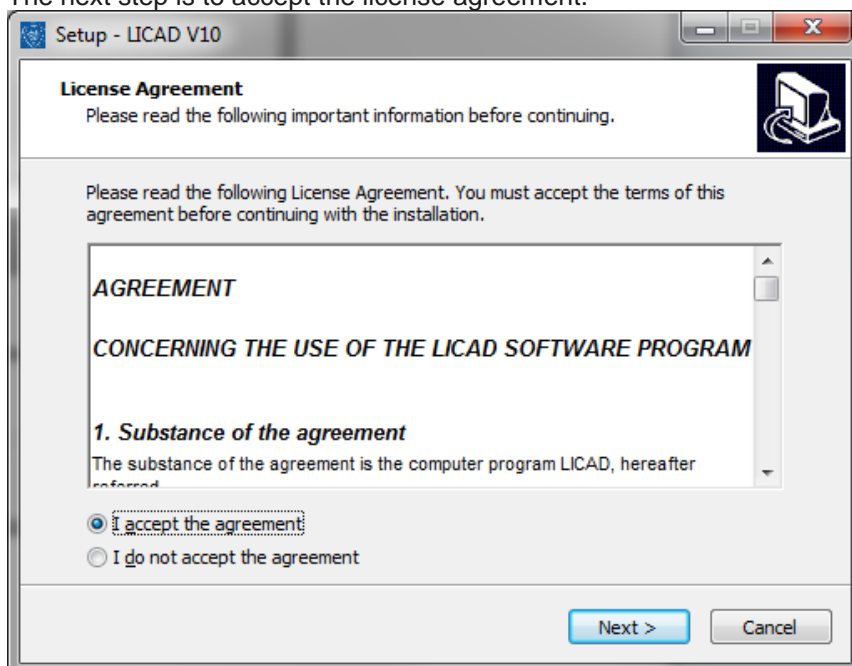
7 LICAD 10.2 Installation

NOTE: **Updating existing LICAD 10 versions (see Chapter 6.10)!**

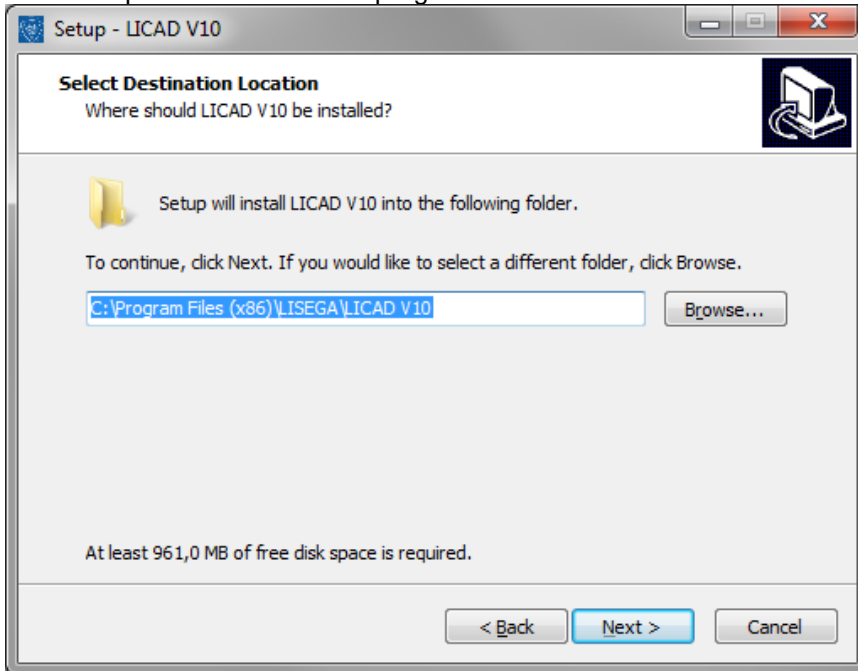
The setup first displays a welcome dialog.



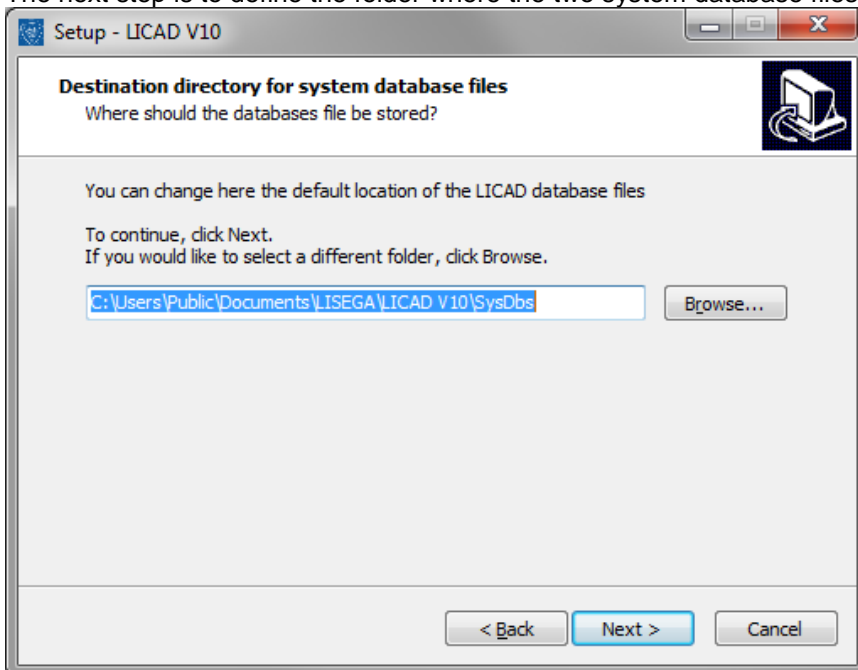
The next step is to accept the license agreement.



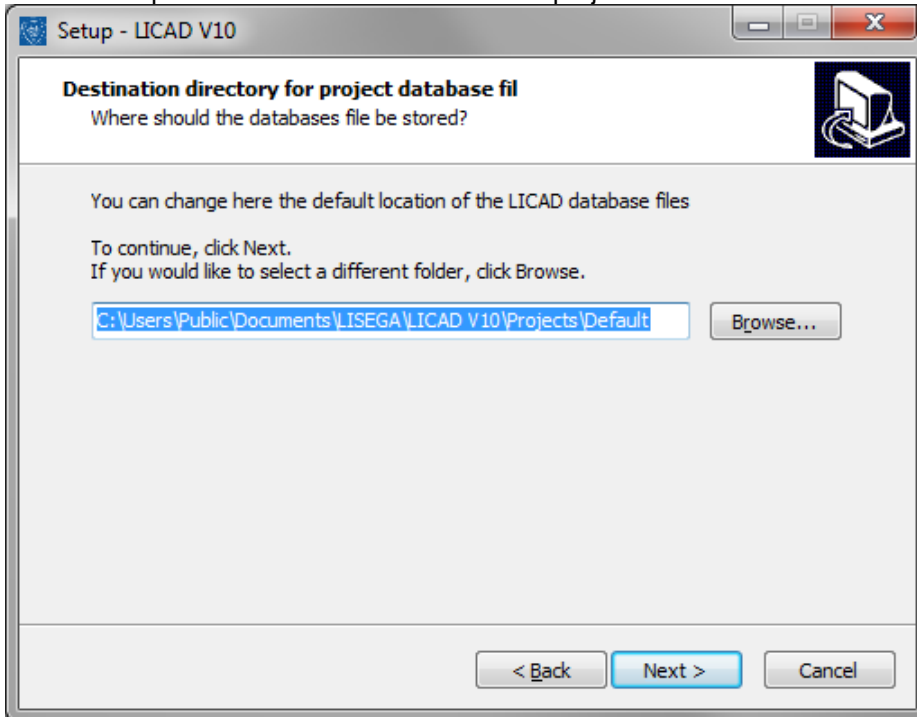
The next question is where the program files should be installed.



