



XI. Inspection program QM-PIN

XI.1. General

The program QM-PIN is used for computer aided inspection of cylindrical measuring pins (used as single pins or pin sets), thread check wires and sets of thread check wires used for the measurement of external threads according to the "Three-wire-method", feeler gauges or other sets of gauges.

Only a basic knowledge of computers is necessary in order to use the QM-PIN program. The integration of thorough safety measures ensures the safety of your data and makes working on the quick, efficient and simple.

A complete set of thread check wires or measuring pins consist of a series of pins or wires with a defined step of the pins diameter. The program is able to manage all nominal sizes of a pin library and the results of measurements including all measuring values for each pin or wire.

While inspecting cylindrical pins, the program is calculate for each pin the average, minimum and maximum values and tolerance excursions. The evaluation may be done according to the DIN 2269 standard as well as according your own factory standards.

Measurement data can be entered through an on-line measuring machine or on the keyboard. When using an on-line measurement device, the connection between the device and the computer is made on the serial interface of the PC (V.24, RS 232C, see appendix D).

It is possible to customise your inspection certificates using the so called "Certificate layout files". The output of the results are in a tabular form - either on the screen or via a printer.

- ☞ The program QM-PIN32 does not contain the functionality for a gauge management or for the storage of the gauges history. This functions are an exclusive part of the program QM-MANAG. It means that the complete functionality for the management of pin sets, the monitoring of the calibration date and the handling of the gauge history does additional require a licence for the program QM-MANAG (either "Professional" or "Lite" version).

XI.2. Program start

The QM-PIN program can be opened directly from the QMSOFT-command-Shell (click the corresponded symbol in the shell) or by starting a Gauge inspection through the gauge management program.

Before working with the program you have to customise some things according your individual needs and wishes. The following program settings you have to do:

- Configuration of the On-line Interface:

If you use a direct linkage between the computer and your measuring machine to transfer measuring values, at first you should start the indication program required (RS232DRV, IK102021 or SIDDRV depended on the device and the interface connection you use) and set the correct parameters for the Online Interface (see also the manual of the used program – Appendix C for RS232 connection).

- Program settings and inspection conditions:

Here you can set some general things for the program environment; for example: the default way to transfer measuring values (machine or keyboard) or the unit used for the evaluation. See section V.3 for this.

After the start of the program you get the following main screen:

