

CONTENTS

1. INTRODUCTION	3
1.1 System installation and activation	3
1.2 Description of symbols used in the program	8
2. MAIN MENU	9
2.1 Instrument inventory	11
2.2 Inventory record parameters	21
2.3 Calibration parameters	23
2.4 Users	24
2.5 Groups of instruments	26
2.6 Backup	27
2.7 Supplements	29
2.8 Calibration procedures	30
2.9 Exit	32
2.10 Help	33
3. SEARCH	34
4. PRINT	35
4.1 Preview	35
4.2 Printer	35
4.3 File	35
4.4 Modify	36
4.5 Import	39
4.6 Export	39
5. MEACU PROGRAM	40
5.1 Program function	40
5.2 Description of the MEACU program screen	41
5.3 Program operation	43

5.4 Measuring process, deviation and uncertainty calculation	46
5.5 Test report format	49
5.6 Calibration procedure, list of commands	50
6. GPSU PROGRAM	53
6.1 Program function	53
6.2 Description of the GPSU program screen	53
6.3 Pushbuttons of the GPSU program	54
6.4 Program operation	56
6.5 Alphabetical list of GPSU commands	63

1. INTRODUCTION

The WinQbase software is designed for keeping a record of various types of measuring instruments using inventory records. Among other things, it includes execution and recording of calibrations, recording of instrument repairs, history of changes in inventory records and calibration records etc. The WinQbase program allows you to easily obtain different types of instrument overviews by selected criteria, select executed calibrations and a history of amendments to the records etc. A wide scale of printing features (such as print of records, calibration reports...) is one of its parts. Furthermore, the system allows creating of calibration procedures, that is calibration procedure, for executing calibration and conceivably allows you to use calibration procedures created previously in programs of company MEATEST.

The system basis is a database environment. According to the customer's requirements, other programs, executing for example the actual calibration or creating calibration procedures, are then activated (without the user's interference).

All programs of this system can be controlled using both the keyboard as well as the mouse. You can also use "hot keys" to your advantage. Programs are easy to control by users, all information necessary for operation are displayed on the screen or contingently a brief help displays when you place the mouse cursor on the required object.

The program is created for PC networks. In practice it means that you can work on more computers in a network using a single database. For its operation the program requires the presence of hardlock, which is a part of delivery.

1.1 System installation and activation

The system is supplied on diskettes or on a CD-ROM disc. The installation set contains all necessary programs, created database structures and other auxiliary files and programs. The installation requires Pentium 166 MHz, 32MB RAM, SVGA 800x600 at least. You will need approximately 17MB of free space on hard disk, and further space depending on the number of recorded measuring instruments. The program is designed for WINDOWS95/98/NT operating system.

Installation process

First install the program to all computers on which you wish to use the system (if you have more computers for installation). The same installation must also be executed on the "SERVER" (a computer on which the database will be stored). Computers on which you will operate the system must be provided with an hardlock on a parallel port, the computer on which the database will be stored (hereafter the "SERVER") does not need this key. If you install the full edition and the WinQbase program does not find the key, it will be launched in a limited demonstration mode. The keys are designed as pass-through and thus do not disrupt operation of other devices located on the parallel port of the computer (it is also possible to connect more keys simultaneously). The key must be connected to the computer connector first and only then a printer, portable disc etc.

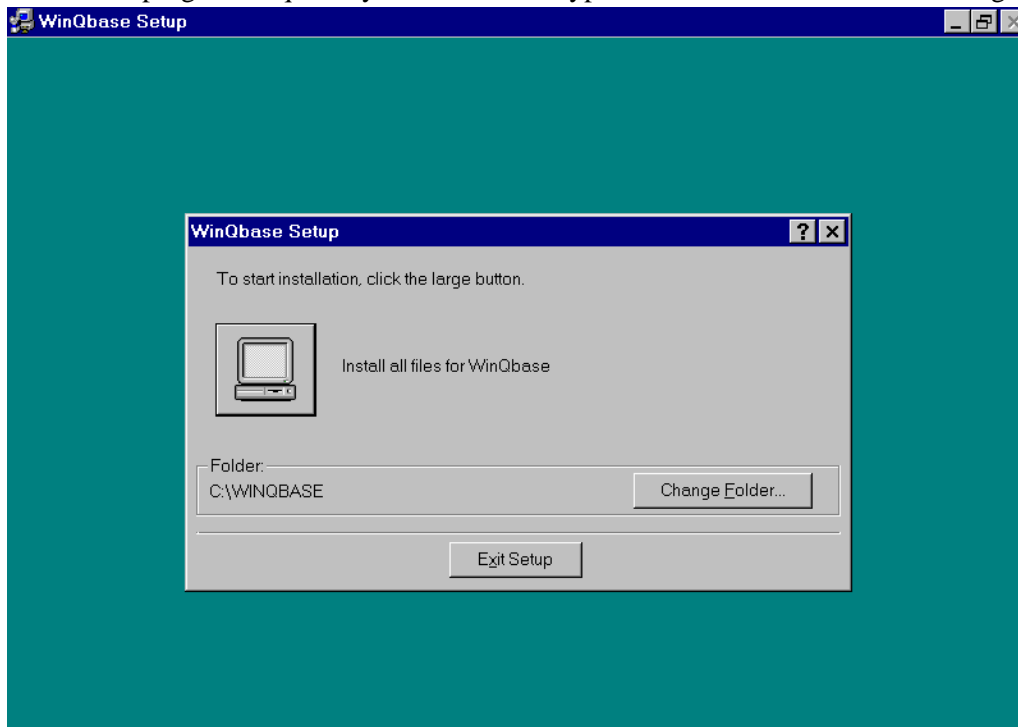
The installation set contains the “setup.exe” program, which enables user-friendly installation of the whole system. When you insert a diskette (CD-ROM) initiate the “WinQbase\EnglishDisk1\setup.exe” program and then follow the installation wizard on the screen.

First, the program displays operation license conditions and then requires you to enter a user name and a company name.

The next part of the installation is entering the name of a directory in which the program will be saved. We recommend you to confirm the offered “WinQbase” directory.

The installation creates database programs, main database and auxiliary programs and files in the WinQbase directory. Separate files “Archive1” and “Archive2” are created for back up in the “Data” directory.

The program requires you to select a type of installation before recording all files.



Using the mouse click the computer icon to copy files to a harddisk.

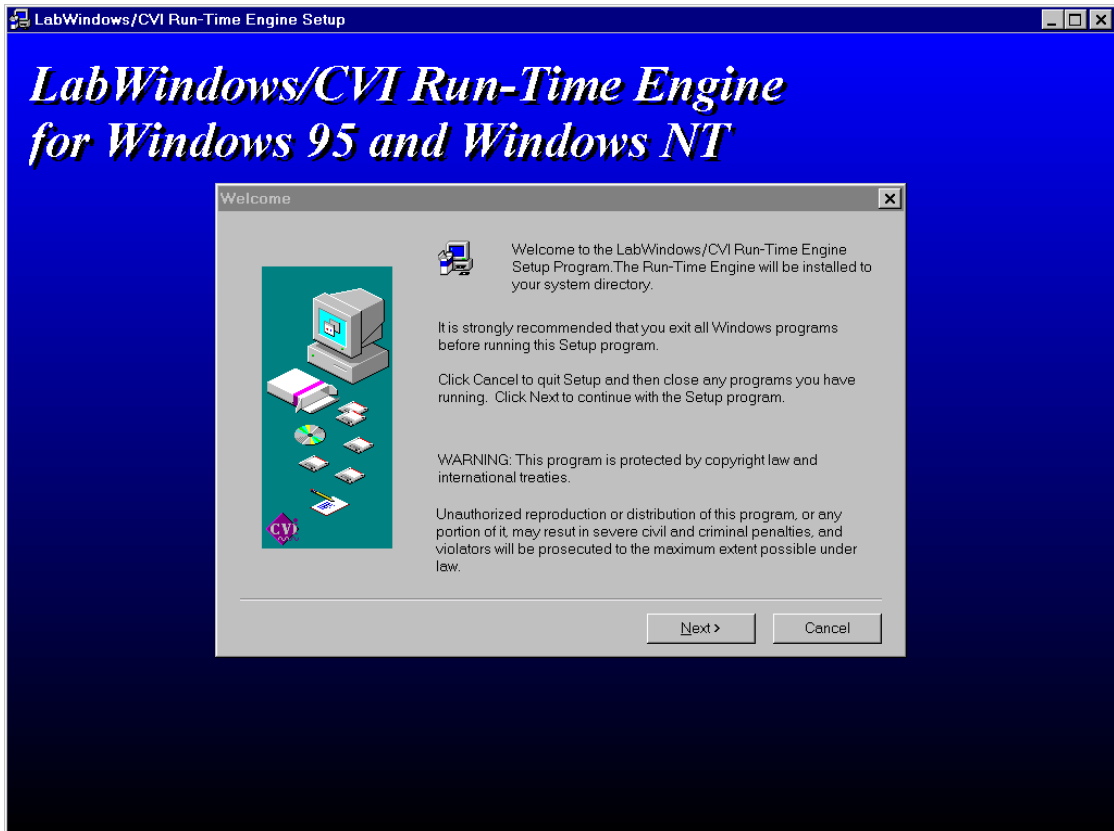
Finally, a WinQbase program group is created, which is placed in the “Start”, “Programs” menu.

Uninstall WinQbase

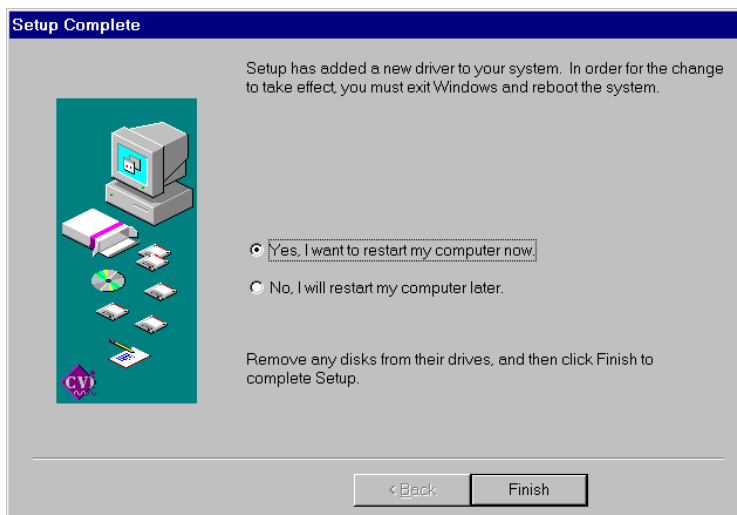
WinQbase can be removed from the computer using original installation CD. To uninstall software start Setup.exe in directory “WinQbase\EnglishDisk1”. Program asks if to restore or remove. If you chose item Remove, software will be uninstalled.

Program modules for calibrations

These programs are part of the WinQbase installation. The LabWindows/CVI Run - Time Engine support module is installed for these programs automatically when WinQbase is initiated for the first time. This installation runs in the background for Windows 95/98 and therefore you cannot see it. When installing for Windows NT the following windows display.



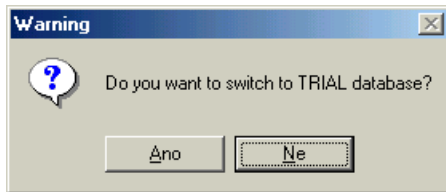
Confirm using the “Next” button.. If computer works under Windows NT, the installation asks whether to restart the computer.



Confirm using the “Finish” button. This will finish the installation.

First startup of the program

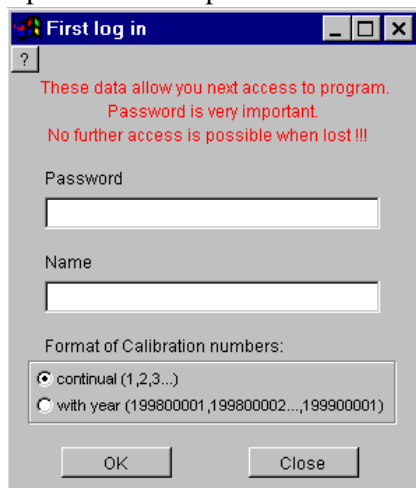
When you start the program for the first time in the Windows NT environment, the Run – Time module for LabWindows/CVI is installed. After starting, user is asked, if to use trial version.



Note: They are prepared two modification of database in installation package. The first is “trial” version. It serves for training and testing features of program. Trial version is fed up with several records of instruments to obtain better imagine about program possibilities. Use this database when you are not experienced enough with the program. Trial database is fully functional. The second database is clean database without any record. It is prepared for entering data of instruments in calibration laboratory. Any time after starting you may decide, which database to use. Both databases are separated. You cannot share records in the databases. The only possibility is to use function Export/Import, if they are available.

If you want to use trial database, confirm Yes. Program is going directly to the main menu. If you want to use normal database, confirm No.

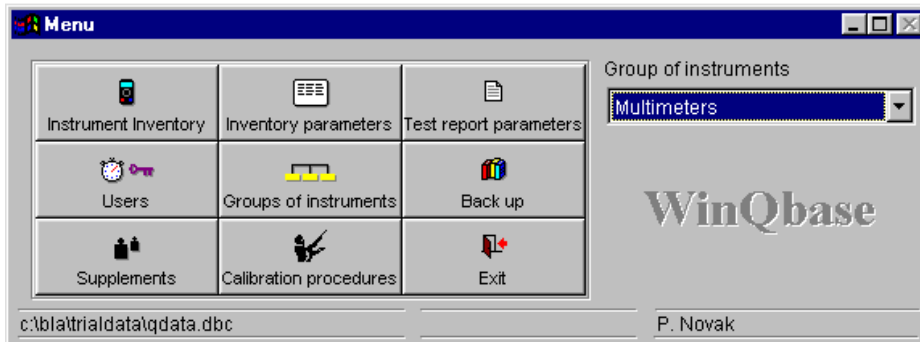
At the first logon, it is also necessary to enter a password and names of the person who will “supervise” the operation of the WinQbase environment. Later this person will be



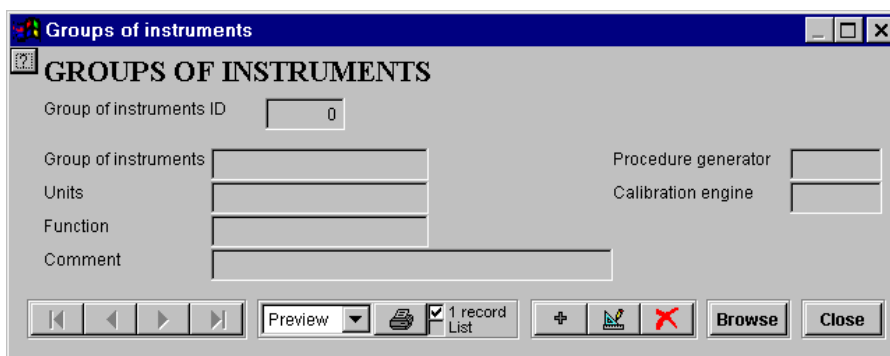
authorized to make any changes to the system and determine access rights and passwords for other users. For that reason, write the set-up password down because you will not be allowed to enter the program without knowing the correct password. We should observe that the password is case sensitive. The user must also choose a method of numbering calibrations. Ascending numbering (1,2,...) is offered automatically, however, you can choose yearly numbering (199800001,199800002....) where calibrations will be numbered from number one at the beginning of each year. It is not possible to change the numbering method hence.



When you press the OK button the program checks the entered password for safety's sake and requires a confirmation. After confirmation, main menu will appear.



If you are not in trial database, at the first startup, it is necessary to enter some basic data. Since the database is divided into groups of instruments, you must first enter at least one group of instruments (you can add other groups any time). Press the “Groups of instruments” button to display the relevant window. Press the “+” button and enter information about the required group of instruments (such as multimeters, manometers etc.) and press the diskette icon to confirm. From this moment all other program menu buttons are enabled. Single items of the “GROUPS OF INSTRUMENTS” database will be explained later.



If you want to use WinQbase in computer network, you have to set correct path to the required database., for example on server. See chapter 2.6 Backup for setting the path.

1.2 Description of symbols used in the program

There are several functional buttons used in the program, which have the same function in all the used windows. The symbols are the following:



Go to the first item.



Go to the previous.



Go to the next item.



Go to the last item.



Record new item in the database. For example a new inventory record, new type of instrument, new calibration procedure etc.



Edit the displayed database item. For example modification of a record, calibration procedure etc.



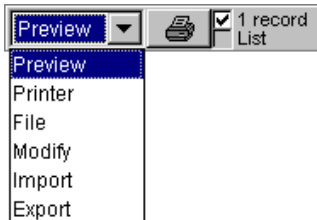
Exclude the displayed item from the database. This button is only functional for some items.