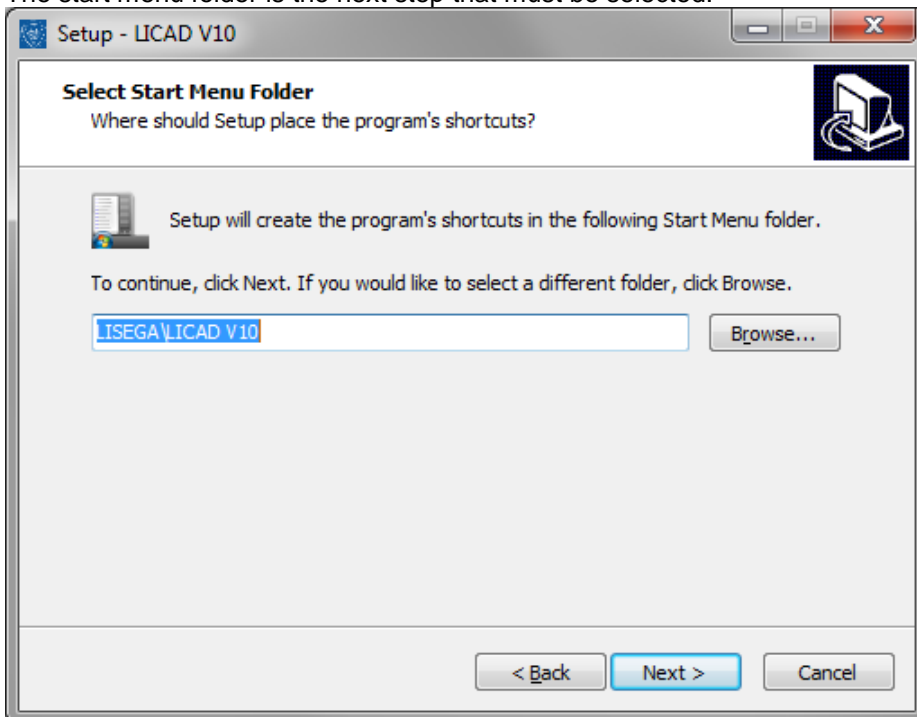
The next step is to define the folder where the two system database files should be installed.



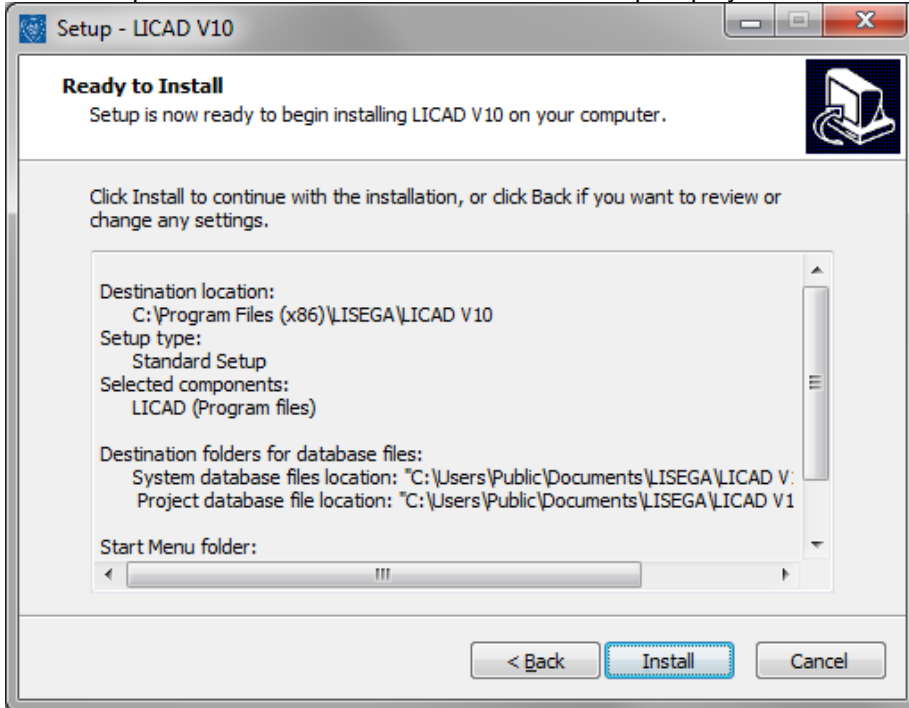
The next step is to define the folder where the project file should be installed.



The start menu folder is the next step that must be selected.

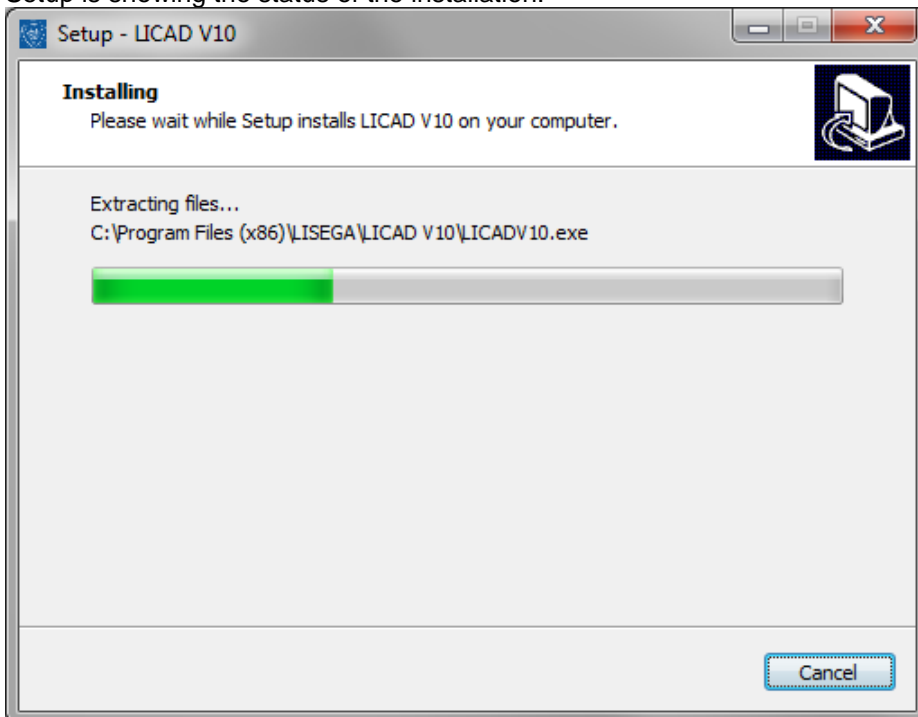


Now all required information are entered and the setup displays the chosen entries.

