

Micro Hammer

Manual

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1. Introduction

1.1 Instructions as to Application

1.1.1 Materials

The **Micro Hammer** has been designed for use at wooden materials (trees, beams, poles). 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 **Micro Hammer** 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 user. 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 Electric Lines

Prior to starting a measurement, please make sure that the connection cables will not get in contact with electric lines or other live parts and that they are protected against humidity.

1.2 General

1.2.1 Conception

It was the intention of those who developed the **Micro Hammer** 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 **Micro Hammer** system has been designed to meet the special requirements of practical examination of trees and wooden structural materials. All switches and keys required for operation are located so as to be within quick and easy reach. The electronic control is located in the electronic unit which the hammer and the sensor are connected to.

1.2.3 Moisture

You should generally avoid any direct contact of the **Micro Hammer** measuring system with water and moisture. 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 humidity.

1.3 Maintenance

On principle, maintenance of the **Micro Hammer** measuring instrument will be carried out by the manufacturer or by an authorized service company. According to the conditions of guarantee, the instrument will have to be sent in for a first inspection after approx. one year. Afterwards, we recommend an inspection by the manufacturer at least once a year.

1.4 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.

1.5 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 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 Micro Hammer system, opening of the instrument will not be required. If the 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 **Micro Hammer**:

- Case
- Hammer and sensor
- Electronic unit
- Battery charger
- Set of screws / magnets
- Screwdriver
- USB data transmission cable
- USB Bluetooth adapter
- IML Software Center

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

3 System Components

The following picture shows the system components of the **Micro Hammer** system:



- ① Sensor
- ② Sensor fixation screw
- ③ Electronic unit
- ④ USB interface
- ⑤ Connection socket for hammer and sensor
- ⑥ Impact cap fixation screw
- ⑦ Impact cap
- ⑧ Hammer

4 Electronic Unit

4.1 Switching ON / OFF

Press the button on the left side to switch on the electronic unit and keep pressed until the following message will appear in the display:



After a short delay the main menu A will be displayed:



Press again the button on the left side to switch off the electronic unit. Keep pressed until the electronic switches off. Only if the main menu A, the main menu B or the system control menu is displayed the electronic unit can be shut down (see next paragraph).

If the electronic cannot be switched off and the unit has hung up, the electronic unit can be shut down by pressing the reset button mounted below the USB interface.

4.2 Main Menu A

After switching on the unit the main menu A will be displayed.



In this menu you can enter the diameter, the ID number of a measurement as well as a remark. Refer to the corresponding chapter for detailed information about these functions.

4.3 Main Menu B

To show main menu B, press the menu key:



Main menu B will be displayed:



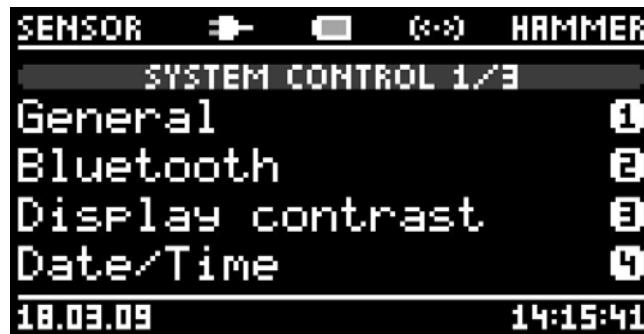
This menu shows the number of stored measurements. You can show stored measurements and also the last measurement or all measurements can be deleted. Refer to the corresponding chapter for detailed information about these functions.

4.4 System Control Menu

To show the system control menu, press anew the menu key:



System control menu page 1 will be displayed:

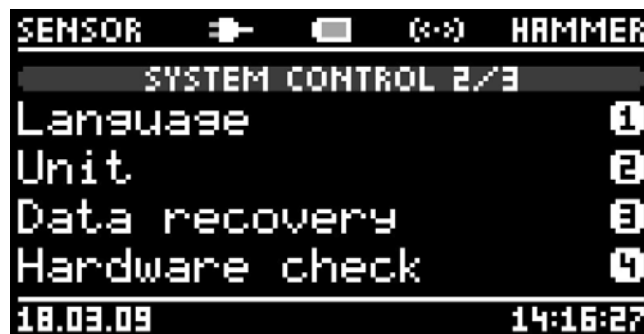


In this menu you can configure the system settings of the electronic unit. Please refer to the corresponding chapter for further information.