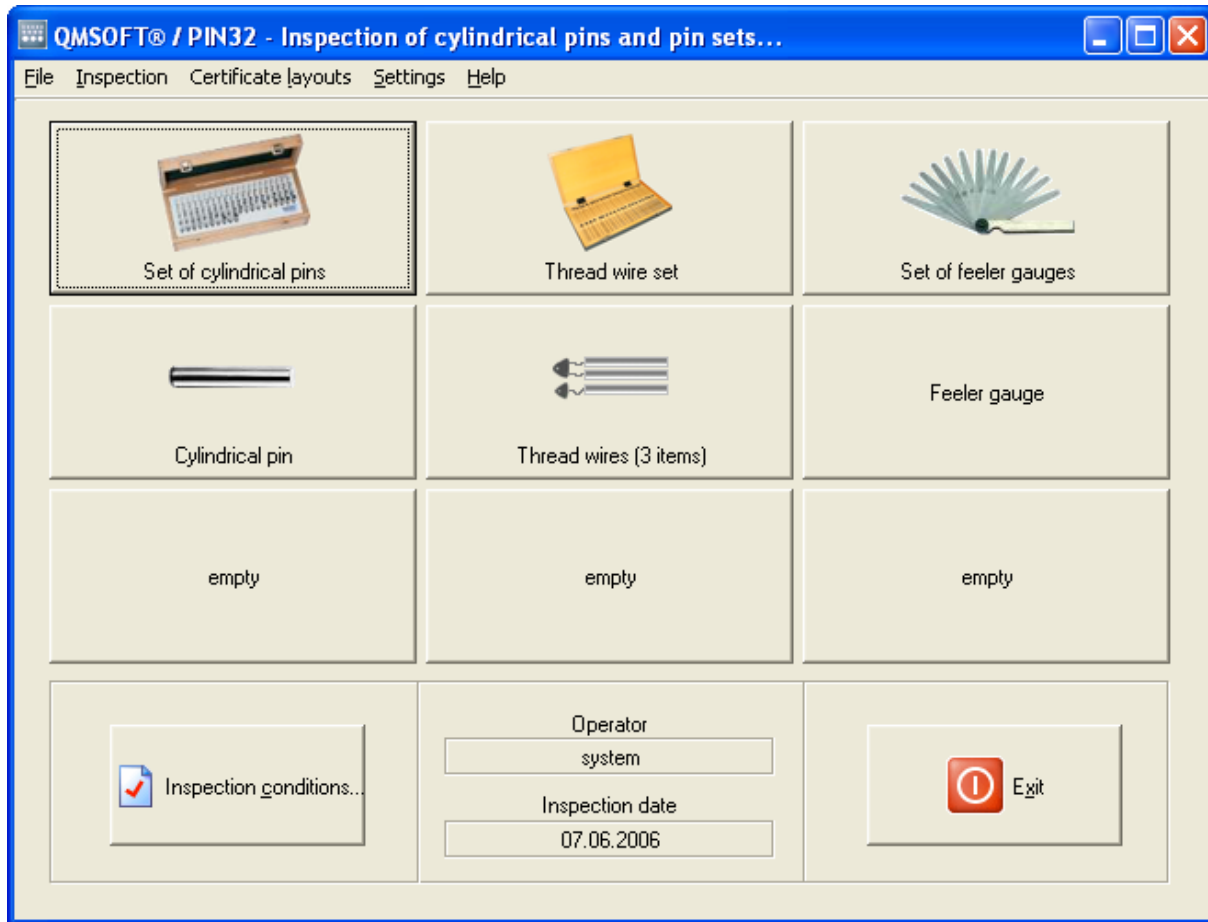


Figure: Main screen program QM-PIN

Here you can start directly the measurement of different gauge types.

XI.3. Menu „Settings“

XI.3.1. Menu “Settings | Program settings”

Register „General“: Here you can choose the program language and switch the tool tips for the dialogue fields on or off.

Register "Save automatically": Here you can make settings for the automatic storage of measuring values in a file and/or for saving the inspection certificates automatically in a file.

Register "Inspection procedures": Here you can enter for each gauge type a reference to a corresponded text file including the inspection procedure. Note that this "inspection procedure" does not influence the inspection process. It will be set using the option "Inspection conditions".

Register "Files / Directories" For some functions (indicating of measuring values; creation and edit of calibration certificates) external programs will be used. Here you can enter the directory where the corresponded program can be found. Additionally you can set a directory to save your calibration certificates.

All "Files" and "Directories" will be set while doing the program installation to a correct value !

ATTENTION: Make sure that these entries are correct. A lot of errors may occur when operating the program with incorrect settings in the screen "Directories".

XI.3.2. Settings | Inspection conditions

Using this option you have the following registers to set "inspection conditions":

Register "General":

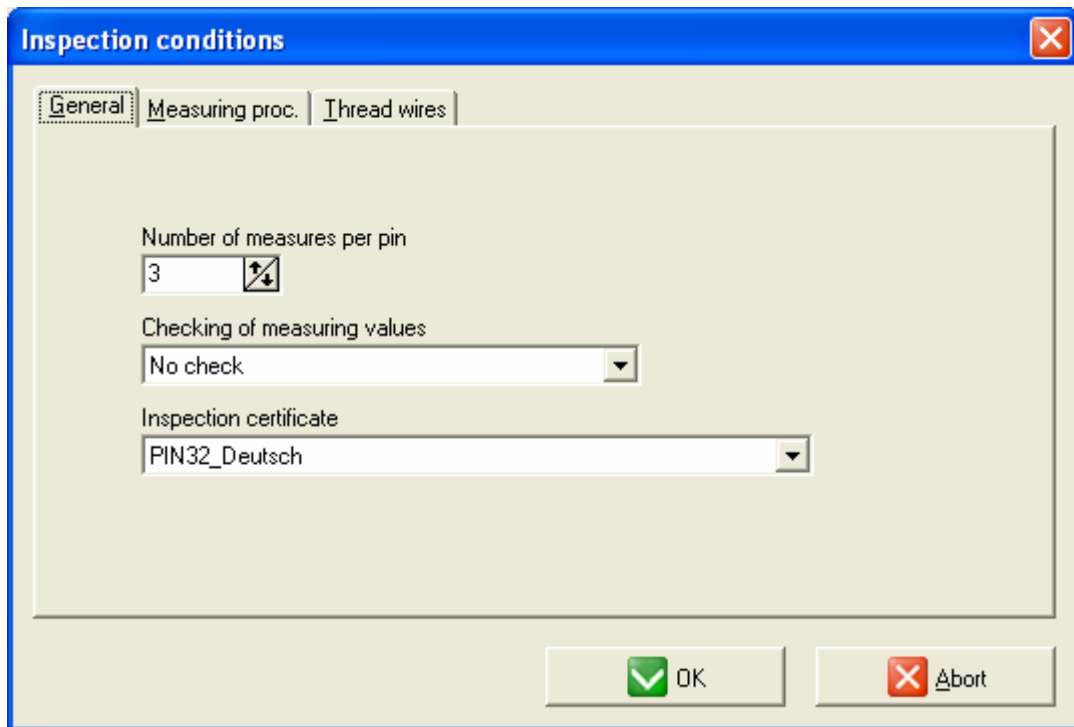


Figure: Inspection conditions – general settings

Enter the parameters:

Number of measures.. : Enter the number of measures you want to take for each pin. Note: the maximum number is „10“.