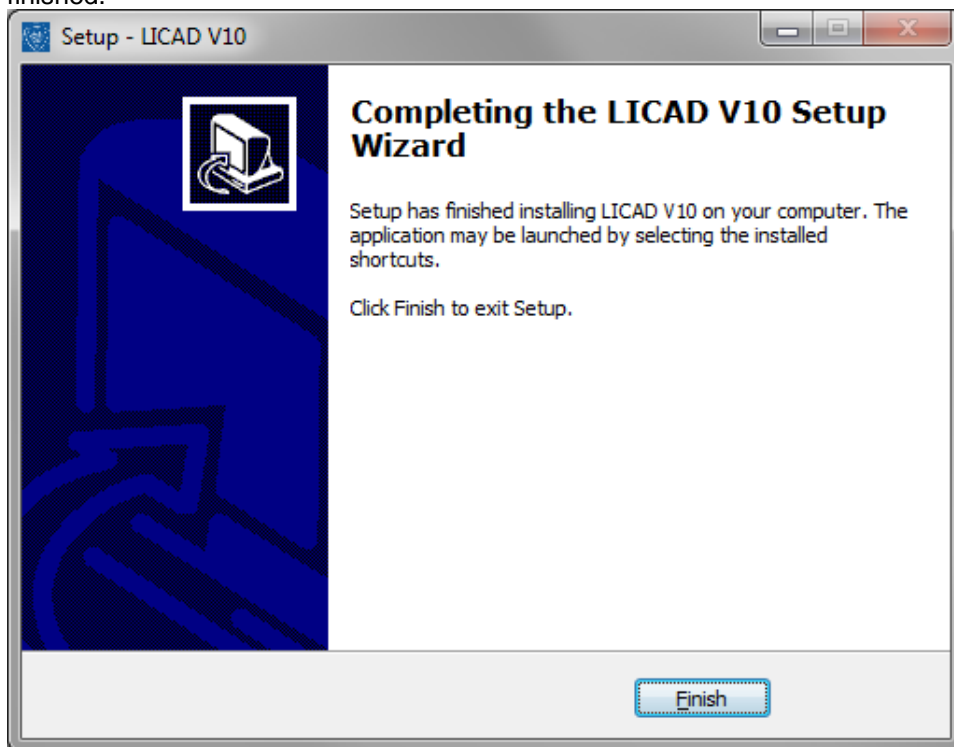


Clicking the button "Install" will start the installation.

Setup is showing the status of the installation.



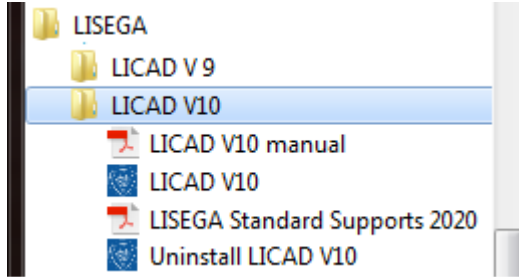
Setup is showing “Installation complete” dialog, after all files are copied and all other installation steps are finished.



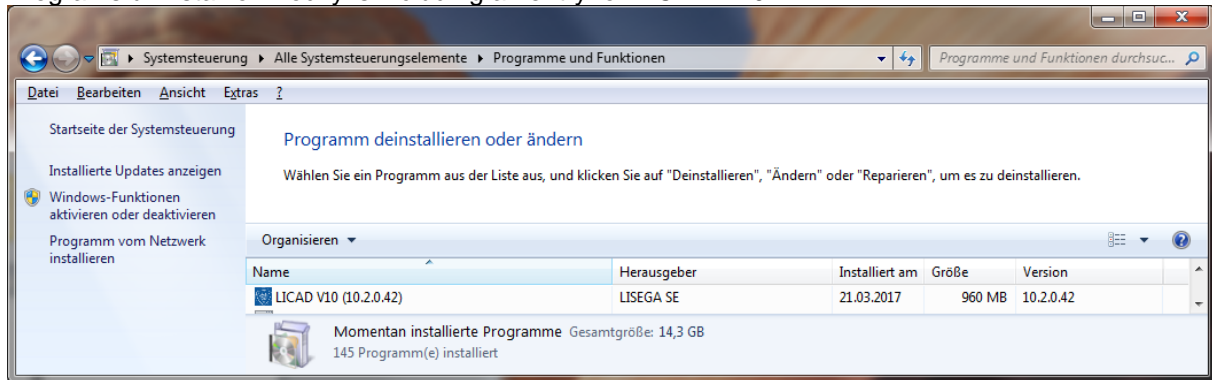
By default a Desktop Icon to launch LICAD is created.



The Start menu is extended for LICAD V10.



Programs uninstall or modify is including an entry for LICAD V10.

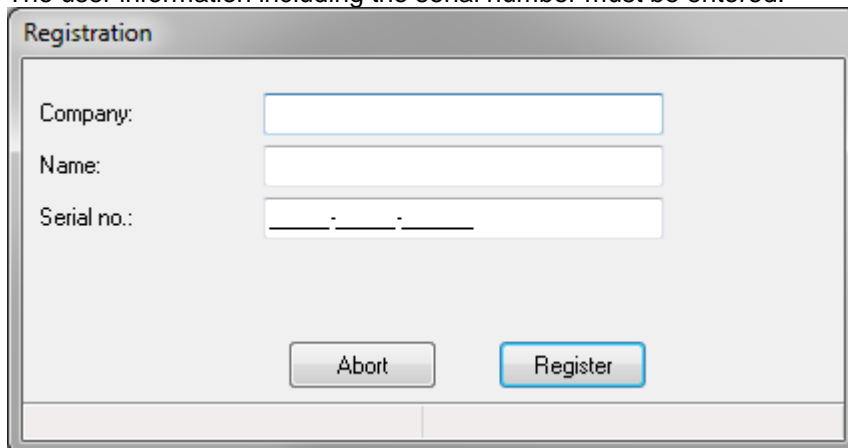


7.1.1 Setup protocol

The setup will create a log file by default in the TEMP folder of the admin user that is installing LICAD. The file is named like "Setup Log 2017-03-24 #001.txt". The default log file name can be overridden with the /LOG="file name" command line. e.g.: "LICADV10_SETUP (V 10.2.0.42).exe" /LOG=C:\temp\licad10_2_setup.log

7.2 Starting LICAD the first time

The user information including the serial number must be entered.