The system control menu consists of 3 pages. Press the following key to show page 2:



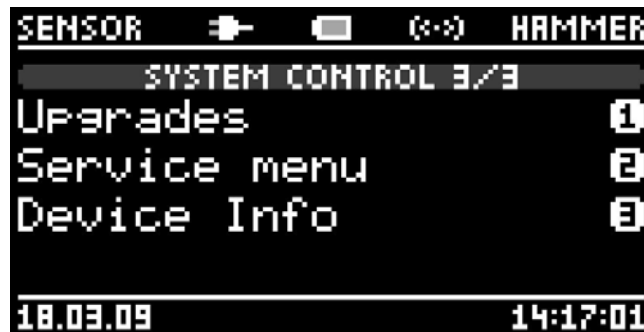
System control menu page 2 will be displayed:



To display page 3, press anew the following key:



System control menu page 3 will be displayed:



To go back to main menu A, press the key below:



4.5 Status Bar

The upper status bar is visible when main menu A, main menu B or the system control menu is shown:



The status bar indicates the condition of the battery. The symbol is blinking when the battery is very low and the remaining battery time is quite short. An animation shows the recharging process.

The instrument connected via USB is shown on the left side of the battery symbol. If the electronic unit is connected to the PC there will appear the symbol of an USB connector. If it is connected to the battery charger there will appear the symbol of a power connector.

The Bluetooth symbol is on the right side of the battery symbol. If the Bluetooth function is enabled and there is no connection to the PC the symbol will be shown shaded. If a connection to the PC has been established the symbol will be shown brightly. If the Bluetooth function is deactivated the symbol will be invisible. Please refer to paragraph *Bluetooth* at chapter *System settings* for further information.

The left side of the status bar indicates whether the sensor is connected to the instrument and if it is detected. The sensor has been detected if **SENSOR** is displayed brightly. The same applies for the status of the hammer, displayed on the right side.

4.6 Confirming a Dialog

When operating the **Micro Hammer**, several dialogs appear, which have to be confirmed with **YES** or **NO** respectively with **OK** or **CANCEL**.

You can confirm these dialogs by the help of the keys below:



= YES or OK

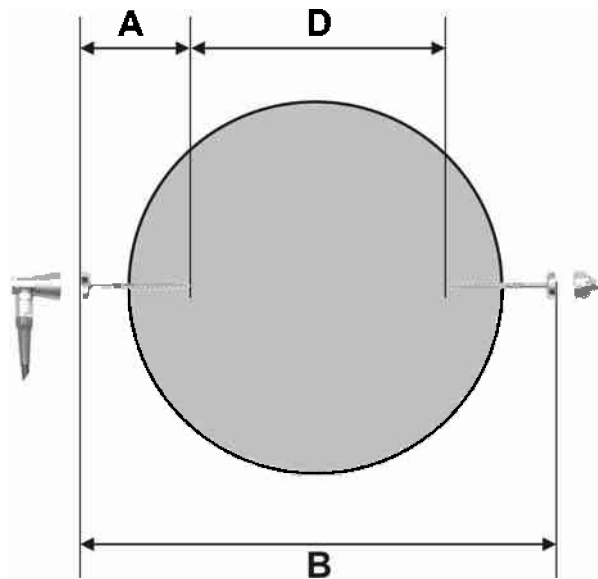


= NO or CANCEL

4.7 Taking a Measurement

4.7.1 Preparation

Prior to starting the measurement, please screw the wood screws supplied into the object to be examined. Then, the effective diameter will be determined on the basis of the graphical representation below:



$$\text{Diameter (D)} = B - 2 \times A$$

After defining the effective diameter, the sensor has to be fixed on the magnetic system. Connect the sensor plug to the socket of the same color on the electronic unit. The electronic unit will detect the sensor and the word **SENSOR** appears.