Displays active items in the form of a list (each item is on one line), which you can leaf through. You can set up the width of individual columns arbitrarily.



Closes the active window and goes to the previous item.



Prepares a test report of the displayed item and, according to the selected function, sends it either to the printer or to a file or displays a view of the test report. It concurrently allows adjustment of the report format. The “Import” and “Export” items are designed for recording or retrieving created test reports. For a more detailed description of report adjustments see chapter 4.0. Fields to the right from the printer have the following function. If you check the “1 record” field only the currently displayed item is printed. If you check the “**By lines**” field all selected items in a compressed form (line display) are printed.



Initiates query functions of the program.



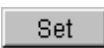
Confirmation of changes or a new entry and storing new data in a database.



Cancels made changes. No record to the database is made.

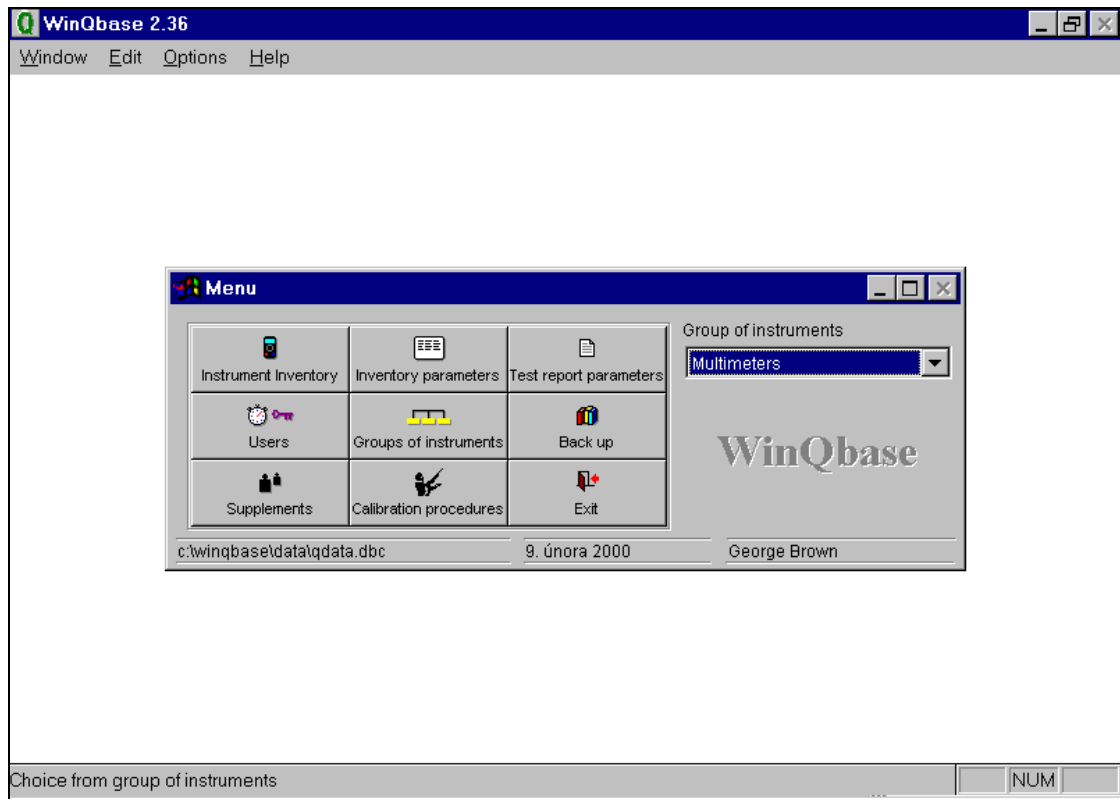


Covers (restores) a record. See the main menu “Options”, “Cover records”.



For so-called codebooks you can set one item as “Sample”. You can then find it easily using the “Find button”.

2. MAIN MENU



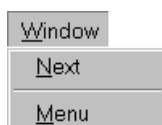
The main menu displays when you enter a password. The screen consists of three parts. These are the following:

1. Upper menu bar of the program (contains menus for selecting windows, editing functions and help).
2. Program desktop (displays active windows of the program).
3. Bottom status line (displays information about the selected item, operation of the program and keyboard status).

Click the selected item (using the left mouse-button) to invoke the required operation. Operation of the program is intuitive with usage common in WINDOWS.

The program automatically displays help for the selected item on the bottom status line. For some items it also displays description next to the mouse cursor. You can switch off the help display on the program menu bar in the “Help” menu (the “Show tips” option).

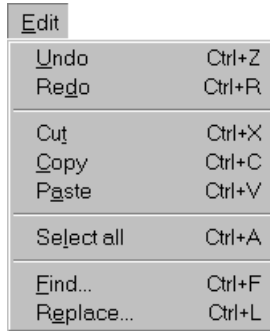
Upper menu bar



Window activates the next window.

Menu displays the main menu from which you can launch the required window.

The first four items of this function are only active when you modify or add a new record.



Undo cancels the last executed operation.

Redo executes the last canceled operation.

Cut extracts the selected text and saves it in memory.

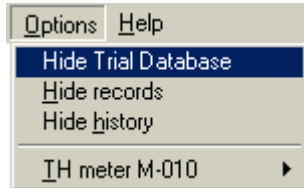
Copy copies the selected text to the memory.


Paste inserts the last text saved in memory to the cursor location.

Select all selects the whole text as a block.

Find... enables search in the displayed text.

Replace... enables automatic replace in the selected text.



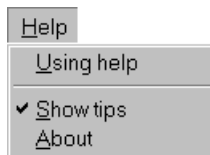
Hide records does not display items marked 

Hide **h**istory does not display the history of inventory and calibration records.

Hide **Trial Database** allows not to display question, if to use trial database after starting. If ticked, program automatically use

normal database.

TH meter M-010 allows cooperation with MEATEST M-010 laboratory environment monitor by selecting a serial socket COM1 through 4.



Using help displays contents of the WinQbase program help.

Show tips disables and enables display of brief help at the buttons when you move the mouse cursor.

About displays the WinQbase program information.

You can find more information about help in chapter 3.

2.1 Instrument inventory



This function allows you to modify and create new inventory records and their relevant calibration records.

An inventory record is a kind of an instrument “identity card”. It accompanies the instrument during its usage as well as after it has been put out of service.

 A screenshot of the "Instrument Inventory" software window. The window title is "Instrument Inventory" and it has standard Windows window controls. The main area is divided into three tabs: "Instrument Inventory", "Calibrations", and "Supplements". The "Instrument Inventory" tab is active and contains several input fields: "Type of inventory", "Quantity", "Category", "Model", "Manufacturer", "User's item 1", "User's item 2", "First recorded on", "Price", "Serial number", "Activated on", "Discarded on", "Customer", and "Phone". The "Calibrations" tab contains fields for "Inventory serial No.", "Asset number", "Documentation", and a "Calibrations" table with columns for "Date", "Verify to", and "Result". The "Supplements" tab contains a "HISTORY" section with "Version" and "Author" fields, and a "Traceability to" section with "Specification" and "Comment" fields. At the bottom, there is a toolbar with navigation arrows, a "Preview" button, a printer icon, a "1 record List" checkbox, and "Browse" and "Close" buttons.

One inventory record always belongs to one physical instrument.

Calibrations executed on an instrument and its repairs refer to an inventory record. Permissible changes made to the inventory record data are recorded with the option to find the person who made the change.

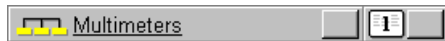
Press the “Instrument inventory” button to enter the inventory record index. Here you can view and modify individual existing records or enter new records. To the existing records you can execute or add calibrations and write supplements (repairs, standard data and other). An inventory record contains many details of which some are compulsory and without them you cannot save the record in the database.

Information about executed calibrations and repairs of this instrument will apply to a new created inventory record. You cannot execute a calibration for an instrument with no inventory record.

You must always create a new inventory record with high responsibility and enter the data very carefully. Before creating a record, the user should always know details about the instrument, such as its registration number, manufacturer and other items, which he is required to enter. If for some reason it is not possible to enter an item, the record cannot be stored in the database.

Some items are selected using an auxiliary table (so-called ‘codebook’), which is a list of all values that can be entered in the given item (for example the question is a list of instrument manufacturers). If you cannot find the required item in the codebook (the manufacturer is not in the list), you can enter the new value immediately and next time it will be included and displayed in the range. We will explain this point later in greater detail.

Since all inventory records are divided into groups of instruments, you must have a relevant group of instruments selected (multimeters, wattmeters...) before you enter the database of inventory records. You can only choose from the given values. Naturally, you can extend the database to another group of instruments. However, this function is only accessible to persons with the highest access level (level 7 – see chapter 2.4). Users usually work with inventory records of only one group of instruments. Nevertheless, users with access to all groups of instruments are allowed to switch off the filter for a group of instruments and thereafter view records of all groups. A button with the following symbol, located in the upper part of the form, enables this option:



Each inventory record includes the following items:

1. **Type of inventory** describes an instrument from the point of view of its relation to a calibrating laboratory. For this item exists a codebook, in which the “Calibrating”, “Internal” and “External” values are pre-defined. Calibrating instrument is an instrument, which the laboratory itself uses for calibrations, internal instrument is an instrument of the given organization and external instrument is an instrument delivered for calibration by a customer of a different organization. If you change this item, a history of the inventory record is created automatically.
2. **Quantity** defines the laboratory in which the given instrument is checked. For example, if you have a laboratory for electric, magnetic and longitudinal quantities, fill in the items in the codebook as “Electric”, “Magnetic” and “Longitudinal”. If you change this item, a history of the inventory record is created automatically.
3. **Category** of instrument describes an instrument from the point of view of its function in the company. For this item exists a codebook, in which the “Standard”, “Appointed instrument”, “Working instrument” and “Informative instrument” values are predefined. When the item is changed, a history of the inventory record is created automatically.
4. **Model** of instrument contains standard marking of the instrument, for example PU500, M3650, DU10 etc. If you change this item, a history of the inventory record is created automatically.
5. **Manufacturer** contains information about the instrument manufacturer, for example METRA, HP, FLUKE etc. If you change this item, a history of the inventory record is created automatically.
6. **User’s item 1** is an item purely for special user requirements. This item also has a codebook assigned, which you can predefine fully in accordance with your needs (for example, differentiate instruments by application sphere). If you change this item, a history of the inventory record is created automatically. You can change the name of this item by double clicking this item in the inventory record form (for users with the highest access).
7. **User’s item 2** is another item for the user, for which he can choose the name and the function. This item is not a codebook and it is not necessary to enter it.
8. **Inventory serial number** is assigned to the created records by the computer. The user cannot interfere in this numbering. The numbers do not have to form a consecutive sequence. Some numbers can be skipped.
9. **Asset number** of an instrument has not a codebook assigned and allows you to enter any combination of 10 characters at most. If you change this item, a history of the inventory record is created automatically.

10. **Documentation** only allows you to enter yes (checked box) and no (unchecked box) values. It informs you about the existence of documentation for an instrument. Changing this item does not result in creating a history of the inventory record.
11. **First recorded on** of an inventory record is entered by the computer. The user cannot interfere in this item.
12. **Price** determines the purchase price of an instrument. This item has not a codebook and allows you to enter any numerical data. Changing this item does not result in creating a history of the inventory record.
13. **Serial number** of an instrument has not a codebook assigned and allows you to enter any combination of 10 characters at most. If you change this item, a history of the inventory record is created automatically.
14. **Activated on** contains the date on which an instrument was put into service. This item is not compulsory and has not a codebook assigned. Changing this item does not result in creating a history of the inventory record.
15. **Discarded on** contains the date on which an instrument was put out of service. This item is not compulsory and has not a codebook assigned. Changing this item does not result in creating a history of the inventory record.
16. **Customer** and **Phone** contain information about an instrument owner. This is an item with a codebook assigned. If you change this item, a history of the inventory record is created automatically.
17. **Traceability** contains information about standards to which an instrument can be traced. This item is not compulsory and its change does not result in creating a history of the inventory record.
18. **Specification** contains information about instrument accuracy (table, text expression etc.). This item is not compulsory and its change does not result in creating a history of the inventory record.
19. **Comment** is designed for your comments relating to the given inventory record. This item is not compulsory and its change does not result in creating a history of the inventory record.
20. **HISTORY** allows you to trace changes made to inventory records. You can determine who made a change, when it was made and what was the state of the record before the change was made. Using the right and left pointers you can go through all the changes made to a record. It should be observed that changes are not recorded for all the items in an inventory record. In the text above you can find which items invoke creating a history of the record and which do not.
21. **CALIBRATION** the locked button enables display of the date, validity and result of the last calibration on the inventory record of an instrument. You can switch this option off because it slows down leafing through records. This slowdown develops especially on less powerful computers.

Each inventory record has calibration records and alternatively records of instrument repairs assigned. These records are accessible after entering an inventory record.

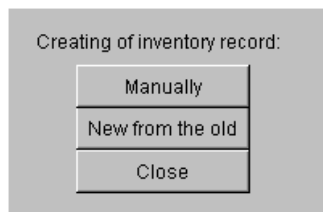
In the inventory records window you can also display results of the last calibration. Use the calibration button to switch this function on. The background color changes for the validity item as follows:

1. more than 1 month - green
2. 0 to 1 month - yellow
3. validity expired - red
4. not entered - neutral

It is recommended to have this feature switched off on slower computers - leafing through inventory records is faster.

Creating a new inventory record

When you press the '+' button, the program offers you a few methods of creating an inventory record. You can choose from the following methods of creating an inventory record:



1. **Manually** creates a new inventory records in such a manner that you enter all items on the inventory record. This record enters the creation mode and automatically marks items that can be entered. White spaces allow you to enter data directly, items for which there is a codebook symbol displayed (...) require you to enter data from this codebook. To enter data press the symbol of the relevant codebook. Find the required item in the codebook and press the „Close“ button to enter it in the inventory record. If the required item is missing in the codebook, you can add it. You cannot change other items; they are only informational. After filling an inventory record you can either store it in the database or cancel it.
2. **New from the old** allows you to enter individual items on the inventory record based on the information said on an existing inventory record. This feature is very convenient if you have an inventory record created for the same type of instrument. The new inventory record is created based on the currently displayed record. Before storing this record in the database you can modify any items.
3. **Close** will close this option without creating an inventory record.

Editing an inventory record

Changes to a created inventory record can only be made in the edit mode (relevant level of access to data is a requirement). In the edit mode, you can change individual items like when creating a new record. According to the changes made, a history of the inventory record can be created. **Creating a history** is regulated by the following principles:

1. If the inventory record does not have a history yet and one of the following items is changed:
 - type of inventory, quantity, category, model, manufacturer, user item 1, serial number, asset number or customer, a history is created automatically.
2. If a history already exists and one of the above-mentioned parameters change, the program queries whether to create a history or rewrite the original inventory record.

After changes are made, you can either store the new record or cancel the changes.

Printing an inventory record

The program allows you to print selected inventory records on a printer. A button with a printer icon serves to this purpose. Fields next to the printer icon allow you to choose a printing method. Using these fields you can print 1 inventory record (displayed on the screen) or all (selected) inventory records. You can also print selected inventory records in the form of line display or in the form of inventory records. Naturally, all types of test reports can be modified).

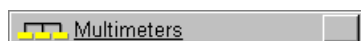
Calibration of an instrument

The screenshot shows the 'Instrument Inventory' application window. The 'Calibrations' tab is active, displaying a form for entering calibration details. The form includes fields for 'Calibration No.', 'Inventory serial No.', 'Temperature [°C]', and 'Humidity [%]' under the 'Instrument Inventory' section. Under the 'Calibrations' section, there are fields for 'Calibration procedure', 'Report name', 'Result', and 'Operator'. A 'Test report' section shows 'User's item 3'. The 'Supplements' section has a 'HISTORY' button and fields for 'Version' and 'Author'. On the right, there are 'Parameters' and 'Export' sections with fields for 'Date received', 'Date of calibration', 'Calibration period', and 'Verify to'. The bottom toolbar contains navigation buttons, a printer icon, a 'Preview' dropdown, a '1 record List' button, and 'Browse' and 'Close' buttons.

