MEASURING TABLE

Manual

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PROMAT

Your Solution To Testing Instrument

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Contents

1 Introduction

1.1 Genaral

1.1.1 Conception

It was the intention of those who developed the measuring table system to make available a measuring system for practical utilization, which is easy to handle, sturdy, and precise at the same time.

1.1.2 Certainty of Reading

The measuring results gained by utilizing the measuring table are not self-explanatory, they require qualified interpretation. Any conclusions with respect to the examined object (e.g. tree) will be left to the sole responsibility of the person who examines. The manufacturer of the instruments will not be responsible for wrong interpretations and conclusions, he recommends the user to attend special seminars and training.

1.1.3 Moisture

You should generally avoid any contact of the measuring table system with water and moisture, despite its splash-proof casing. Although the main components are protected against intake of water, you should – in order to avoid malfunction or failure – consider that electronic instruments are generally sensitive to moisture.

1.2 Guarantee Conditions

The term of guarantee for the measuring table system is 24 months. Guarantee is based on the condition that the instrument will be used exclusively for the purposes it has been designed for and that the safety instructions below are observed. The manufacturer will not be liable for damages owing to inappropriate utilization or handling. The warranty for defects does not cover normal wear and tear (wearing parts and the like), nor damages that result from inappropriate or negligent handling and excessive strain that have not been provided in the contract of purchase. See the manufacturer's *General Terms of Business*.

The measuring system must not be opened by any person, only by the manufacturer or an authorized service company. Otherwise, the guarantee will become extinct.

1.3 Conditions of Use

The user recognizes the manufacturer's conditions of use as soon as he puts the instrument into service. The instrument must not be put into service, unless the present Instructions for Use have been thoroughly read. The manufacturer will not assume any liability for inappropriate handling, nor for damages caused by the application of the instrument for purposes that it has not been provided for, nor in case of non-observance of the safety instructions.

1.4 Safety Instructions

The manufacturer will not assume any liability in case of inappropriate utilization of the instrument. The safety instructions of the manufacturers of other devices bought along with this instrument or required for the operation of this instrument will have to be observed.

The buyer agrees to hand the present Instructions for Use over to any person whom he may let the instrument and to draw his attention to the notes concerning danger.

2 Scope of Delivery

Prior to familiarizing yourself with the instrument, please check, whether the package contains all components comprised in the scope of delivery of the *measuring table*:

- Measuring table
- Holders for drilling cores
- Electronic unit
- Connection cable (measuring table – electronic unit)
- Data transmission cable with adapter plug
- Power supply
- Analysing software T-Tools Light or T-Tools Pro

Should any of the above components should be missing, please contact your distributor.

3 Operating and indicating elements

3.1 Measuring table

Fig. 1 shows the operating elements of the measuring table.

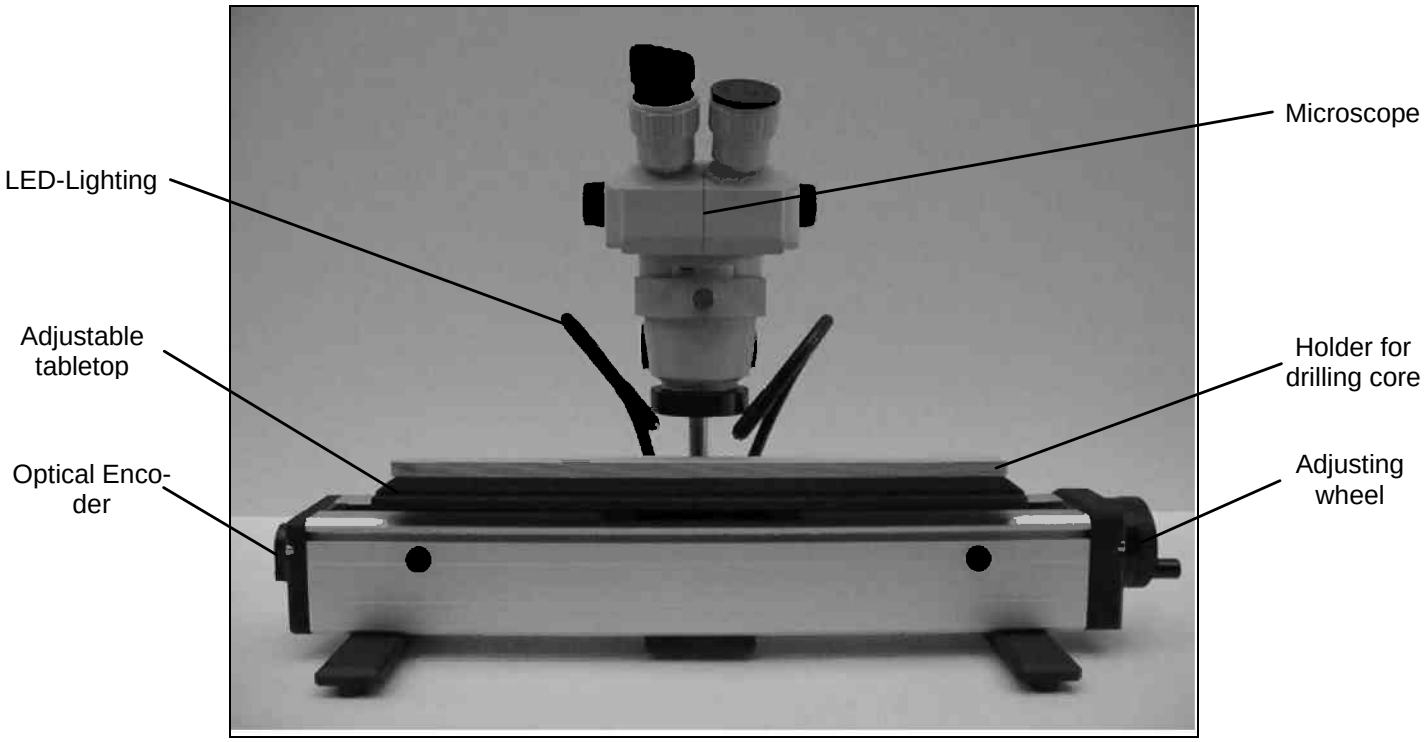


Fig. 1: Measuring table

3.2 Electronic unit

Fig. 2 and Fig. 3 show the operating and indicating elements of the electronic unit.

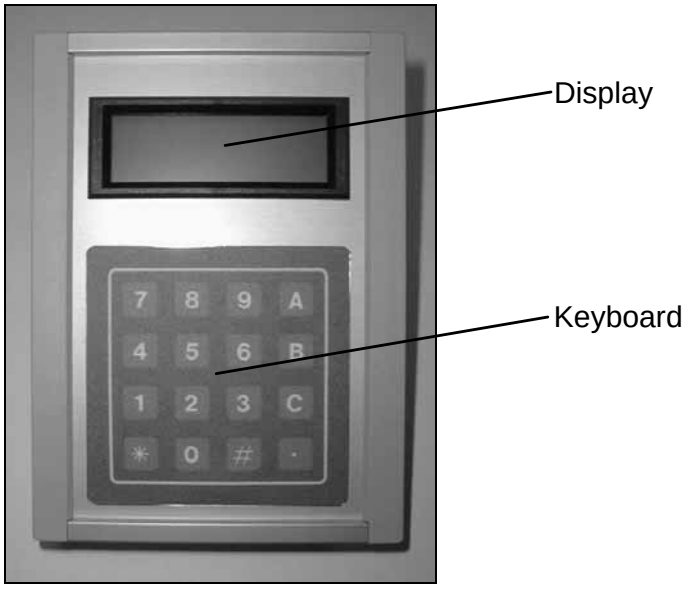


Fig. 1: Front of the electronic unit

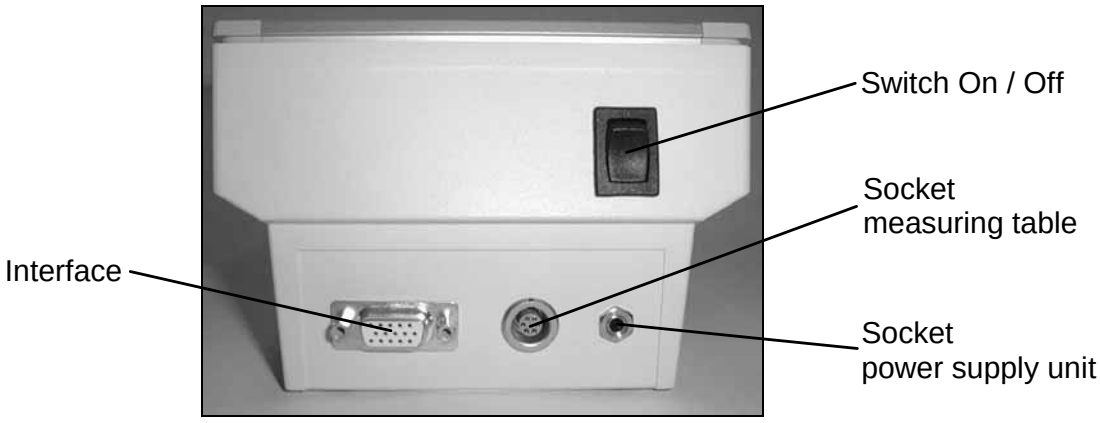
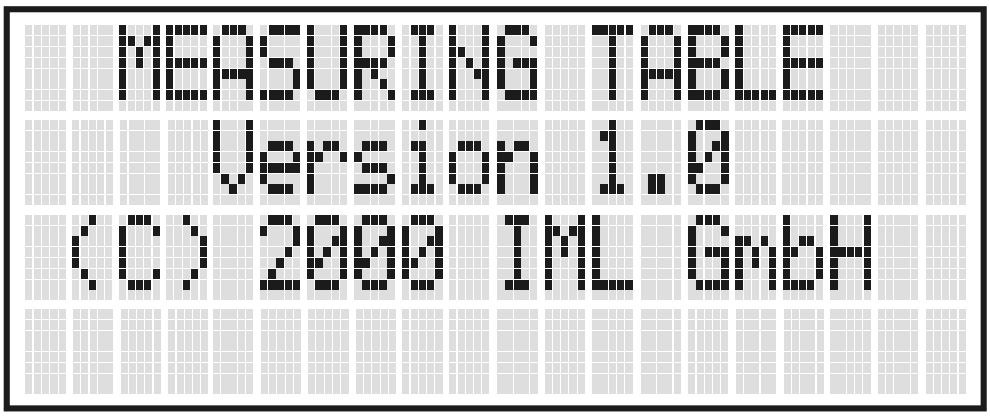