Now connect the hammer to the socket of the same color on the electronic unit. The electronic unit will detect the hammer and the word **HAMMER** appears. Then fix the impact cap on the magnetic system of the screw.

Please make sure that the sensor and the impact cap rest centred on the magnet support and ensure that the connection to the screw is not loose. The correct fixing affects the value of the measurement. Ensure that there is no dirt between the magnet and the sensor or rather the impact cap.

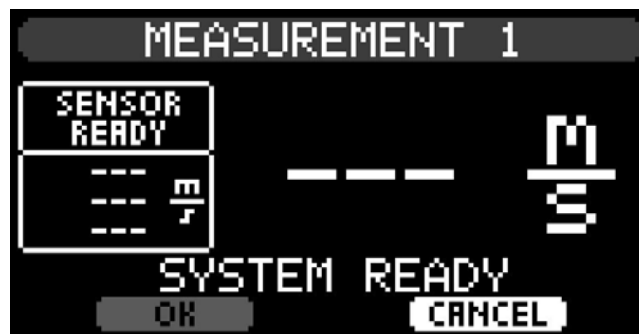
4.7.2 Starting a measurement

Please insert the diameter of the object before starting a new measurement. Please read therefore the chapter *Changing the Diameter*.

Please notice that a new measurement can only be started if main menu A, main menu B or system control menu is displayed. Press the following button to start a new measurement:



The following dialog appears:

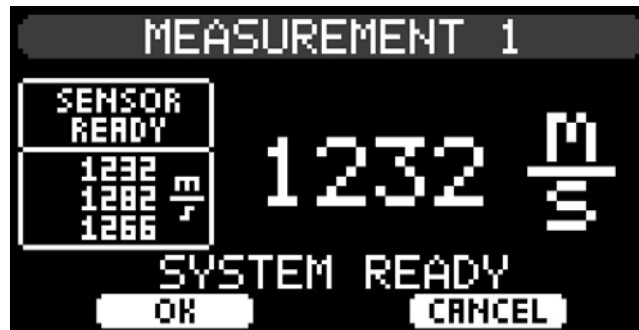


On the left side the sensor status will be displayed as well as the last 3 measurement values received by the sensor. On the right side appears the output of the actual measurement value. Right above the buttons the status of the system is displayed.

SYSTEM READY appears when the system is ready for a new measurement. As long as the sensor is affected by vibrations it is not ready for a new measurement and the message **SENSOR NOT READY** is displayed.

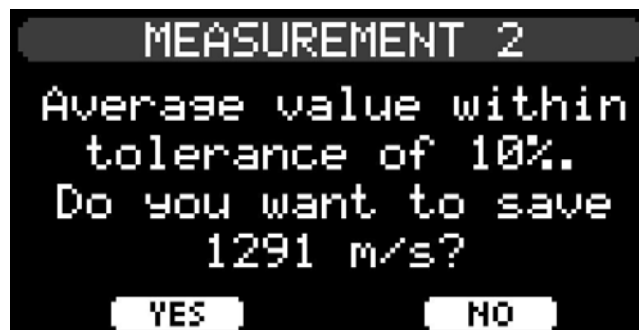
Hold the electronic unit calmly in your hand and ensure that no vibrations or shocks will reach the sensor via the tree and via the sensor cable.

Then hit slightly straight on the impact cap with the hammer. The measurement value appears.



If the blow was too slight, a message will appear in the status bar.

Below the sensor status, the last 3 measurement values are displayed. If the average value of the last 3 measurement values is within a tolerance of 10%, the electronic unit suggests automatically to save this average value. The following message will appear:



Choose **YES** to save the measurement and quit. Choose **NO** to not save it and to continue with the measurement. After saving the measurement, the measurement will be displayed. For more details read chapter *Showing a Measurement* in this manual. It is also possible to disable the automatic display of a measurement. For more details read chapter *System control, General information*.