This dialog will be shown for each user starting LICAD the first time. Each user must enter its own serial number. Two users with the same serial number aren't possible.

7.3 Setup command line parameters

The LICAD setup was created with Inno Setup, so all default Inno Setup command line parameters can be used and two new parameters for LICAD V10.2 were added.

7.3.1 LICAD V10.2 specific command line parameters

/SYS_DBS_FOLDER = "x:\dirname"

Overrides the default directory name displayed on the *Select Systemdatabase files Destination Location* wizard page. A fully qualified pathname must be specified.

/PRJ_DB_FOLDER = "x:\dirname"

Overrides the default directory name displayed on the *Select project database file Destination Location* wizard page. A fully qualified pathname must be specified.

7.3.2 Default Inno Setup command line parameters

NOTE: The following information is taken from the help of Inno Setup!

The Setup program accepts optional command line parameters. These can be useful to system administrators, and to other programs calling the Setup program.

/HELP, /?

Shows a summary of this information. Ignored if the UseSetupLdr [Setup] section directive was set to no.

/SP-

Disables the *This will install... Do you wish to continue?* prompt at the beginning of Setup. Of course, this will have no effect if the DisableStartupPrompt [Setup] section directive was set to yes.

/SILENT, /VERYSILENT

Instructs Setup to be silent or very silent. When Setup is silent the wizard and the background window are not displayed but the installation progress window is. When a setup is very silent this installation progress window is not displayed. Everything else is normal so for example error messages during installation are displayed and the startup prompt is (if you haven't disabled it with DisableStartupPrompt or the '/SP-' command line option explained above).

If a restart is necessary and the '/NORESTART' command isn't used (see below) and Setup is silent, it will display a *Reboot now?* message box. If it's very silent it will reboot without asking.

/SUPPRESSMSGBOXES

Instructs Setup to suppress message boxes. Only has an effect when combined with '/SILENT' or '/VERYSILENT'.

The default response in situations where there's a choice is:

- Yes in a 'Keep newer file?' situation.
- No in a 'File exists, confirm overwrite.' situation.
- Abort in Abort/Retry situations.
- Cancel in Retry/Cancel situations.
- Yes (=continue) in a DiskSpaceWarning/DirExists/DirDoesntExist/NoUninstallWarning/ExitSetupMessage/ConfirmUninstall situation.
- Yes (=restart) in a FinishedRestartMessage/UninstalledAndNeedsRestart situation.

5 message boxes are not suppressible:

- The About Setup message box.
- The Exit Setup? message box.
- The FileNotInDir2 message box displayed when Setup requires a new disk to be inserted and the disk was not found.
- Any (error) message box displayed before Setup (or Uninstall) could read the command line parameters.
- Any message box displayed by [Code] support function MsgBox.
- **/LOG**
- Causes Setup to create a log file in the user's TEMP directory detailing file installation and [Run] actions taken during the installation process. This can be a helpful debugging aid. For example, if you suspect a file isn't being replaced when you believe it should be (or vice versa), the log file will tell you if the file was really skipped, and why.
- The log file is created with a unique name based on the current date. (It will not overwrite or append to existing files.)
- The information contained in the log file is technical in nature and therefore not intended to be understandable by end users. Nor is it designed to be machine-parsable; the format of the file is subject to change without notice.
- **/LOG="filename"**
- Same as /LOG, except it allows you to specify a fixed path/filename to use for the log file. If a file with the specified name already exists it will be overwritten. If the file cannot be created, Setup will abort with an error message.
- **/NOCANCEL**
- Prevents the user from cancelling during the installation process, by disabling the Cancel button and ignoring clicks on the close button. Useful along with '/SILENT' or '/VERYSILENT'.
- **/NORESTART**
- Prevents Setup from restarting the system following a successful installation, or after a *Preparing to Install* failure that requests a restart. Typically used along with /SILENT or /VERYSILENT.
- **/RESTARTEXITCODE=exit code**
- Specifies a custom exit code that Setup is to return when the system needs to be restarted following a successful installation. (By default, 0 is returned in this case.) Typically used along with /NORESTART. See also: [Setup Exit Codes](#)
- **/CLOSEAPPLICATIONS**
- Instructs Setup to close applications using files that need to be updated by Setup if possible.
- **/NOCLOSEAPPLICATIONS**
- Prevents Setup from closing applications using files that need to be updated by Setup. If /CLOSEAPPLICATIONS was also used, this command line parameter is ignored.
- **/FORCECLOSEAPPLICATIONS**
- Instructs Setup to force close when closing applications.
- **/NOFORCECLOSEAPPLICATIONS**
- Prevents Setup from force closing when closing applications. If /FORCECLOSEAPPLICATIONS was also used, this command line parameter is ignored.
- **/RESTARTAPPLICATIONS**
- Instructs Setup to restart applications if possible. Only has an effect when combined with '/CLOSEAPPLICATIONS'.
- **/NORESTARTAPPLICATIONS**
- Prevents Setup from restarting applications. If /RESTARTAPPLICATIONS was also used, this command line parameter is ignored.
- **/LOADINF="filename"**
- Instructs Setup to load the settings from the specified file after having checked the command line. This file can be prepared using the '/SAVEINF=' command as explained below.
- Don't forget to use quotes if the filename contains spaces.