Checking of measuring values: While entering the measuring values it may be useful to check the plausibility or correctness of the measures. Here you can set different options how to do this. Using the option „Warning if out of tolerance plus the entered limit“ you can set your individual limits to get a warning. If the limits entered will be exceed while measurement you will get a „Warning“ on the screen.

Inspection certificate layout file..: Here, you can enter the name of the "Certificate layout file(s)" used to create the layout of your calibration certificate. This file includes all information about the layout and the content of the record list being created.

Register "Measuring process": Here you can switch on / off the the inspection of "Roundness" and "Roughness".

Register "Thread wires": Remember that the program includes the possibility to measure sets of thread wires. Thread wires will be used to measure external threads according to the "Three wire method". Caused by this you have always three wires with the same nominal diameter. For the evaluation of a thread measurement you need the "mean" or "effective" value of the three wire diameters. Select here the formula you want to use for the calculation of this "mean" value. With the option "Show/print each single wire" you can decide if you want to record only the mean value or the results of each single wire on your certificate.

XI.3.3. Settings | Edit factory tolerances

The program give you the possibility to manage tolerances for different gauge types.

All tolerance values will be stored in a "XML" - file. After installing the program it is the file "Tolerances.xml" which is located in the "...\\QMSOFT32\\PIN32_Settings" directory.

Here you can select the tolerance tables for the different gauge types and can edit it or you add new tolerance tables if required.

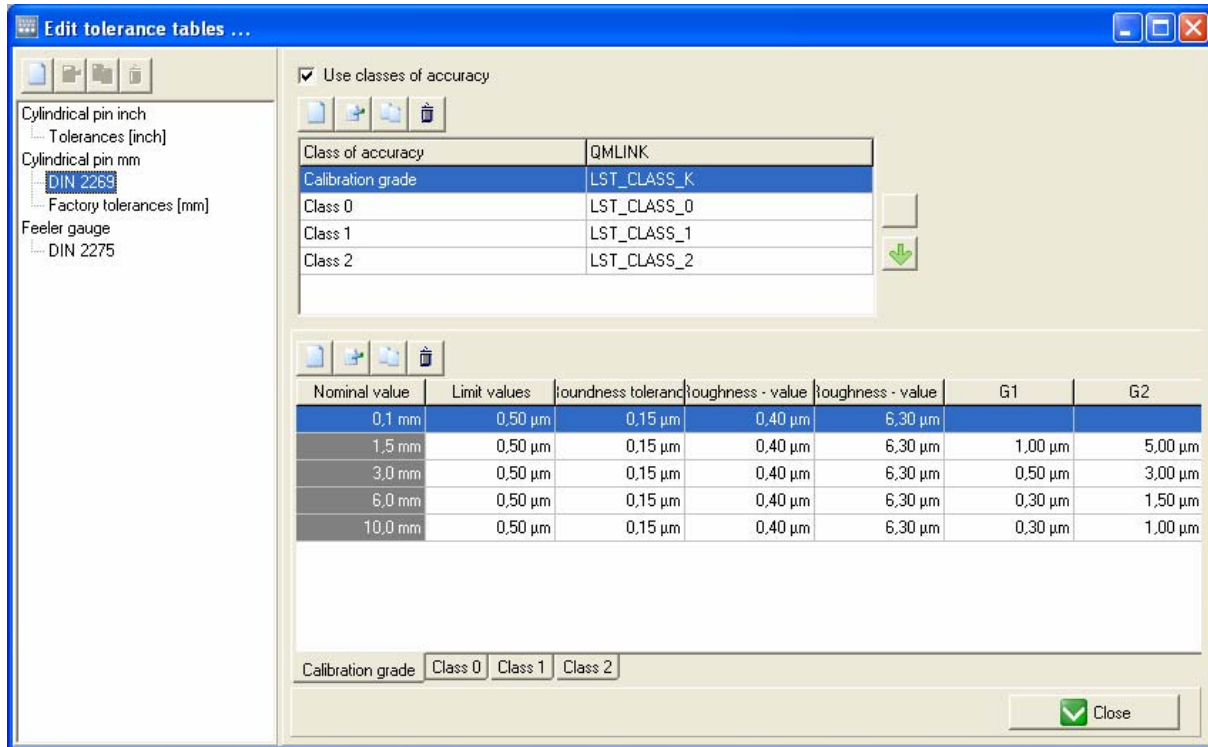


Figure: Edit tolerance tables

XI.4. Certificate layouts | Edit certificate layouts..