In the system control it is possible to disable the function suggesting automatically to save the measurement. For more details read chapter *System Settings, General*.

4.8 Changing the Diameter

Be sure that main menu A is displayed:



To change the diameter, press key 1. The input dialog appears:



By the help of keys 0 to 9 you can enter the new diameter. Press the key below to delete the last char:



Keep the key pressed to delete the entire entry.

You can apply data by pressing the button **OK** or cancel this progress by pressing the button **CANCEL**.

4.9 Changing the ID Number

An ID can be used for assigning a measurement to a tree or to a project. The very ID will be saved with each measurement.

Be sure that main menu A is shown:



To change the diameter, press key **2**. The input dialog appears:



You can select the desired character by the help of keys **0** to **9**. Press the key below to delete the last char:



Keep the key pressed to delete the entire entry.

You can apply data by pressing the button **OK** or cancel this progress by pressing the button **CANCEL**.

4.10 Changing the Remark

To add a note to the measurement, you can use the function **REMARK**. The remark will be stored with every measurement and it will be shown behind the measuring data, after transferring the data to the PC.

Be sure that main menu A is shown:



To change the remark, press key **3**. The input dialog appears:



You can select the desired character by the help of keys **0** to **9**. Press the key below to delete the last char:



Keep the key pressed to delete the entire entry.

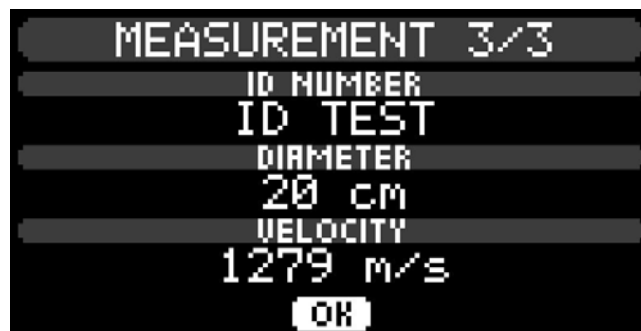
You can apply data by pressing the button **OK** or cancel this progress by pressing the button **CANCEL**.

4.11 Showing a measurement

Be sure that main menu B is shown:



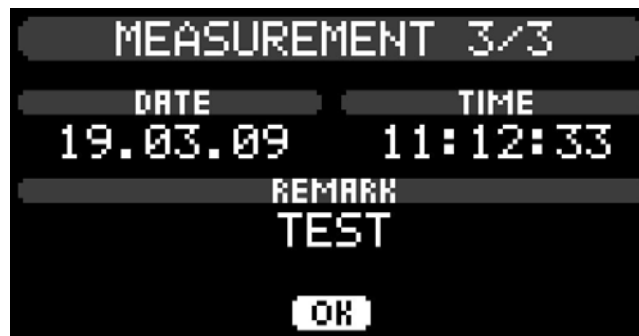
To show a saved measurement, press key 1. Page 1 of the last measurement is displayed:



To show page 2, press the key below:



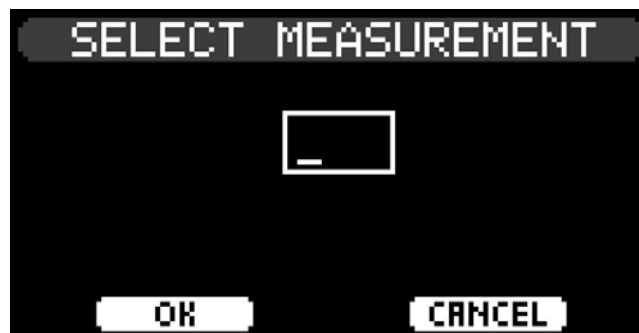
Afterwards the remaining data will be displayed:



To select a different measurement, press the key below:



The input dialog appears:



After entering the requested measurement number, press **OK**.

4.12 Deleting the last Measurement

To delete the last measurement, be sure main menu B is displayed:



After key **2** has been pressed, a message will appear asking if you really want to delete the last measurement. If you select **YES**, the last measurement will be deleted.

