

# **IML-RESI**

# **E-Series**

## **Manual**

Issued 02-2008



**IML**

**Instrumenta Mechanik Labor System GmbH**

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# **1. Introduction**

## **1.1 Instructions as to Application**

### **1.1.1 Materials**

The IML-Resi measuring instrument has been designed for use at wooden materials (wood, trees). Inappropriate utilization may cause damages to the measuring system and / or the material to be examined.

### **1.1.2 Certainty of Reading**

The measuring results gained by utilizing the IML-RESI 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.

## **1.2 Genaral**

### **1.2.1 Conception**

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

### **1.2.2 Structure of the System**

As to stability, the IML-RESI system has been designed to meet the special requirements of practical examination of trees, structural timbers, poles, and wooden structural materials. All switches and keys required for operation are within easy reach.

Electronic control, printer, power supply are located in the electronic unit which may be connected to the measuring instrument means of a cable.

### **1.2.3 Moisture**

You should generally avoid any contact of the IML-RESI measuring 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.

## **1.3 Application**

### **1.3.1 How to Hold the Drilling Instrument**

There is no special way of holding the IML-RESI measuring instrument. The measuring results do not depend on a certain orientation. You will, however, have to ensure your own stability during each measuring procedure, as, when the instrument penetrates the material to be examined, there will be forces acting in opposite direction of drilling.

### **1.3.2 Examination of Wooden Poles**

If you examine a wooden pole, it is expedient to drill at an angle of e.g. 45°. A 45° adapter (optional) will serve as support for the instrument for utilization in inclined position. Thus, by means of a special drilling needle, the examination of wooden poles will be easier.

## 1.4 Maintenance

On principle, maintenance of the IML-RESI measuring instrument will be carried out by the manufacturer or by an authorized service company. According to the conditions of guarantee, the drilling instrument will have to be sent in for a first inspection after approx. 1000 measurements or after one year at the latest. Afterwards, we recommend an inspection after every 1000 measurements or at least once a year.

## 1.5 Guarantee Conditions

The term of guarantee for the IML-RESI 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 drilling instrument must not be opened by any person, only by the manufacturer or an authorized service company. Otherwise, the guarantee will become extinct.***

## 1.6 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.

## 1.7 Safety Instructions

The instrument must not be utilized but for the purpose described in the present Instructions for Use (examination of wood or material that is similar to wood). 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 safety pin mounted to the instrument ensures that the system will only start if the instrument has been correctly applied to the object to be examined. Removal or bridging of the safety installation is strictly prohibited.

The manufacturer will not be liable for inappropriate utilization of the instrument. 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.

***For normal utilization of the IML-RESI system, opening of the drilling instrument will not be required. If the drilling instrument has been opened by any person that has not been authorized by IML, the guarantee will immediately become extinct.***

## 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 *IML-RESI E Line*:

- Case
- Drilling instrument with handle and cable
- Electronic unit
- Battery charger
- Drilling needles
- Universal pliers
- Printer paper
- Data transmission cable for PC
- Analysing software E-Tools or E-Tools Pro

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

### 3 Operating and Indicating Elements

The following is a description of the operating and indicating elements of the drilling instrument and of the electronic unit.

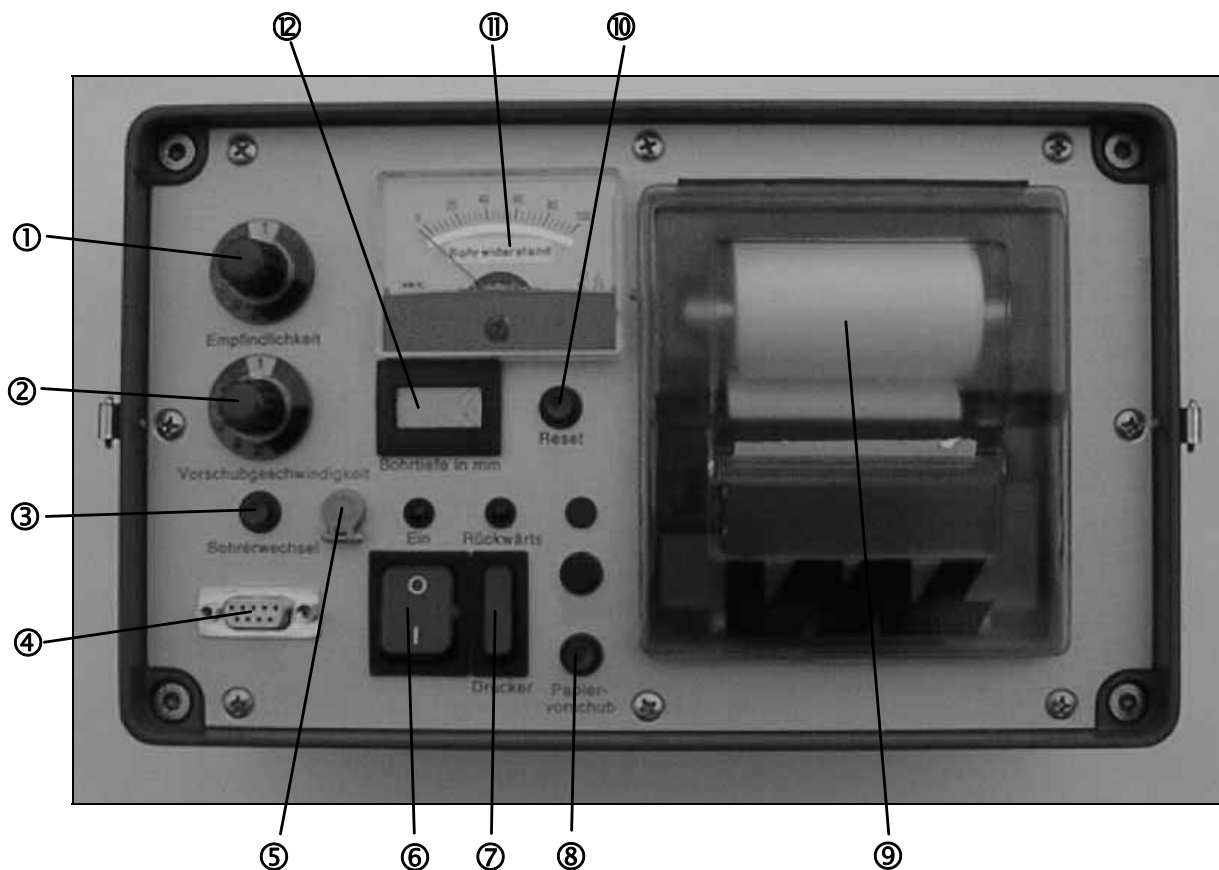
#### 3.1 Drilling Instrument



- ① Safety pin
- ② Drilling needle
- ③ Key for reverse movement
- ④ Start key with locking lever
- ⑤ Connection cable

### 3.2 Electronic Unit

The figure below shows the expanded electronic unit with memory operating unit.