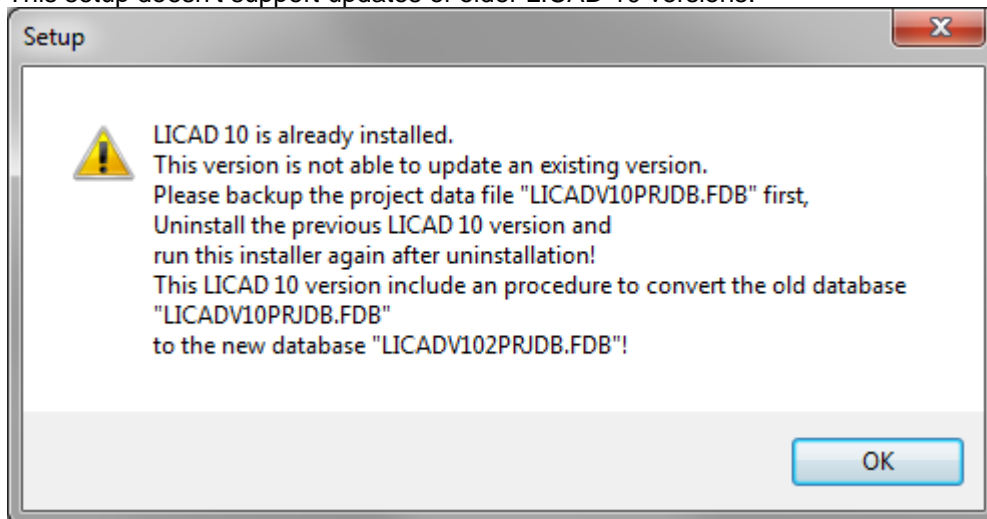
- **/SAVEINF="filename"**
- Instructs Setup to save installation settings to the specified file.
- Don't forget to use quotes if the filename contains spaces.
- **/LANG=language**
- Specifies the language to use. *language* specifies the internal name of the language as specified in a [Languages] section entry.
- When a valid /LANG parameter is used, the *Select Language* dialog will be suppressed.
- **/DIR="x:\dirname"**
- Overrides the default directory name displayed on the *Select Destination Location* wizard page. A fully qualified pathname must be specified. May include an "expand:" prefix which instructs Setup to expand any constants in the name. For example: '/DIR=expand:{pf}\My Program'.
- **/GROUP="folder name"**
- Overrides the default folder name displayed on the *Select Start Menu Folder* wizard page. May include an "expand:" prefix, see '/DIR='. If the [Setup] section directive DisableProgramGroupPage was set to yes, this command line parameter is ignored.
- **/NOICONS**
- Instructs Setup to initially check the *Don't create a Start Menu folder* check box on the *Select Start Menu Folder* wizard page.
- **/TYPE=type name**
- Overrides the default [setup type](#).
- If the specified type exists and isn't a custom type, then any /COMPONENTS parameter will be ignored.
- **/COMPONENTS="comma separated list of component names"**
- Overrides the default [component](#) settings. Using this command line parameter causes Setup to automatically select a custom type. If no custom type is defined, this parameter is ignored.
- Only the specified components will be selected; the rest will be deselected.
- If a component name is prefixed with a "*" character, any child components will be selected as well (except for those that include the dontinheritcheck flag). If a component name is prefixed with a "!" character, the component will be deselected.
- This parameter does not change the state of components that include the fixed flag.
- Example:
- Deselect all components, then select the "help" and "plugins" components:
/COMPONENTS="help,plugins"
- Example:
- Deselect all components, then select a parent component and all of its children with the exception of one:
/COMPONENTS="*parent,!parent\child"
- **/TASKS="comma separated list of task names"**
- Specifies a list of [tasks](#) that should be initially selected.
- Only the specified tasks will be selected; the rest will be deselected. Use the /MERGETASKS parameter instead if you want to keep the default set of tasks and only select/deselect some of them.
- If a task name is prefixed with a "*" character, any child tasks will be selected as well (except for those that include the dontinheritcheck flag). If a task name is prefixed with a "!" character, the task will be deselected.
- Example:
- Deselect all tasks, then select the "desktopicon" and "fileassoc" tasks:
/TASKS="desktopicon,fileassoc"
- Example:
- Deselect all tasks, then select a parent task and all of its children with the exception of one:
/TASKS="*parent,!parent\child"
- **/MERGETASKS="comma separated list of task names"**

- Like the /TASKS parameter, except the specified tasks will be merged with the set of tasks that would have otherwise been selected by default.
- If [UsePreviousTasks](#) is set to yes, the specified tasks will be selected/deselected after any previous tasks are restored.
- Example:
- Keep the default set of selected tasks, but additionally select the "desktopicon" and "fileassoc" tasks:
/MERGETASKS="desktopicon,fileassoc"
- Example:
- Keep the default set of selected tasks, but deselect the "desktopicon" task:
/MERGETASKS="!desktopicon"
- **/PASSWORD=password**
- Specifies the password to use. If the [Setup] section directive Password was not set, this command line parameter is ignored.
- When an invalid password is specified, this command line parameter is also ignored.

7.4 Updating existing versions

7.4.1 Update LICAD 10 version prior 10.2

This setup doesn't support updates of older LICAD 10 versions.

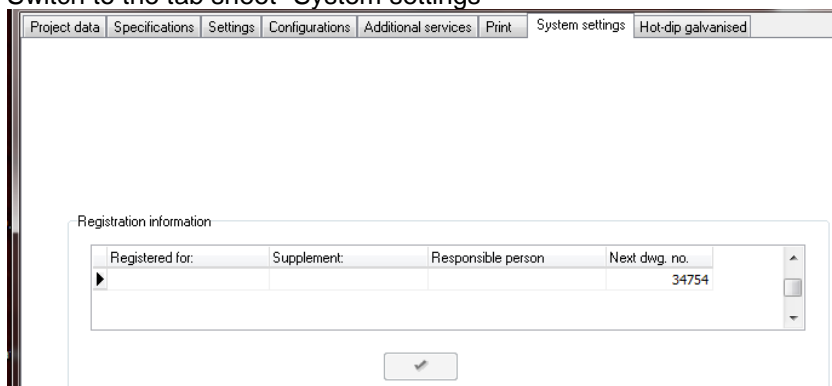


Five steps must be done to prepare the computer to install of LICAD 10.2.

Step 1:

Start the currently installed LICAD 10 version and click on button "Specs".

Switch to the tab sheet "System settings"



Remember the next drawing number shown. You need it for the first start of LICAD 10.2.
Close LICAD application.

Step 2:

Make sure LICAD V10 isn't started!

The current project file "LICADV10PRJDB.FDB" of the installed LICAD 10 version needs to be backup manually. Therefore copy the file "LICADV10PRJDB.FDB" into a new directory. The default installation location is:

"<Common Documents>\LISEGA\LICAD V10\"

Step 3:

Uninstall the previous version of LICAD 10. This will also delete the current project file "LICADV10PRJDB.FDB". That's the reason why a manual backup of this file is necessary!

Step 4:

Install LICAD V10.2, start LICAD, enter the user information and your serial number.

Now reset the next drawing number to the remembered value (from step 1). Goto "Specs" -> "System settings" and change the value 1 to the value from step 1.

This will avoid duplicate drawing numbers and/or the error "Key violation error".

Step 5:

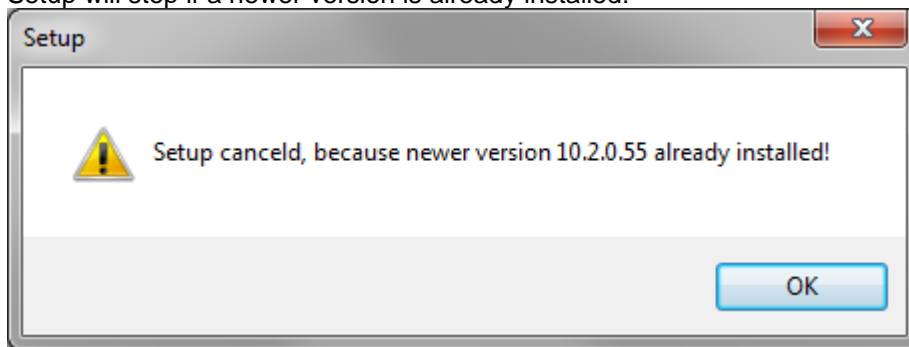
Convert the old project file "LICADV10PRJDB.FDB" to the new format using LICAD 10.2 (File menu -> "Convert V10.0/V10.1 project database")

Now the update is complete and you can continue using LICAD.

7.4.2 Installing over a newer version

Installing an older version isn't supported.