Fig. 2: Rear of the electronic unit

4 Functional Description

4.1 Switching ON

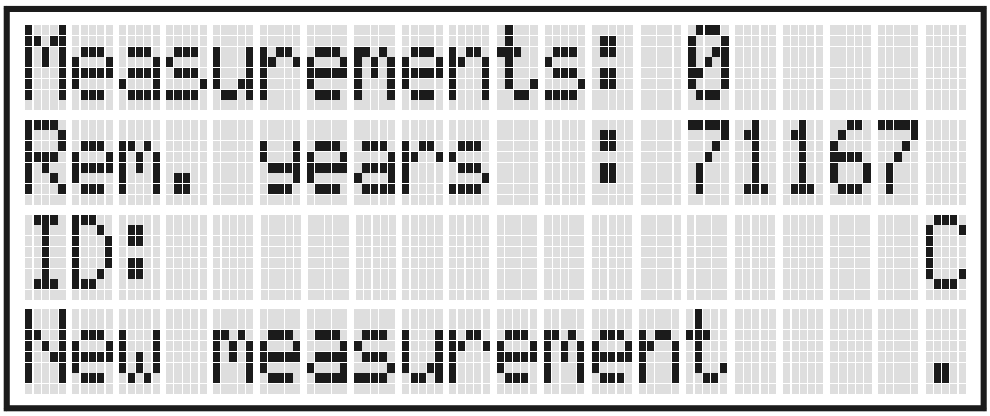
Prior to switching on the electronic unit, please ensure that the measuring table and the power supply unit are connected to the electronic unit. Now switch on the electronic unit by operating the switch at the rear. The display will show the following message for approx. 2 seconds:



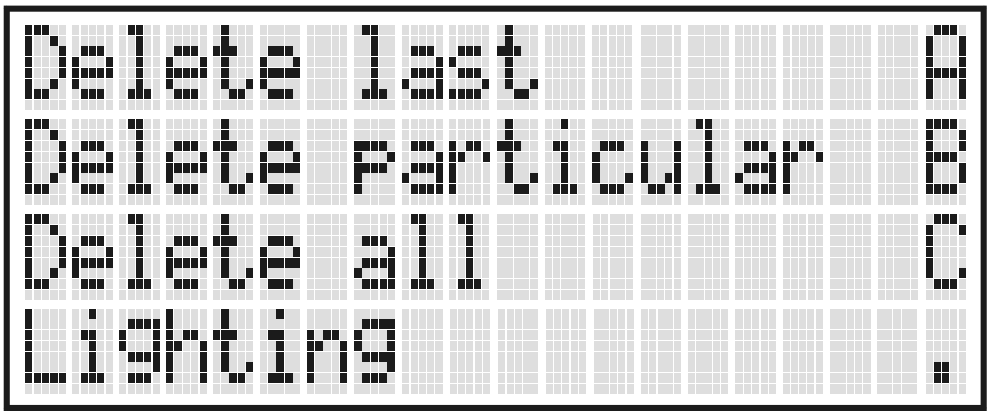
Then the information menu, which is described in the following section, will appear.

4.2 Information Menu

After the switch-on procedure has been terminated, the following information will be shown in the display:



This is **page 1** of the information menu. This page shows the number of measurements stored, the remaining years (measuring points), the user-defined identification number (e.g. number of drilling core) as well as menu item serving for the start of a new measurement. Press the # key to see **page 2** of the information menu.

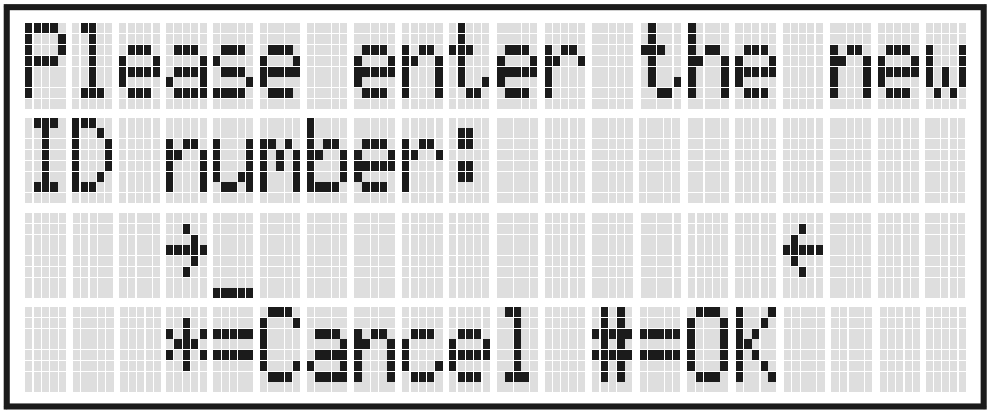


The menu on page 2 serves for deleting the last measurement, a selected measurement, or all measurements and for setting the illumination. The procedure is described later in the present manual.

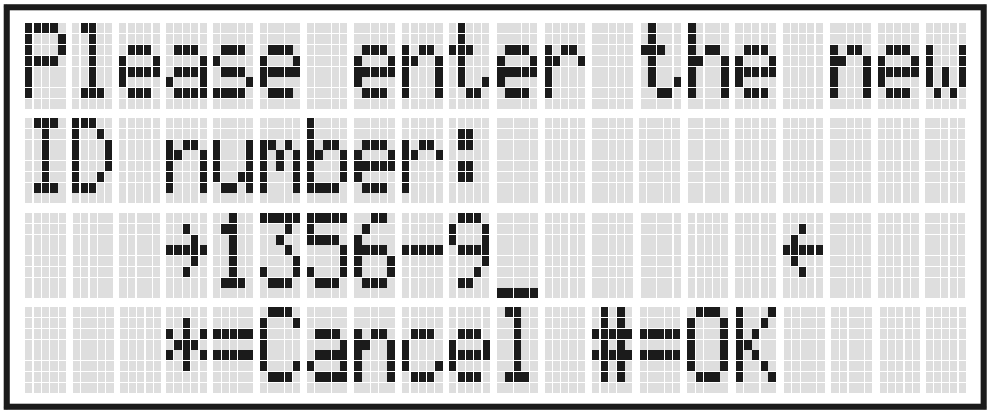
Upon pressing the # key again, page 1 of the information menu will be shown. The * key serves for scrolling backwards through the menu. As long as no measurement is stored, only the two pages described above will be shown.

4.3 Changing the ID number

If you want to enter or change an identification number (ID number), page 1 of the information menu must be shown in the display. Upon pressing the **C** key, the ID number entry mode will appear:



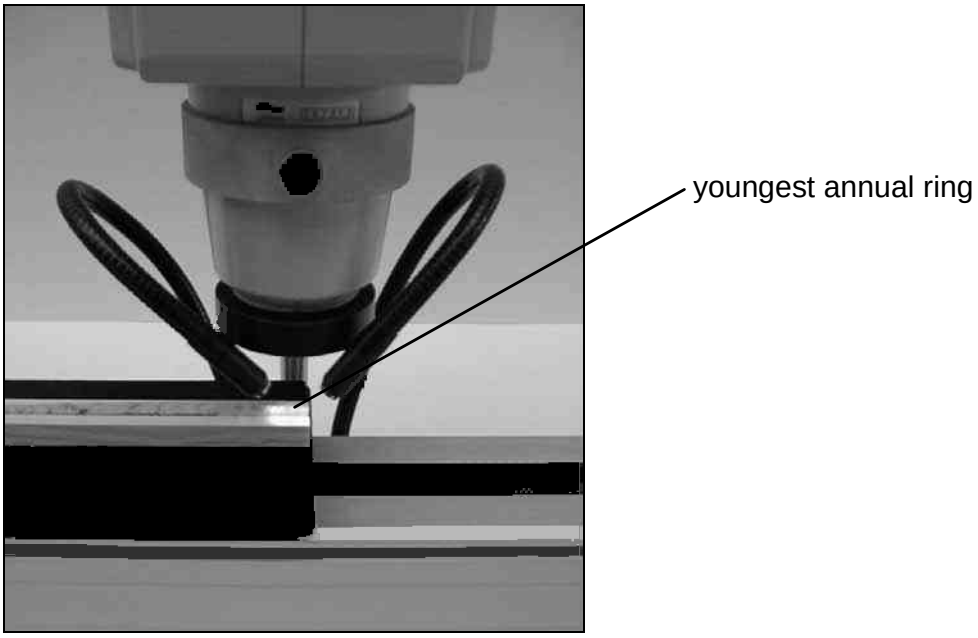
You may enter a new ID number or change an existing one by pressing the numeral keys. The **A** key serves for entering special characters, the **B** key for moving the cursor one space to the right, the **C** key for deleting the last character. The letter mode is activated by pressing the • key. As long as the letter mode is activated, you may select letters by pressing the **A** key.



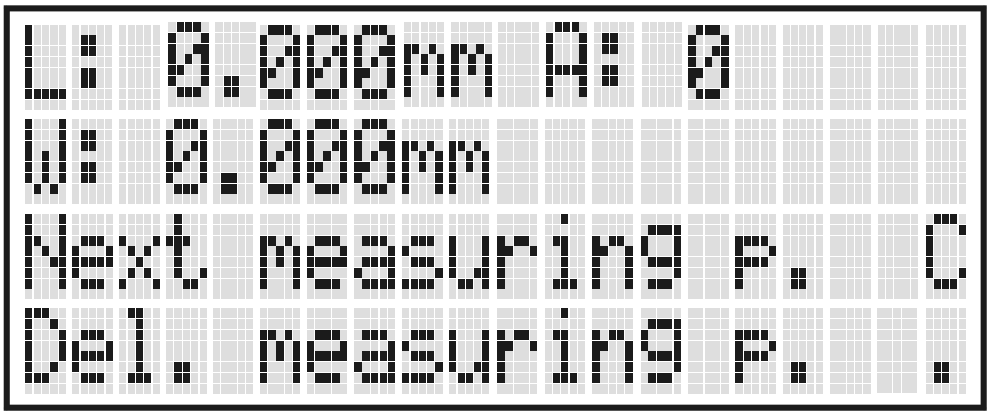
To accept the modifications, press the # key. To quit the entry mode, press the ∗ key.

4.4 Recording a Measurement

To record a new measurement, you will have to position the cross wires of the microscope above the youngest annual ring. The following picture shows the correct position of the drilling core.

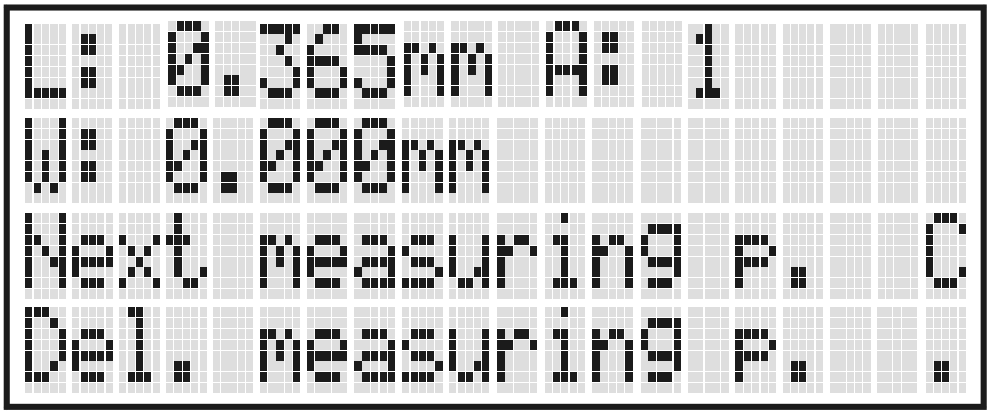


The display must show page 1 of the information menu. Upon pressing the • key, the measuring menu will appear:



The top line shows the actual measuring length and the number of measuring points. The second line shows the actual width of the annual ring. Now position the cross wires above the next annual ring and press the **C** key. The

measuring point will be saved and the number of measuring points will be increased by one.