- ① Switch for sensitivity adjustment
- ② Switch for adjustment of advance speed
- ③ Key for exchange of drilling needle
- ④ Connection socket for drill
- ⑤ Connection socket for data transmission cable
- ⑥ Main switch
- ⑦ Switch for printer
- ⑧ Key for paper feed
- ⑨ Printer
- ⑩ Key for reset of depth indicator
- ⑪ Measuring instrument for display of drilling resistance
- ⑫ Depth indicator

## 4 Functional Description

### 4.1 Switching on the Electronic Unit

The drilling instrument will be connected to the electronic unit by means of the connection cable. When inserting the plug, please pay attention to the direction of the contact guides, as otherwise the contacts may be damaged.

To switch on the electronic unit, press the main switch. If the printer is on, the status of the device will be printed.

If the instrument has been out of use for 10 minutes, a warning signal will sound. Switch off the alarm signal by pressing the key *Exchange needle* on the electronic unit or the *Start key* on the drill.

## 4.2 Advance Speed

The switch *Advance speed* (on the electronic unit) serves for selecting the desired advance speed. The six advance stages correspond with the following speeds:

Advance stage	Advance speed
1	10 cm/min
2	15 cm/min
3	20 cm/min
4	30 cm/min
5	40 cm/min
6	45 cm/min

The advance stage is shown in the display above the key.

If the advance speed is too high, the overload protection of the instrument will usually respond and abort the measurement in order to prevent the destruction of the drilling needle or other components. On principle, you should pay attention to the noise caused by the drilling instrument during the drilling procedure. As you can recognize the variations in density of the annual rings from acoustic signals, you can likewise perceive cavities, obstacles or contact with stones or other non-wooden materials. Prompt interruption of the drilling procedure will prevent the destruction of the sensitive point of the needle.

As to selection of the optimal advance speed, please refer to the following table and to the instructions and hints to be found in the respective literature. To ensure a verifiable evaluation it is expedient and necessary to select the same advance speed for the examination of the same species of trees or types of wood. Therefore, the switch serving for changing the advance speed is not located on the drilling instrument but on the electronic unit.

***As a rule, you should select an advance speed that allows measurement below the maximum load to be expected from the tree or timber to be examined. You should, therefore, prefer a lower advance speed to a higher one.***

As to the selection of the advance speed, please refer to the table below, which serves as a guideline. Owing to the different characteristics of the individual species of wood, the advance stage will have to be determined in each single case of application.

<b>Object</b>	<b>Wood species</b>	<b>Usual advance stage</b>
Hard wood	Carpinus, Quercus, Fagus, Acer, Platanus, Castanea, ...	1-4
Soft wood	Abies, Pinus, Picea, Tilia, Betula, Aesculus, ...	3-6
Structural timbers, poles	Quercus, Picea, Pinus, Abies, Larix, Thuja, ...	2-6

### 4.3 Gain

The switch *Gain* serves for raising or lowering the height of the amplitude depending on the hardness of the wood. The following table shows the amplification factors:

Key position	Amplification
1	x1
2	x2
3	x3

## 4.4 Execution of a Drilling

To start a drilling procedure, the safety pin and the start key must be pressed. The drilling needle will start rotating, and after 0.5 seconds, the advance will start at the speed selected. The start key may be locked by means of the locking lever.

If the printer is switched on, first the header and then the curve will be printed out. Print-out will be effected simultaneously only if the advance speed is low enough to allow the printer to make up for the time lost by printing the header.

The measurement will regularly end if:

- the *Start key* and / or the safety pin are released
- the maximum drilling depth has been reached
- the *Reverse* switch on the drilling instrument is pressed.

The measurement is aborted if:

- the overload protection of the instrument responds
- the battery voltage amounts to less than 13.0 volts.

***In case a measurement is stopped by one of the above abortion criteria, a message will be printed, whether the printer is on or off.***

Reverse motion of the advance unit will be controlled in dependence of the load and regardless of the advance speed. This means that the higher the load is, the lower is the withdrawal speed of the drilling needle. This ensures that the drilling needle will not be withdrawn too fast in hard wood.

After the advance unit has run back into the rear position, the drilling motor will keep on running for another approx. 2 seconds before it is switched off. During this time, the instrument will carry out a no-load current measurement of the drilling motor. This is equivalent to an automatic zero line adjustment. You are, therefore, recommended to wait until the motor is switched off in the rear position in order to obtain the actual alignment. The measured value will be printed out under the designation of *Offset*. If there is a deformed drilling needle in the instrument or the mechanism is defective, the offset value will increase owing to the higher frictional forces. Thus, the increased

value allows the detection of an anomaly of the drilling instrument. Normally, the value should remain under 10 %.

## 4.5 Printer

The Printer integrated within the electronic unit serves for printing out the measuring curve during the measurement.

Switch on the printer by pressing the *Printer* switch on the electronic unit.

To place a new paper roll, please take the following steps:

- Switch on printer
- Open printer cover
- Cut or tear paper slantwise and pass it below the printing cylinder
- Press *Paper feed* key
- Pass paper through slot in printer cover and close cover.

## **4.6 Drilling Needles**

### **4.6.1 Preservation**

The drilling needles will have to be kept dry to prevent oxidation (e.g. rust formation) of the surface. This may lead to particles getting into the guiding mechanism of the instrument during drilling, thus affecting its operability.

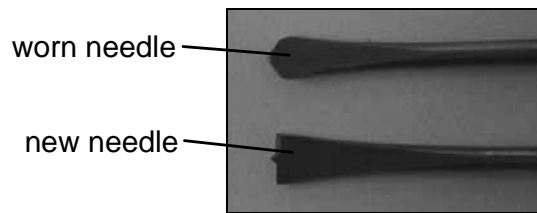
### **4.6.2 Stability**

The dimensions of the drilling needles of the IML-RESI system have been designed so as to allow the least possible damage to the object to be examined. This means that the needles are extremely thin and sensitive. You should, therefore, treat them with the greatest care.

### **4.6.3 Wear and Tear**

Above all, the service life of the drilling needles depends on appropriate handling and on the density of the wood to be examined. Wear and tear will mainly affect the front part of the needle point. If you use a needle with a worn-out point, the consequence will be lateral deviations from the straight drilling direction and decrease of the density resolution. Thus, reproducible and reliable annual ring analyses and the examination of zones of transition to decay will become difficult, if not impossible.