The program QM-PIN gives you the possibility to customise the layout of your calibration certificate. The layout of the calibration certificate is based on a so called "Certificate layout file". This file contains all information about the form of the certificate and the values should appear in this. By editing this certificate layout file you can change the layout. Saving this file with another file name give you the possibility to work with different certificate layouts.

All certificate layout files have the extension ".L32". Usually these files are saved in the directory "...\\QMSOFT32\\QMPin32_Templates"

NOTE: Do never open a "L32" certificate file outside of the program. In this case you will loose all "placeholders" representing the "actual values" when the certificate will be created !

A certificate layout file is consisting of three different types of information:

- **standard text:** is text information just like in a known text processing application; you can change the text as you want and you can set the different text parameters;

- **"Placeholders" ("Fields"):** a "Field" is including a variable information about the gauge, the measuring process or the measuring environment. A "field" will be fulfilled with the actual information while executing the program.
While editing a certificate layout file you can change "field" positions, delete "fields" (if you do not need the related information) and insert new "fields".
- **"Line conditions":** A line condition gives you the possibility to control the certificate layout in dependence of different program situations. A text or field following to an line condition will be print out on the certificate only if the condition is "true". For example you can print a special text only if an "External measurement" was done. Please open an existing certificate layout and see the comments for the "Line conditions" available.

The usage of "Place holders" (fields):

To insert a new "Place holder" in your certificate layout use the menu **"Insert | Fields"**.

Using this menu you can also see all available "Place holders" (Fields) and the related information. The fields are grouped to different categories (e.g. Gauge nominal values). If you select a field (click on it) you can see the field designation.

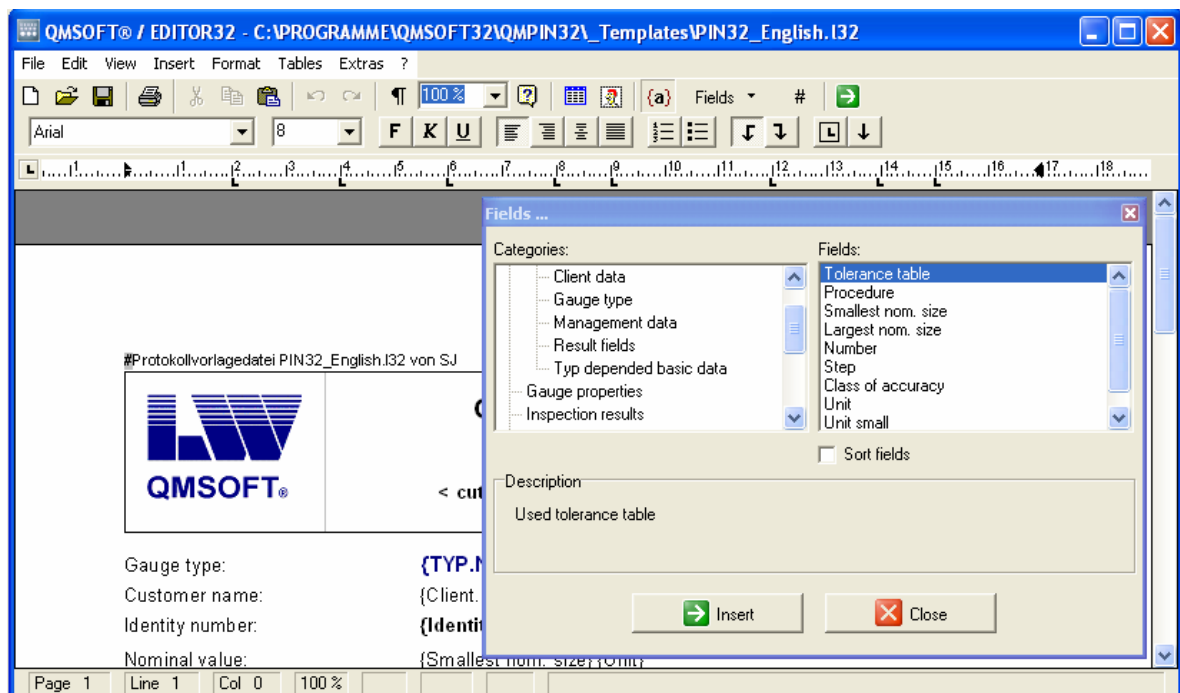


Figure: Inserting of fields into a Certificate layout file

Note: Fields which does contain text information can have an property "Language". To open the "Field property" dialogue click the right mouse key on the related field. If this dialogue have an field "Language" (see figure) you can change it to create "Multilingual" certificates.