You can only execute a calibration for an instrument that has an inventory record created. First, find the inventory record of the instrument you wish to check and select the „Calibration“ **bookmark**. If there has not been a calibration executed for this instrument so far, the window showed above will display. If the instrument had any calibrations, details about the last calibration will display. You can only view calibrations and supplements of a single inventory record (instrument) – implicitly, or you can switch this filter off. A button with the following symbol (“1” means one inventory record), located in the upper right corner of the form, enables this option:



Further, users with access to all groups of instruments can switch off a filter for a group of instruments and thereafter view inventory records, calibrations and supplements from all groups of instruments. A button with the following symbol, located in the upper part of the form, enables this option:



Each calibrations window contains the following items:

1. **Calibration No.** is assigned to individual calibrations by the computer. The user cannot interfere in the numbering.
2. **Inventory serial No.** is assigned to individual calibrations by the computer. This item shows an inventory record, to which the given calibration is assigned. The user cannot change this number.
3. **Temperature [°C]** contains information about the environmental temperature during calibration. If M-010 laboratory environment monitor (manufactured by MEATEST) is connected to the computer, the temperature is read from this device automatically during calibration. You can switch this option off using the „Options“ menu. The user can change this option with the change resulting in creating a history of the calibration record.
4. **Humidity [%]** contains information about environmental humidity during calibration. If M-010 is present, the data are read automatically. You can switch this option off using the „Options“ menu. The user can change this option with the change resulting in creating a history of the calibration record.
5. **Calibration procedure** is the name of a methodology by which the calibration was executed. A calibration procedure name cannot be changed after it has been entered. The name for calibrations, which are not executed by computer (test reports are imported), is „Not entered“.
6. **Report name** is a type of report, which is used for printing a calibration in its full form (not by lines). Predefined are “One-page certificate”, “More-page certificate” and “CALIBER”.

Item “*One-page certificate*” is matched for printing of one-page calibration certificates. This certificate is created, if unit under test in only one point is calibrated. typical example is calibration of standard resistor. In this print form all information are on the first page. Item “*More-page certificate*” is matched for calibration, which was performed with calibration module MEACA or MEACU. Certificate consists of several pages with appended test report with all results of all calibration points.

Item “*CALIBER*” is matched for calibration, which was performed with calibration module CALIBER. Certificate consists of several pages with appended test report with all results of all calibration points. Difference between two last print forms is in different formatting of test report.

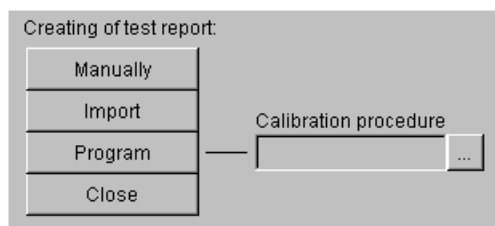
Naturally, the user can extend the relevant codebook to other types if needed. This item can be changed, however a history of the calibration record is created. Before creating a history, the program verifies whether you really wish to change the item. After confirming your intention press the button again to store the history in the database.

7. **Result** contains the result of a calibration. Again, you select this item from a codebook, which has the following types of results predefined: “*Pass*”, “*Pass except points*” and “*Failed*”. For calibrations executed by computer, the WinQbase program evaluates and determines the result automatically. For other calibrations, the user must make this assignment. You can find a more detailed discussion about the evaluation method and codebook options in chapter 2.3. This item can be changed, however a history of the calibration record is created. Before creating a history, the program verifies whether you really wish to change the item. After confirming your intention press the button again to store the history in the database.
8. **Operator** when a calibration record is created, this item is identical with the “Author” item in the “History” box. Nevertheless, before entering a calibration to the database it is necessary to enter the name of the person who physically executed this calibration (this person does not have to be the same person who stores it in the database). The name of the calibration author must be selected from a codebook of users. These persons do not need to have access passwords assigned.

9. **User's item 3** similarly to an inventory record, this is an item for which the user selects its name and at his discretion. On a report this item is used as "Request No."
10. **Test report** contains recorded data (supplement) for calibrations created by the program. For other calibrations it usually contains the whole test report inclusive of the front sheet. This item can be changed, however a history of the calibration record is created. Before creating a history, the program verifies whether you really wish to change the item. After confirming your intention press the button again to store the history in the database.
11. **Comment** is designed for additional information relating to the given calibration record. This item is not compulsory and its change does not result in creating a history of the calibration record.
12. **Export** this button allows you to export the contents of the "Test report" window to a text file or Microsoft Excel sheet (this program must be installed). Caution – only recorded data are exported, not the whole test report including the front sheet. When Microsoft Excel sheet is selected, WinQbase search for source file "report.xls" placed in WinQbase directory. First row of the file must contain names of columns you want to export.
13. **Parameters** allows you to complement and alternatively modify codebooks containing test report parameters. For detailed codebook descriptions see chapter 2.3.
14. **HISTORY** allows you to trace changes made to calibration records. You can determine who made a change, when it was made and what was the state of the calibration record before the change was made. Using the right and left pointers you can go through all the changes made to a record. It should be observed that changes are not recorded for all the items in a calibration record. In the text above you can find which items invoke creating a history of the record and which do. The history is designed in order that the program automatically records the original and the current state of the calibration record. It depends on the user whether he will keep individual phases of changes in the database as well (on making each change the program queries whether to save it in the database).

Creating a new calibration

You can create a new calibration (or enter it to the database) using the '+' button. The program inquires about the method you wish to use for calibration. There are the following possibilities:



1. **Manually** means that you rewrite a calibration test report in the "Test report" window. After entering the test report, complement the remaining details ("Result", "Type of report" etc.).
2. **Import** is for reading a calibration test report from a text file. After reading the test report, complement the remaining details ("Result", "Type of report" etc.).
3. **Program** enables calibration by the computer based on the created calibration procedure (this can also be created at this point). The name of the methodology by which the calibration will be executed must be selected from the "Calibration procedure" codebook. When you press the button, control is transmitted to the executive program, which will perform the actual calibration. The name of this program is stated in the database of

groups of instruments under the “Measuring file” item. You can find descriptions of these program operations in their user’s manuals.

4. **Close** will close this option without creating a test report.

Printing calibrations

The program allows you to print a selected calibration record in its full form (always only one) or in a short form by lines (implicitly all referred to the selected instrument). Naturally, you can choose arbitrary conditions for which test reports will be printed (you can choose either within one group of instruments or all groups of instruments) using filters. When printing a full form, the program selects the type of report (form of test report), which is stated in the “Type of report” item.

For calibrations, the program WinQbase program divides a calibration report test report into sheets by number of lines. You can set up the number of lines on the actual form. Pre-defined value is 50 lines and it also matches pre-defined type of calibration report. When you change this report (for example font sizes on test reports), you can obtain correct text layout by changing number of lines.

Moreover, you can enter two control characters into a test report, which will affect test report paging:

1. Character with code 12 always invokes a beginning of a new page.
2. Character with code 11 tells the WinQbase program that the next four lines are the header and the program places this header automatically at the beginning of a page until it finds a new header. If the program does not find a header, it does not create any.

These characters are always created automatically in programs of company MEATEST.

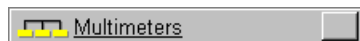
Supplements

Supplements allow you to enter other items to an inventory record. Each supplement is always related to an inventory record. Further, supplements are classified by so-called types of supplements. The number of types is practically unlimited. Two types of supplements are pre-defined: repair and standard data. For example, if you need to enter a new repair, an inventory record to which the repair appertains is selected (in the Inventory record bookmark), in the Supplements bookmark a type of supplement is selected and the repair can be entered. If you need to create a new supplement, you must activate the Types of supplements button from the main menu (only enabled for users with the highest access level).

You can only view supplements of a single inventory record (instrument) – implicitly, or you can switch this filter off. A button with the following symbol, located in the upper right corner of the form, enables this option:



Furthermore, users with access to all groups of instruments can switch off a filter for a group of instruments and thereafter view supplements from all groups of instruments. A button with the following symbol, located in the upper part of the form, enables this option:



Supplements contain the following items:

1. **Type of supplement** is a codebook, which content should represent the character of a supplement. The “Repair” and “Standard data” supplements are implicitly stored in the database.
2. **Supplement No.** is assigned to individual supplements by the computer. The user cannot interfere in this numbering. The numbers do not have to form a consecutive sequence.
3. **Inventory serial No.** is assigned to individual repairs by the computer. This item refers to an inventory record to which the given supplement is assigned. The user cannot change this number.

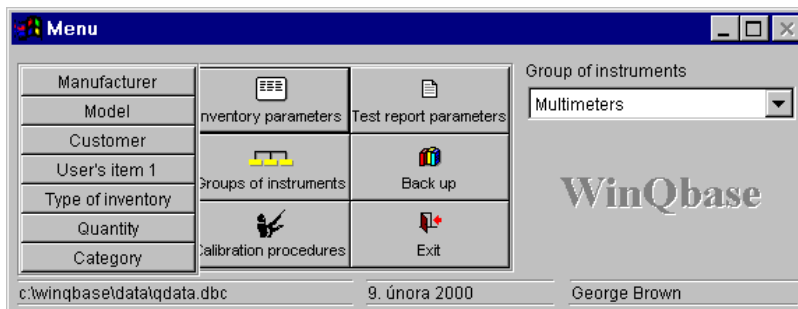
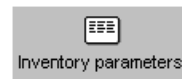
4. **Current time** contains information about the time and date of entry in the database. This item is determined by computer and the user cannot change it.
5. **Date** is set by the computer according to the current date; the user cannot change this date.
6. **Comments** is an item containing 20 characters. The user can choose the meaning of this field except for standard data, where a standard name must be entered under which this standard will then be accessible in calibration programs. This item is optional.
7. **Content** is a text or a binary item of unlimited length. For repairs a repair description is stated here, and for standard data the standard calibration data. You can also import to this field using the import button. This item is optional.

To enter a new supplement to an inventory record, press the '+' button. Supplements database has no history; therefore changes made here cannot be traced. If the selected type of supplement is "Standard data", no changes can be made. When you change standard calibration data, you must create a new "Standard data" record. In such cases calibration programs always use current (latest) data.

Printing a supplement

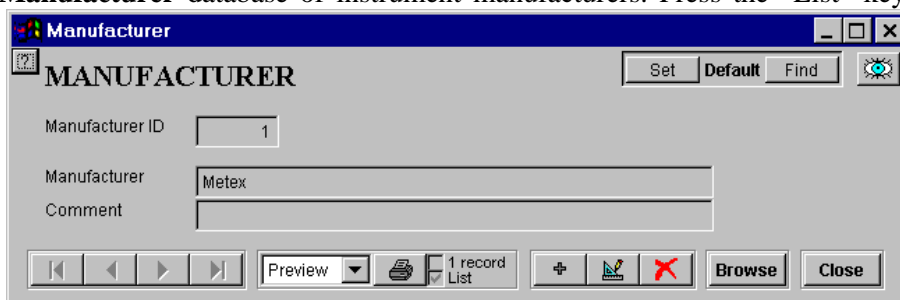
The program allows you to print a supplement in its full version (with the supplement description) or by lines, where all selected supplements are printed. Each type of supplements has separate reports.

2.2 Inventory record parameters

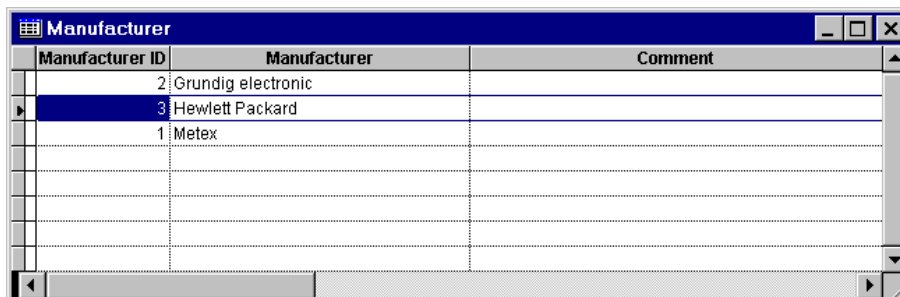


This function allows you to set codebooks for inventory records. Codebooks are separate databases containing, for example, names of all instrument manufacturers. Codebooks are common for all groups of instruments. You can extend a codebook to another item either using the “Inventory record parameters” option, or directly when entering a new inventory record. You can delete codebook items as well. Nevertheless, only on condition that this item is not used in any calibration record. The following codebooks refer to inventory records:

1. **Manufacturer** database of instrument manufacturers. Press the “List” key to display a



database of manufacturers in line display. Most lists order records automatically in



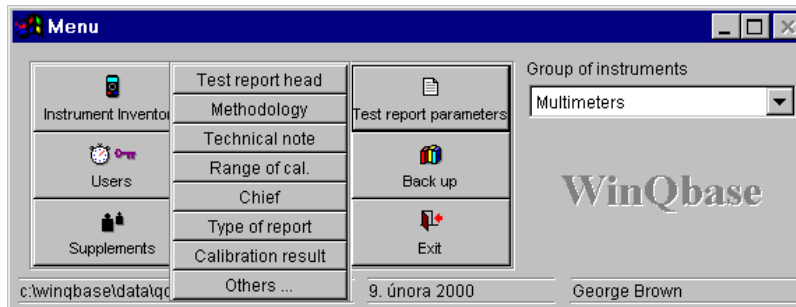
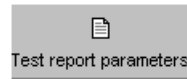
alphabetical order. Use the “Close” key to switch to the main menu. You can hide any records and set any record as sample. You can find a record set as sample any time using the “Find” button.

2. **Type of instrument** a database of types of instruments. You can hide any records and set any record as sample.
3. **Customer** a database of customers. It contains information about the instrument owner. You can hide any records and set any record as sample.
4. **User's item 1** a database by the user's choice. The user can choose the function and the name of this item (for example differentiate instruments by application sphere; he can then determine it by this function in a test report). You can hide any records and set any

record as sample.

5. **Type of inventory** a database of types of inventory records. Pre-defined types are “Internal”, “External” and “Calibrating”. However, you can enter other types of inventory records. You can hide any records and set any record as sample.
6. **Quantity** a database of places executing calibrations of instruments (laboratories). For example electric, magnetic, longitudinal etc. You can hide any records and set any record as sample.
7. **Category** a database of instrument characters (informative, working standard etc.). You can hide any records and set any record as sample.

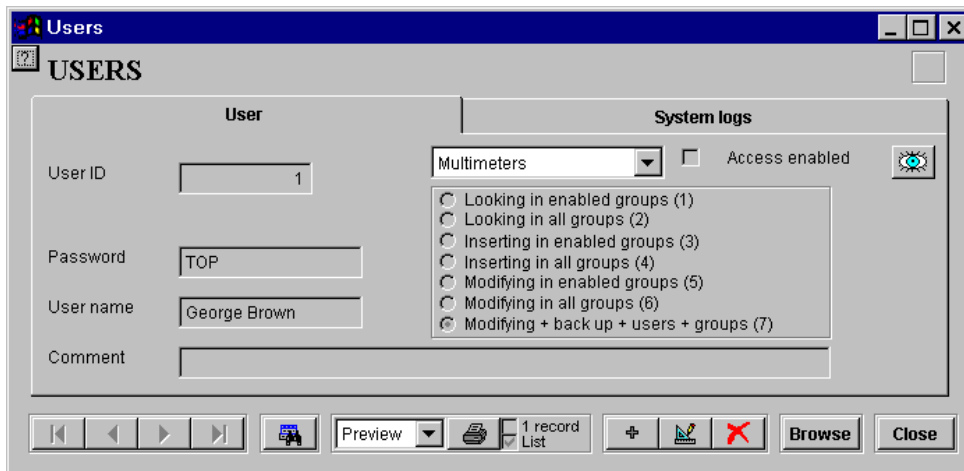
2.3 Calibration parameters



Use this function to setup codebooks for calibration records. Codebooks are common for all groups of instruments. If you wish to extend a codebook to another item, you can do it either directly at a new calibration or using the “Calibration parameters” option. You can also delete items from codebooks. Nevertheless, only on condition that this item is not used in any calibration record. To calibration records refer the following codebooks:

1. **Test report head** database of test report heads. It usually includes the calibrating laboratory name and address. A new test report automatically uses the head from the previous test report. The head consists of three lines, which are placed to the appropriate place in the test report and centered. You can also use a figure as head by placing an OLE object – such as .DOC document if you have the Microsoft Word application installed. You can hide any records and set any record as sample.
2. **Methodology** contains information about the calibration method used. On a calibration report this item is used as “Calibration procedure”. You can hide any records and set any record as sample.
3. **Technical note** is used on a preset calibration report as “Measuring conditions”. You can hide any records and set any record as sample.
4. **Range of cal.** determines, which parameters are the subject of calibration for the given instrument. For example AC/DC voltage, AC/DC current and other. This item is not used on the preset report, however you can add it. You can hide any records and set any record as sample.
5. **Chief** shows the name of the worker responsible for laboratory operation. You can hide any records and set any record as sample.
6. **Type of report** differentiates a type of report, which will be used when printing calibration. When installed, this codebook contains “Calibration 1” – single-page calibration and “Calibration” – multipage calibration. You can extend it to other types if needed. You can hide any records and set any record as sample.
7. **Calibration result** differentiates possible results of calibration. When installed, this codebook contains the “Pass”, “Pass except points” and “Not pass” items. Into these three categories the program automatically places calibrations executed by computer based on the calibration procedure. If all checked points are correct, the calibration result is “Pass”, if all points are out of allowed tolerance, the result is “Not pass”. If a checked instrument only has some points out of tolerance, the calibration result is “Pass except points” and this text is on the first report page complemented by “Marked as ...”, where symbols used for marking points out of tolerance are specified. Usually, points out of allowed tolerances are marked by the ‘*’ symbol and points within deviation allowed +/- uncertainty are marked by the ‘?’ symbol. However, the user can change these symbols in measuring programs. You can hide any records and set any record as sample.