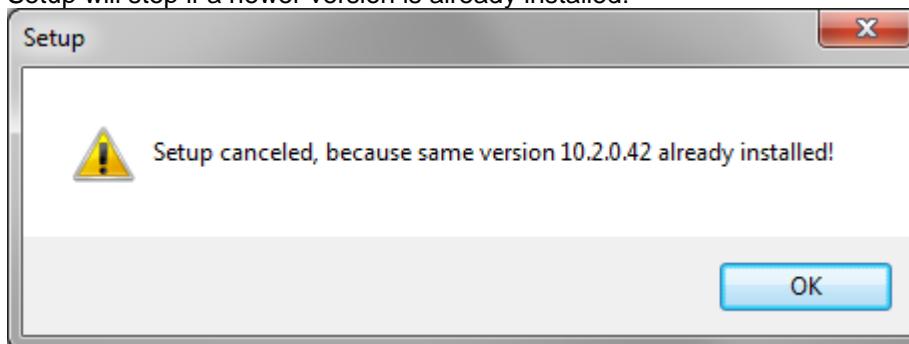
Setup will stop if a newer version is already installed!



7.4.3 Installing the same version

Installing the same version again isn't supported.

Setup will stop if a newer version is already installed!



7.5 Examples to start up installation program

7.5.1 Installation with defined log file

Specifying the /LOG="file name" command line parameter will do that.

e.g.: "LICADV10_SETUP (V 10.2.0.42).exe" /LOG=C:\temp\licad10_2_setup.log

By default a log file named like "Setup Log <date> #<counter>.txt" is created in the TEMP folder of the admin user that is installing LICAD.

7.5.2 Interactive installation with predefined directories

This command line will only change the directory names that are displayed first in the corresponding wizard directory selection pages.

The user can change them during installation as normal.

```
"LICADV10_SETUP (V 10.2.0.42).exe" ↵  
  /DIR="C:\Progs\LICAD_10" ↵  
  /SYS_DBS_FOLDER="C:\Progs\LICAD_10\databases" ↵  
  /PRJ_DB_FOLDER="C:\Progs\LICAD_10\databases"
```

7.5.3 Silent installation

```
"LICADV10_SETUP (V 10.2.0.42).exe" /VERYSILENT /SUPPRESSMSGBOXES
```

This will install LICAD without any user interaction in the default directories.

7.5.4 Silent installation with defined directories and log file

```
"LICADV10_SETUP (V 10.2.0.42).exe" ↵  
  /VERYSILENT ↵  
  /SUPPRESSMSGBOXES ↵  
  /DIR="C:\Progs\LICAD_10" ↵  
  /SYS_DBS_FOLDER="C:\Progs\LICAD_10\sysdbs" ↵  
  /PRJ_DB_FOLDER="C:\Progs\LICAD_10\prjdb" ↵  
  /LOG=C:\temp\licad10_2_setup.log
```

This will do a complete autoinstall of LICAD 10 without any user interaction. All files are stored in the path "C:\Progs\LICAD_10\" including the databases which are stored in sub directories according to the command line parameters. The log file is set to "C:\temp\licad10_2_setup.log".

8 Installation description of the LISEGA PDMS catalog (Version 2020)

The LISEGA catalog DB with the title LIS060 and the Hanger&Support Dictionary DB with the title LIS058 for the latest PDMS release can be found on the CD in the directory 'LICAD - 3D Interfaces\PDMS'. You can copy these files to your hard drive at installation time. The files will be stored in the subdirectory 'PDMS-interface'. This can be done also with the installation files from the internet.

8.1.1 Initial installation of the LISEGA catalog DB

The following steps are recommended for the installation of the LISEGA catalog DB in a project:

- no user may work in the said project
- the PDMS module 'ADMIN' is to be called up
- a new CATA-DB has to be set up
- the file number is to be set up (three- or four-digits)
- the file number has to be set at 6993

Suggestion:

Name	LS_CATA
owning team	MASTER
Database Type	Catalogue
Access Mode	Multiwrite, Implicit Claim
DB Number	6993

The catalog DB should be created with these settings. For the MDB's in which they are to be used the value 'current' has to be set.

Via the creation of the new catalog DB in 'ADMIN' a new file is created in the directory (e.g.'xxxooo') in which the project DB's are to be found. It consists of the three-digit project logogram and a consecutive three- or four-digit number (which if desired can correspond to the directory number allocated). Via these steps the catalog DB is created.

The following should be further carried out so that the current data can be utilised:

- The file LIS060 must be copied into the above mentioned CD index and is to be retitled then so that it assumes the name of the file created in 'ADMIN'

8.1.2 Initial installation H&S Dictionary DB

The following steps are recommended for the installation of the H&S Dictionary DB in a project:

- no user may work in the said project
- the PDMS module 'ADMIN' is to be called up
- a new DICT-DB has to be set up
- the file number is to be set up (three- or four-digits)
- the file number has to be set at 6994

Suggestion:

Name	H&S_DICT
------	----------

owning team	MASTER
Database Type	DICTIONARY
Access Mode	Update
DB Number	6994

The dictionary DB should be created with these settings. For the MDB's in which they are to be used the value 'current' has to be set.

Via the creation of the new dictionary DB in 'ADMIN' a new file is created in the directory (e.g.'xxxxoo') in which the project DB's are to be found. It consists of the three-digit project logogram and a consecutive three- or four-digit number (which if desired can correspond to the directory number allocated). Via these steps the dictionary DB is created.

The following should be further carried out so that the current data can be utilised:
The file LIS058 must be copied into the above mentioned CD index and is to be retitled then so that it assumes the name of the file created in 'ADMIN'.

Note: It is recommended that both DB's are activated in a catalog project and are made known to the actual projects via external links.

8.1.3 Reading in a new catalog release (catalog upgrade)

- No user may work in the said project
- The file LIS060 must be copied into the DB-index (e.g. 'xxxxoo' from the CD and then retitled so that it adopts the name of the LISEGA catalog DB' (as described above).

The catalog upgrade is thereby completed.

Note: The installation description of the LISEGA application can be found on the CD in the index \PDMS !

8.1.4 Installation of the LISEGA menu in DESIGN

8.1.4.1 Creation of a user-defined PMLLIB path for DESIGN

(e.g. Standard : D:\CADCENTRE\PDMS11.2\PMLLIB
User defined: D:\PMLLIB\LISEGA\DESIGN)

and copying of the macros:

```
jslisegalif.pmlfrm  
jslisegalof.pmlfrm  
jsliseganuts.pmlfrm  
lisegadesign.pmlfrm
```

(Source on LICAD CD : /PDMS/Macros)

8.1.4.2 Notification of the PMLLIB path in the 'evars.bat' file

The PMLLIB search variable is to be extended:

e.g. standard is:

```
if not '%pmlib%'==' goto pmlok  
set pmlib=%1\PMLLIB  
echo PMLLIB set to %PMLLIB%  
:pmlok
```

(%1 stands for the PDMS installation path (e.g. D:\CADCENTRE\PDMS11.2)

Necessary extension :

```
if not '%pmlib%'==' goto pmlok
set pmlib=D:\PMLLIB\LISEGA\DESIGN %1\PMLLIB
echo PMLLIB set to %PMLLIB%
:pmlok
```

8.1.4.3 Access PDMS, start MONITOR module and open Command Line

The LISEGA macros are registered by entering :

```
PML REHASH ALL
```

A 'pml.index' file is hereby created in the new PMLLIB path (writing permission is to be respected !)