You may, thus, measure all annual rings, one after the other. If you have committed an error in positioning, you may delete the last measuring point and measure the annual ring anew. To delete the last measuring point, press the • key. After confirming the deletion, the number of measuring points will be decreased by one and you may measure the last annual ring anew.

If the specimen should slip out of place, please set it to the last annual ring measured and press the **0** key. The width actually displayed will then be reset, and you may continue measuring.

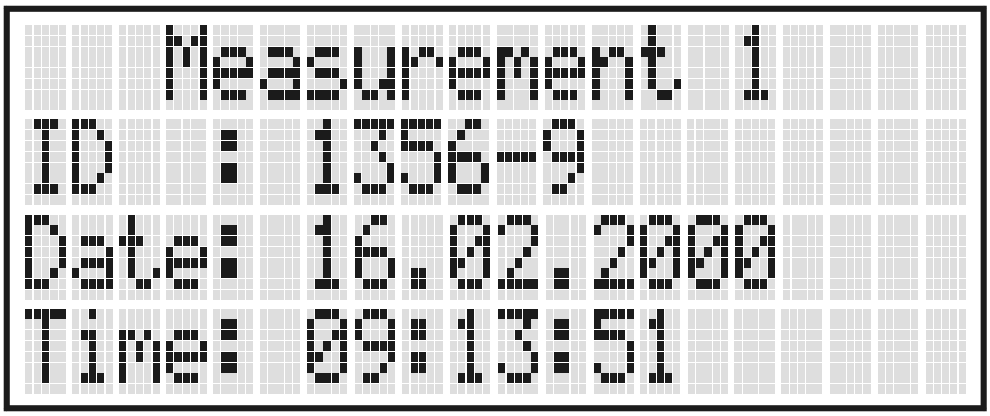
To terminate and save the measurement, press the # key. If no measurements have been saved, the following message will appear in the display:

To abort the measuring procedure, press the * key.

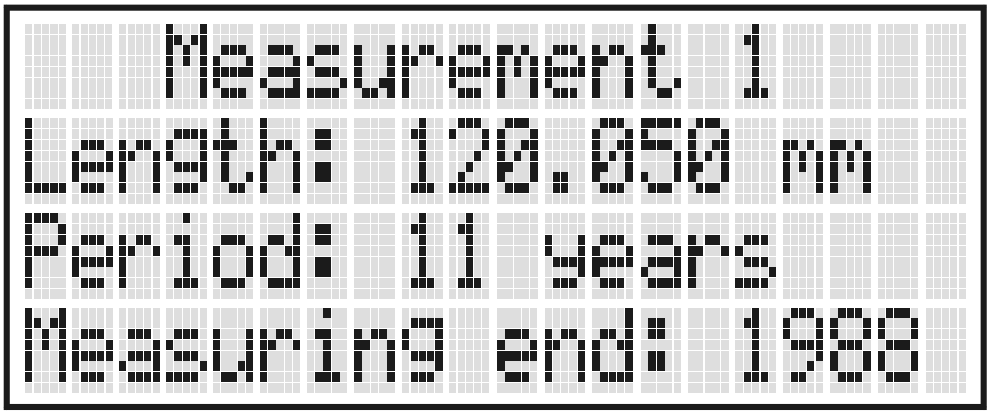
Upon saving the measurement, the assessment will be shown. The following section will describe how you may have all data of the measurement shown in the display.

4.5 Showing a Measurement

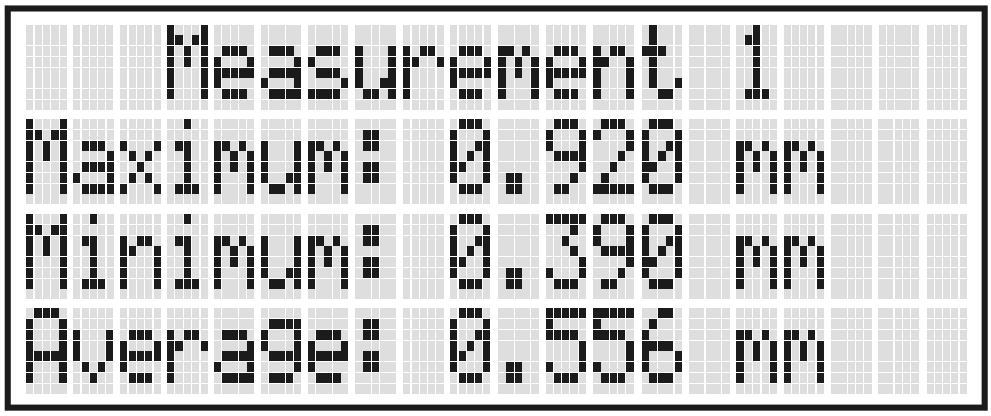
If at least one measurement has been stored, **page 3** will be inserted into the information menu. This page serves for showing each measurement stored. To get to this page, press the # key or the ∗ key until the measurement view menu is shown:



Press the • key to have further data of the measurement shown:



The display shows the length of the sample and the period (number of annual rings). Moreover, the end of the measurement will be calculated (year of measurement less the number of annual rings). Press the • key anew to see the assessment of the annual rings. The following information will appear in the display:



The display shows the maximum, the minimum, and the average width of the annual rings. Press the • key again to get back to the first page of the measurement.

If several measurements have been stored, the **A** key serves for showing the previous and the **B** key for showing the next measurement. If you want a certain measurement to be shown, press the **C** key. An entry menu will appear, where you may enter the number of the desired measurement.

4.6 Deleting the Last Measurement

To delete the last measurement, you will have to go to page 2 of the information menu. Upon pressing the **A** key, you will be asked whether you really want to delete the last measurement. Press the # key to delete the last measurement. Press the ∗ key to abort.

4.7 Deleting a Certain Measurement

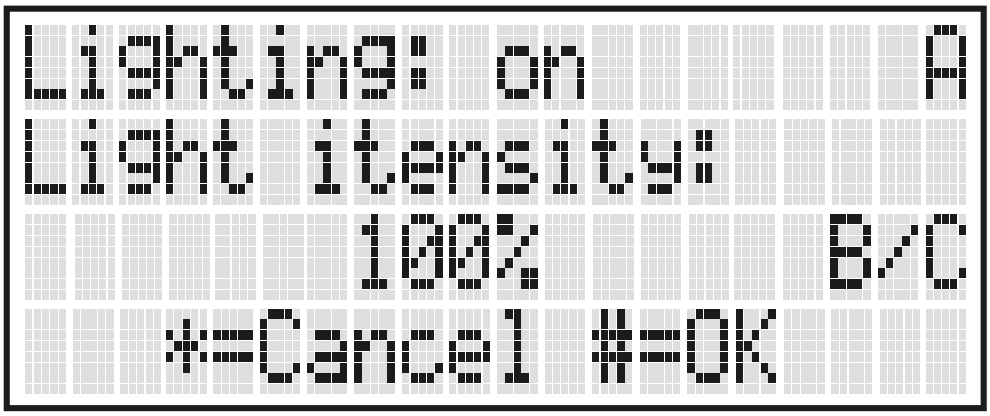
To delete a certain measurement, you will have to go to page 2 of the information menu. Upon pressing the **B** key, an entry menu will appear, where you may enter the number of the measurement to be deleted. After having entered the number, press the # key. If there is a measurement, it will be deleted. Press the ∗ key to abort.

4.8 Deleting all Measurements

To delete all measurements, you will have to go to page 2 of the information menu. Upon pressing the **C** key, you will be asked whether you really want to delete all measurements. Press the # key to delete all measurements. Press the ∗ key to abort.

4.9 Changing the Illumination

To change the illumination settings, you will have to go to page 2 of the information menu. Press the • key to get to the illumination change menu:



The **A** key serves for switching the illumination on and off. Light intensity may be increased by pressing the **B** key and decreased by pressing the **C** key.

Press the # key to accept the modifications. Press the * key to quit the menu.

4.10 Changing the Measuring Unit

You may select between centimetre and inch. This is, however, only possible by means of the software programmes T-Tools Light and T-Tools Pro. The respective section of the software manual will describe how to change the measuring unit.

4.11 Changing the Language

Changing the language, as well, is only possible by means of the software programmes T-Tools Light and T-Tools Pro. The respective section of the software manual will describe how to change the language.

4.12 Maintenance

The electronic unit is maintenance-free. However, after several years, the RAM buffer battery will be dead. For exchange of the battery, please contact your dealer. The buffer battery is dead, if after switching on the following message is displayed:

Please confirm this message by pressing any key. All values will then be reset to the following default values:

Language:	English
Unit:	Centimeter
No. of measurements:	0

5 Technical Data

Resolution:	5 µm (0,005 mm)
Maximum number of measurements:	1000
Maximum number of measuring points per measurement:	500
Maximum width of annual ring:	100 mm
Storage capacity: in case of 256 kB	approx. 70000 measuring points
in case of 512 kB	approx. 180000 measuring points
in case of 1MB	approx. 440000 measuring points
Voltage supply:	DC 6–9V
Current input:	approx. 500mA
Operating temperature:	0°C to 50°C

6 T-Tools Light / T-Tools Pro

6.1 System Requirements

- IBM compatible PC with processor min. 486SX/25 MHz
- Min. 8 MB RAM (16 MB recommended)
- Min. 2 MB hard disk memory
- Graphics adapter min. VGA
- Windows 95 or later

Attention: *The higher the resolution of the monitor, the clearer will be the presentation of the curves. To obtain the optimum result, please choose the highest possible resolution of your monitor.*

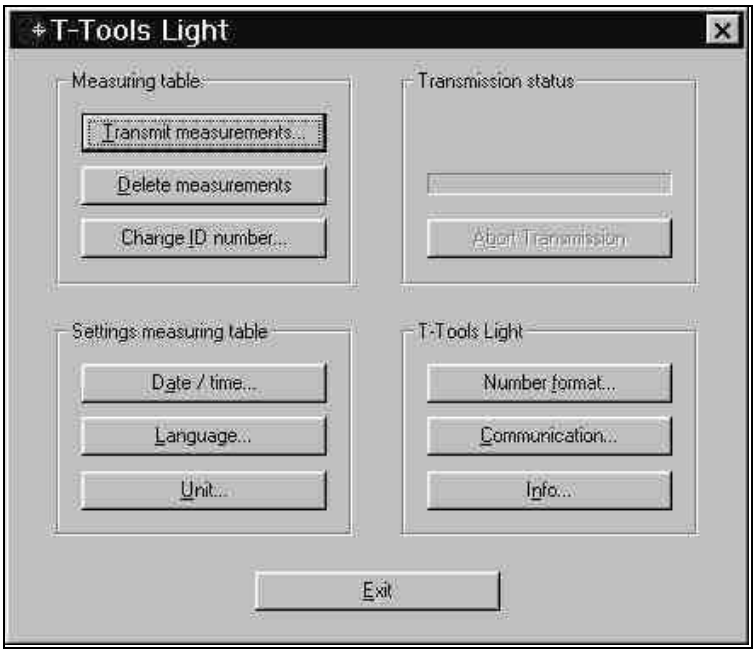
6.2 Starting T-Tools Light / T-Tools Pro