2.4 Users

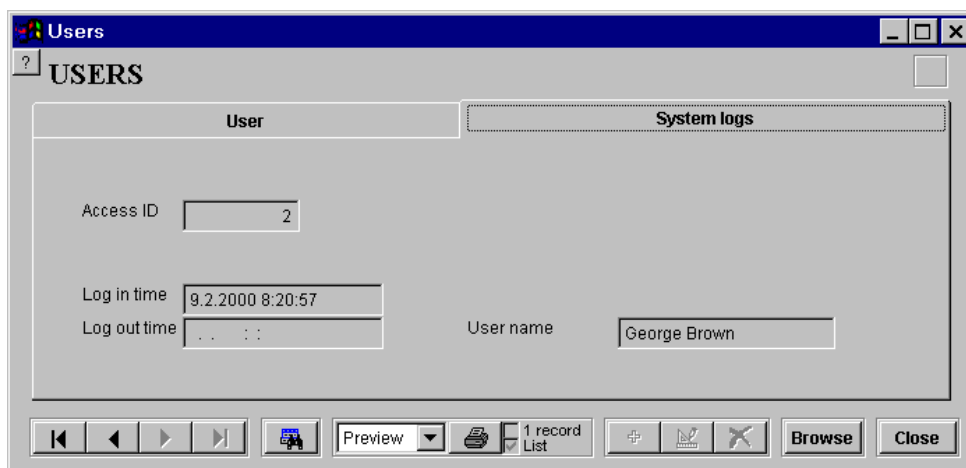


This function is only accessible for users with the highest access level (level 7 – see below). Use it to set access rights for individual program users or authors of calibrations. Concurrently, it keeps a record of program usage. It records who and when worked with this program.

Each user can have access rights of level one through seven assigned:

1. Viewing inventory records in specific groups of instruments. Each group to be accessible for a user must be marked in the “Access allowed” field.
2. Viewing inventory records in all groups of instruments.
3. Inserting new inventory records and creating test reports in specific groups of instruments. Each group to be accessible for a user must be marked in the “Access allowed” field.
4. Inserting new inventory records and creating test reports in all groups of instruments.
5. Modifying inventory records and test reports in specific groups of instruments. Each group to be accessible for a user must be marked in the “Access allowed” field.
6. Modifying inventory records and test reports in all groups of instruments.
7. Same as 6 plus data back up, user checks and creating new groups of instruments.

To enter a new user into inventory, use the ‘+’ button for entering new records. Set the “Password” and “User Name”. If a user only has the right to work in specified groups of instruments, do not forget to set up access rights for these groups. If you do not enter a password for a user, he will not have access to the database and his name can only be used as “Author”.



The “USERS” function also includes an entry register file. Here you can trace who and when used this program. At each startup the program records the time and password using which it was launched, and at shutdown it records time of exit. If time of exit is missing for some items, it was caused by illegal shutdown (for example, the computer was switched off while the program was running).

Naturally, you can print the list of users or the entry register on a printer.

2.5 Groups of instruments



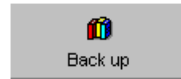
This function is only accessible for users with the highest access level (level 7 – see below). Use it to create new groups of instruments and alternatively management of existing groups. Each group of instruments has the following items:

1. **Group of instruments** contains the name of the given group. For example Multimeters, Wattmeters, Manometers, Weights up to 20kg etc.
2. **Units** contains the name of units used for this group of instruments. The unit name is important if you create methodologies using a universal program GPSU. If you have special equipment for the given group of instruments (such as P1106 – Multimeter calibrations, P1026 – Wattmeter calibrations etc.), the unit name is not important.
3. **Function** contains an abbreviation of the name of quantity, which this group uses for measuring. For example V-DC, WEIG, PRESS etc. Like for “Units”, the “Function” name is only important if you use the GPSU program.
4. **Comment** any text relating to the given group of instruments.
5. **Procedure generator** shows the name of a program that launches WinQbase when you wish to generate a new measuring methodology for the given group of instruments. If WinQbase is delivered together with calibration module CALIBER for calibration of multimeters, this program will be prior offered. Confirm it. Except it, a standard part of WinQbase program is program module GPSU, see chapter 5, 6. If you want to use it, replace CALIBER with program name GPSU.

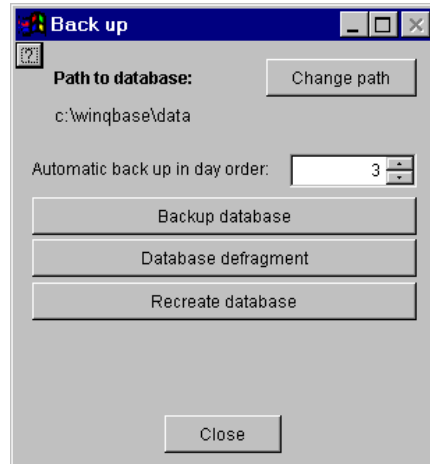
Note: Program GPSU is much more simple than CALIBER. If you have both, using of CALIBER is recommended.

6. **Calibration engine** is the name of a program that launches the WinQbase program when you wish to execute a calibration of an instrument. Again, if you have CALIBER, confirm the offered name. Otherwise you can replace it with program module MEACU.

2.6 Backup



This function is only available for users with the highest access level (level 7 – see chapter 2.4.). It enables recovery or backup of data managed by the WinQbase program.



Database backup

This function is run automatically, always after the last user logs out of the database and concurrently, after the number of days determined in the backup form pass. During automatic backup, two subdirectories ARCHIVE1 and ARCHIVE2 are stored alternatively and placed in the DATA database directory on a server. Backup file in these subdirectories is named “Qbase.pck”. It is recommended to set a number of days for automatic backup higher than zero, so that if you often start your computer when data are damaged, backups in the ARCHIVE1 and ARCHIVE2 directories are not overwritten by these incorrect data as well.

Apart from automatic backup, you can also backup your data by pressing the “Backup database” button. Nevertheless, only on condition that no other users are logged on. This option allows you to backup directly on a selected media (magnetic tape, diskettes, external disk, CD ROM and other). When you use backup on diskettes, it is necessary to mark the sequence of individual diskettes. Here backup files are also named “Qbase.pck”.

Database defragment

Database defragmentation removes all deleted records, executes conversion of the database checking all records and redefines all table indexes. It is recommended to backup the database before its defragmentation. Defragmentation is only possible if no user is logged on to the database.

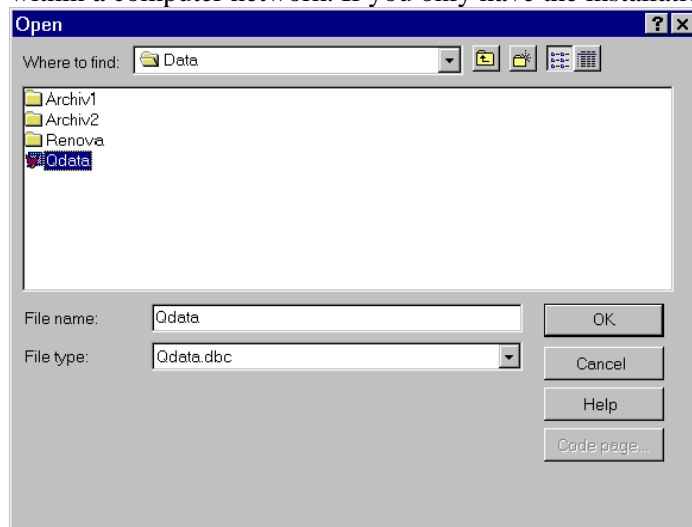
Recreate database

Database recreation is initiated when you press the “Recreate database” and it is only possible if no users are logged on to the database. If the WinQbase program is running on another computer, the “Database in use!” message displays and it is not possible to recreate the data. If the database is not being used, its recreation is executed from a selected media or directory.

Change path

When you press this button, the path to a shared database is changed. You must close and start the program again. The program inquires about the new path. This path will also be used automatically for data backup and database backup will be created here.

Setting correct path is important since it determines the location of a shared database within a computer network. If you only have the installation on



one computer, the situation is easy because there is only one database. However, if you have the program on more computers connected in a network it is necessary to select one computer on which the shared database will be located. You set up a path to this computer (its “Qdata.dbc” file) on all computers with the installed program.

2.7 Supplements

A screenshot of a Windows-style dialog box titled "Supplements". The dialog has a blue title bar with a question mark icon on the left and standard window controls on the right. The main area contains three input fields: "Type of supplement ID" with the value "1", "Type of supplement" with the value "Repair", and "Comment" which is empty. At the bottom, there is a toolbar with navigation arrows, a "Preview" dropdown menu, a printer icon, a "1 record List" indicator, a plus sign, a magnifying glass, a red X, a "Browse" button, and a "Close" button.

Inventory records contain calibrations and supplements. A codebook of types of supplements was designed for further classification of supplements. When you create a new type of supplement, reports in their full versions as well as by lines are created in the database, which you can modify consecutively.

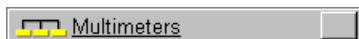
Number of supplements is practically unlimited. Predefined are two types of supplements: repair and standard data. For example, if you need to enter a new repair, select an inventory records (in the Inventory record bookmark) to which the repair appertains, in the Supplements item select repair as type of supplement and enter the repair. If you need to create a new supplement, you must activate the Supplements button from the main menu (only available for users with the highest access level).

2.8 Calibration procedures



This function manages a database of methodologies (called calibration procedures) using which individual calibrations are executed. It allows you to create new calibration procedures, import and export calibration procedures and modify them. Depending on the access level you have assigned in this program. You can delete a calibration procedure from the database, provided it is not used for any calibration.

Users with access to all groups of instruments can switch off a filter for a group of instruments and consecutively view all calibration procedures included in the database. A button with the following symbol, located in the upper part of the form, enables this option:

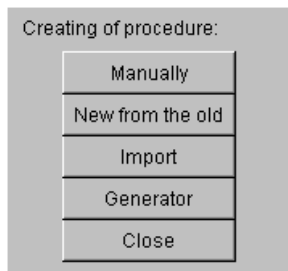


In the database of calibration procedures you can find the following items:

1. **Calibration procedure ID** displays the identification number of a calibration procedure (for internal purposes of WinQbase). The user cannot create or modify this number.
2. **Procedure name** displays the name of a calibration procedure. According to this name you select calibration procedures for calibration of instruments. The user cannot change the name of calibration procedure. The only option is to create a copy of the given calibration procedure with a new name.
3. **Author** contains the name of the user who created the calibration procedure. The program assigns this name automatically (according to the password entered at logon).
4. **Date** contains the date on which a calibration procedure was loaded to the database. The program assigns the date automatically.
5. **Procedure** displays the whole calibration procedure. You can edit the contents of this window (if you have relevant rights).
6. **Comment** serves for better orientation. It can contain any text.
7. **Export** is provided for creating a file containing the selected calibration procedure in a text format.

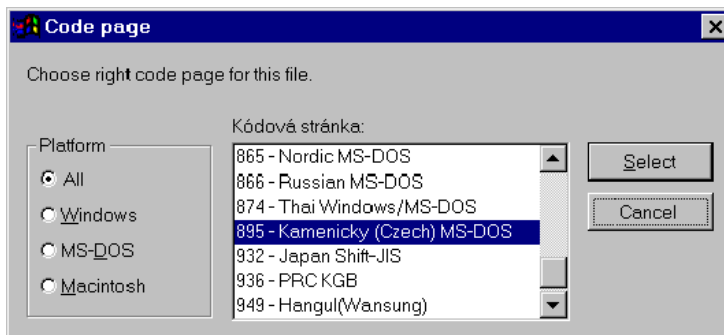
Creating calibration procedures

When you press the '+' button, the program offers you several methods of creating a calibration procedure.



You can choose from the following methods of creating a calibration procedure:

4. **Manually** creates a new calibration procedure in such a way that you write the given calibration procedure directly in the "Procedure" window. Nevertheless, for this method you need to know command syntaxes impeccably. For that reason it is useful for experienced programmers.
5. **New from the old** allows you to copy an existing calibration procedure to a new file, to which you then assign a new name. This function is useful if you have a calibration procedure created for a similar instrument. You can modify the newly created calibration procedure using edit.
6. **Import** enter a calibration procedure recorded in a text format in a file *.riz to the database. You can use this function, for example, for entering calibration procedures using an external text editor. The program allows an automatic conversion of various code pages. For example, for calibration procedures written in MBASE for DOS programs select conversion 895-Kamenicky (Czech) MS-DOS.



7. **Generator** creates a calibration procedure using a program in an interactive way. WinQbase uses a program whose name is written in the "GROUPS OF INSTRUMENTS" database in the "COMMAND FILE" item. Mostly it will be a universal program GPSU, which is a standard part of WinQbase. Using special programs GPSA, GPSW etc. is the easiest way to create a calibration procedure. You can find detailed descriptions of these programs in their user's manuals.

When you create a new calibration procedure, you can either store it in the database or cancel it.

Printing calibration procedures

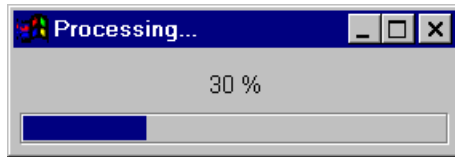
The program allows you to print calibration procedures in their full versions or by lines. You can choose necessary records using query conditions.

2.9 Exit



This function serves for a legal termination of the WinQbase program. When you close the database, automatic backup is executed, provided that all necessary requirements are met (no user is logged on, the predetermined number of days have passed).

Database backup:



2.10 Help

The program is provided with a help system. It provides very brief help on the bottom line (it describes the current object here). Furthermore, it displays help when you point the mouse cursor to some objects. You can switch this short help in the “Help” menu using the “Show tips” item. Full help is provided when you press the <F1> key. You can cancel display of help using the ESC button.

3. SEARCH

When you press the Search button, search conditions for filtrating records in the active table display. Only these records will then be displayed in the window until you cancel the filter or open the window again.

These conditions apply to printing as well (except for a calibration report, where only the active report is printed).

In the Search dialog window you can enter up to four conditions by which records of

the current table will be filtrated (selected).

Must fulfil – you can enter fulfilling of all conditions or at least one condition.

Match letter case – if it is not checked, search is not case sensitive.

Field – is an item, which is to be the subject of search. The menu displays fields valid for the current window.

Operator – is a comparative function (less than, between, equal etc.). There is also the Contains function, which can search a part of the whole text (for example M 3 – searches all items containing M3 – M 3800, M 3850), furthermore the. NULL function, which determines that an item has never been entered (in the windows it is marked by the ‘-‘ sign).

Value – is a value, which a field must equal, according to the selected function. For some fields, the value can be entered from a codebook using the button to the right (if active).

Find – executes a selection by conditions. If no record responds – a message is sent and it is necessary to change the conditions or not to execute the selection at all.

All – selects all records (cancels the last selected filter). Even if you cancel a filter, records can be filtrated by:

group of instruments (inventory records, calibrations, supplements, calibration procedures)

inventory record (calibration, supplements)

hiding records (all)

hiding history (inventory records, calibration)

Back – does not change the last selected filter and closes entering conditions.