Wear of the point of the drilling needle will have to be visually checked after a certain number of drillings or after certain events (such as drilling on stone or other non-wooden materials). Considering examination of trees, the mean service life of the drilling needle will be 200-300 drillings in case of conifers and soft leaf-wood and 50-100 drillings in case of hard wood. This analogously applies to structural timbers, however, in this case, certain events (e.g. contact with stones) or inappropriate handling may entail premature wear.



***Drilling with worn-out drilling needles may cause damages to the IML-RESI system and to misinterpretation of the measuring curves, owing to - for instance - deviations from the straight drilling direction. The drilling needle must not - under no circumstances - be reground. Regrinding of the needles may reduce their overall length and may, therefore, be withdrawn too deeply into the drilling instrument by the motor running in reverse direction. This may lead to damages to the front guiding sleeve, the drilling needle support, and the motor-gear system as well as to the linear guiding elements. Such damages and consequential damages can be clearly identified and will entail immediate extinction of the guarantees on the part of the manufacturer. Moreover, the ratio of the diameter of the needle head and the shaft of reground needles does not comply with the set value. Hence, the measuring profiles will have significantly different features, which may lead to misinterpretation of the measuring curves.***

#### 4.6.4 Exchange

In the drilling instrument, the needles will be connected to the motor shaft by means of an automatic drill holder. For removal, the needle must extend from the instrument by at least 2 cm. Then, hold the needle by means of the pliers supplied.



Upon pressing the key *Exchange Needle* on the drilling instrument, the needle will come off the drill holder and may be pulled out by gently drawing.

Then insert a new drilling needle as far as possible into the instrument. Fix the needle in the drill holder by either switching on the drilling instrument for a short moment or by manually turning the needle clockwise. Now you may reset the motor to the rear position.

#### 4.6.5 Disinfection

At the front of the drilling instrument, the front guiding sleeve is located. This sleeve is equipped with a piece of felt which serves for removing soiling from the drilling needle. This piece of felt may be soaked with alcohol. The drilling needle will thus additionally be disinfected to minimize the risk of transmitting putrefactive agents.



In order to remove the front guiding sleeve, the drilling needle will first have to be removed from the instrument (refer to the section *Exchange of the Drilling Needle*). Then loosen the three screws and remove the sleeve. To impregnate the piece of felt inside the guiding sleeve, immerse the entire sleeve into the liquid for several minutes. Then attach the sleeve and insert the drilling needle anew.

## 4.7 Deleting all Measurements

Please take the following steps to delete all measurements in the electronic:

- Switch off the electronic unit
- Lock the *Start key* on the drill
- Press and hold the key *Exchange needle* and the safety pin on the drill
- Switch on the electronic unit
- Wait until the status printout is terminated
- Release the key *Exchange of drilling needle*, the safety pin, and the *Start key*

The status report will contain a message confirming that all measurements have been deleted.

## **5 Charging the batteries**

Charging of the batteries is done by means of the charger supplied. Prior to employment, please read the manufacturer's Instructions for Use.

## 6 Problems

### 6.1 The Drilling Needle Jams

The drilling needle may jam in the material pierced, if

- the advance speed is too high,
- it hits hard, non-wooden materials (stone, splinter...),
- a drilling process in green wood has been stopped and re-started more than several minutes later and the needle has stuck in the wood during this time,
- the drilling instrument has been canted during the measuring process, or
- the drilling instrument has been improperly handled in another way.

In such cases, the overload protection will usually stop the drilling procedure. If you should not be able to remove the needle from the drill hole by turning it, you will have to remove it from the drill holder as you would do for exchange of the drilling needle (by pressing the respective key and slowly withdrawing the drilling instrument). The projecting part of the needle shaft should be extracted or cut off.

If you should not succeed in removing the needle from the drill holder this way, you will have to cut it off between the wood and the drilling instrument. The part that remains in the drill holder will be removed as you would do for exchange of the drilling needle and replaced by a new drilling needle.

### 6.2 Charge of the Batteries

If the charge of the batteries decreases significantly after some time, you should first think of the following:

- Have the batteries always been completely discharged? (If not, you should totally discharge and re-charge them several times.)
- Is the outdoor temperature below 0°C? (If yes, you should warm up the batteries to approx. 20°C.)

If any of the above does not bring a solution to your problem, please contact your service company.

## 7 Technical Data

Resolution:	0.1 mm
Storage capacity :	in case of 256 kB approx. 20 m
	in case of 512 kB approx. 40 m
	in case of 1MB approx. 90 m
Maximum number of measurements:	400
Voltage supply:	2 x 7.2V NiCd batteries
Switch off warning:	after 10 minutes
Operating temperature:	0°C to 50°C

## 8 E-Tools / E-Tools Pro

### 8.1 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 drilling curves. To obtain the optimum result, please choose the highest possible resolution of your monitor.*