If you haven't changed the default settings during installation, you may now start the program by proceeding as follows:

- Click the *Start* button (Task bar)
- Select *Programs*
- Select *IML-Software*
- Select *T-Tools Light* or *T-Tools Pro*
- Start *T-Tools Light* or *T-Tools Pro*

6.3 Functional Description T-Tools Light

Upon start of T-Tools Light, the following window will appear:



The individual functions are described in the respective section of the T-Tools Pro manual:

Measuring table:

Transferring measurements:	section 6.4.2.1
Deleting measurements:	section 6.4.2.2
Changing the ID number:	section 6.4.2.4

Settings measuring table:

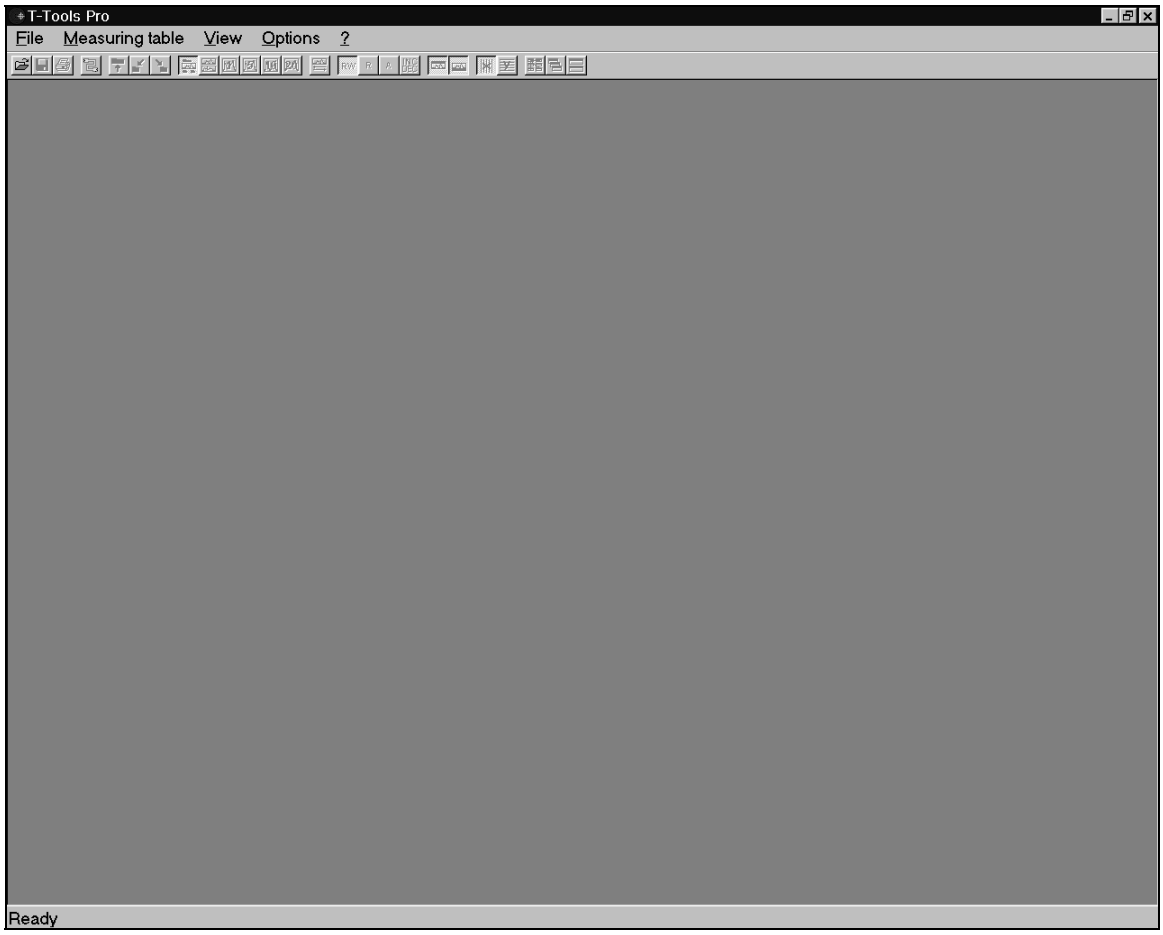
Date / hour:	section 6.4.2.5.1
Language:	section 6.4.2.5.2
Measuring unit:	section 6.4.2.5.3

T-Tools Light:

Number format:	section 6.4.5.2
Communication:	section 6.4.5.3

6.4 Functional Description T-Tools Pro

Upon start of T-Tools Pro, the following window will appear:



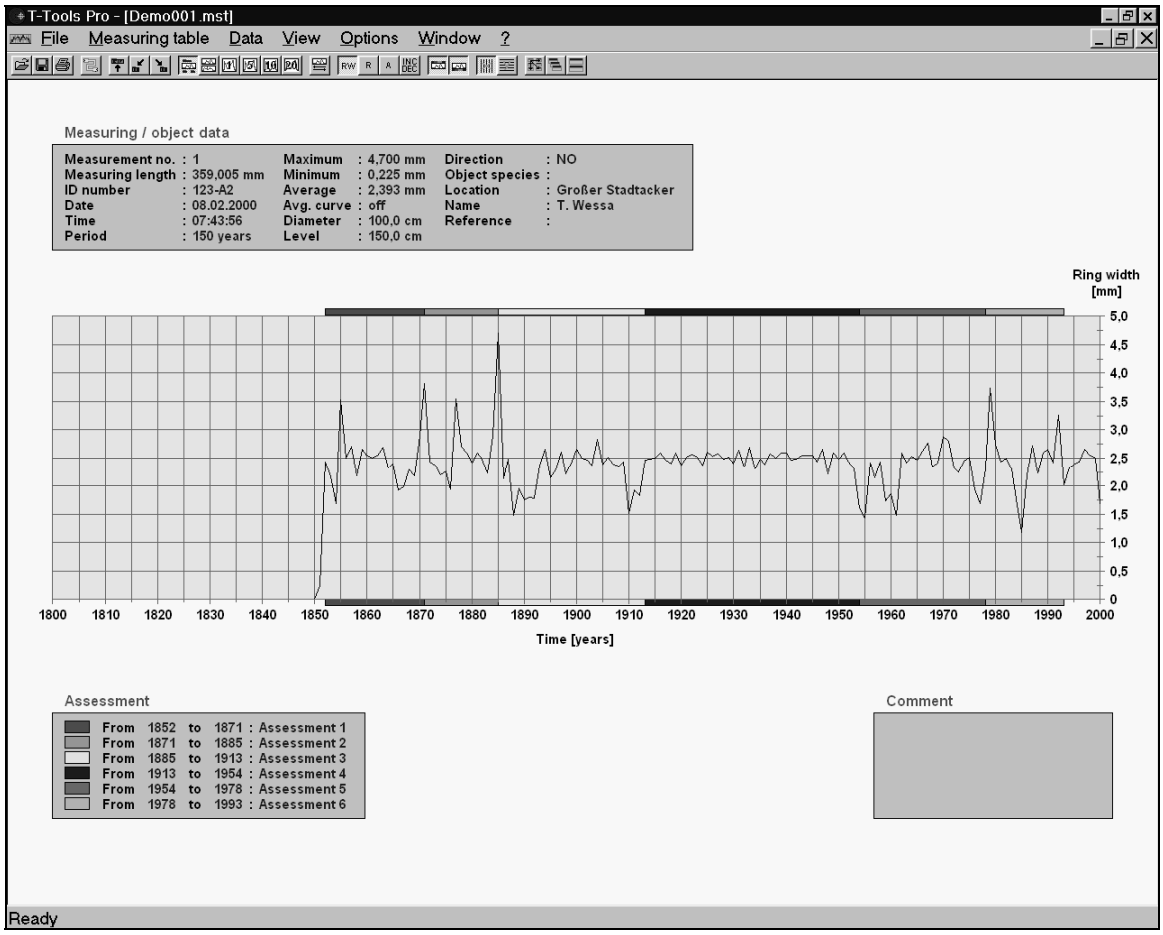
Below the main menu (*File, Measuring table, View, Options, ?*) you see the toolbar, which serves for direct selection of essential functions by clicking an icon with the mouse. In the following, the functions of all menu items of the main menu are described. If there is an icon for any of the menu items in the toolbar, this icon is printed beside the description.

At the bottom of the window you see the status bar, which shows the description of the menu item selected.

6.4.1 Menu Item *File*

6.4.1.1 Open

This menu item serves for loading a measurement from a drive (e.g. hard disk). Upon selecting this menu item, a dialog box will appear, by means of which a measurement may be opened. During installation of the software, ten examples have been installed. Choose any of these measurements and press the *OK* button to open the measurement. To obtain a full screen view, press the *Maximize* button.



Hint: You may select and open several curves simultaneously in the dialog box *Open* by means of the shift key and the Ctrl key.

6.4.1.2 Close

This menu item serves for closing the current measurement. If you have not saved the modifications made in the measurement so far, the program will automatically ask you, whether you want to save the modifications.

6.4.1.3 Close all

This menu item serves for closing all active measurements. If you have not saved the modifications made in any of the measurements so far, the program will automatically ask you, whether you want to save the modifications.

6.4.1.4 Save

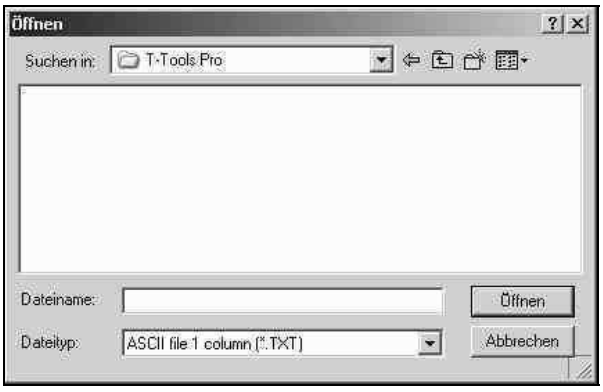
Select this menu item, if you have modified a measurement and want to save the modifications. However, in case that several measurements are opened, only the active measurement is saved. You can recognize the current measurement by title bar appearing in a different colour from the one of the other opened measurements.

6.4.1.5 Save as...

Select this menu item, if you want to save the current measurement in another file. A dialog box will appear, where you may choose or create the target directory. After having chosen the target directory, you may enter a new name of the measurement and save the new file by confirming.