4. PRINT

4.1 Preview



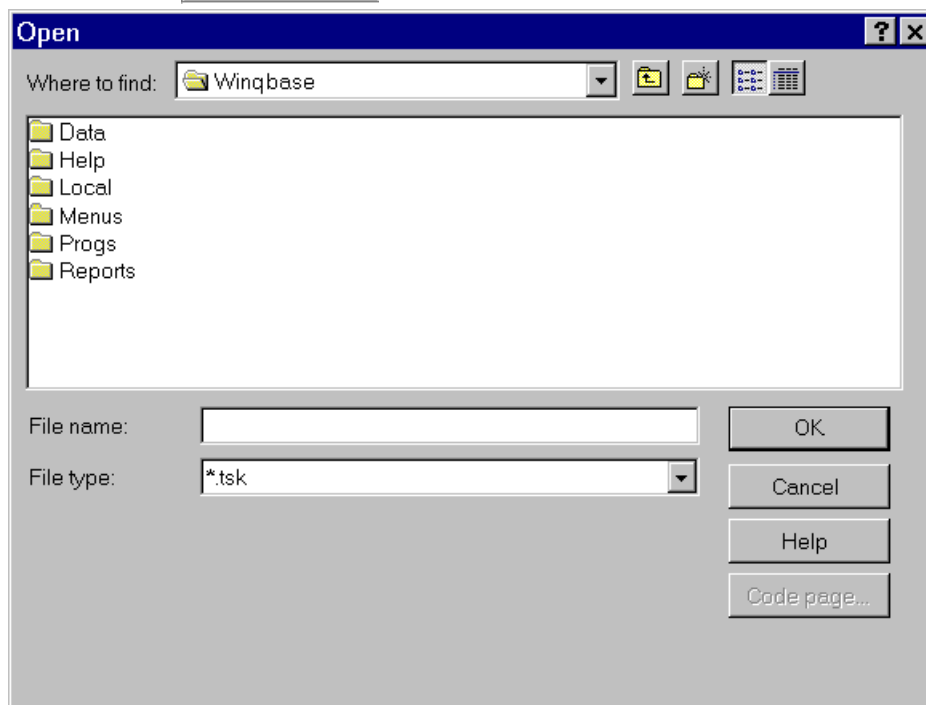
Displays a report preview. Use this tool bar to switch to any side of the report, select a display scale, close the preview or print the report.

4.2 Printer



Prints the current report on a printer. A printer set in the WINDOWS95/98/NT system as default is used.

4.3 File

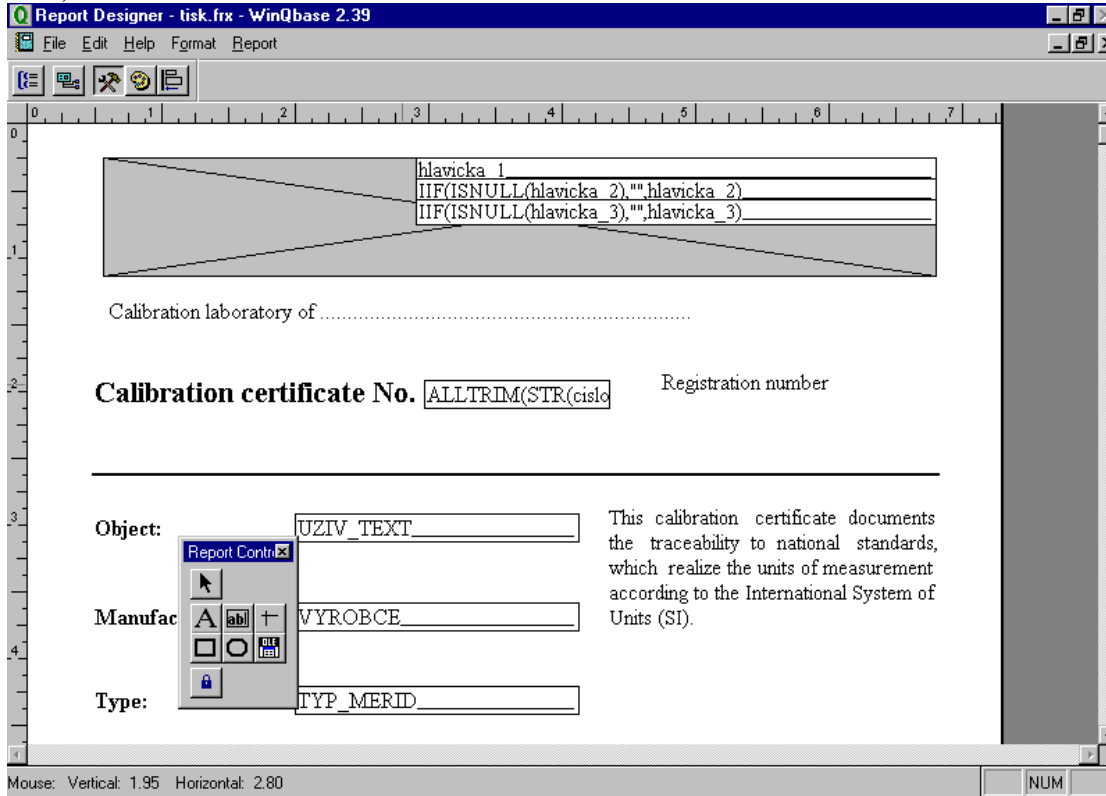


This option exports a report to a file. Press the printer icon and enter a file name. The report is saved in a binary form, which implicitly suits the printer of the WINDOWS95/98/NT system. If you wish to print the report, send the file to the printer. The created file has the “.TSK” suffix.

4.4 Modify



All printouts contain implicitly defined reports. The user can modify these reports according to his needs. Newly created reports are stored in the central database (they are filed).



To execute modifications, select the “Modify” item at the printer icon and press this icon. For example, for a calibration record the following screen will display:

So-called „Report designer“ allows you to make these modifications to output reports:

The „File“ menu

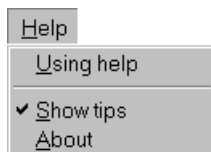


Save – saves the new report modification in the database. All users can use this print form immediately.

Close – closes the report modification program. The system queries whether you wish to save the file. If your answer is negative, the new procedure is not saved and the original procedure is preserved.

The „**M**odification“ menu is standard for the Windows environment and is provided for copying and transmitting blocks or restoring the last modification.

The „H**e**lp“ menu



U help – displays contents of the WinQbase program help.

Show tips – disables, enables display of brief help at buttons when you move the mouse cursor.

About – displays information about the program.

The „**Format**“ menu. This menu is only displayed when you modify the calibration procedure, it allows you to arrange items in the procedure and change the text font.



Align – align objects in procedure.

Size – modifying size of selected items.

Horizontal Spacing – horizontal spacing between selected objects.

Vertical Spacing – vertical spacing between selected objects.

Bring to **F**ront – selected object is transferred to foreground.

Send to **B**ack – selected object is transferred to background.

Group – groups selected objects into one object.

Ungroup – object combined using “Group” is split again.

Snap to **G**rid – place objects in the grid.

Set **G**rid **S**cale – invokes a panel for grid size setup.

Font – invokes a panel for font setup.

Text **a**lignment – layout of text (alignment, formatting etc.).

Fill – sets a fill color of a box.

Pen – sets width of lines and their style for lines and boxes.

Mode – sets transparency or non-transparency for selected objects.

The „**Report**“ menu is only left for completeness. However, its use can only be recommended to experienced programmers in Visual FoxPro.

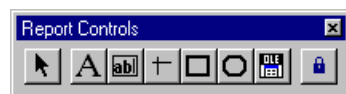


Furthermore, there are tool bars available. Again, the first two bars (Data grouping and



Data environment) are left only for completeness and their use is also recommended after contingency perusal of user’s manuals for Visual FoxPro 5.0.

When you open edit, the standard „**Report pushbuttons**“ bar displays using which you



can add figures, texts or other variables available in the given report. You must either draw figures using the available tools or import them in the BMP format.

The following is description of basic tools included in the “Report pushbuttons” bar. There are eight of them and they have the following function.

Select objects – selects one or more objects in the output report.

Description – places any text in a selected place of the output report.

Field – places any database item in the output report. The program offers you a list of items available for the given report automatically.

Line – places a line in the output report.

Box – places a box in the output report.

Box with round corners – places a box with round corners in the output report.

Figure/linked OLE element – places a figure in the BMP format or an OLE object in the output report.

Button lock – locks a selected function on the tool bar. This is useful if you place more identical elements in the output report.

You can format individual fields or texts, define conditions for printing items etc. using commands. The program offers you a list of format commands automatically.

Another toll bar is the “**Color palette**”.



If you have a printer with color printing available, using this palette you can set a color for individual texts (figures) as well as for the background. The following is a description of basic tools included in the “Color palette” bar:

Foreground color – a two-state button. Its lower (pressed) position means active function.

Background color – a two-state button. Its lower (pressed) position means active function.

Palette of 16 colors – by activating one of the colors the color of the pre-selected object changes directly.

Other colors – displays a standard palette of other colors.

The last tool bar is the “**Layout**”. It allows you to align individual items, order them etc.



Before you use the first eight functions, you need to select a group of objects (it can be text, table field or figures) to be aligned.

Align left

Align right

Align upper margins

Align bottom margins

Align center vertically

Align center horizontally

Set same width

Set same height

Set same size

Center horizontally

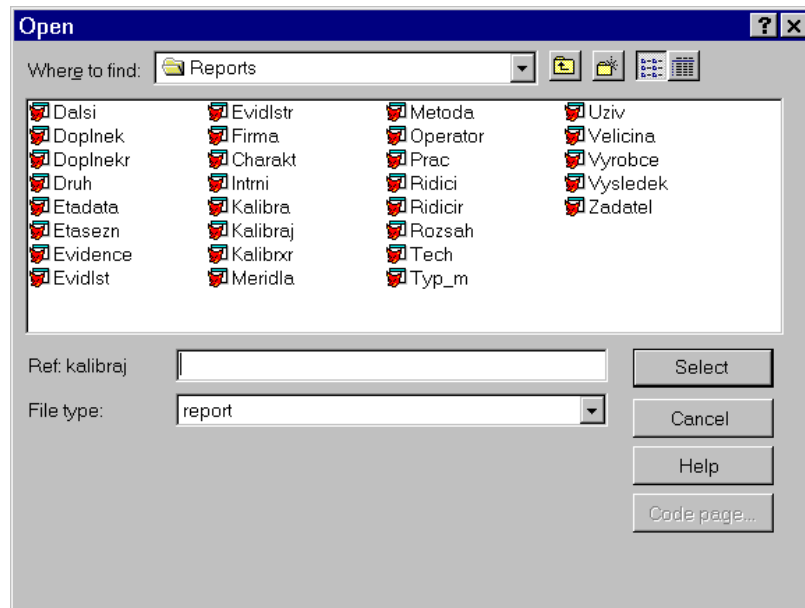
Center vertically

Transfer to foreground

Transfer to background

Since modifications of reports are very extensive and allow everything the Visual FoxPro 5.0 environment enables, we can refer those interested in a more detailed study of this field to a user’s manual for this environment. In any case, if you fail to create the required output report, you can return to the implicit report format supplied with the program (the “Import” function – see below).

4.5 Import



This function allows you to open a report. All reports supplied with the program are placed in the \WinQbase\Reports\ directory. If you fail to set a report correctly, you can return to the original report any time using the “Import” command.

When selecting a file, the program offers you a help message with the name of the original file to the left from the entry field.

4.6 Export



This function allows you to store a report. Naturally, a new created report is saved in the central database. Furthermore, you can create its backup as a file. This system allows you to create several reports (calibration procedures) for a single report (for example a single-page report).

5. MEACU Program

This program was designed for semiautomatic calibrations of instruments of both electric as well as non-electric quantities. Data transfers from calibrated instruments, and alternatively an standard (calibrator), are only executed by writing on the computer keyboard. The system output is a calibration report containing recorded values and their evaluation. It is a part of the WinQbase program designed for keeping a record of and sorting reports, methodologies, types of instruments etc.

Software properties are in accordance with the EN 45001 standard and a series of the ISO 9000 standard. The system output is a calibration report containing recorded values and their evaluation.

The WinQbase program can be extended to components for calibration of wattmeters, electrometers, multimeters and other types of instruments.

Software was designed in order that the system provides sufficient variability when checking various types of instruments. Program support is split into two parts:

- a/ efficient part (MEACU program), which executes the actual calibration,
- b/ preparatory part (GPSU program), called a command file generator, which creates a report for the MEACU program.

5.1 Program function

The actual calibration program MEACU is lead by setups defined in a report. The program controls calibration order, evaluates measuring, performs uncertainty calculations and generates a calibration record. When a calibrated instrument is being checked, you can change the program operation very limitedly. It is practically impossible to enter required information or to stop the program.

The program allows various methods of **entering standard values**, using which a calibration is executed:

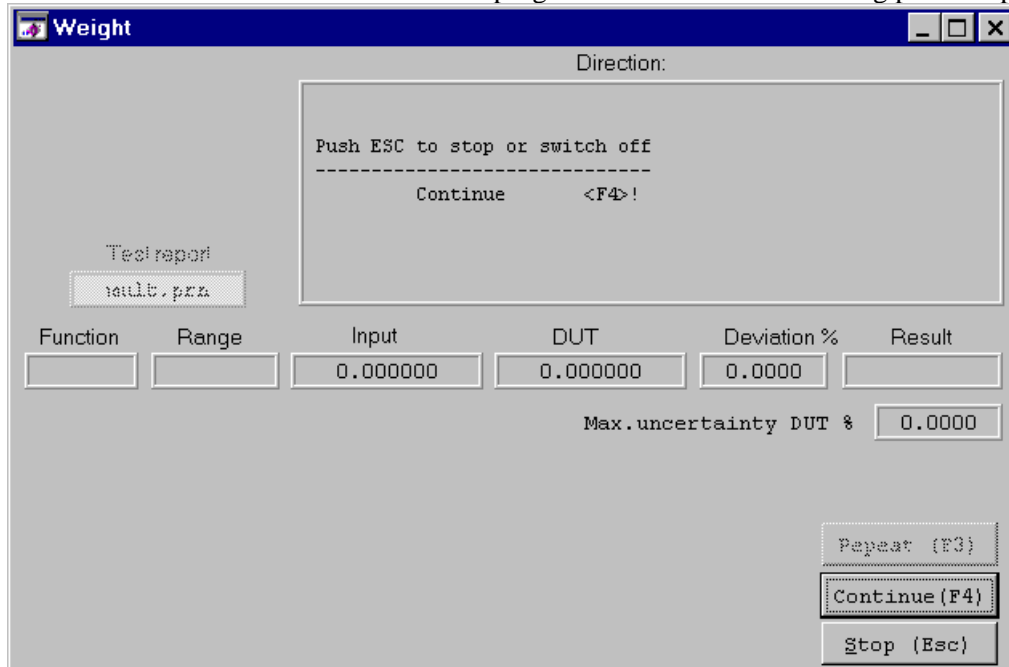
- 1) Standard value is entered manually in a calibration procedure when it is being created. This method of introducing an standard value is easy, nevertheless its disadvantage is that when you change an standard calibration data, you must change the relevant parameter in the calibration procedure as well. Calibration of scales using an standard weight set can be an example.
- 2) Standard value is entered at calibration of an instrument simultaneously with a value indicated by the calibrated instrument. This method compares an standard with a calibrated instrument. Calibration of a manometer compared with an standard manometer, where a pressure gas cylinder with a regulating valve serves as a “source of signal”, can be an example.
- 3) Standard value is entered in the WinQbase database, in the “Standards” item. In this case it is not necessary to enter an standard value neither when generating a calibration procedure nor during the actual calibration. When generating a calibration procedure, you only determine in which data file calibration data are stored. This method is most convenient, because it gives you the option to keep a record of standard calibration data.

You control the program using three buttons, **Repeat**, **Continue** and **Stop**. You can control it using the mouse, or the functional keys, F3 (Repeat), F4 (Continue) or ESC (Stop).

The program is created in the C language, in the LabWindows/CVI environment.

5.2 Description of the MEACU program screen

In the WinQbase environment initiate creating of a new report by the program. The database transfers control to the efficient program MEACU. The following panel displays:



In the upper right corner is a field in which the program writes all information for the user. If the measuring process stops and user's cooperation is required, the user finds a brief description of the required operation in this window.

The Report window contains the name of a file in which the MEACU program stores recorded data. If you use the WinQbase database superstructure (and it is usual), you must not change this file name!

Windows in the center of the screen inform you about the measuring in progress. They have the following meaning:

Function: text description of the set function on the checked instrument (weight, pressure etc.).

Range: text description of the range of the checked instrument (10 kg, 100 Pa etc.).

Input: standard value (the standard value is specified either in a calibration procedure or a table of standards). Only when using the comparative method, the user is required to enter (or confirm the pre-defined) standard instrument data.

DUT: value recorded by the checked instrument.

Deviation %: deviation of the checked instrument (relative to a testing point, for testing points less than 0.5% of range relative to the range being checked).

Result: evaluation of the checked point (Pass, Out +, Out -).

Max. uncertainty maximal allowed uncertainty of a checked instrument at the given

DUT %: point (relative to a testing point, for point less than 0.5% of range to the range being checked).