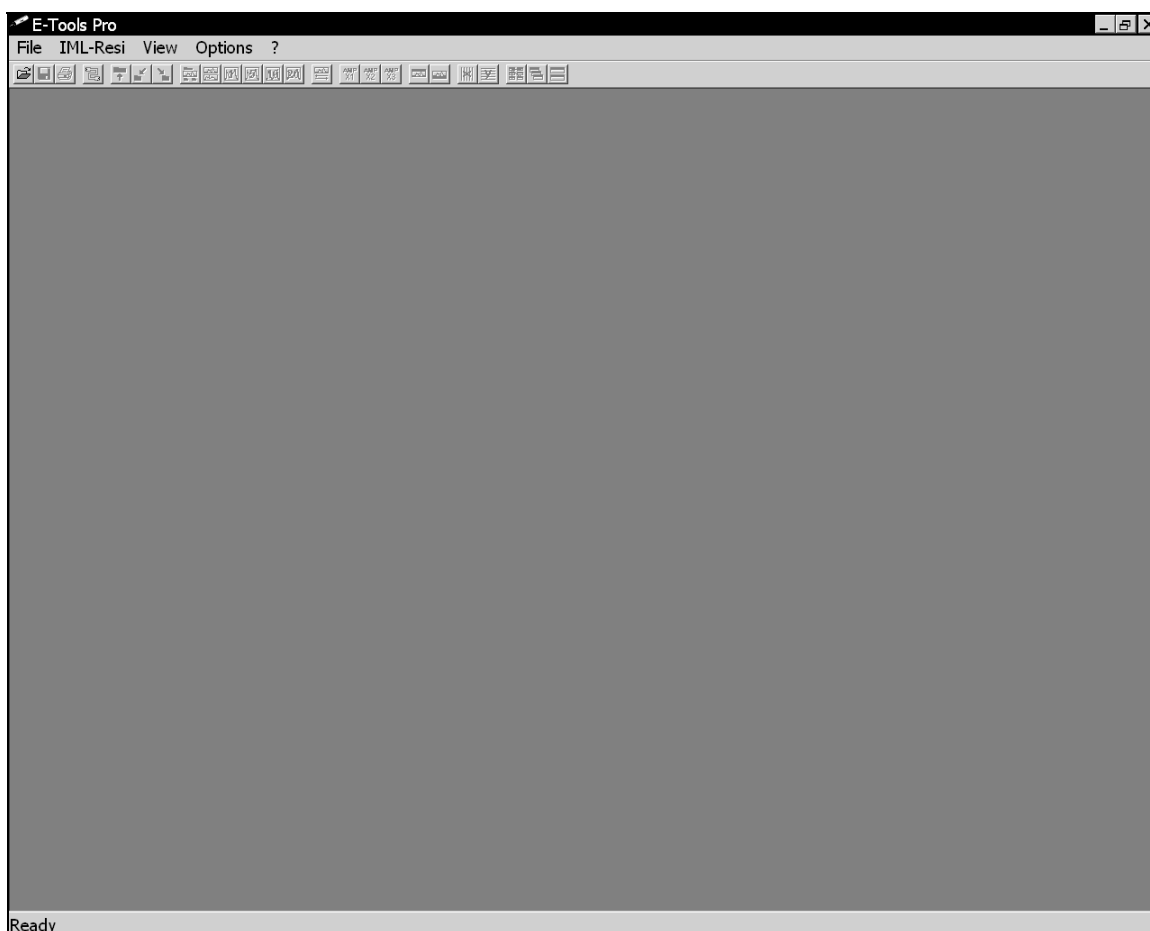
### 8.2 Starting E-Tools / E-Tools Pro

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 *E-Tools* or *E-Tools Pro*
- Start *E-Tools* or *E-Tools Pro*

## 8.3 Functional Description

Upon start of the program, the following window will appear:



Below the main menu (*File, IML-Resi, 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.

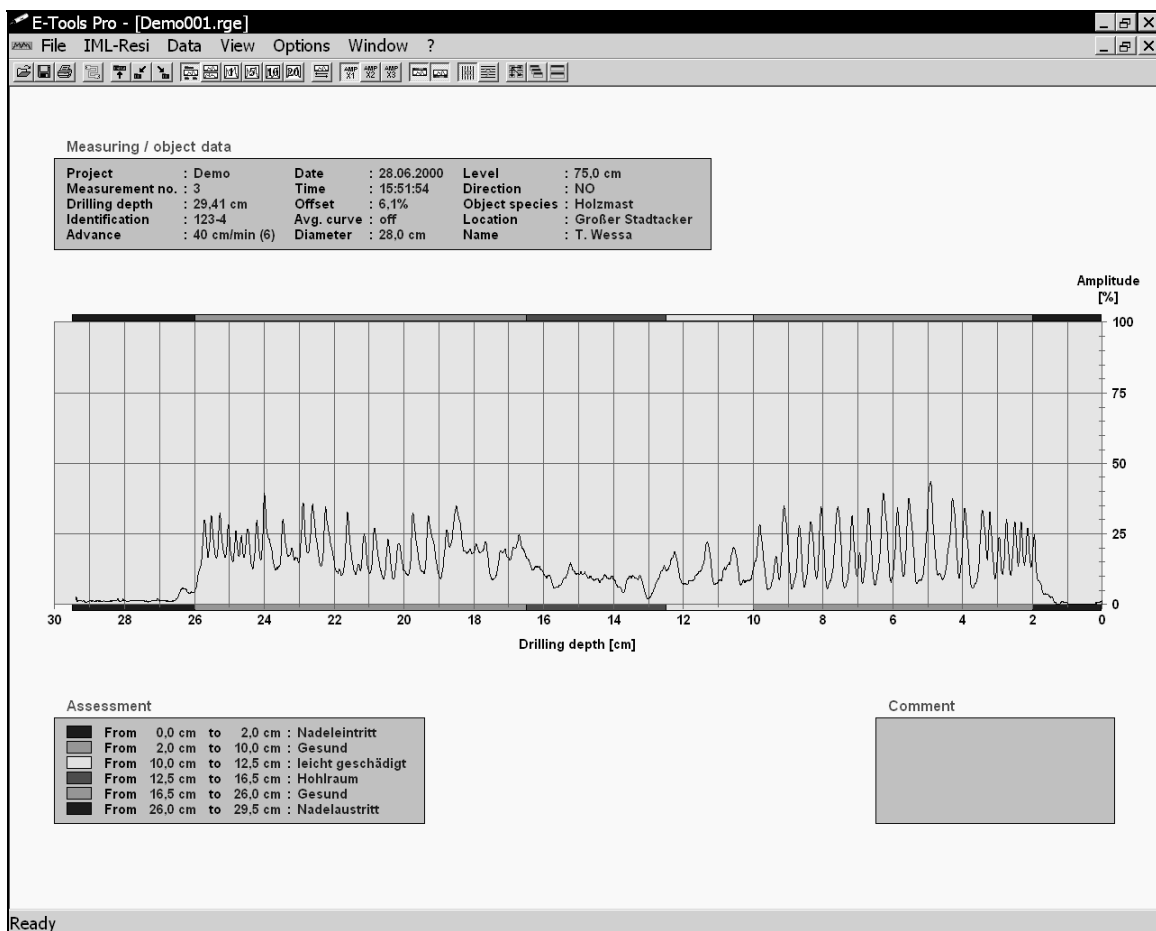
At the bottom of the window you see the status bar, which shows the description of the menu item selected.

### 8.3.1 Menu Item *File*



#### 8.3.1.1 *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.

### 8.3.1.2 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.

### 8.3.1.3 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.



### 8.3.1.4 Save

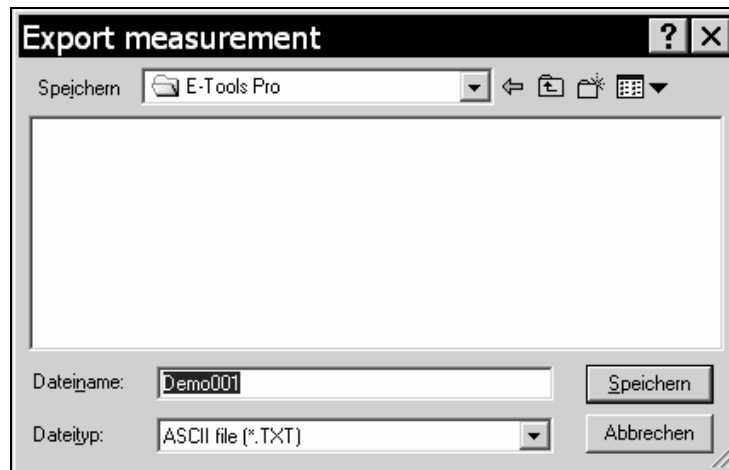
Select this menu item, if you have modified a measurement and want to save the modifications. However, in case that several measurements are opened, only the active measurement is saved. You can recognize the current measurement by title bar appearing in a different colour from the one of the other opened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

### 8.3.1.5 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.

### 8.3.1.6 Export... (E-Tools Pro only)

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 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<sup>®</sup>) for you to adapt the curve or the assessment to your requirements. The data of the curve start in line 36.
2. 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.