This procedure is not project related and only needs to be followed once.

8.1.4.4 The actual accessing of the LISEGA menu

The actual accessing of the LISEGA menu in DESIGN is made on the Command Line by entering :

```
SHOW !!LISEGADESIGN
```

(On storage of 'FORMS & DISPLAY', the menu remains active.)

On starting DESIGN via the order 'LOAD FROM MACRO-FILES', the order

```
SHOW !!LISEGA
```

is to be entered again.

8.1.4.5 Menu items of the LISEGA menu in DESIGN

8.1.4.5.1 Start output File (LOF)

File browser to start the LOF files created by LICAD.

The LSROD sprefs of the respective HANG elements are set simultaneously and the hex nuts put in place. (LSROD's are subject to graduation in length)

8.1.4.5.2 Create Input File (LIF)

For the calculation or design of a hanger arrangement the corresponding UDA values of the ATTA can be transferred to LICAD. This menu creates a file for this from PDMS that can be imported into LICAD.

Note: Set output path (.LIF): The path for the .LIF file can be defined by the environment variable HANGER.

Example of how HANGER is defined: set HANGER=C:\Data\Lif-Files

If the variable is not defined, the file is written to the starting area, where PDMS was started from, eg into the desktop.

8.1.4.5.3 Resetting rods and nuts

On manual creation or alteration of a hanger design (e.g. created via a LOF file) it is imperative to carry out this menu procedure !

In this way the correct LSROD sprefs of the individual HANG elements are (newly) set and the hex nuts newly placed according to the modified design.

8.1.4.6 Important notes

Please note:

1.) A pre-condition for the trouble-free functioning of the LISEGA design macros in the menu items of the LISEGA DESIGN menu is that the the hanger supports have been created with the Version 3.0 of the LISEGA catalog (as of 23. April 2000), and that LICAD Version 8.0 is used to create the LOF files.

2.) The dictionary database /MASTER/H&S_DICT (dbfile: lis058, dbnumber: 6994) must be set as 'CURRENT DB' in the MDB selected. This database contains all the UDA's (User Defined Attributes) for the data exchange LICAD and PDMS !

It is to be carried out once in the LEXICON module of the compile procedure via the 'COMPILE' command.

8.2 Installation of the LISEGA catalog in MicroStation (Version 2010)

The following directory can be found on the CD 'LICAD - 3D Interfaces\ PDS_MicroStation\' including the files

IL3V2010D.MA,
IL3V2010E.MA,
INSTALL_GERMAN.txt und
INSTALL_ENGLISH.txt.

You can copy these files to your hard drive at installation time. The files will be stored in the subdirectory 'PDS-interface'.

Note: This can be done also with the installation files from the internet.

8.2.1 Installation and run application

The following steps are recommended for installation:

Either the application program

IL3V2010D.MA (german language) or

IL3V2010E.MA (english language) should be copied into the directory `...ustation\mdlapps` of the current used MicroStation version.

The installation of the LISEGA catalog is thereby completed.

3D placement is started with the command within MicroStation:

'MDL Load IL3V2010D' (German) or

'MDL Load IL3V2010E' (English).

In the selection menu, a L3D file previously generated from LICAD must then be selected.

8.3 Example of a LIF-file (LISEGA Input File)

```
[DWG]
HangerMark=My_hanger_mark_nr
DwgNo=
```

```
[StaticLoad]
Load=25.0
Hydro=30.1
```

```
[DynamicLoad]
Load(H)=
Load(HZ)=
Load(HS)=
```

```
[PIPE]
Size=323.5
Temp=500
Insulation=120
Pipe_Z=12500
Pipe_X=12500
Pipe_Y=12500
Orientation_X=0
Orientation_Y=0
Orientation_Z=1
```

```
[StaticMovements]
Lateral=1
Horizontal=0
Vertical=25
```

```
[DynamicMovements]
Positive=
Negative=
```

```
[SteelConnection]
EI_Steel_L=15200
EI_Steel_R=15000
Width=900
```

8.4 Example of a LOF-file (LISEGA Output File)

```
-- 000 Begin LICAD-Data
-- 001 Fichier : /C:\temp\L3D\05LCL21BQ005.LOF
-- 002 LICAD-No. plan LICAD : /231-3-54322
-- 003 No. support : /05LCL21BQ005
-- 004 No. plan. client : /
-- 005 Point de la note de calcul : /
-- 105 Charge à froid [kN]= 0.42
-- 106 Charge à chaud [kN]= 0.40
-- 107 raideur du ressort [N/mm]= 4.2
-- 108 Variation de charge [%]= 4
-- 110 Déplacement - Direction X [mm]= 0.0
-- 111 Déplacement - Direction Y [mm]= 0.0
-- 112 Déplacement - Z - Direction [mm]= 4.0
-- 113 Offset - Direction X [mm]= 0.0
-- 114 Offset - Direction Y [mm]= 0.0
-- 120 Diamètre tuyauterie [mm]= 76.1
-- 121 Calorifuge [mm]= 30
-- 122 Température [°C]= 155
-- 123 Variation de charge [%]= 4
-- 124 Position de blocage [mm]= 75
-- 301 Alpha = 0.00 Delta I SLCA = 0.00 Delta I SCLP = 0.00
-- 400 Non Type Désignation Qté Poids Matière
-- 401 [kg]
-- 410 01 75D119 Gousset à souder 01 0.10 S235JR
-- 410 02 61D919 Chape taraudée avec 01 0.10 P 250 GH
-- 410 03 67D119 Pièce filetée 01 0.02 S235JR
-- 410 04 21D219 Support variable 01 3.00
-- 410 05 60D919 Oeillet fileté 01 0.05 P 250 GH
-- 410 06 430819 Collier horizontal 01 1.20 S235JR
-- 410 07 63D929 Ecrou hexagonal 02 0.02 Gr. 8
-- 410 08 67D419 Tige filetée 01 0.75 S235JR
-- 997 LICAD Version: 10.0.0.20
-- 998 (PDMS) Version: 10.0.0 - 2015/08/28
-- 999 End LICAD-Data
--
FOR

NEW RESTR /05LCL21BQ005/RE
HSPE SPEC /LISEGA3.0

Function 'EUR'

Purpose N

:USTDYNLOADS 0 0 0
:USTFORCES 0 0 0.40
:USTTESTLOAD 0.00
:USTMOVEMENT 0 0 4 0 0
--:USTMOVEMENT [horz] [late] [vert]
:USTSTEELELEV 0
:USTDISTROD 0
:USTMAXTRAVEL 100
:USTSTATLOAD 0.42
:USTBLOCKPOS 75
:USTHNGOFFSET 0 0
handle any
endhandle
:USTWELDVALUE 3
:USTSRATE 4.16
:USTOLOAD 0.40
handle any
endhandle
:USTLOADDEV 4
handle any
endhandle
```