In the bottom right part are three windows, using which you can partly control the course of an instrument check. These are the “**Repeat (F3)**”, “**Continue (F4)**” and “**Stop**

(Esc)” buttons. The Repeat button allows a new measurement of a testing point if a fatal error occurs. Using the Continue button allows continuation of the program (for example after switching an instrument range) and the Stop button allows you to stop the course of an instrument check at any time. If you stop the instrument check prematurely, a report is created based on the recorded data, however the check result is “Not pass”. Controlling is possible either using the mouse or the keys in parenthesis.

5.3 Program operation

In the WinQbase database environment select a calibration of the relevant instrument. After filling a calibration record, operation is transmitted to the MEACU program.

Most methodologies begin with a so-called external check. The user answers a few queries here relating to mechanical damage not occurring on the instrument, completeness of its documentation and other. The results of the external check will be stated on the reverse side of a calibration report. If a calibration procedure contains implicit answers to queries, these will be displayed in the window for entering text.

After the external check of an instrument, a measuring accuracy check on individual ranges succeeds. The program allows display of a block diagram of interconnected instruments, for better illustration. However, this figure must be pre-prepared using an appropriate graphic editor, which can create the PCX format. Convenient are for example Paintbrush or CorelPHOTO-PAINT. The illustration of interconnection is not necessary for the actual calibration process. It only increases user comfort.

Connect instruments according to the showed drawing and press the F4 key to initiate calibration. Since you cannot operate instruments from the computer, a semiautomatic calibration will be executed. In the text window the computer requires you to set the right function and measuring range on the instrument. The 'Function' window displays calibrated quantities and the 'Range' window displays a nominal range value with the units specified (both details are transmitted from the calibration procedure).

Function	Range	Input	DUT	Deviation %	Result
Weight	1.0 g	0.000000	0.000000	0.0000	

Max.uncertainty DUT % 0.0000

Repeat (F3)
Continue (F4)
Stop (Esc)

When you press the F4 key, the computer requires you to enter a value for an external reference, i.e. for a connection of an standard with the required value to the instrument being calibrated. The 'Input' window displays the standard value of this point, provided the calibration detail was entered in the calibration procedure (manual entry), or if calibration data for the standard are determined in one of the standard sets in WinQbase. If a comparative calibration with an standard, for which you do not know the right value beforehand, is executed (for example comparing an standard with a calibrated manometer), the computer changes the color of the box and requires you to first enter an standard value in the 'Input' field.

The screenshot shows the 'Weight' window with a 'Direction:' dialog box. The dialog contains the text: 'Set value of external standard. Continue <F4>!'. Below the dialog is a table with the following data:

Function	Range	Input	DUT	Deviation %	Result
Weight	10 g	2.000090	0.000000	0.0000	

Below the table, there is a field for 'Max.uncertainty DUT %' with the value '0.0000'. At the bottom right, there are three buttons: 'Repeat (F3)', 'Continue (F4)', and 'Stop (Esc)'.

When you enter this value, the computer changes the fill color of the 'DUT' window and places the mouse cursor on it. Deduct the value displayed on the display of the checked instrument and enter it in the 'DUT' window. You always enter values in basic units determined in the 'Range' field. The number can also include an exponent. When you confirm the entry using the 'Enter' key, calculation is performed and its results are displayed in relevant windows. Calibration at another point succeeds.

If the number of calibration revisions at one point is set to 3 at least, the program calculates a medium data value and scattering.

The screenshot shows the 'Weight' window with a 'Direction:' dialog box. The dialog contains the text: 'Course error! New measurement <F3>! Continue <F4>!'. Below the dialog is a table with the following data:

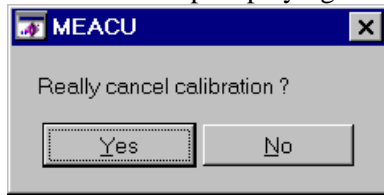
Function	Range	Input	DUT	Deviation %	Result
Weight	10 g	2.000090	2.600000	0.0000	

Below the table, there is a field for 'Max.uncertainty DUT %' with the value '0.0000'. At the bottom right, there are three buttons: 'Repeat (F3)', 'Continue (F4)', and 'Stop (Esc)'.

The program checks the entered value and if a recorded deviation exceeds about 5%, it informs the user about the occurrence of a fatal error and allows him to correct the entered value. You can enter the correct value using the "Repeat (F3)" button and when you press the "Continue (F4)" button, the calculation is finished with the original value and the program

continues. Every time you set a new calibrating point, a pause is set (about 2 seconds) for possible stabilization of the value. All points determined by the methodology are checked progressively.

If you wish to terminate the measuring prematurely, the program requires you to confirm this step displaying the following message:



Before checking another range, the program requires you to perform the relevant instrument setup.

When all ranges of the instrument are checked, the program returns to the database system automatically.

5.4 Measuring process, deviation and uncertainty calculation

Measuring process

Standard is set to a value determined in the calibration procedure (command \$h). Calibration using the checked instrument is executed. If it is necessary to repeat the measuring (when a fatal error occurs), the whole procedure is executed again automatically.

Deviations

The deviation calculation method is appointed by the program. A relative deviation, relative to an actual value is calculated. Exception are testing points less than five thousandths of the range ($0.005 * MHR$), where deviations are relative to the range of the checked instrument (the relevant line is marked by "R").

Allowed deviation is determined for each range and function by the following relation:

$$t_M = \text{;Error!} \quad [\%]$$

or for a testing point less than $0.005 * MHR$:

$$t_M = \text{;Error!} \quad [\%]$$

- L₁** - a constant from a calibration procedure, it equals a deviation from the range [%] multiplied by range value
- L₀** - a constant from a calibration procedure, it represents a deviation from the measured value [%]
- X** - the value recorded by the checked instrument
- E** - an standard value obtained from a calibration procedure, from the STANDARDS file or entered in the "Input" window when using the comparison method
- MHR** - maximal range value of the checked instrument

Deviation of a checked instrument is calculated from the relation:

$$d = (\text{;Error!} - 1) * 100 \quad [\%]$$

or for a testing point less than $0.005 * MHR$:

$$d = (\text{;Error!}) * 100 \quad [\%]$$

The **X** value is entered by the user. Standard value (**E**) is standard calibration data.

Uncertainty

The uncertainty calculation method is appointed by the program based on TPM 0051-93. Relative uncertainty relative to an actual value is calculated. An exception is testing points less than five thousandths of the range ($0.005 \cdot \text{MHR}$), where uncertainty is relative to the range of the checked instrument (the relevant line is marked by “R”). If the calculated measuring deviation falls within the ‘maximal deviation allowed +/- uncertainty’ span, the relevant line is marked by the “?” symbol. You can replace the “?” symbol with a different symbol using the \$n command. Similarly, you can exclude uncertainty from measuring evaluation (you do not enter the second parameter in the \$n command).

Relative extensive uncertainty is calculated for each point:

$$U = k_u \cdot u_c \text{ [%]}$$

k_u - an extension coefficient entered by calibration procedure. Usually $k_u = 2$.

u_c [%] - standard combined uncertainty determined from the relation

$$u_c = \sqrt{u_a^2 + u_b^2 + u_d^2 + u_e^2 + u_m^2} \text{ [%]}$$

u_a [%] - general uncertainty type A, given by a calibration procedure constant (usually 0.0)

u_b [%] - general uncertainty type B, given by a calibration procedure constant (usually 0.0)

u_d [%] - uncertainty caused by ultimate resolution of digital instruments

$$u_d = 0.29 \cdot \text{;Error!} \cdot 100 \text{ [%]}$$

or for a testing point less than $0.005 \cdot \text{MHR}$:

$$u_d = \text{;Error!} \cdot 100 \text{ [%]}$$

MHR - maximal range value of the checked instrument

b - testing point value

dig - number of instrument digits, entered by the calibration

procedure

u_e [%] - uncertainty caused by maximal standard uncertainty

$$u_e = \text{;Error!} \cdot \text{;Error!} \text{ [%]}$$

or for a testing point less than $0.005 \cdot \text{MHR}$:

$$u_e = \text{;Error!} \cdot \text{;Error!} \text{ [%]}$$

d_{max} - maximal standard deviation at a testing point

b - a testing point value

MHR - maximal range value of the checked instrument

u_m [%] - uncertainty type A, it is only included in calculation if the number of measuring revisions at one point is set to at least 3 in the calibration procedure. If this

condition is not fulfilled, the program considers u_m equal 0 and you must determine u_a instead – if this constituent is not insignificant.

$$u_m = \text{Error!} * 100 [\%]$$

or for a testing point less than $0.005 * \text{MHR}$:

$$u_m = \text{Error!} * 100 [\%]$$

$$X = \text{Error!}$$

- b** - a testing point value
- n** - a number of measuring revisions

5.5 Test report format

The format of a test report is appointed by the program, including a relevant head. Measuring uncertainty is determined for each line and it is stated, whether the given measuring is satisfactory. Standard accuracy is an essential constituent of uncertainty. For an accurate calculation see chapter 5.4. The following symbols can appear at the end of each line:

- * - recorded deviation exceeds allowed deviation (a different symbol can be set)
- R - all deviations and uncertainty are relative to the range
- ? - recorded deviation is within the maximal deviation +/- uncertainty (a different symbol can be set)
- ok - the testing point is correct

Sample test report:

Funkce	Rozsah	Vstupní hodnota	Naměřená hodnota	Chyba naměř. [%]	% spec. [%]	Chyba povol. [%]	Nejist. ku=2.0 [%]	
TLAK	100 kPa	50000.0	50420.0	0.840	28	3.008	0.5803	ok
TLAK	100 kPa	80000.0	79960.0	-0.050	-2	2.250	1.0399	ok

- Function** - instrument function
- Range** - instrument range
- Input value** - testing point, standard value
- Recorded value** - value indicated by calibrated instrument
- Deviation rec.** - deviation of checked instrument
- % spec.** - percentage of specification extract (Deviation rec./Deviation all. *
100 %)
- Deviation all.** - maximal allowed deviation of an instrument
- Uncert.** - extensive measuring deviation for ku = xxx (see chapter 5.4)

5.6 Calibration procedure, list of commands

Calibration procedure includes commands for execution of a test, information for the user and supplementary texts for a test report. It is a procedure in the ASCII text format, for which individual commands on each line begin with the '\$' symbol in the first column, and end with the "new line" symbol. You can edit this procedure using any text editor or create it in the GPSU program. A command (usually a letter of the lower or upper case) begins with the '\$' symbol and behind this symbol follows a list of parameters separated by commas. The procedure ends with the '\$e' symbol. Any comments can be stated behind a command. Commands whose last parameter is a text item are exception. Such commands cannot be complemented by a comment on the line. If extract is not switched on, you can enter a comment also in between commands. Every line which does not begin with the '\$' symbol is interpreted as a comment.

Alphabetical list of commands:

\$d

- a pause (waits for the F4 key being pressed)

\$e

- end of calibration procedure

\$f, 0, T_FUNCTION

- a text expression of the instrument function.

0 - not used

T_FUNCTION - a text expression of the function (any text of max. 4 characters in length – limited by test report)

\$g

- beginning of text to the test report (up to \$k)

\$h, VALUE, P_RANGE, DEV

- setup of a value, range and deviation

VALUE - standard calibration data if manual entry of standard is selected

- a testing point if comparison of an standard with a calibrated instrument is selected

P_RANGE - a range value of the measured instrument (serves for deviations calculation)

DEV - standard uncertainty if manual entry of standard is selected

\$i, TEXT, INFO

- text to the test report required from the user.

TEXT - a text item written in a test report before the text entered by the user

INFO - help for the user

\$k

- end of text extract (either for the user or for a test report)

\$L, 0, 0, L_0 , L_1

- defines accuracy for the given range and function

0,0, - not used

L_0 - a deviation from value [%]

L_1 - a deviation from range * range value [%]

\$m

- delete the "Directions for user" window

\$n, *SYMBOL_ERR*, *SYMBOL_UNC*

- defines symbols for marking test report points with deviation larger than allowed

SYMBOL_ERR - a symbol for marking a point with deviation exceeding allowed deviation

SYMBOL_UNC - a symbol for marking a point which deviation is within the deviation allowed +/- uncertainty.

If the second symbol is not specified, then only deviation recorded is compared with allowed deviation without including uncertainty.

\$p

- copy the following text to the test report and to the command window (up to the \$k command)

\$P, *NAME*, *X*, *Y*

- figure display

NAME - a file name (figure in the PCX format)

X,Y - beginning of display on screen (upper left corner = 0,0)

\$r, 0, *T_RANGE*

- text of tested instrument range

0 - not used

T_RANGE - a text expression of the range (any text)

\$s, *KEY,REPEAT*

- selecting a type of calibration data

KEY 0 to 999 – standard calibration data are saved in file STANDARD.TXT

1000 – calibration data entered in calibration procedure

1001 – calibration data are entered in the 'Input' window

when calibrating

REPEAT a number of calibration revisions at one point 1 through 5

\$t

- copy the following text to the "Directions for user" window

\$U, u_a , u_b , *DIG*, k_u

- parameters for measuring uncertainty calculation

u_a - uncertainty constituent type A. It is relative uncertainty, relative to a value.

u_b - uncertainty constituent type B. It is relative uncertainty, relative to a value.

DIG - uncertainty constituent type B. Only considered for digital instruments and represents uncertainty caused by ultimate resolution of the instrument.

The dig. item determines the resolution (number of digits).

k_u - an expansion coefficient. It multiplies the calculated standard combined uncertainty. Usually calculated with coefficient 2.

\$x, NUMBER

- perform test in the set testing point. The value of the NUMBER parameter is always 1.

\$y, 0, T_MODE

- setting an instrument type

0 - not used

T_MODE - a text expression of a calibrated instrument type

\$z

- end of test (pass x not pass)

\$+m, K0

K0 - an additive constant of recalculating function

\$*m, K1, K2, K3, K4

K1 to K4 - constants of recalculating function (polynomial of 2nd order)

Final value of a calibrated instrument is calculated as follows:

$$m = K0 + K1 * x^{+1} + K2 * x^{-1} + K3 * x^{+2} + K4 * x^{-2}$$

where x the value indicated by an instrument

m the final value after recalculation

6. GPSU Program

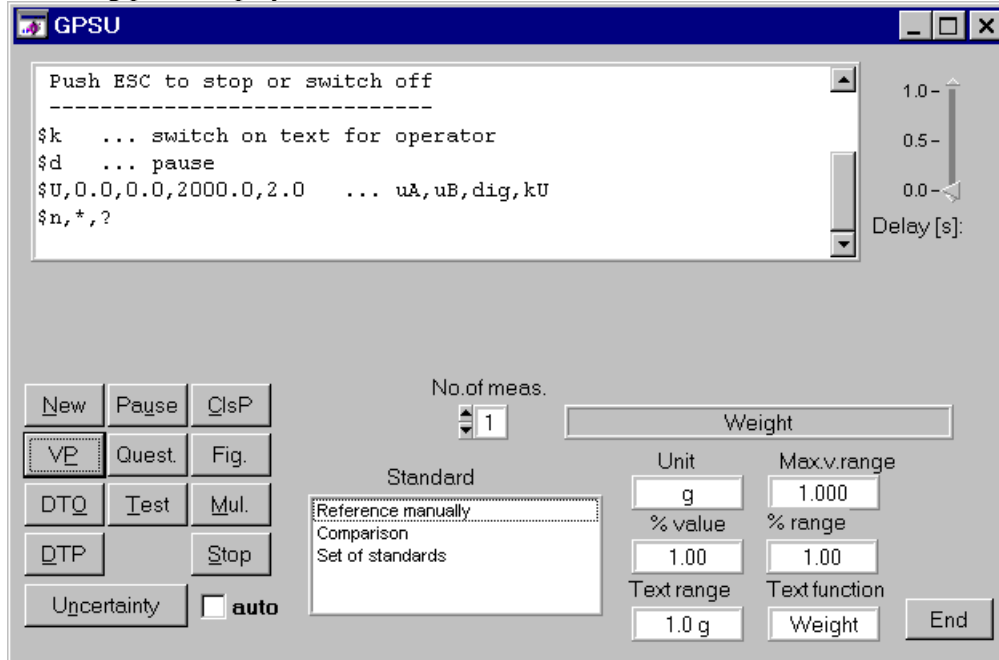
6.1 Program function

The GPSU program is a command file generator. It does not communicate with any instruments while in operation. It creates a methodology for an instrument check progressively, based on the operator's commands. After terminating its operation the program saves the resulting sequence of commands on a disk under the name MEROL.RIZ. If GPSU operates under the WinQbase program (which is usual), transmission of this file to relevant databases is provided automatically.

You can operate the program using simulated "buttons" and "switches", and by entering numerical and text values. The "mouse" is also very useful for operation.