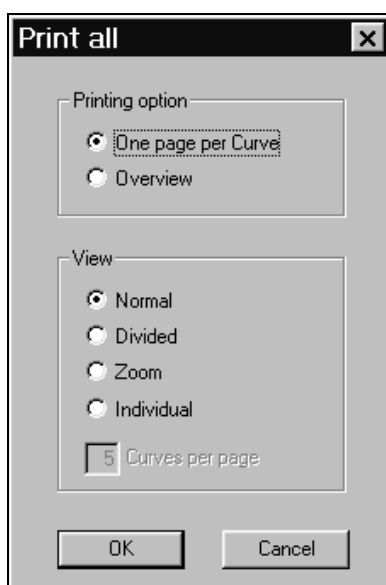


### 8.3.1.7 *Print...*

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 full-screen).

### 8.3.1.8 *Print all...* (E-Tools Pro only)

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*).

#### 8.3.1.9 *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.

#### 8.3.1.10 *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.

## 8.3.2 Menu Item *IML-Resi*



### 8.3.2.1 *Transmit measurements...*

This menu item serves for transmitting all measurements from the IML-Resi 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 socket PC 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 8.3.5.3).

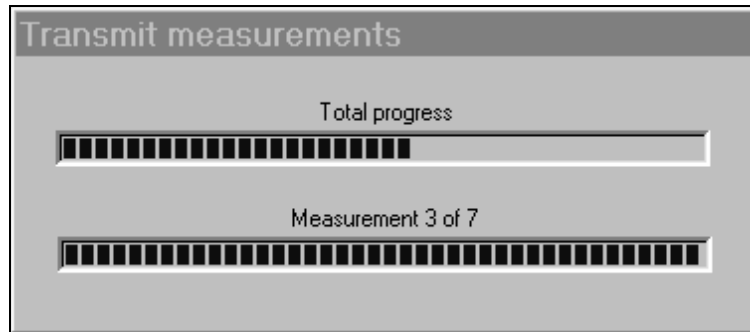
Upon selection of this menu item, a dialog box will appear, by means of which you may choose the target directory for these measurements.