6.4.1.6 Import...

Select this menu item, if you want to export the measurement into a different format. After having selected this menu item, the following dialog box will appear:



There are two ways of importing a measurement available:

1. The ASCII format

This item serves for importing an ASCII file that has been created by means of T-Tools Light or another programme. The file scheme will have to be as follows:

1st line: Number of annual rings
2nd line: Identification of the sample (max. 16 characters)
from 3rd line: Width of the annual rings in mm

Example:

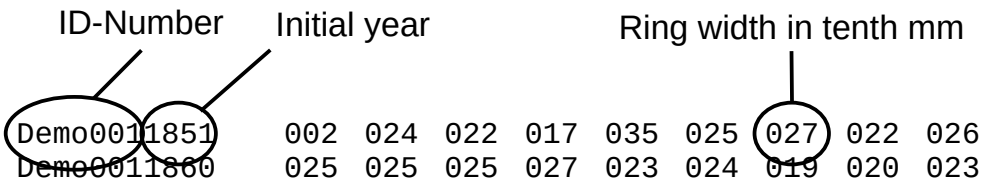
```
4
123-A2
01,680
02,490
02,535
02,645
```

The mantissa of the annual ring width may be separated by a comma or by a full stop.

2. The Tucson format

This item serves for importing an Tucson file that has been created by means of another programme. The file scheme will have to be as follows:

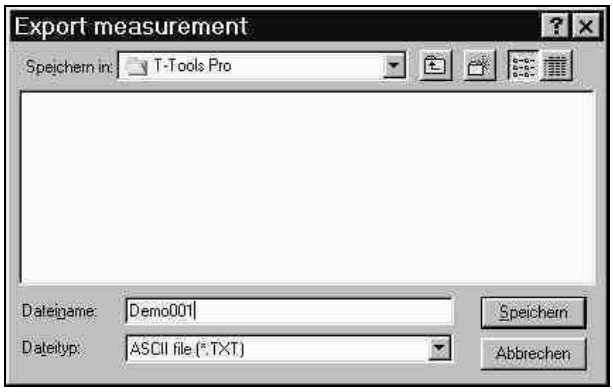
--- or 001: Unknown width
999: End




```
Demo0011851    002  024  022  017  035  025  027  022  026
Demo0011860    025  025  025  027  023  024  019  020  023  022
Demo0011870    029  038  024  024  022  023  019  035  027  026
Demo0011880    024  026  025  022  029  047  021  025  015  020
Demo0011890    018  018  018  024  027  021  023  026  022  024
Demo0011900    027  025  025  024  028  024  025  024  023  024
Demo0011910    015  019  018  025  025  025  026  025  024  026
Demo0011920    024  025  026  025  024  026  025  026  025  025
Demo0011930    024  026  023  027  023  025  024  ---  025  026
Demo0011940    026  025  025  025  025  025  024  027  022  026
Demo0011950    025  026  024  023  016  014  024  021  024  017
Demo0011960    019  015  026  024  025  025  026  028  023  024
Demo0011970    029  028  023  022  024  025  019  017  023  037
Demo0011980    027  024  025  023  018  012  022  027  022  026
Demo0011990    027  024  033  020  023  024  024  026  025  025
Demo0012000    017  999
```

6.4.1.7 Export...

Select this menu item, if you want to export the measurement into a different format. After having selected this menu item, the following dialog box will appear:



There are three ways of exporting a measurement available:

1. The ASCII format: If you export the measurement into the ASCII format, you will obtain a text file containing all data relating to the measurement. This file may be imported into another program (e.g. Excel®) for you to adapt the curve or the assessment to your requirements. The data of the curve start in line 38.

2. The ASCII 1 column format: If a measurement is exported in this format, the file scheme will correspond to the one described in section *6.4.1.6 Import*.

3. The EMF format: If you export the measurement into the EMF format (enhanced Windows meta file), you will obtain a file which saves the curve in the shape of a graphical representation. You may then import this file into a word processing program in order to document or record it. If you want to export the measurement into this format, select the entry *Enhanced windows meta file (*.EMF)* in the selection box *Type of file*.

You may export all opened measurements simultaneously by entering the key word **.A** as a file name (do not forget the full stop). Upon pressing the *Save* button, all measurements will be exported in the format selected.

6.4.1.8 Reference curve

This menu item contains a sub-menu offering the following functions:

6.4.1.8.1 Add...

This function serves for representing two curves simultaneously in one window.

After having clicked this menu item, a dialog will appear, where you may select the reference curve. You may select any curve that has been saved in the MST format. The reference curve selected will be added into the diagram of the opened curve. You will now see two curves in the diagram.

When you save the measurement, the file name of the reference curve will as well be saved. When you open the measurement anew, the respective reference curve will also be shown (if the file has not been removed from the data medium).

6.4.1.8.2 Remove

Select this function to remove the reference curve from the diagram.

6.4.1.8.3 Create...

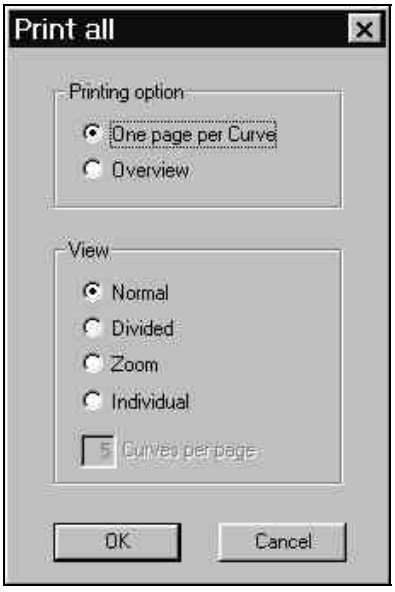
This function serves for creating a reference curve: All opened measurements are averaged year by year. Upon having activated this menu item, a dialog box will appear, where you may select the directory and the file name of the reference curve. After clicking the *Save* button, the reference curve will be created and may then be opened like any other measurement.

6.4.1.9 Print...

This menu item serves for printing out the current measurement. Upon selection of this menu item, a dialog box will appear, by means of which you may set the printer options. Print-out will be done in the view selected (normal, divided or zoomed).

6.4.1.10 Print all...

Upon selection of this menu item, the following dialog box will appear:



Select the printing option *One page per curve*, to print out all opened measurements one after the other. Print-out will be done in the view selected. If you have selected the view *Individual*, all measurement will be printed out in the view currently set.

Select the printing option *Overview*, to obtain a print-out of several curves on one page. After you have selected this option, you may fix the number of curves to be printed on the page (max. 10).

Upon confirmation of this dialog box by pressing the *OK* button, a dialog box will appear by means of which you may select the printer options. The program automatically selects the orientation of the page (portrait or landscape) depending on the number of curves to be printed (in case of the option *Overview*).

6.4.1.11 Files last opened

Above the menu item *Exit*, the four measurements that have last been opened are shown. You may directly open any of these four measurements by selecting it.

6.4.1.12 Exit

Select this menu item, if you want to quit the program. If the modifications of a current measurement have not yet been saved, the program will automatically ask you, whether you want to save these modifications.

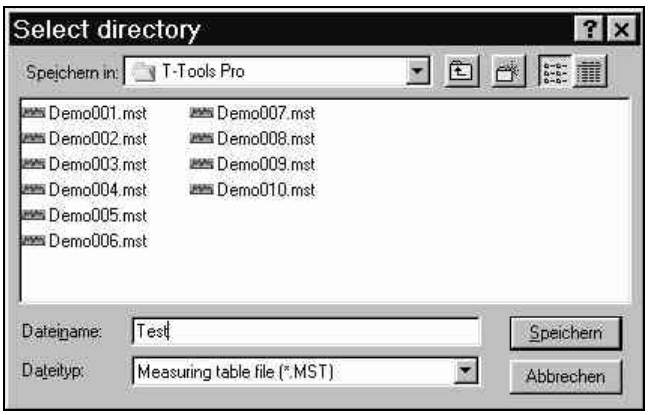
6.4.2 Menu Item *Measuring table*

6.4.2.1 Transmit measurements...

This menu item serves for transmitting all measurements from the measuring table to your PC.

Previously, however, you will have to connect the electronic unit to your PC by means of the cable supplied. Insert one of the plugs into the PC socket on the electronic unit, and connect the other end of the cable with a free serial interface on your PC. If you select an interface different from COM2, you will have to checkmark the respective interface in the software (cf. section 6.4.5.3).

Upon selection of this menu item, a dialog box will appear, by means of which you may choose the target directory for these measurements.



As to the file name, there are two possibilities:

1. Enter a root name (any string of characters **without full stop**). In our example, the name entered is *Test*. The file name is then formed from the root name entered and the measurement number. If, for instance, four measurements are transmitted, the file names of these measurements will be:

```
Test001.mst
Test002.mst
Test003.mst
Test004.mst
```

2. Enter *.ID* in the field **File name** (do not forget the full stop). The file name will then be formed from the identification number of each measurement (e.g. the tree number) and the measurement number. If, for instance, four measurements have been carried out and each of these have been given an ID number:

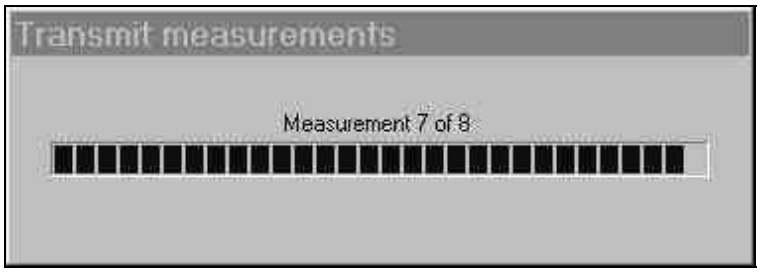
Measurement 1: 98-001
Measurement 2: 98-002
Measurement 3: 98-002
Measurement 4: 98-003

the file names after transmission of the measurement will be the following:

```
98-001M001.mst
98-002M002.mst
98-002M003.mst
98-003M004.mst
```

Attention: *Since the special characters* **\ / : * „ > < |** *must not be used in the file name (Windows default), please pay attention to* ***not*** *using these characters when entering the ID number (option 2 above). If, however, you want the file name to be formed from the root name (option 1), you may use these special characters for the ID number.*

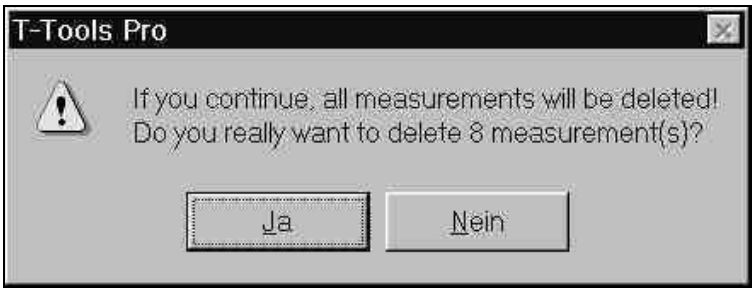
After the file name has thus been entered and you have confirmed by pressing the *OK* button, the measurements will be transmitted:



The upper progress indicator shows the overall progress, the lower progress indicator shows the progress of the measurement currently transmitted. If you want to quit the transmission, press key **0** of the electronic unit and wait for the transmission to be aborted.