6.2 Description of the GPSU program screen

In the WinQbase environment select creating of a new calibration procedure by the generator. Enter basic details relating to the methodology being prepared and press the "Generator" button. The database transfers operation to the efficient program GPSU, the following panel displays:



In the upper half of the window is a window displaying the generated test methodology. In the right part of the upper half of the window you can see a scroll bar, using which you can setup a pause between generation of individual lines. The pause range is 0 to 1 second. A longer pause slows down a methodology generating procedure; nevertheless, you can easily view the text being composed.

In the lower part of the screen are pushbuttons of the GPSU program. Using these you can setup the function, range, accuracy etc. of the checked instrument.

6.3 Pushbuttons of the GPSU program

New - deletes the screen and starts generating a new procedure. You can also press this button during a generation process if you wish to start creating a test methodology again. Among other things, contents of the UVODU.GPS file are copied to the generated methodology.

VP - inserts instructions for external check into the calibration procedure (contents of the VPROHL.GPS file).

DTQ - supplementary text for the operator. Text including instructions (help) for the operator executing calibration.

DTP - supplementary text for the test report. It allows you to complement information into the report, which are not included as standard.

Pause - stops the testing procedure and waits for the F4 key being pressed. This key is used only exceptionally. In most cases (change of range, function etc.) the program stops automatically.

Quest. - inserts a query into the procedure. It will be answered in the test report. You can use it for example for entering humidity, atm. pressure etc.

Test - generates a test program, each testing point must be entered. If the “Auto” function is selected at the “Uncertainty” button, the program requires current parameters of measuring uncertainty at each point.


QlsP - deletes the “Directions for user” window of the MEACU program.


Obr. - inserts a figure in the PCX format into the calibration procedure.

Mul. - enters correction constants of the checked instrument. Generally, the program enables correction of each instrument characteristics using polynomial of second order.

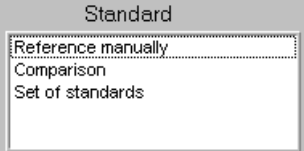
Stop - ends generation of the methodology and saves the generated text in the MEROL.RIZ file. Further edit does not affect this file.

Uncertainty **auto** - is a feature for entering uncertainty into the methodology. If you wish to enter uncertainty individually for each checked point, activate the “Auto” button. Otherwise they are only entered at the beginning of generation of the methodology (when you press the “New” button) or when you press the “Uncertainty” button, for example when a range or function changes. For more details see chapter 5.4.

 - ends operation of the GPSU program, return to the WinQbase environment.
! CAUTION ! If the generating process was not ended using the “Stop” button, the procedure is lost irrecoverably.



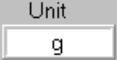
- selecting a number of measuring revisions at one range. The permissible range is 1 through 5.



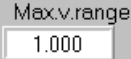
- selecting a type of standard. You can change the standard during file generation any time. The subsequent values are then compared with the selected standard. The “Reference manually” position is for entering an accurate standard specification (value and accuracy) into the calibration procedure. In the “Comparison” position, a check is executed by comparing a previously unknown standard value with the measured instrument. The program requires you to enter only nominal standard values. An accurate value and maximal standard deviation are entered during the actual calibration. The last position, “Set of standards”, allows you to enter one of the standards of which values are saved in the WinQbase program under the name “Standards”. Similarly, only a nominal standard value is rewritten into the file and an accurate standard specification is searched in a relevant table during the actual calibration.




- information window. It displays a selected group of instruments in the WinQbase program.




- in this window you can setup units for the checked quantity. Implicit setup is determined by setup of units at the relevant group of instruments in the WinQbase program. Text for “Text range” is generated automatically based on the setup of this window.



- maximal range value of the measured instrument. It is used for calculation of errors. Text for “Text range” is generated automatically based on the setup of this window.



- maximal allowed deviation for the checked instrument at the given range. It is entered in two components. The “% value” window is used for setup of percentage of the measured value. The “% range” window represents percentage of the range. If an instrument has a part of the recorded value specified absolutely or in digits, it is always a component of percentage of the range and it must be recalculated to express percentage.

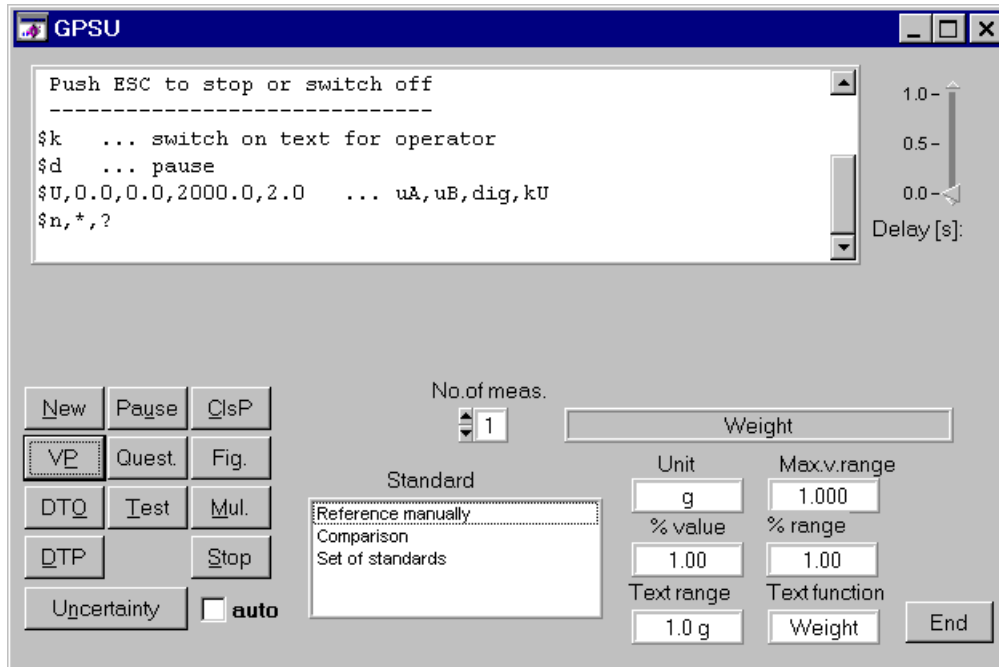


- text items which are rewritten into the test report. They are setup in the GPSU program automatically, always after entering relevant values, however their user setup is also possible. Implicit setup of the “Text function” window is determined by the appropriate setup in the WinQbase window.

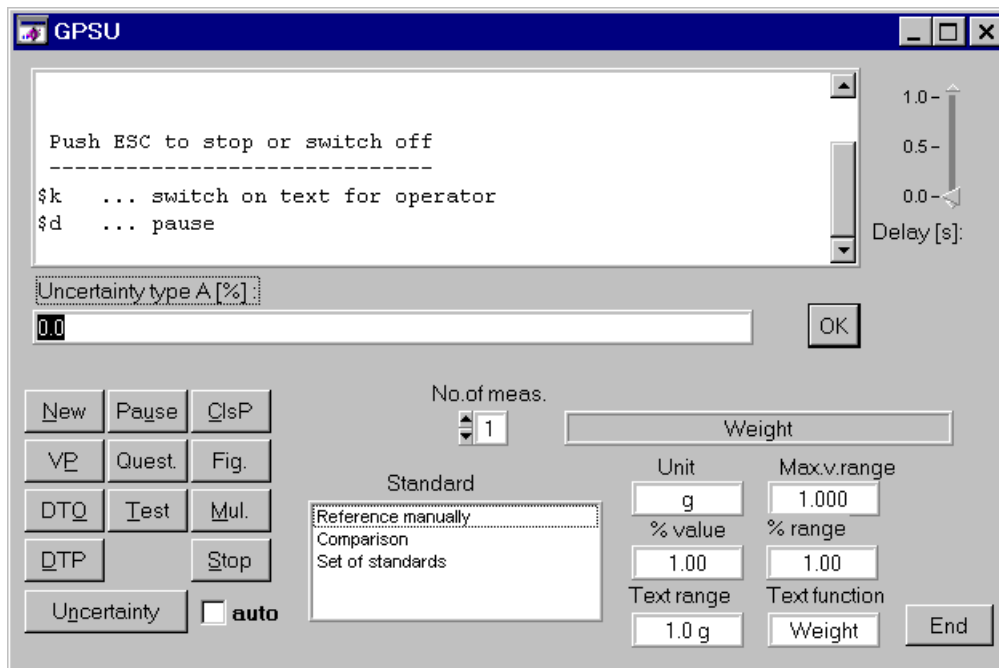
6.4 Program operation

When operating this program it is necessary to keep the following process:

a/ Activate the **New** button.



Subsequently, the introductory sequence from the UVODU.GPS file is inserted.

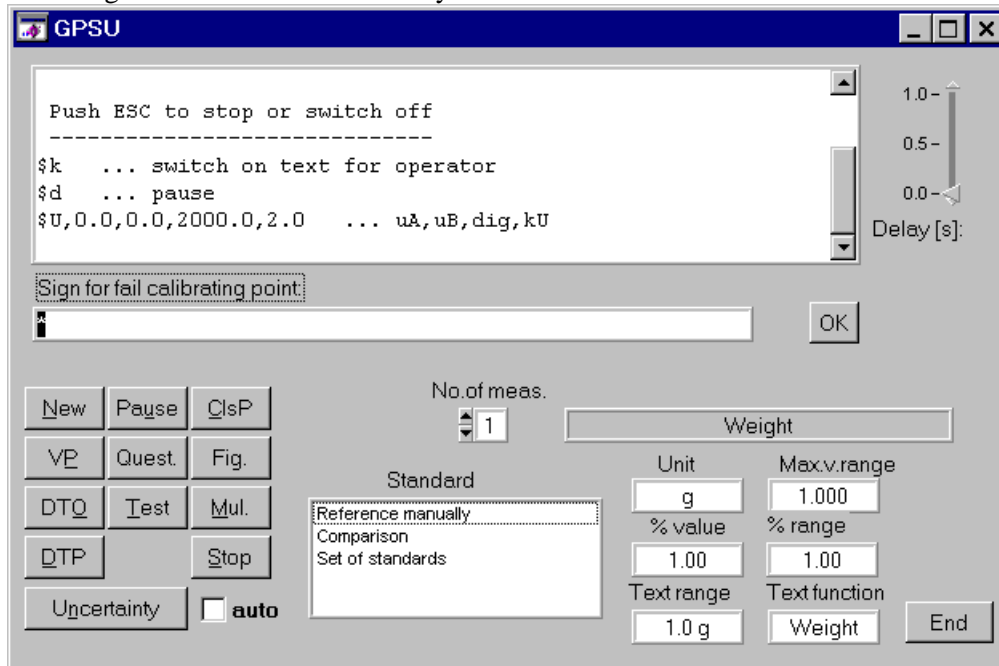


Finally, the program enquires about individual uncertainty constituents.

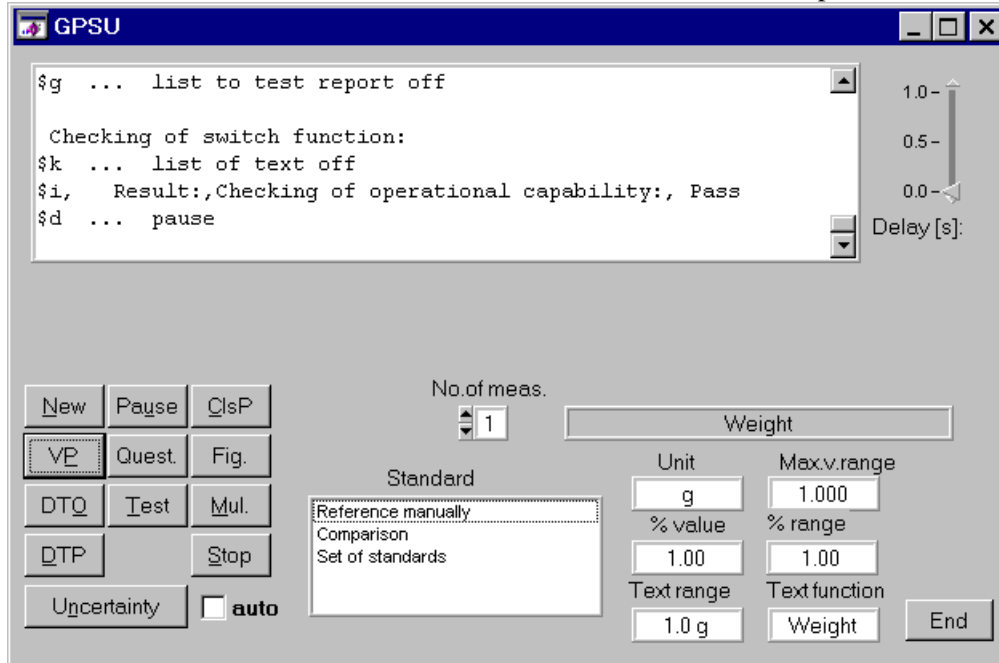
First enter uncertainty type A (ua constituent). It is an additive constituent, which you only enter is the program does not affect one of the uncertainty constituents in its calculations, in most cases you confirm the given value 0.0.

Furthermore, enter uncertainty type B (constituent u_B). The value 0.0 will be suitable in most cases here as well. For digital instruments enter a scale length and finally the expansion coefficient k_u . The calculation method is described in chapter 2.4.

At the end you are required to enter symbols to be used for marking points in the test report, at which deviation exceeds allowed tolerance of the instrument. You are offered the following symbols: “*” for marking points out of the allowed tolerance and “?” for marking points whose deviation falls within the interval deviation allowed \pm uncertainty. Nevertheless, you can choose other symbols instead. The choice is - “ * + ? ! “, with the second symbol optional. If you do not enter it, the program performs evaluation without including the influence of uncertainty.

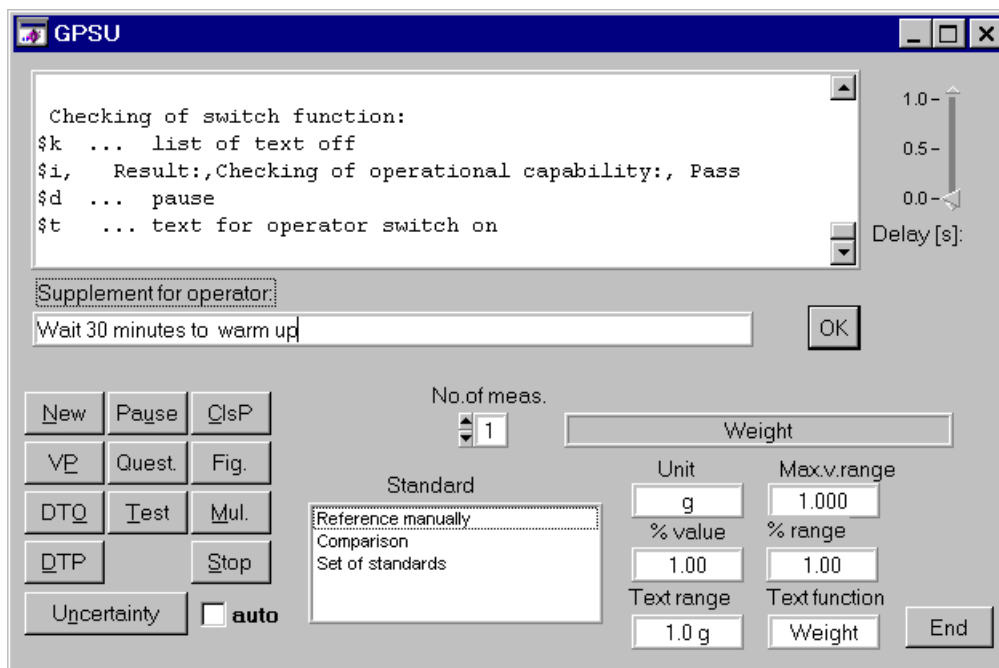


b/ Activate the VP button. Contents of the VPROHL.GPS file are copied to the command file.