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.rge  
Test002.rge  
Test003.rge  
Test004.rge
```

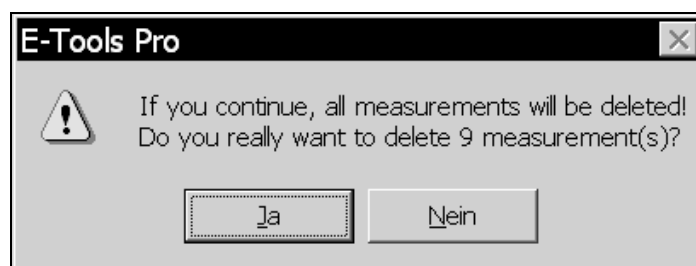
After the file name has thus been entered and you have confirmed by pressing the *OK* button, the measurements will be transmitted:



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 the key *Exchange needle* on the electronic unit and wait for the transmission to be aborted.

### 8.3.2.2 Delete all measurements

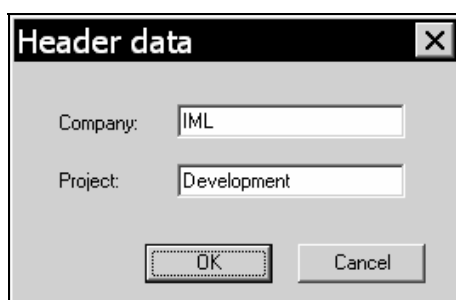
Select this menu item to delete all measurements from the IML-RESI. Upon selection of this menu item, a dialog box will appear, asking you, whether you really want to delete all measurements:



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

### 8.3.2.3 Change header data...

The headers will be printed out by the electronic unit at the beginning of each measurement. This menu item serves for modifying the data. Upon selection of this menu item the following dialog box will appear, which shows the headers actually stored in the electronic unit (ensure that your PC is connected to the electronic unit).



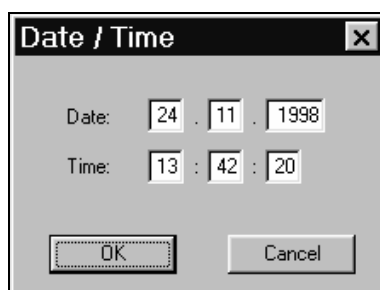
After having modified the headers, press the OK button in order to modify the headers in the electronic unit.

### 8.3.2.4 Options

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

#### 8.3.2.4.1 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 having checked the data, press the *OK* button.

#### 8.3.2.4.2 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.

### 8.3.3 Menu item *Data*



#### 8.3.3.1 *Measuring / 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:

Measuring data		Object data	
Project:	Demo	Diameter:	28 cm
Measurement no.:	1	Level:	75 cm
Identification:	123-4	Direction:	NO
		Object species:	Holzmast
		Location:	Großer Stadacker
		Name:	T. Wessa

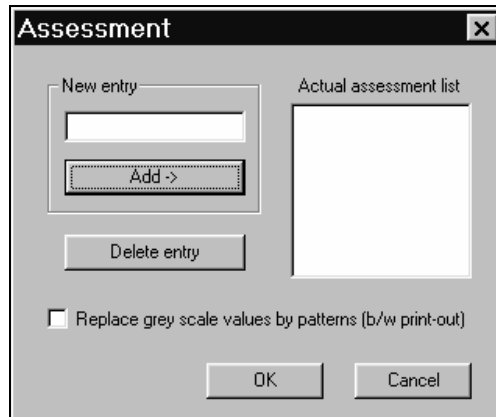
Upon pressing the *OK* button, the modifications will be shown in the main window.

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



### 8.3.3.2 Assessment...

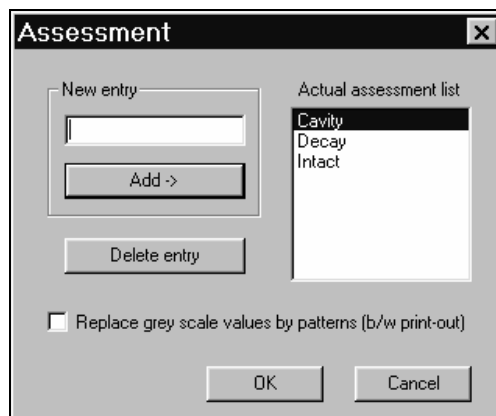
To facilitate assessment of the measurement, you should previously make a list of the most current special terms. For this purpose, select the menu item *Options – Assessment*. The following dialog will appear:



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.

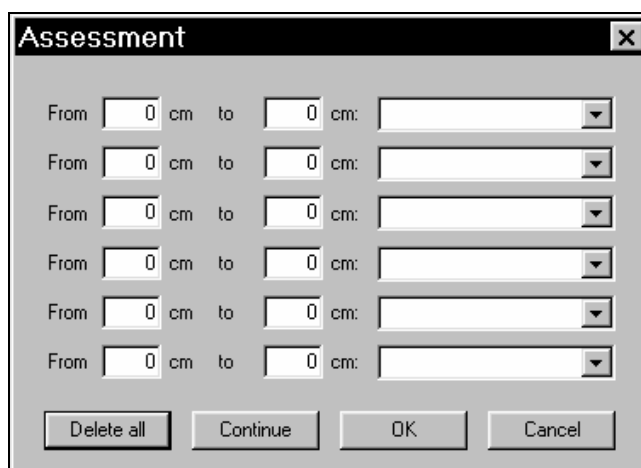
The following figure shows an example of an assessment list.



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 dialog box titled "Assessment" contains six rows of input fields. Each row consists of a "From" text box (containing "0"), the text "cm", a "to" text box (containing "0"), the text "cm:", and a dropdown menu. At the bottom of the dialog are four buttons: "Delete all", "Continue", "OK", and "Cancel".

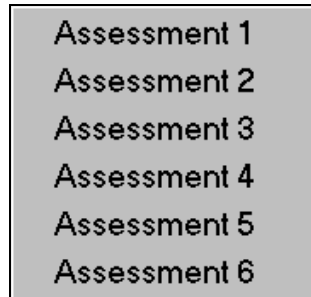
The cases *From* and *To* serve for entering the zone to be marked. In the case on the right side, you may either enter a term (e.g. entrance of needle) or select a pre-defined term from the assessment list by clicking the arrow. If you want to delete all cases, press the *Delete all* button.

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 8.3.5.4 *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.

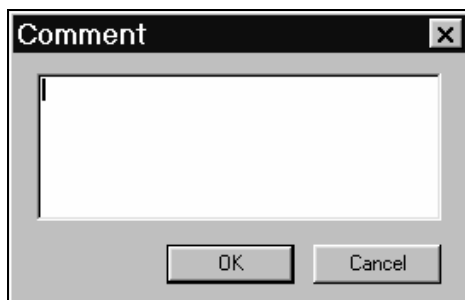