The usage of "Text conditions":

Use the menu " **View | Text conditions** " to show the "Text conditions" available (see figure).

Select a text condition in the shown list to get there description. Then use the "add to list" button to move a selected condition to the "condition list". Using this list you can combine several text conditions.

Use the "Insert" button to insert the selected condition in your certificate layout.

Note: A "Text condition" is not restricted to one line in your layout. The condition is active until a new "Text condition" is defined or an "empty" condition is set. The text after an "empty" condition will appear on your certificate in any cases.

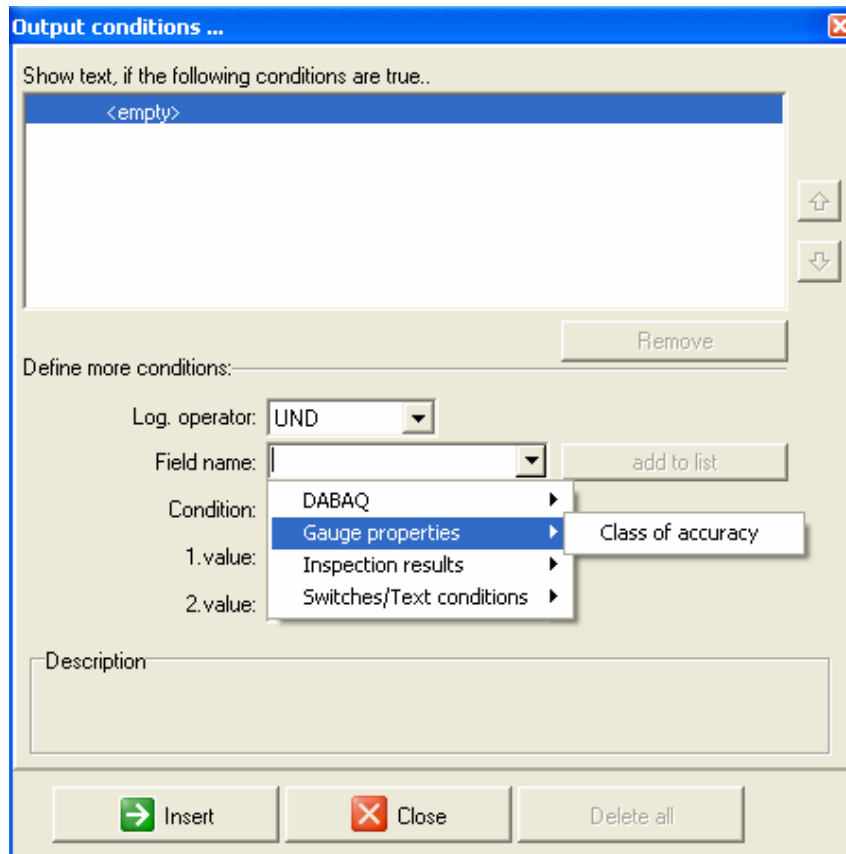


Figure: Inserting of fields into a Certificate layout file

XI.5. Measurement of pins and pin sets

The following explanation was made with an example of a "Set of cylindrical pins". You can use the same procedure if doing the inspection of "Feeler gauges" or others.

XI.5.1. Entering the gauge data

If you do not execute the measurement through the gauge database, at first you have here to enter the data to describe the pin set.