6.4.2.2 Delete all measurements

Select this menu item to delete all measurements from the IML-Resi. Upon selection of this menu item, a dialog box will appear, where you are asked, whether you really want to delete all measurements:



Attention: *Upon pressing the YES button, all measurements are irrevocably deleted!*

6.4.2.3 Online measurement

This function serves for showing the data on the screen simultaneously with the measurement.

6.4.2.3.1 Start

Upon clicking this menu item, an empty measurement will opened and a new measurement will be automatically started by the electronic unit (the electronic unit must be connected to your PC). Whenever a measuring point is saved or deleted in the electronic unit, the data will simultaneously be actualized and shown in your PC.

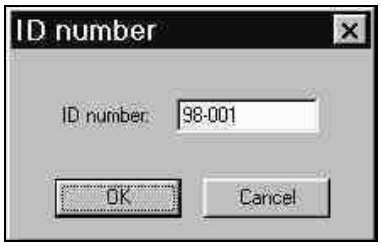
Saving and deletion of a measurement may as well be effected by means of the mouse. Clicking the left button saves the measuring point, clicking the right button deletes the last measuring point. This offers you the possibility of effecting a measurement without having to operate the electronic unit.

6.4.2.3.2 End...

Select this menu item to terminate the online measurement. A dialog box will appear, where the measurement may be saved. Simultaneously, the measurement will be stored in the electronic unit.

6.4.2.4 Change ID number...

Upon selection of this menu item, a dialog box will appear, which shows the current ID number of the electronic unit appear (ensure that your PC is connected to the electronic unit):



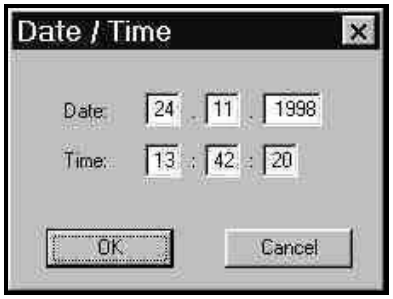
You may now change the ID number by entering any 12-digit string of characters. Press *OK* to confirm the modification.

6.4.2.5 Options

This menu item serves for managing the system settings of the electronic unit. The following is a description of the individual submenu items.

6.4.2.5.1 Change date / time...

This menu item serves for setting the date and the time of the electronic unit. Upon selection of this menu item, the following dialog box will appear:



The system time of your PC will be automatically entered into the cases. After checking the data, press the *OK* button.

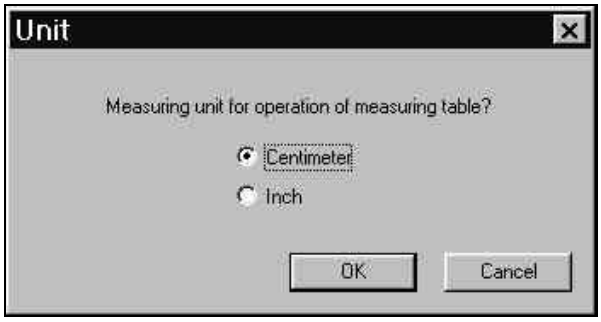
6.4.2.5.2 Change language...

Select this menu item to select the language of the electronic unit. The following dialog will appear (ensure that your PC is connected to the electronic unit).

After having selected the desired language, press the *OK* button.

6.4.2.5.3 Change unit...

Select this menu item to select the measuring unit of the electronic unit. The following dialog will appear (ensure that your PC is connected to the electronic unit):

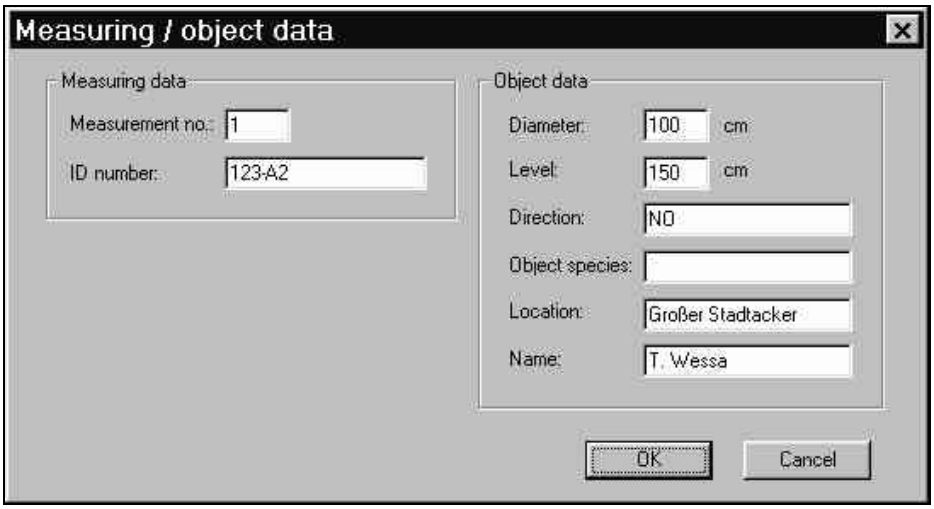


After having selected the desired language, press the *OK* button.

6.4.3 Menu item *Data*

6.4.3.1 Mesasuring / object data...

This menu item serves for modifying the measuring and object data of the active measurement. Upon selection of this menu item, a dialog box will appear:

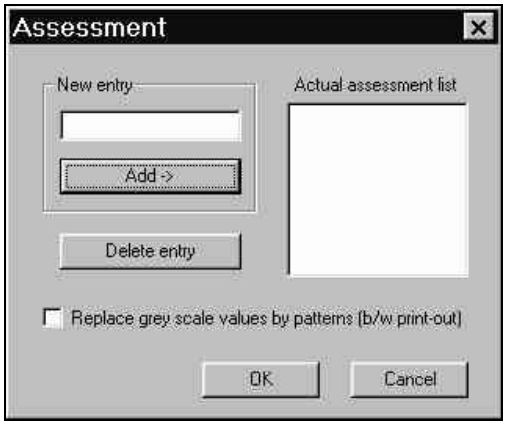


Upon pressing the *OK* button, the modifications will be shown in the main window.

Hint: You may invoke the dialog box as well by double-clicking with the left mouse button the case *Measuring / object data*.

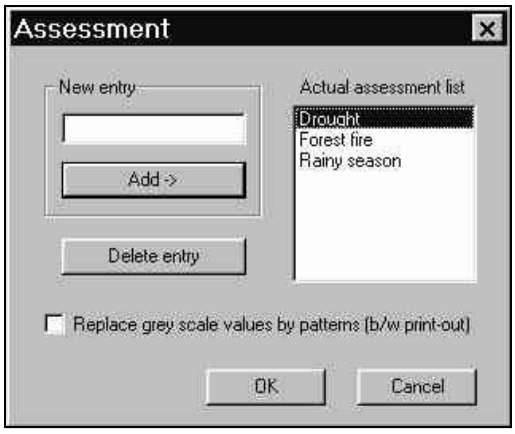
6.4.3.2 Assessment...

To facilitate assessment of the measurement, you should previously make a list of the most current special terms. For this purpose, select the menu item *Options – Assessment*. The following dialog will appear:



Enter a new term into the case *New entry*. Press the *Add* button to add this term to the list. The term will be added to the list in alphabetical order. If you want to delete a term from the list, highlight this term and press the *Delete entry* button.
If the function *Replace grey scale values by patterns (b/w printout)* is activated, the coloured markings above and below the curve will be filled with patterns in order to achieve a clearer differentiation in case of black and white printout.

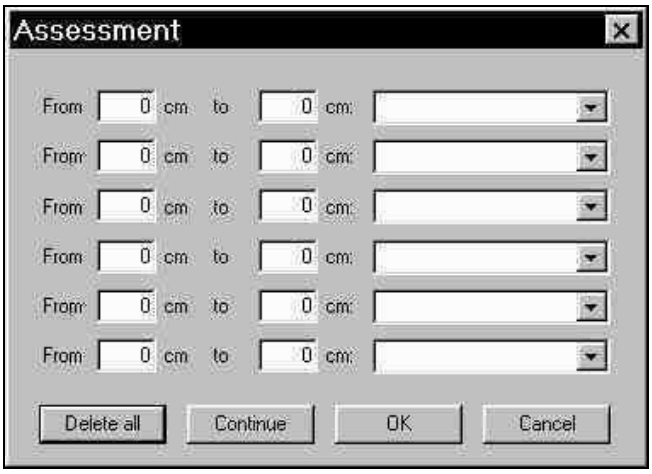
The following figure shows an example of an assessment list.



After you have thus made your assessment list, assessment of the curve may be carried out in two different ways:

1. Manual Assessment

Upon selection of the menu item *Data – Assessment* the following dialog box will appear:



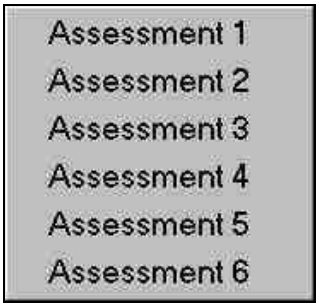
The cases *From* and *To* serve for entering the zone to be marked. In the case on the right side, you may either enter a term (e.g. entrance of needle) or select a pre-defined term from the assessment list by clicking the arrow. If you want to delete all cases, press the *Delete all* button.

Upon pressing the *OK* button, you can see the modifications in the main window. The colours of the markings above and below the curve may be individually changed. For the description, please refer to section *6.4.5.4 Colours*.

Hint: You may invoke the dialog box as well by double-clicking with the left mouse button the case *Assessment*.

2. Assessment by Means of the Mouse

If you want to assess the curve by means of the mouse, please press the right mouse button. The following context menu will be shown:



Please select the line where you want the assessment to be entered. A line will appear (if the mouse pointer is positioned above the curve), which marks the beginning of the marking. As soon as you have positioned the line at the beginning, press the left mouse button. A second line will appear, by means of which you may fix the end of the marking. Upon pressing the left mouse button again, the above assessment dialog box will appear. The beginning and the end of the marking will be automatically entered into the cases. If necessary, you may manually modify the value. Now, please enter an assessment term either manually or by selecting one from the assessment list.

Upon pressing the *OK* button, you can see the modifications in the main window. You may now carry out the next assessment by pressing the right mouse button.

If you click the *Continue* button instead of the *OK* button, the next measurement will automatically be started, the programme adopting the final value of the previous measurement as starting value of the new measurement. This function serves for quickening the assessment of a curve, since each time you only have to select the end of an assessment section.

A checkmark beside an entry in the context menu shows that this assessment has already been carried out.

6.4.3.3 Comment...

Select this menu item to provide the measurement with a comment. Upon selection of this menu item, the following dialog box will appear:

You may enter 6 lines with 70 characters each.

Hint: You may invoke the dialog box as well by double-clicking with the left mouse button the case *Comment*.