4.13 Deleting all Measurements

To delete the last measurement, be sure main menu B is displayed:



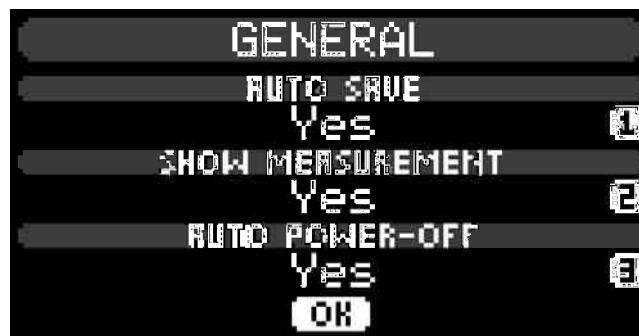
After key **3** has been pressed, a message will appear asking if you really want to delete all measurements. If you select **YES**, all measurement will be deleted.

4.14 System Settings

Switch to the system control menu to change the system settings. The relevant options of this menu will be explained in the following paragraphs.

4.14.1 General

After selecting this menu item the following dialog will appear:



With **AUTO SAVE** you can determine whether it is suggested to save the measurement automatically if the last 3 measurement values were within a tolerance of 10 %.

With **SHOW MEASUREMENT** you can determine whether the measurement is displayed right after saving it or not.

With the option **AUTO POWER-OFF** the electronic unit will be switched off after 10 minutes of inactivity. Select **Yes** if the period between the measurements is longer or if you want to ensure that the instrument does not keep switched-on accidentally and the battery runs down. Deactivate the function if you want to ensure that the instrument is always ready when you start a measurement and that it has not been switched-off in the meantime

4.14.2 Bluetooth

After selecting this menu item the following dialog appears:



The menu item **STATUS** indicates if the Bluetooth system is on or off.

With the menu item **CONNECTION** you can add a new connection or change the actual connection.

Before selecting the menu item **New** please install the Bluetooth system on the PC that you want to connect (see chapter 5.2.3 *Bluetooth interface*).

If there is stored at least one connection the following dialogue will appear when you select the menu item **New**:



Select the storage location where the new connection has to be stored. There can be stored at most 3 connections. If you select a storage location that is already used by another connection, this connection will be overwritten by the new connection.

After selecting the storage location, new Bluetooth devices will be searched. If an instrument is in reach, it will be displayed as shown below in the example:



Confirm to establish a new connection to the indicated instrument. Select **NO** to display the next instrument that has been found.

If you have selected **YES**, the connection process will be started. A window will appear on your PC requesting a pin. Please enter **0000** on your PC. After selecting OK, the electronic unit will try to establish a connection with the PC. If the connection process was successful, the connection can be stored.

After entering the connection pin, some Bluetooth systems require another confirmation that the electronic unit is allowed to access the PC. Please confirm that the electronic unit is always allowed to access the PC and close the dialogue.

Select the menu item **Change** in the Bluetooth dialogue to change the existing connection. The following dialogue will appear:



In this dialogue you can choose the instrument to which the Bluetooth connection will be established in the future. Select **OK** to close the dialogue.

All modifications of the Bluetooth configuration will not be applied before you have closed the Bluetooth menu and the main menu is displayed.

4.14.3 Display Contrast

The following dialog appears after selecting this menu item:



If there is strong sunlight it is possible to switch contrast from **Normal** to **High** so that it is easier to read the display. Please regard that the lifetime of the display will decrease with this setting.

4.14.4 Date/Time

The following dialog appears after selecting this menu item:



With the menu item **DATE FORMAT** it is possible to choose the display format for the date.

After selecting the menu item **Change Date / Time** the dialogue for changing the date and the time will appear:



Please enter first the date and then the time. After pressing **OK** you have to confirm another time with **OK** to save the new time settings.

Please regard that date and time settings are synchronized with the PC time when measurements are transferred to your PC.