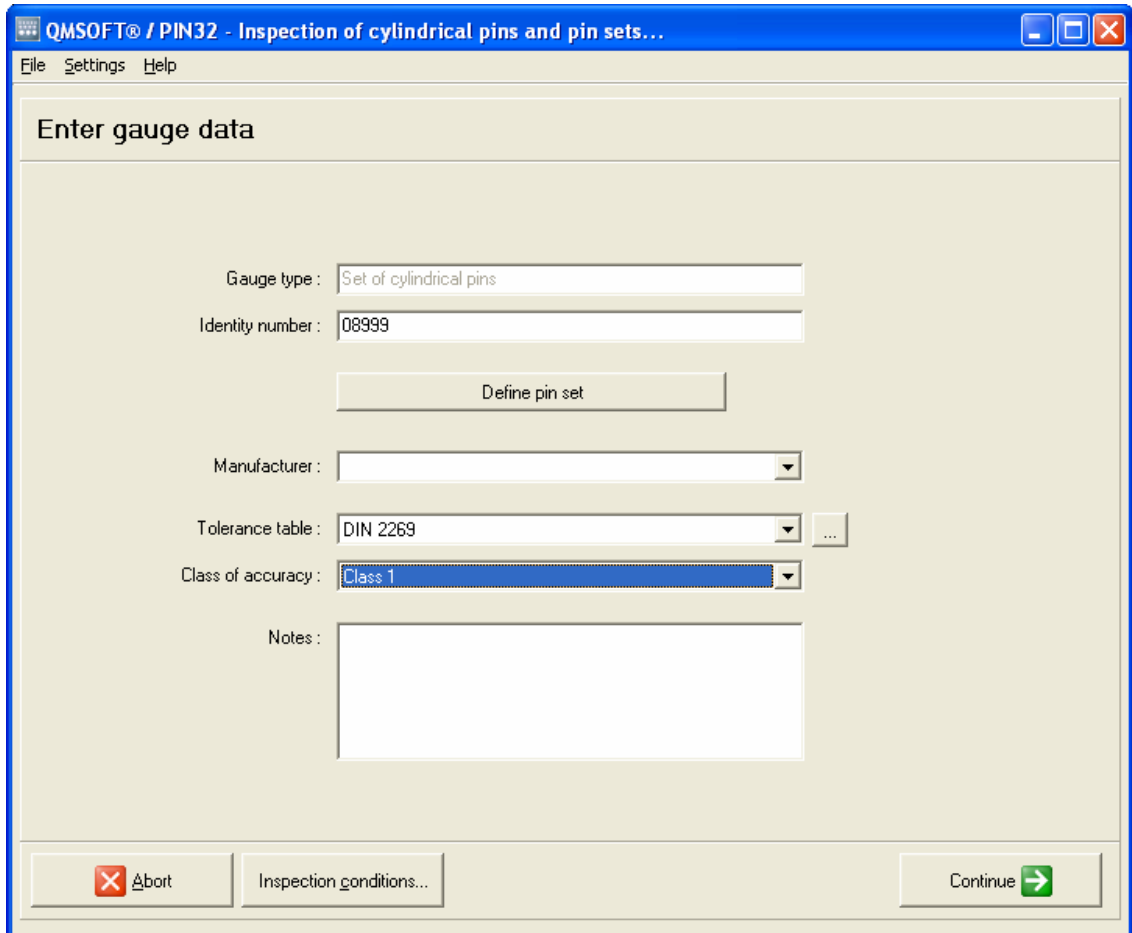


Figure: Insert a new pin set

These fields are to be filled out:

Identity number: Enter an identity number of the gauge.

Manufacturer: Enter the name of the manufacturer.

Tolerance table: You can select a tolerance table ("DIN 2269" or "Factory standard") from the list of defined tolerances.

Class of accuracy: If you select a tolerance table which does contain different classes of accuracy (e.g. "DIN 2269") then you have to select the "Class of accuracy".

Notes: Field to enter notes.

XI.5.1.1. Define the single pins in a set

To define the single pins click on the button "Define pin set". You will get the following screen:

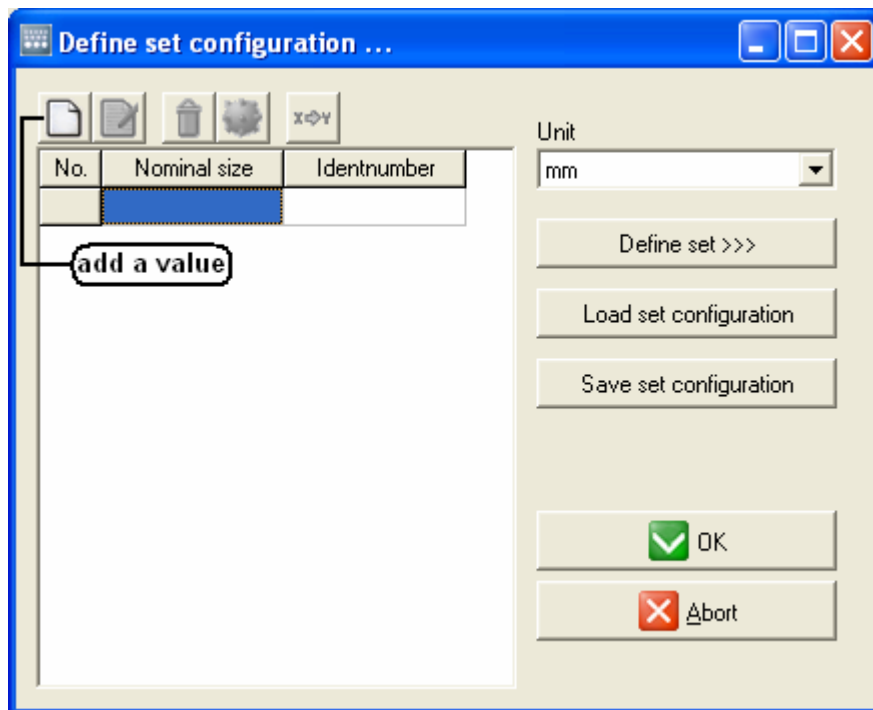


Figure: Defining the single pin values

At first select the unit.