If you click the *Continue* button instead of the *OK* button, the next measurement will automatically be started, the programme adopting the final value of the previous measurement as starting value of the new measurement. This function serves for quickening the assessment of a curve, since each time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



### 8.3.3.3 *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*.

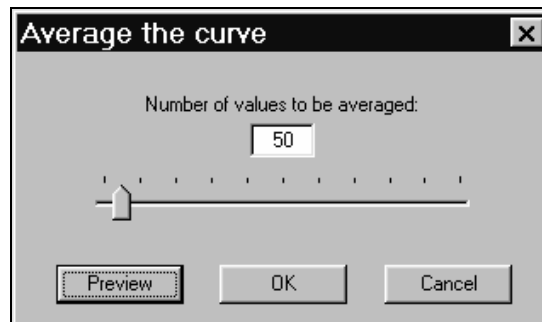
#### 8.3.3.4 Transfer measuring / object data...

This function serves for transferring different measuring / object data of the active measurement to all other open measurements. This is very helpful if there are 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.

#### 8.3.3.5 Average the curve (E-Tools Pro only)

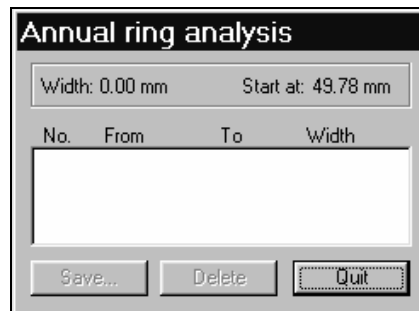
Please select this menu item, if you want to add an averaged curve into the diagram. Depending on the extent to which the curve has been averaged, the tendency is more clearly recognizable. You may, however, not activate this function before the averaged curve is shown on the screen (menu *View*, item *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.

### 8.3.3.6 Start annual ring analysis (E-Tools Pro only)

This function serves for measuring the annual rings and subsequently exporting the data. Upon selection of this menu item, the following dialog box will appear in the top left corner of the active measurement:



When the mouse cursor is moved above the curve, a marker will appear. Please position this marker on the first annual ring and press the left mouse button to fix the start position. The dialog box will show the start value. Now you may highlight all annual rings (left mouse button). The dialog box will show the annual ring number, the start and end positions, and the width of the annual ring. If you want to delete the last marking, press the *Delete* button in the dialog box. If you want to quit the annual ring analysis, press the *Quit* button.

Before you quit the annual ring analysis, you should, however, save your data by pressing the *Save...* button. Upon pressing this button, the same dialog box as described in section 8.3.1.6 *Export...* will appear. The selection box *Type of file* serves for selecting either 'ASCII file' or 'measuring table file'.

The ASCII format serves for saving the data of the annual ring analysis in the text format so that you may import them into another application (e.g. Excel<sup>®</sup>). The data of the individual annual rings start in line 37.

The export filter *Measuring table file (\*.MST)* serves for saving the annual ring analysis in the MST format. This file may be opened and processed by means of the software T-Tools or T-Tools Pro.

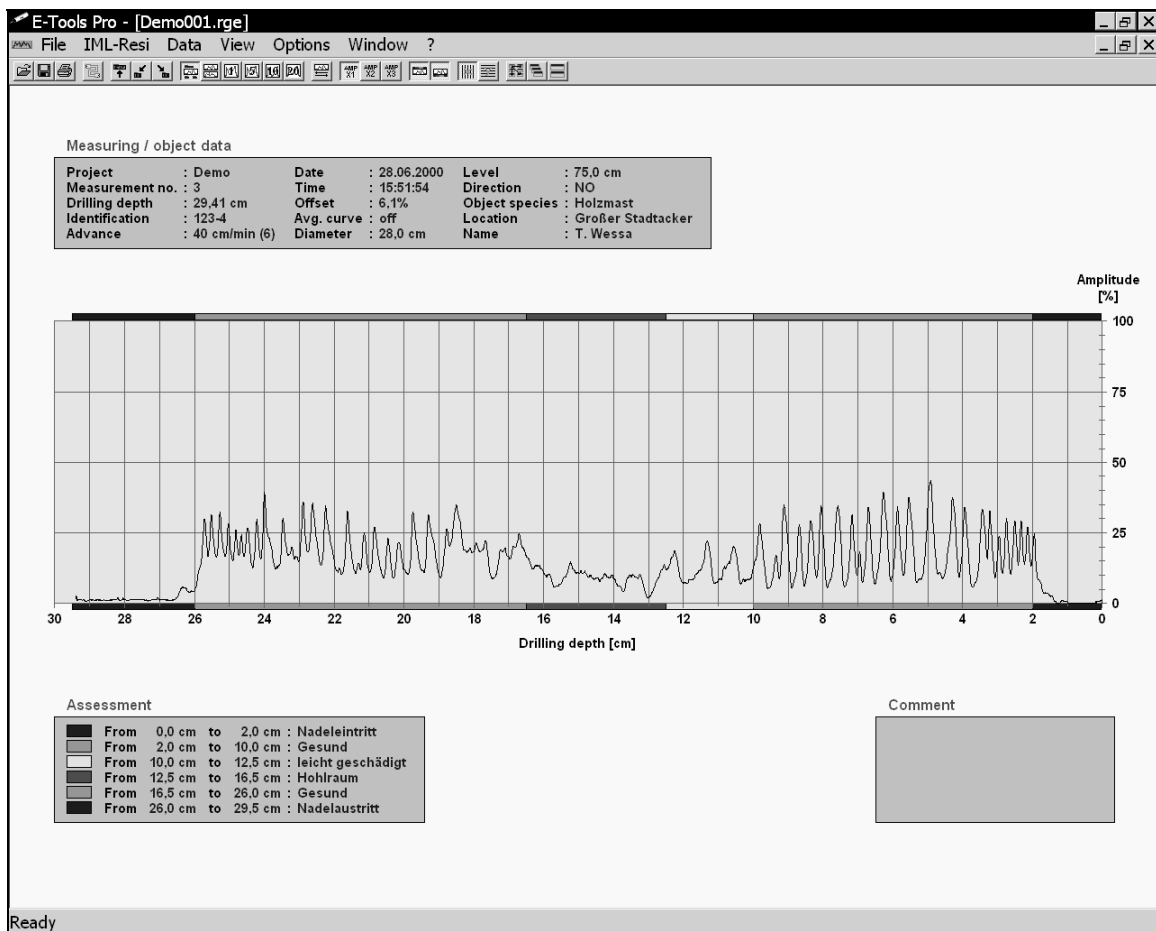
***To ensure accuracy, the annual ring analysis should be carried out in enlarged view (factor 20, cf. section 8.3.4.3)!***

## 8.3.4 Menu Item View



### 8.3.4.1 Normal

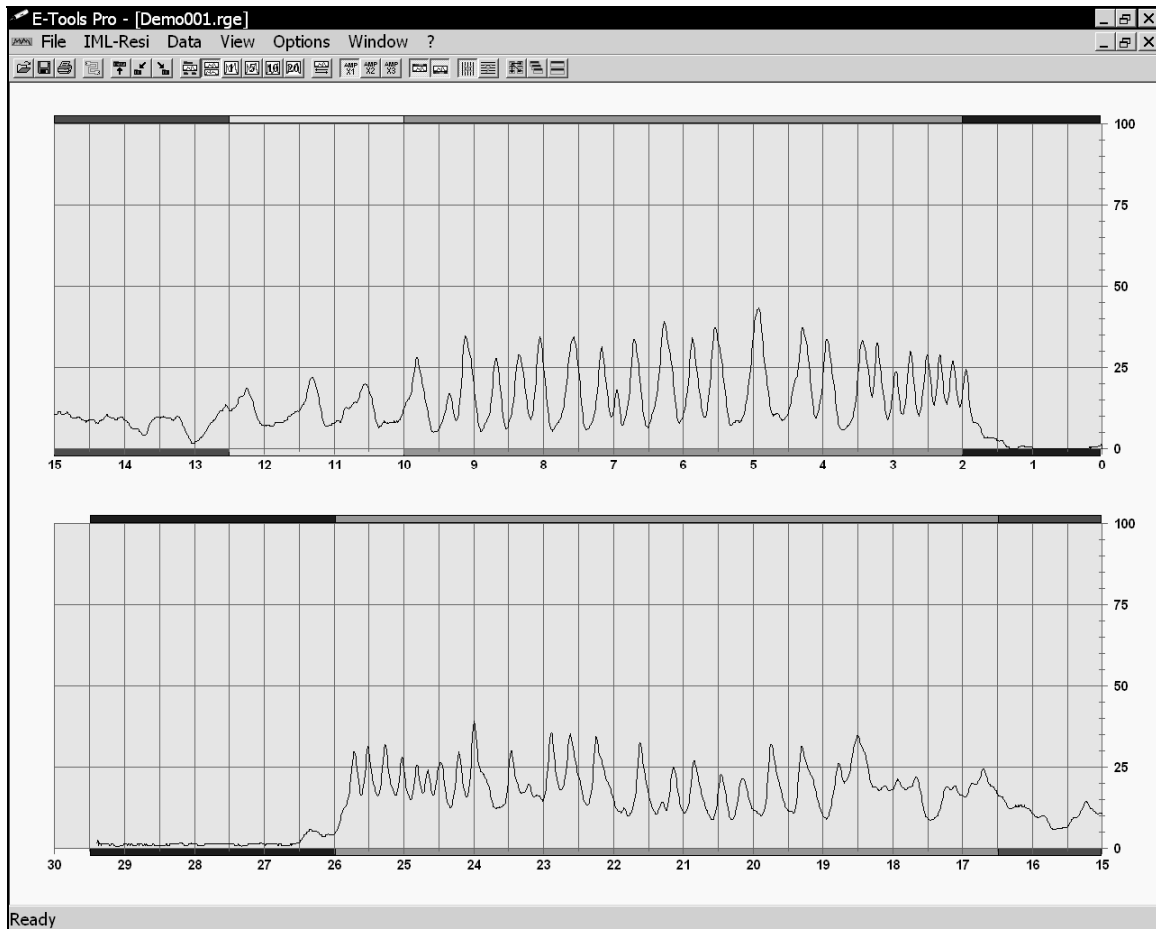
Select this view to get an overall view of the measurement. The curve and all relevant data will be displayed.





### 8.3.4.2 Divided

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





### 8.3.4.3 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 mm
- ⇐ = Shift curve to the right by 1 mm
- ↑ = Shift curve forward by 1 cm
- ↓ = Shift curve backward by 1 cm
- 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.