4.14.5 Language

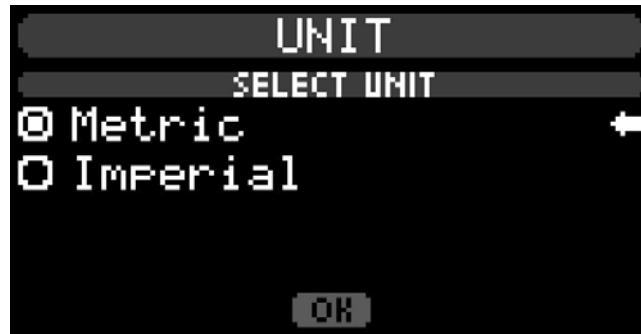
The following dialog appears after selecting this menu item:



Select the desired language.

4.14.6 Unit

The following dialog appears after selecting this menu item:



Select the desired unit.

4.14.7 Data Recovery

After selecting this menu item a request appears asking if you really want to start the data recovery. After confirming this request with **YES** the data recovery will start:



The data recovery routine searches the complete memory for valid measurements and recovers them. This function will be helpful if you have deleted measurements accidentally and you want them to be recovered.

4.14.8 Hardware Check

With this function you can check the connected sensor and hammer for correct operability.

After choosing this menu item the following menu will appear:



Select the option **Hammer** to check the hammer. A dialogue will appear, displaying the status of the hammer. Hit the impact cap to check if the hammer generates a correct signal:



Select the option **Sensor** to check the sensor. Confirm the following message with **OK**. Then the status of the sensor will be displayed.

4.14.9 Upgrades

After selecting this menu item, the following dialog will appear:



The menu item **INSTALLED OPTIONS** indicates the upgrade options you have purchased and already installed. For the **Micro Hammer** the following options are available:

MSM	Multi Sensor Mode
RCI	Remote Control Interface

With **ADD/REMOVE OPTION** it is possible to add or remove options. To run one of these functions you need the corresponding activation key that you obtain purchasing the upgrade option.

After selecting **Add**, the dialog to enter the activation key for the upgrade option will appear. Please enter your code and select **OK**. If the entered activation key was correct, the option that has been installed will be displayed in the menu item **OPTIONS INSTALLED**.

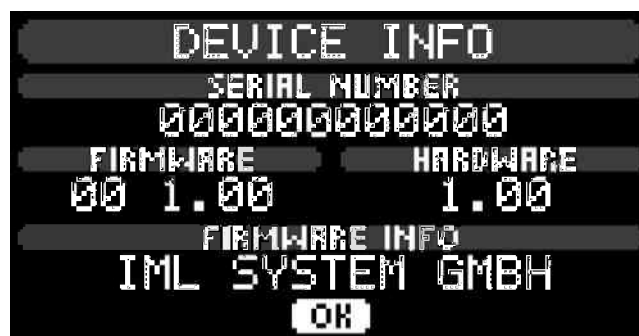
After selecting **Remove**, the dialog, to enter the activation key for the upgrade option to be removed, will appear. Please enter the code and select **OK**. If the entered activation key was correct, the option will no longer be shown in the menu **OPTIONS INSTALLED**.

4.14.10 Service Menu

This menu is designed for internal service activities and not addressable for end users.

4.14.11 Device Info

The following dialog appears after selecting this menu item:



There are displayed the serial number of the electronic unit, the firmware version and the hardware revision.

4.15 Charging

It is possible to charge the electronic unit either by the provided battery charger or by a connected PC.

Charging with the PC makes it possible to charge the electronic unit on the way by a notebook without having connection with the grid. Please regard that for charging via the USB connection it is necessary to have installed the USB drivers. They will be installed automatically while the installation of M-Tools Light.

If the charging process is running while the instrument is on, an animated symbol in the status bar will show it. If the electronic unit is off there will appear an animation as well as a status information.



Only connect the battery charger to the electronic unit. Otherwise, if you connect it to a PC or an USB hub, it may cause damage to the PC components or the battery charger.