Using the button "Add value" you can now add the nominal values of the pins.

Usually if you have to insert a set of pins the diameter difference between two pins follow one another is constant. In this case you can simplify the data input by using the "Define set" function. You can also use the "Load set configuration" if you have stored special set configurations before.

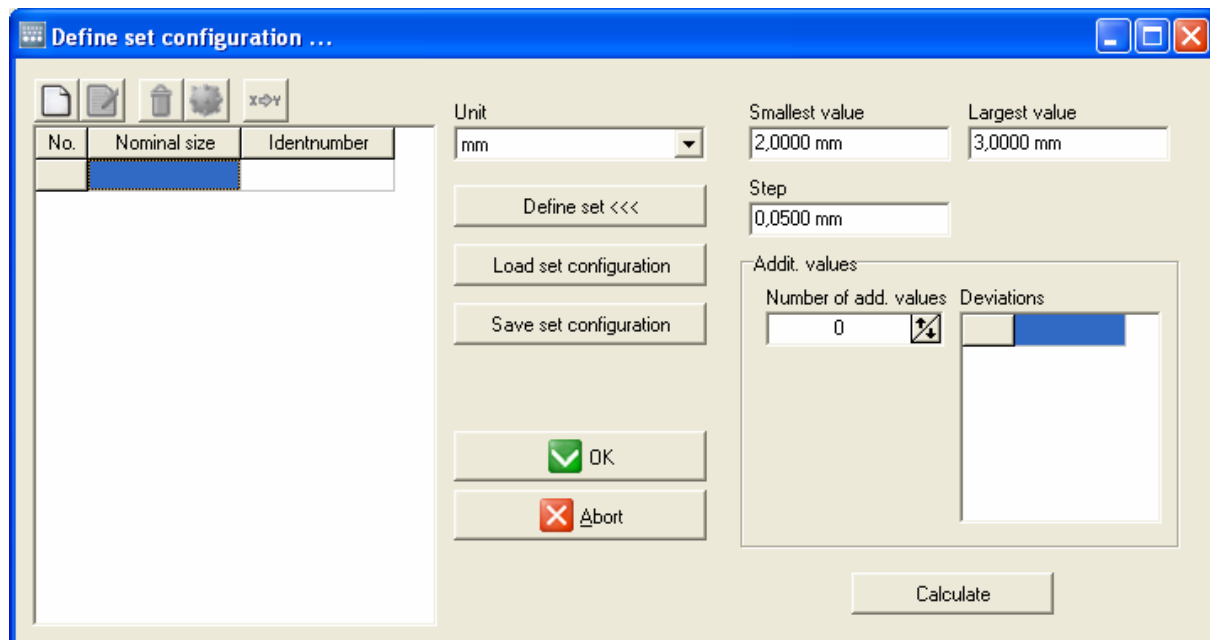


Figure: Define a set configuration

To define a set please enter these data:

Smallest value: Enter the first nominal size of your pin set (usually the smallest diameter).

Largest value: Enter the last nominal size of your pin set (usually the largest diameter).

Step: Enter the value of the diameter difference between two pins in the set.

If you have entered all required information use the button „Calculate“ to calculate the nominal sizes of all pins in your set. The list of pins will now inserted and the number of pins will be calculated.

If your pin set has no regular step you can use the function “Save set configuration” to save your set with a special name. Sets you have saved there, you can reload by using the function “Load set configuration”.

Sometimes a pin set is created according to a defined structure. For example you have a set with a basic step of 0,10 mm but for each pin in this serie you have additional a pin 2 µm smaller and another one 2 µm larger then the basic step. To define such sets use the option “Addit. values”

How to operate this: Enter the number of pins which there are between your “basic step”. After that enter the deviations of this pins in relation to the “basic size” (“+2µm” and “-2µm”). Press the “Calculate” button to create the pin list.

If required you can add or delete single pins after that operation from the shown list.

XI.5.2. Doing a gauge inspection

After defining or loading your set configuration now the inspection can be started. Measurement values are always entered in a sequence of measurement values 1 to n corresponding to the entered number of measures per pin.