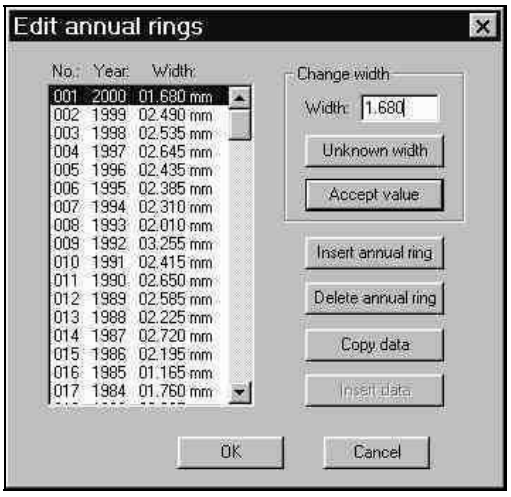
6.4.3.4 Transfer measuring / object data…

This function serves for transferring different measuring / object data of the active measurement to all other open measurements. This is very helpful if there is a large number of measurements, since many data will have to be entered just once.

Select this function after you have edited the measuring / object data of a measurement. A dialog box will appear, where you may select the data to be adopted. Highlight the desired fields and click the *OK* button.

6.4.3.5 Edit annual rings...

Upon selection of this function, the following dialog box will appear:



All annual rings are listed in the list field on the left. To change the width of an annual ring, select the desired annual ring from the list and change the width in the text box. If you do not know the width of the annual ring, click the *Unknown width* button. Upon modification of the width, click the *Accept value* button. The list and the graph will be actualized.

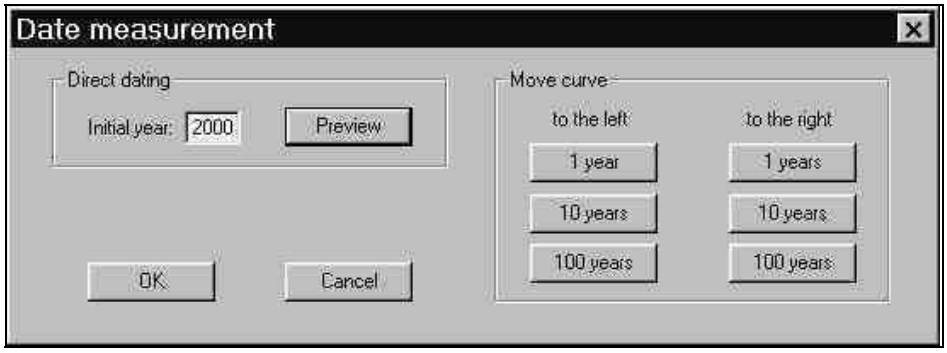
To add a new annual ring, highlight the annual ring before which you want to insert the new one by means of the mouse. Click the *Insert annual ring* button and enter the desired width. If you want to delete an annual ring, highlight the annual ring to be deleted and click the *Delete annual ring* button.

If you want to copy individual annual rings or zones into another curve, highlight these annual rings by means of the mouse, simultaneously pressing the *Ctrl* or the *Shift* key. Click the *Copy data* button. Select the curve into which you want to insert the annual rings. Open the dialog box serving for editing the annual rings and highlight the annual ring before which you want to insert the data. Click the *Insert data* button.

Hint: You may invoke this dialog box by positioning the mouse cursor upon the annual ring to be modified in the main window and then double-clicking the left mouse button.

6.4.3.6 Date measurement...

Select this menu item to fix the date of the measurement. The following dialog box will appear:

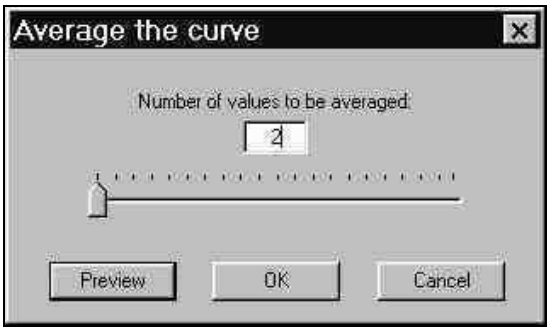


If you know the date of the measurement, you may enter the initial year of the sample directly into the text box. Click the *Preview* button to actualize the graph.

If the date of the measurement is unknown, you may determine the date by means of the reference curve inserted. The group field *Move curve* contains the buttons that serve for shifting the curve to the right and to the left. Shift the measuring curve by clicking these buttons until it coincides with the reference curve.

6.4.3.7 Average the curve...

Please select this menu item, if you want to add an averaged curve into the diagram. Depending on the extent to which the curve has been averaged, the tendency is more clearly recognizable. You may, however, not activate this function before the averaged curve is shown on the screen (menu *View*, item *Average the curve*, submenu *Show*). Upon selection of the menu item *Average the curve*, the following dialog box will appear:

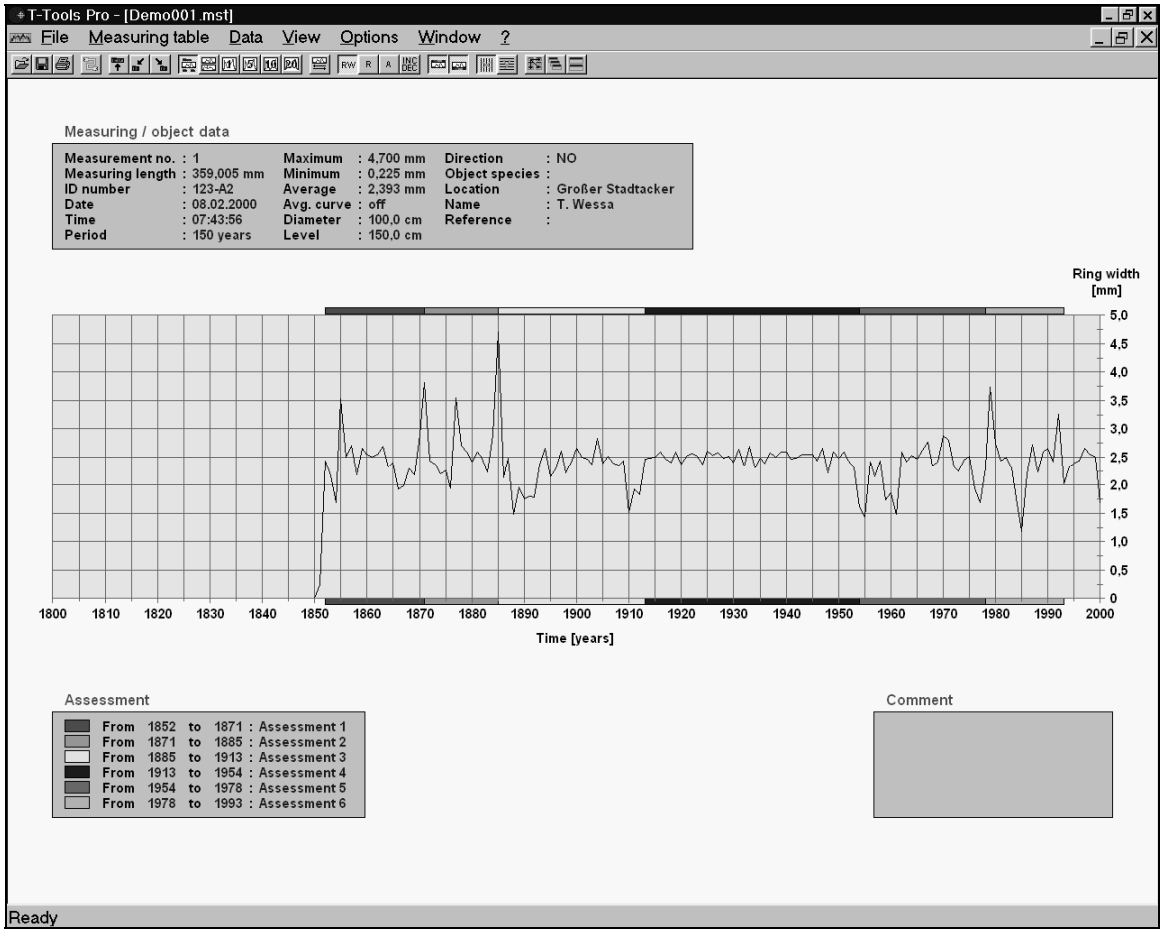


You may fix the number of values to be averaged either in the case or by means of the scroll box. The *Preview* button serves for showing the curve without closing the dialog box. If the averaged curve meets your requirements, press the *OK* button to confirm the modifications and to close the dialog box.

6.4.4 Menu Item *View*

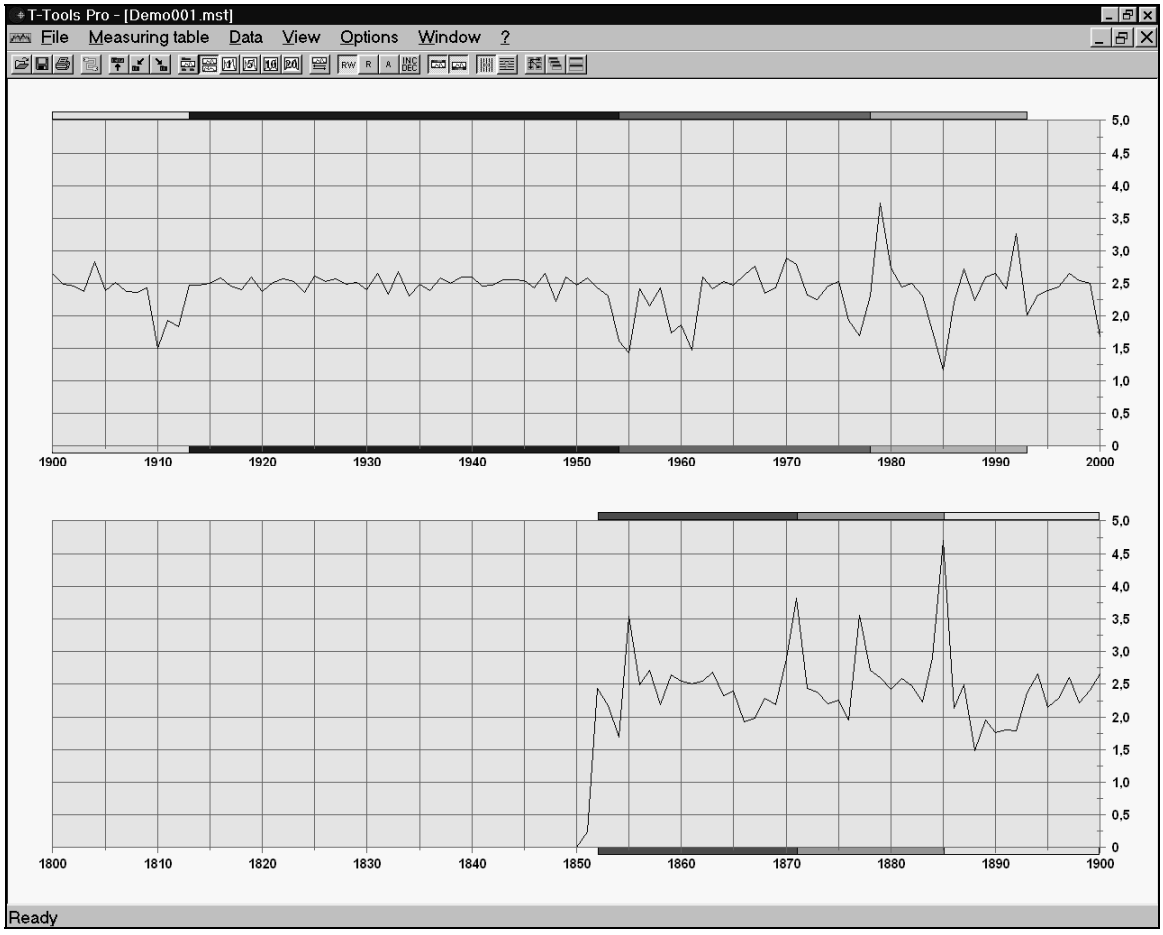
6.4.4.1 Normal

Select this view to get an overall view of the measurement. The curve and all relevant data will be displayed.