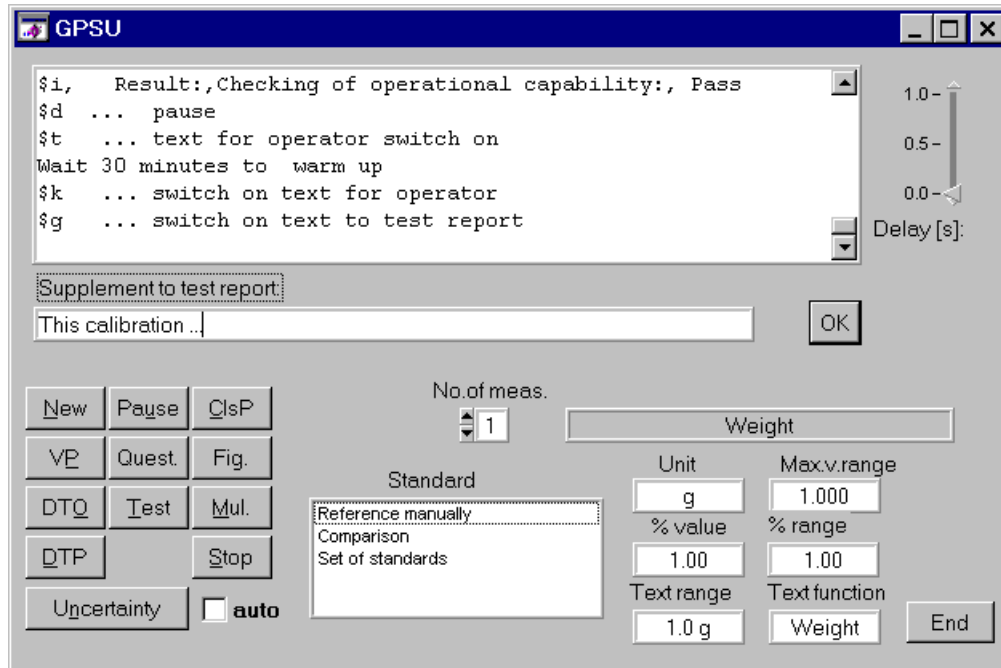
Commands for the operator of the MEACU program are created this way, which will secure execution of an external check on the checked instrument.

c/ According to specific requirements, other texts for the operator of MEACU can be included



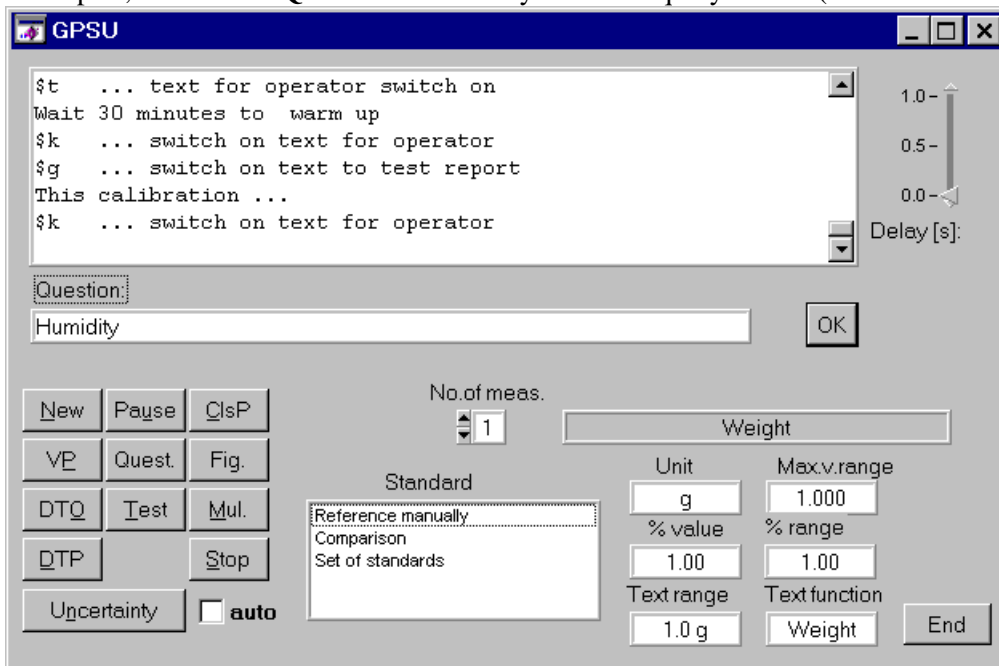
using the **DTQ** button (supplementary text for the operator). When you activate this function, texts are entered in the conversational line in the upper “panel”. The number of lines can be selected arbitrarily, however the comprehensibility and lucidity requirements must be met. To end this function, activate the OK button. If you need to delete the MEACU program window, activate the **ClsP** button.

d/ You can include any texts into the output test report of the MEACU program in a similar way.



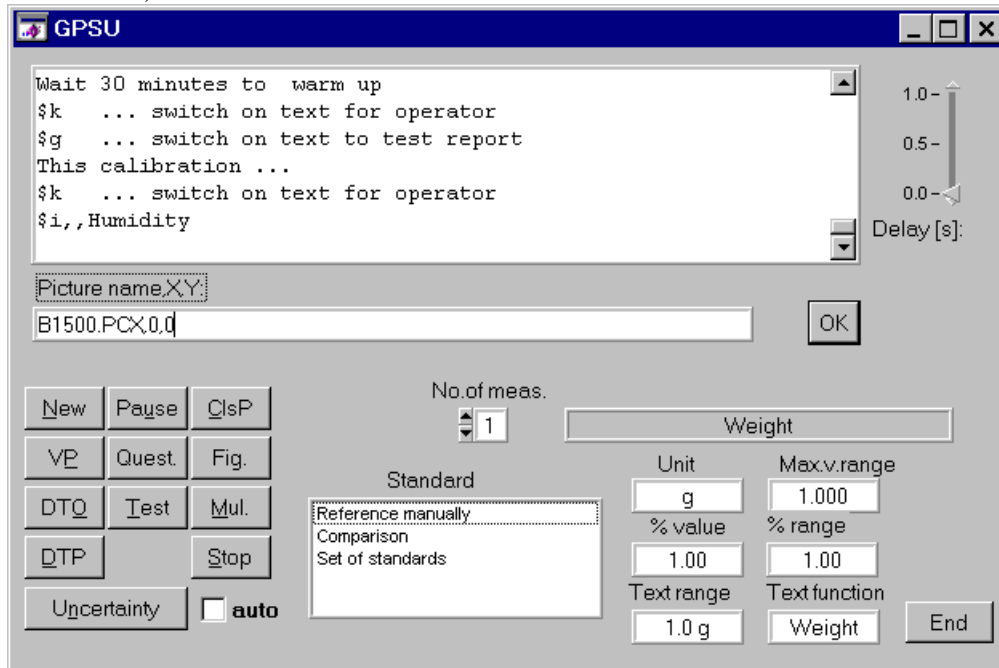
Using the **DTP** button to select this function (supplementary text to the test report). You can also include formatting commands for the printer by pressing and holding ALT and writing a numerical code of a symbol in ASCII (decimally) on the numeric part of a PC keyboard and releasing the ALT key. Nevertheless, this function is mostly used for entering a text which is not included in the test report as standard. This text is then shown on the reverse side of the instrument calibration report.

e/ If an operator of the MEACU program is supposed to answer queries to be included in the test report, activate the **Quest.** button. First you enter a query format (i.e. text that will



be displayed for the operator of the MEACU program). Then you enter text by which the answer will be stated in a test report. Queries mostly refer to humidity, atmospheric pressure and alternatively other measuring conditions. Their answers will be stated on the reverse side of an instrument calibration report.

f/ Use the **Fig.** function to activate any figure (for example a block diagram of the instruments).

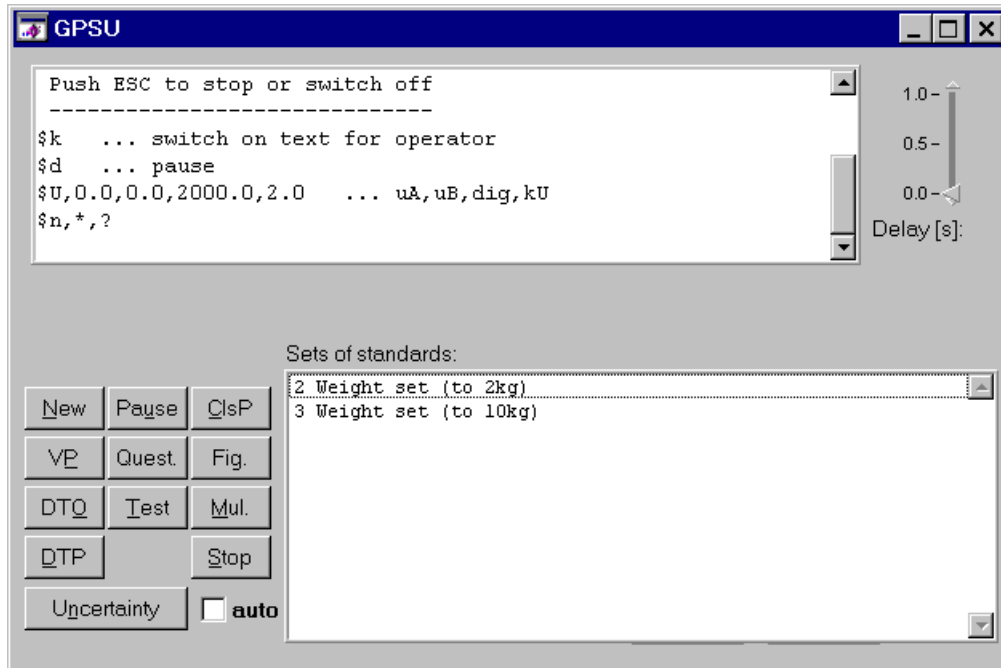


Enter the figure file name (in the PCX format, created by a graphic editor) and coordinates of the upper left corner of the figure (usually 0.0). The file containing the figure must be placed in a directory of the MEACU (or WinQbase) program.

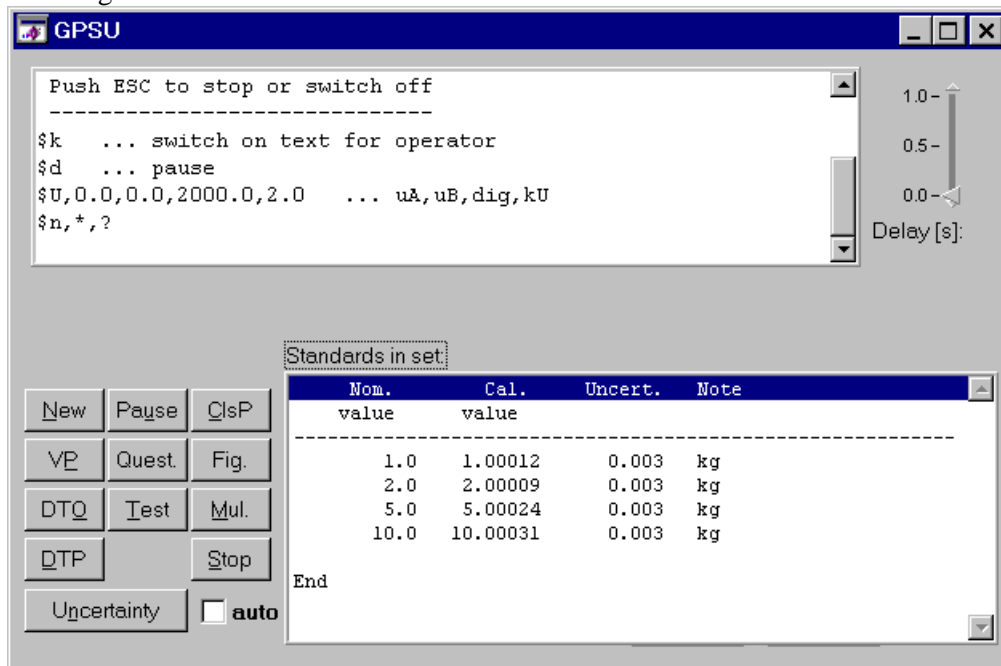
g/ Use the **Pause** button to insert a pause. Then the program waits for you to press the F4 key.

After executing these introductory operations (which can also be used more times – points **b/** through **g/**) you generate commands for the actual check.

h/ Setup and check **Units**, **Max.ran.val.** (maximal range value), allowed deviation (**% value**, **% range**). Text windows (**Text range**, **Text function**) are entered implicitly, however you can revise them according to specific requirements. According to the type of measuring, select the relevant Standard. If you select “Reference manually”, the program enquires about the calibration value and standard accuracy. You cannot change them during calibration. The “Comparison” position serves for standards, which value and accuracy you only know at calibration. The nominal standard value is sufficient. If the standard used to check the given point is a part of an standard set specified in the WinQbase program, use the “File” option.



The program offers you to choose from used standard sets. Double click the mouse button to select the required standard set. The program displays standards included in this set. By selecting



an standard generates a check program at the appropriate testing point. You close the standard set by double clicking the mouse button on the Close item located at the end of the extract. In other cases use the **Test** button to generate commands for a range check.

If the “Auto” function at the “Uncertainty” button is active, the program stops before each generated point and requires entering individual constituents of measuring uncertainty. Description of individual constituents and an uncertainty calculation method is described in chapter 5.4. The value of a point, for which the program requires entering uncertainty, is written as help in slashes (for example /0.5/ for point 0.5 Pa).

i/ When generating a methodology, you can easily transform values of checked instruments. Basically, you can correct them using a function described by polynomial of second order. Enter an additive constant (press ENTER to confirm the implicit offer 0.0). Further, enter other coefficients of correction polynomial ($x+1$, $x-1$, $x+2$, $x-2$).

j/ Press the Stop button to enter generating. Evaluation commands (\$z), file creation date and test report ending (\$e) are saved in the calibration procedure, which is stored on a disk under the MEROL.RIZ name. If this file existed before, it will be rewritten. When you launch the program for the WinQbase database environment, the MEROL.RIZ file is not saved and the methodology is written in a relevant database file.

k/ To end the GPSU program press the Exit button. If the created calibration procedure was not saved using the “Stop” button, its contents are lost!

If you need to modify the newly generated command file, you can do it directly in the edit window of the program. You can include other points, ranges etc. into the file. When executing these modifications, it is necessary to pay attention so that you do not require testing point parameters, which are out of the checked range.

6.5 Alphabetical list of GPSU commands

- \$d-a pause, continuation after pressing F4
- \$e-entering calibration data and ending a test report
- \$f-text function
- \$g-supplementary text to the test report
- \$h-setting a value, range and accuracy of the standard
- \$i-a query
- \$k-ending a text extract
- \$L-specification of a checked instrument, range, function
- \$m-deleting the “Directions for operator” window
- \$n-defining symbols for marking points out of tolerance in a test report
- \$p-text for the operator and to the test report
- \$P-entering a figure from the *.PCX file stating the beginning x,y
- \$r-text range
- \$s-selecting a type of standard
- \$t-supplementary text for the user (ending a text by the \$k command)
- \$U-measuring uncertainty
- \$x-a test at a testing point by the specified algorithm
- \$y-setting a type of instrument
- \$z-evaluation of the measuring result for the test report
- \$+m-a summation constant of a measured instrument
- \$*m-a multiplication constants of a measured instrument

7. WinQbase in PC network

WinQbase can run in PC network. For sharing database in PC network, following rules are valid:

- All PCs in network with WinQbase installation can access to the shared database.
- Only PC with connected hardlock on parallel port can record into database.
- Database viewing only is available, on PC without hardlock.
- WinQView program has to be installed on the PC for viewing database. WinQView is located on installation CD ROM.

After WinQbase installation, on every PC with installation, two local database are created. The first is TRIAL database in directory “..\WinQbase\Trialdata\ “, the second is empty BASIC database in directory “..\WinQbase\Data\”. See chapter 1.1. TRIAL database is always local database and it cannot be shared in PC network. Every computer with WinQbase has its own TRIAL database. BASIC database can be shared in PC network.

Following procedure is recommended to install WinQbase in PC network:

- a) Select the PC (server), which will be BASIC database stored on. This computer must be switch on, when you want to work on arbitrary of other WinQbase PC (client). Server with BASIC database need not its own hardlock, except it is used also for working with WinQbase (as client).
- b) Install program WinQbase on all PCs, where hardlock is connected and on the server too.
- c) Run WinQbase on any of client PC. After starting select BASIC database (not TRIAL). Enter password, name and chose type of calibration certificate numbering.

Note: The password, name and numbering here set-up are valid for access to BASIC database on this client computer.

In main menu push the button Backup. Select Change path. The Windows table with directory structure will appear. Find server and look out file Qdata.dbc in directory “..\WinQbase\Data\”. Confirm it and close WinQbase.

- d) Restart WinQbase. You have to enter password, name and numbering once more. Here entered data will be valid for shared database on server.

Note: Now you have two passwords. The first is for access to local BASIC database, the second is valid for shared database. If you want, you can set both passwords of the same form.

- e) Repeat procedure in step c) for all client computers. In every client computer you will be asked to enter password, name and numbering. These data will be valid for its local BASIC database. Because password, name and numbering for shared database are already set-up through the first client computer, you will not be asked for them.

All client computers are equivalent. Level of access from each client computer depends on used password and related level of access, see chapter Users. Level of access may set-up only supervisor, i.e. operator with the highest level of access.