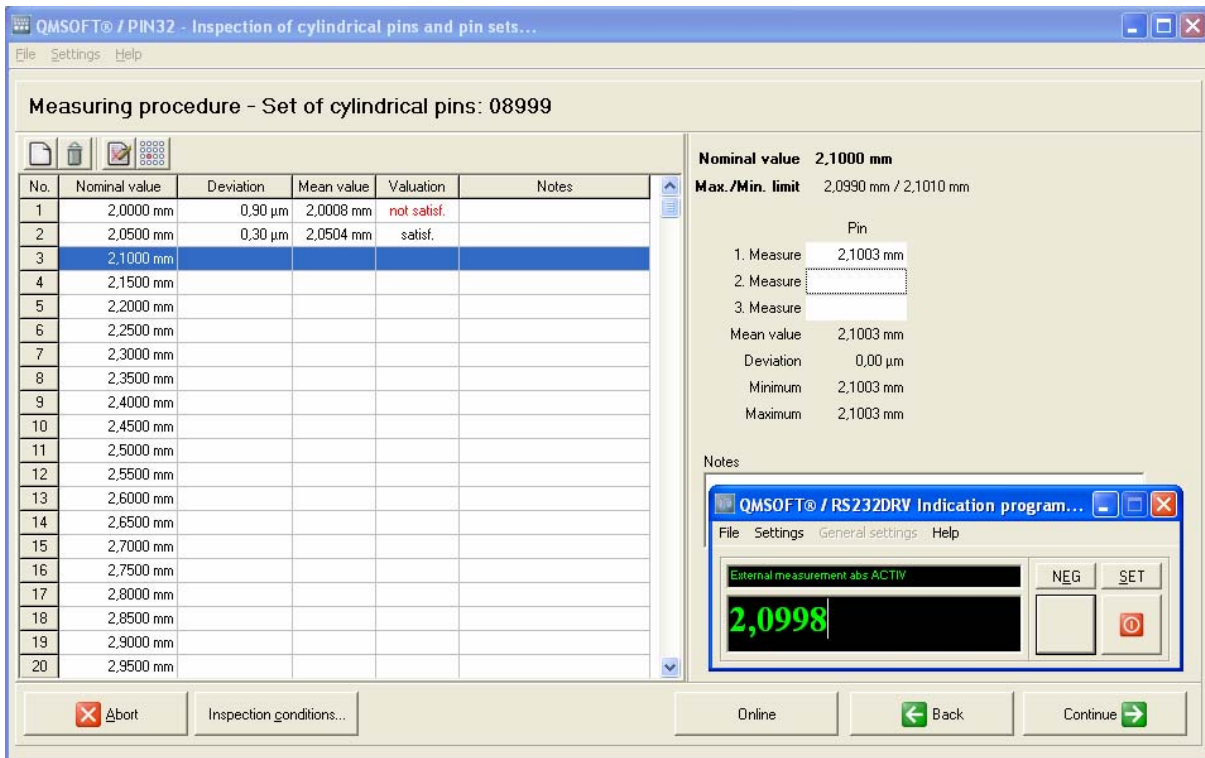


Figure: inspection of a pin set

You can use the function key “F5” or the related button to mark a pin as “not usable”. For example if it is rust-spotted it may be useless to measure it. To mark a pin as “not usable” will continue the inspection with the next pin. You will get a related text for the marked pin on the certificate.

If a pin is missing in your set you can mark it as “Missing” with the “F6” function key or the button. You will get the text “missing” on the certificate instead of the measuring values.

In the shown pin list you can repeat measures as you want; click with the mouse in the related line do to this.

Reaction of measuring values – outside of the defined limits

Remember section XI.3.2 “Settings | Inspection conditions”. There you have the possibility to define a “warning limit” for your measures. Even if a measuring value is outside of this limits you will get an error dialogue. The reason may be that the pin is really outside of tolerance, that you have made a fault while measuring (may be you have to check your indication) or that you have the fault pin (sometimes the pins are mixed up). Now you can decide if you want to “Ignore” the warning; the measure will be shown as “outside” (red colored); you can repeat the measurement or you can mark the pin as “Not usable” to continue with the next one.

XI.6. Output of results

After entry of the measurement data has been completed, the screen "*End of inspection*" will appear.

QMSOFT® / PIN32 - Inspection of cylindrical pins and pin sets...

File Settings Help

QMSOFT® - End of inspection / Valuation

Customer:

Calibration certificate number:

Valuation:
still in inspection

Comments:

Inspection certificate layout:
PIN32_English

Edit certif. layout

Show certificate

Print certificate

Actual Date: 07.06.2006

Next inspection: ..

Operator: system

Abort

Inspection conditions...

Back

Finish

Figure: End of inspection / show certificate

If the inspection is finished you get the screen shown above. The summary result of the inspection is shown. Here you can enter the name of the customer, the date for the next inspection and also some remarks to the inspection.

Before creating the calibration certificate you can change the "certificate layout file" will be used. To start the output of the results press the "Show certificate" button.

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