6.4.4.2 Divided

This view serves for dividing the curve into two parts. The upper part shows the curve up to half of the period and the lower part shows the other half of the curve. This stretching of the curve results in a higher resolution in x direction.






6.4.4.3 Zoom

This menu item contains a submenu with various factors of enlargement. Depending on the factor, the width of the curve will be more or less enlarged. You may scroll through the curve by means of the scroll bar at the bottom of the window (except in case of factor 1). Instead of the scroll bar, you may use the arrow keys to shift the curve to the right and to the left:

⇨ = Shift curve to the left by 1/10 year
⇦ = Shift curve to the right by 1/10 year
⇧ = Shift curve forward by 1 year
⇩ = Shift curve backward by 1 year
Pos1 = Start of the curve
End = End of the curve

Shifting of the curve by means of the keys is only possible if no marker is displayed.

6.4.4.4 Diagram type

Upon selection of this menu item, a sub-menu containing the following diagram types will appear:

6.4.4.4.1 Ring width

This is the default type of diagram. The graph will show the width of the annual rings in dependence on time.

6.4.4.4.2 Radius

If you select this diagram type, the radius of the sample in dependence on time will be shown.

6.4.4.4.3 Ring area

This diagram type will show the ring area (which is not the circular area) of the sample in dependence on time.

6.4.4.4.4 Deviation

If you have selected this diagram type, the deviation of an annual ring from the one before in dependence on time will be shown. Calculation is based on the following formula:

$$\text{Deviation } [\%] = \frac{Rw_{t-1} - Rw_t}{Rw_t} \cdot 100\%$$

6.4.4.5 Period

This menu item contains a sub-menu with a list of periods from which you may select. Usually, the period will be automatically calibrated. If, however, you want a different period to be shown, you may here select the desired period.

6.4.4.6 Year of planting

Upon activation of this menu item, the year of planting of the tree (initial year) will be shown. The width of the annual ring will be set to 0.

6.4.4.7 Mirror curve

This menu item serves for mirrored representation of the curve. The curve will be represented from the left to the right instead of from the right to the left.

6.4.4.8 Subsidiary lines

This menu item contains the submenus *x axis* and *y axis*. These functions allow activating and deactivating the subsidiary lines of the x axis and the y axis. You may use the subsidiary lines to adapt the sectioning of the different views to your personal requirements.

6.4.4.9 Assessment

This menu item contains the submenus *Top* and *Bottom*. They serve for activating and deactivating the coloured markings of the assessment.

6.4.4.10 Averaged curve

This menu item contains the submenus *Show* and *Show only*. The submenu *Show* serves for showing and hiding the averaged curve. If this menu item is activated, the averaged curve may be shown exclusively in the diagram by selecting the menu item *Show only*.

6.4.4.11 All Windows

This menu item serves for transferring the view of the active window to all other opened measurements. This is helpful in case several measurements are represented side by side or one above the other and you want to adapt the views of all measurements to the active measurement.

6.4.4.12 Toolbar

This menu item serves for showing and hiding the toolbar on top of the window. If you do not want to use the toolbar, you may hide it from the screen to obtain a larger space for the presentation of the curve.

6.4.4.13 Status bar

This menu item serves for showing and hiding the status bar at the bottom of the window. If you do not want to use the status bar, you may hide it from the screen to obtain a larger space for the presentation of the curve.

6.4.5 Menu Item *Options*

6.4.5.1 Unit

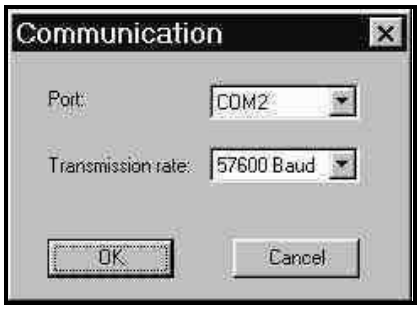
This menu item allows switching over between the units 'centimeter' and 'inch'. Calibration of the curve and all numeric values are indicated in the unit selected.

6.4.5.2 Number format...

After clicking this menu item, a dialog box will appear, where you may select the number format you want the application to use. Upon clicking the *OK* button, all numbers will be displayed or exported in the format selected.

6.4.5.3 Communication...

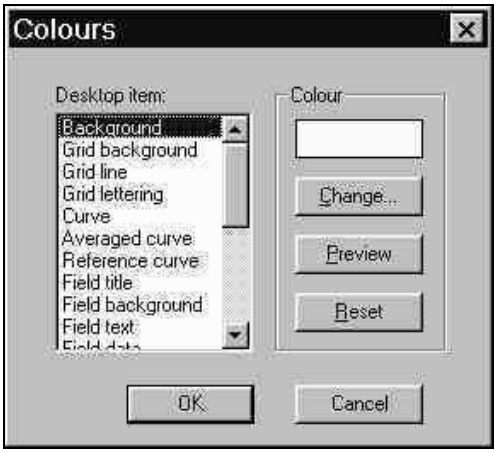
This menu item serves for configuring the PC to which the IML-Resi is connected. Upon selection of this menu item, the following dialog box will appear:



Select the port in the upper case and the transmission rate for the serial communication in the lower case. Always set this value to the maximum rate. If there are problems during transmission you may choose a lower rate.

6.4.5.4 Colours...

Upon selection of this menu item, a dialog box will appear, by means of which you may change the desktop colours:



Choose an item in the list field *desktop items*. The current colour of the respective item is shown in the box on top on the right side. To change the colour, press the *Change* button. A dialog box will appear, by means of which you may choose a colour. Upon closing of the dialog box, the colour selected will be shown in the above box. If you want to be shown the modification in advance, press the *Preview* button. The main window will now be displayed in the current colours. To reset all colours to default, press the *Reset* button.

6.4.5.5 Assessment...

This menu item serves for modifying the assessment list (cf. section *6.4.3.2 Assessment*).

6.4.5.6 Print-out

This menu item serves for managing the printing options. The following is a description of the sub-menu items.

6.4.5.6.1 Change footer...

Select this menu item to enter a text which will appear in the footer of the print-out. Here, you may enter for instance the name of your company.

6.4.5.6.2 Colour print-out

If you have connected a colour printer to your PC, you may activate this menu item to have the curve and the data printed out in the desktop colours selected.

6.4.5.6.3 No print-out of file name

If this menu item is activated, the file name will not appear on the print-out.

6.4.5.6.4 Print file name

If this menu item is activated, the name of the measurement (file name) will appear on the print-out.

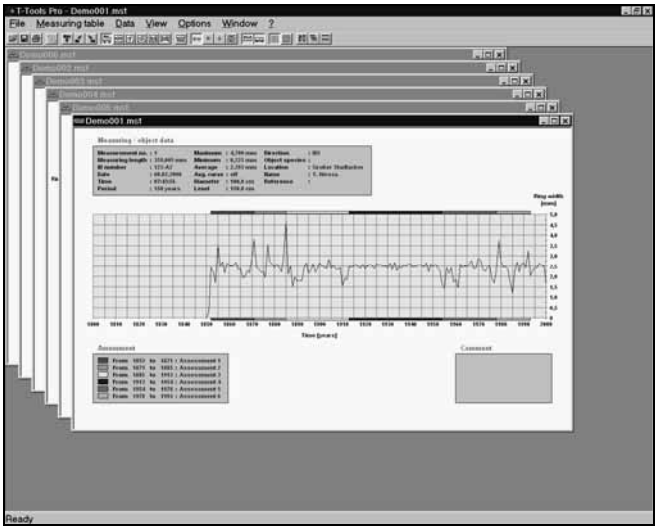
6.4.5.6.5 Print file name including path

If this menu item is activated, the file name of the measurement, incl. the directory containing the file, will appear on the print-out.

6.4.6 Menu Item *Window*

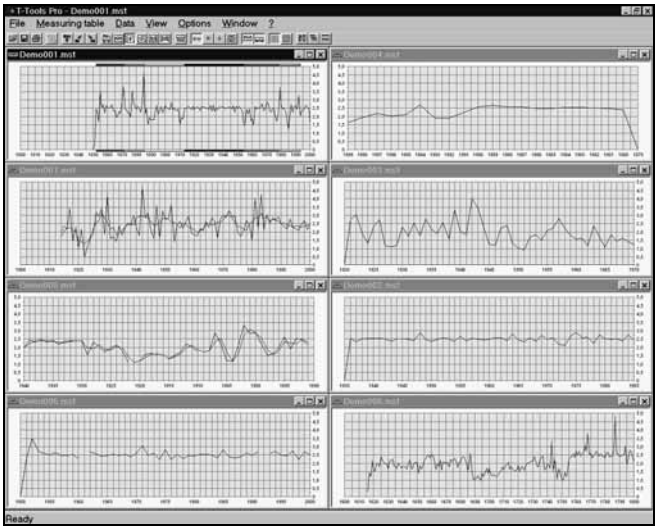
6.4.6.1 Cascade

Upon selection of this menu item all opened windows are arranged cascadingly.



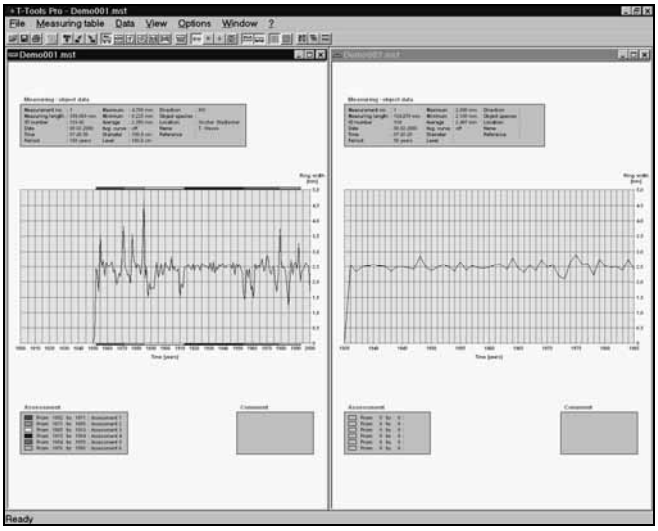
6.4.6.2 Tile horizontal

Upon selection of this menu item all opened windows are arranged one above the other:



6.4.6.3 Tile vertical

Upon selection of this menu item all opened windows are arranged side by side:



6.4.6.4 Arrange Icons

Upon selection of this menu item, the icons of the minimized windows are arranged.