NEW HANG
 HSPE SPEC /LISEGA3.0
 HSRO SPCO /LISEGA3.0/M10
 POS HH AT /05LCL21BQ005
 HREF /05LCL21BQ005
 HCON TUB
 HBOR 65

NEW PCLA
 SPRE SPCO /LISEGA3.0/430819
 LSRO SPCO /LISEGA3.0/M10
 DESP 10 10 0 76.1
 CONN
 VAR !OR dir X

NEW HELE
 SPRE SPCO /LISEGA3.0/60D919
 LSRO SPCO /LISEGA3.0/67D419
 DESP 10
 CONN
 ORI AND PL IS U

NEW HELE
 SPRE SPCO /LISEGA3.0/21D219
 LSRO SPCO /LISEGA3.0/M10
 DESP 10 0 75
 CONN
 ORI AND Y IS \$!OR
 BY u 1380mm

NEW HELE
 SPRE SPCO /LISEGA3.0/67D119
 LSRO SPCO /LISEGA3.0/M10
 DESP 10
 CONN

NEW HELE
 SPRE SPCO /LISEGA3.0/61D919
 LSRO SPCO /LISEGA3.0/M10
 DESP 10
 CONN
 ORI AND Y IS \$!OR

NEW SCLA
 SPRE SPCO /LISEGA3.0/75D119
 LSRO SPCO /LISEGA3.0/M10
 DESP 10
 CONN

OWN
 CONN PT TO LAST MEM

END

REST

!!isRotateRestraint()

handle ANY
 \$P Rotation function not available!
 endhandle

\$.

8.5 Example of a L3D-file for PDS

```

$* 000 Start INFO-L3D-data
$* 001 File : /C:\temp\L3D\05LCL21BQ005.L3D
$* 002 LICAD-Drawing-No. : /231-3-54322
$* 003 Hanger mark No : /05LCL21BQ005
$* 004 Customer-Drawing-No. : /
$* 005 Calculation point : /
$* 104 F [kN] : 0.4
$* 105 F(Cold) [kN] : 0.42
$* 106 F(Hot) [kN] : 0.40
$* 107 Springrate [N/mm] : 4.2
$* 108 Travel-X-Direction [mm] : 0.0
$* 109 Travel-Y-Direction [mm] : 0.0
$* 110 Travel-Z-Direction [mm] : 4.0
$* 111 Preset position [mm] : 75
$* 112 Pipe diameter [mm] : 76.10
$* 113 Insulation [mm] : 30
$* 114 Temperature [°C] : 155
$* 115 Total travel [mm] : 4.00
$* 116 Force deviation [%] : 4
$* 117 F Preset [kN] : 0.4
$*
$* 400 No Type Description Dimension Qty Weight Material
$* 401 [kg]
$* 410 01|75D119 |Gousset à souder | |01| 0,10|S235JR
$* 410 02|61D919 |Chape taraudée avec | |01| 0,10|P 250 GH
$* 410 03|67D119 |Pièce filetée |30| |01| 0,02|S235JR
$* 410 04|21D219 |Support variable | |01| 3,00|
$* 410 05|60D919 |Oeillet fileté | |01| 0,05|P 250 GH
$* 410 06|430819 |Collier horizontal |D76,1| |01| 1,20|S235JR
$* 410 07|63D929 |Ecrou hexagonal |M10| |02| 0,02|Gr. 8
$* 410 08|67D419 |Tige filetée |(1380)| |01| 0,75|S235JR
$*
$* 997 LICAD Version: 10.0.0.20
$* 998 L3D Version: 10.0.0 2014/12/03
$* 999 End INFO-L3D-Data
$* Catalogue: Metric-Standard(1) Metric-Nuclear(2) US-Standard(3) US-Nuclear(4)
$* Catalogue#:1
$*
$* global info start
Height B-EG B-DB X-Coordinate Angle Y-Coordinate Angle Z-Coordinate Angle
Hanger-mark
2000 0 0 0.00 0.00 0.00 0.00 0.00 0.00
05LCL21BQ005
$* global info end
$* partslist start
Type Ori Rot90 Ori_Bottom E_DIM Pipe Width X-Value Y-Value Z-Value Top-Con
75D119 0 0 0 40 0 0 0 0 0 0
61D919 0 0 0 35 0 0 0 0 40 0
67D119 0 0 0 30 0 0 0 0 75 0
21D219 0 0 0 325 0 0 0 0 105 0
67D419 0 0 0 1380 0 0 0 0 430 0
60D919 1 0 0 25 0 0 0 0 1810 0
430819 0 0 0 165 76 0 0 0 1835 0
63D929 0 0 0 0 0 0 0 0 449 0
63D929 0 0 0 0 0 0 0 0 1791 0
$* partslist end

```

8.6 Example of a ITM-file for SupportModeler

```
' LICAD by LISEGA SE, Version: 10.0.0.20
' ITM Version: 9.1.3 2013/01/24
PROMPTS
CATEGORY, String, Read LICAD ITM Files
DESCRIPTION, String,LICAD N°: 231-3-54322
OBJ_LEN_UNITS, String, MILLIMETERS
PLACE_POINTS, Int, -102

SCRIPT

Placeltem( "SM_Lisega_2020", "TYPE43", "", LOC( 0,0, 0), "size", "430819" )
Placeltem( "SM_Lisega_2020", "TYPE60", "", ROTX(180)+LOC( 0,0, 190), "size", "60D919" )
Placeltem( "SM_Lisega_2020", "TYPE67B", "", LOC( 0,0, 190), "size", "67D419", "length", " 1380" )
Placeltem( "SM_Lisega_2020", "TYPE63", "", LOC( 0,0, 200), "size", "63D929" )
Placeltem( "SM_Lisega_2020", "TYPE63", "", LOC( 0,0, 1560), "size", "63D929" )
Placeltem( "SM_Lisega_2020", "TYPE21", "", LOC( 0,0, 1570), "size", "21D219", "dir", "up", "working_trav", "
4", "hot_load", " 0.40", "preset_licad", " 75" )
Placeltem( "SM_Lisega_2020", "TYPE67A", "", LOC( 0,0, 1895), "size", "67D119" )
Placeltem( "SM_Lisega_2020", "TYPE61", "", ROTZ(90)+LOC( 0,0, 1925), "size", "61D919" )
Placeltem( "SM_Lisega_2020", "TYPE75", "", ROTZ(90)+LOC( 0,0, 1960), "size", "75D119" )
Placeltem( "SM_Util_MM", "SM_WELD_FILLET_MM", "", LOC( 0,0, 2000), "WELD_FILLET_SIDE", "Arrow",
"WELD_FILLET_SIZE", "3", "FIELD_WELD", "Yes", "ALL_AROUND", "Yes" )
```


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