### 8.3.4.4 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.



### 8.3.4.5 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.



### 8.3.4.6 Assessment



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



#### 8.3.4.7 *Amplitude*



This menu item contains the submenus *Normal*, *Twice* and *Triple*. These functions serve for modifying the calibration of the curve, which corresponds to the modification of the amplitude in the electronic unit (switch *Gain*).



#### 8.3.4.8 *Averaged curve (E-Tools Pro only)*

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*.



#### 8.3.4.9 *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.

#### 8.3.4.10 *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 representation of the curve.

#### 8.3.4.11 *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 representation of the curve.

## 8.3.5 Menu Item *Options*

### 8.3.5.1 *IML-Resi type*

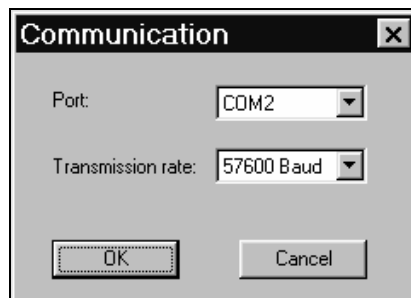
Upon selecting this menu item, a list of the different types of IML-Resi will appear. Choose from this list the type of drilling instrument you employ, to ensure that the calibration of the drilling curve is adjusted to the drilling length of your instrument.

### 8.3.5.2 *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.

### 8.3.5.3 *Communication...*

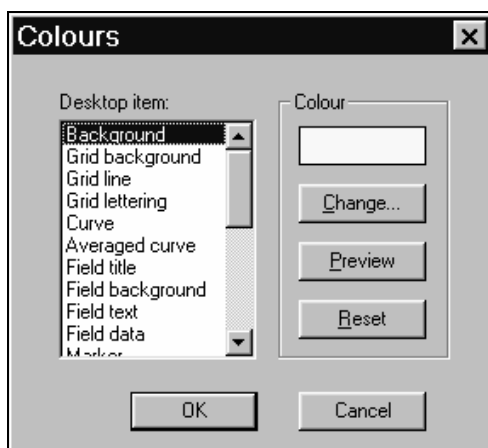
This menu item serves for configuring the PC to which the IML-RESI is connected. Upon selection of this menu item, the following dialog box will appear:



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.

#### 8.3.5.4 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 item*. 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.

#### 8.3.5.5 Assessment...

This menu item serves for modifying the assessment list (cf. section 8.3.3.2 *Assessment*).

### 8.3.5.6 *Print-out*

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

#### 8.3.5.6.1 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.

#### 8.3.5.6.2 Colour print-out

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

#### 8.3.5.6.3 No print-out of file name

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

#### 8.3.5.6.4 Print file name

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

#### 8.3.5.6.5 Print file name including path

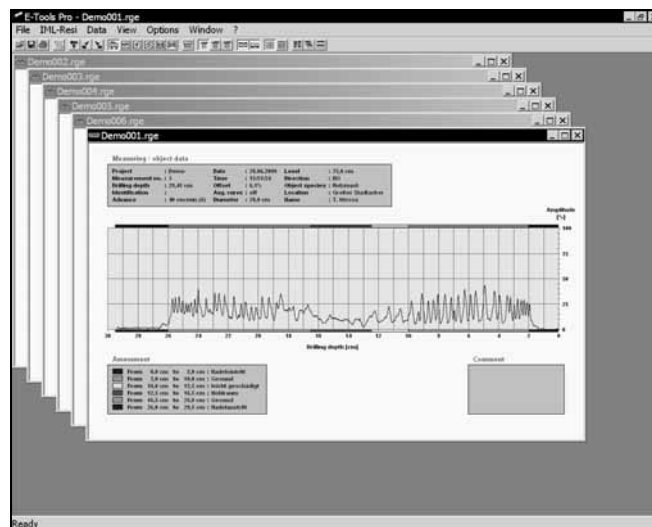
If this menu item is activated, the file name of the measurement, incl. the directory containing the file, will appear on the print-out.

## 8.3.6 Menu Item *Window*



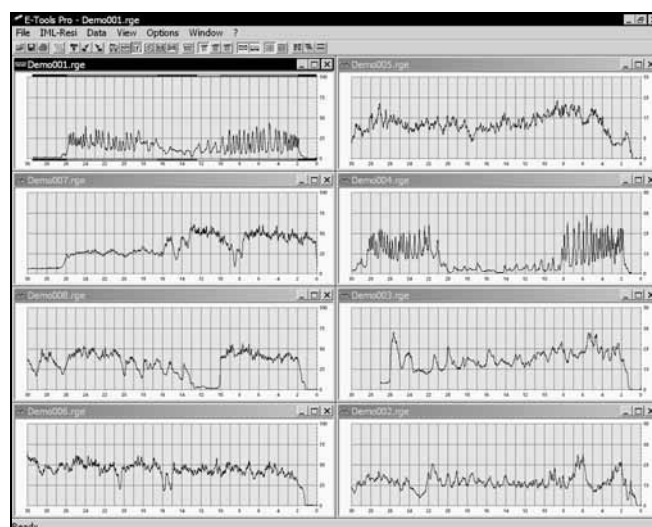
### 8.3.6.1 *Cascade*

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



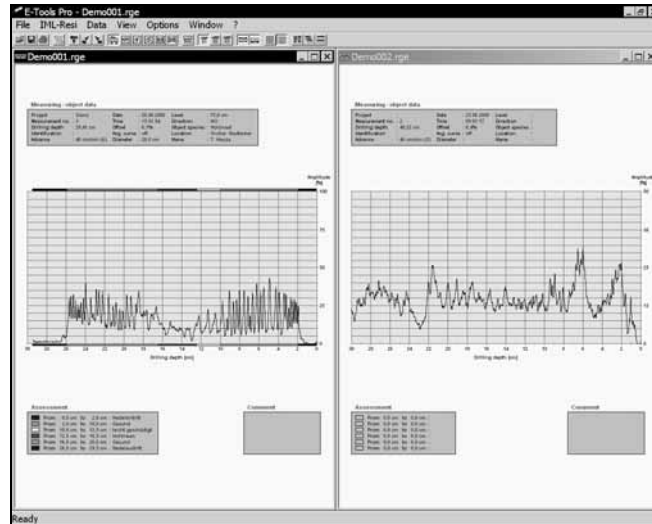
### 8.3.6.2 *Tile horizontal*

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



### 8.3.6.3 Tile vertical

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



### 8.3.6.4 Arrange Icons

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

Suggestions

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**Suggestions IML-RESI E-Series:**

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**Suggestions E-Tools / E-Tools Pro:**

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**Have you found any errors in the present manual?**

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Sender:

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

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Großer Stadtacker 2  
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or fax to: (49) 06222-6797-10