Please disconnect the battery charger from the electronic unit before unplugging it from the wall. This way you avoid overvoltages that may damage the electronic unit.

5 I-Tools Light

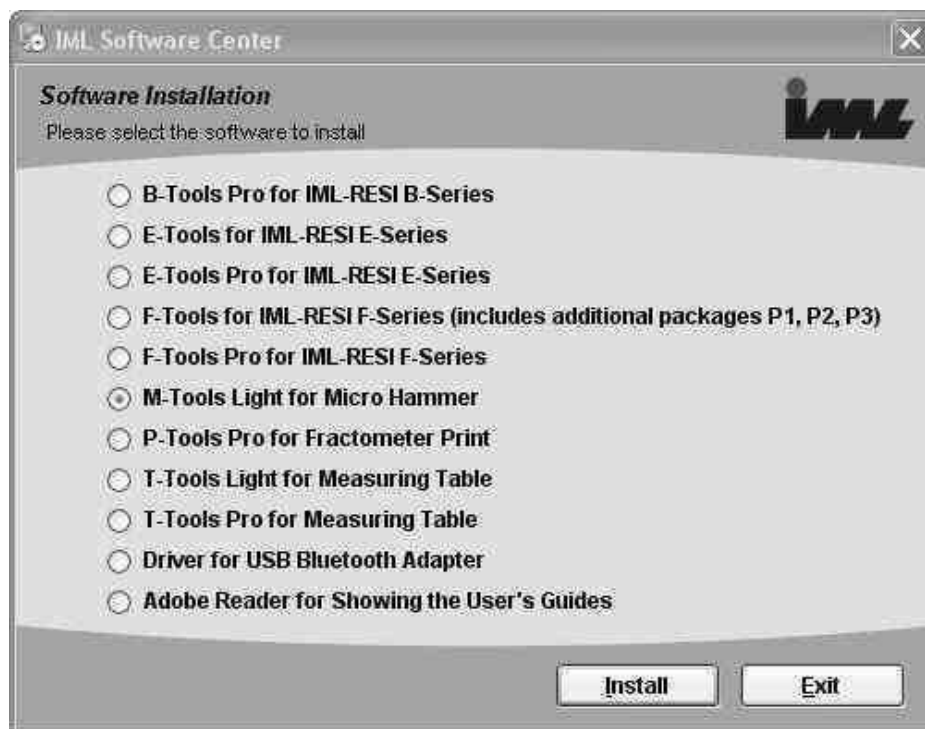
5.1 System Requirements

- 32-bit Operating System Windows 98SE or later

5.2 Installation

5.2.1 M-Tools Light

Insert the provided CD ROM into the CD ROM drive of your PC. Click on **Start, Run, Browse** if the CD ROM does not start automatically. Navigate to your CD ROM drive and start the file Setup.exe. The IML Software Center will appear:



Select the software M-Tools Light and click on **Install** to start the installation. Follow the instructions on the screen to finish the installation.

5.2.2 USB Interface

After the successful installation of M-Tools Light, connect your electronic unit to an USB connection of your PC. After connecting the following dialog will appear:



Mark the third option as shown in the screenshot and select **Next**. The next dialog will appear:



Mark the first option and select **Next**. The hardware wizard will install the new hardware. After the successful installation your PC can transmit data via USB and you can use M-Tools Light.

5.2.3 Bluetooth Interface

Before setting up the Bluetooth connection please set up the USB interface (see previous paragraph).

If you want to use the provided USB Bluetooth adapter please see the following paragraph. If there is already a Bluetooth interface on your system, please follow with the next paragraph but one.

Please regard that only one Bluetooth receiver can be connected to your PC.

5.2.3.1 Installation of the provided USB Bluetooth-adapter

Please regard that the provided USB Bluetooth adapter may not be connected to the USB interface of your PC before the driver installation asks you to do so!

Using the IML Software Center you have to select the option **Bluetooth driver for Delock USB Bluetooth Adapter** and then click on the button **Install** to install the Bluetooth driver for the USB Bluetooth adapter. Follow the instructions on the screen to finish the installation.

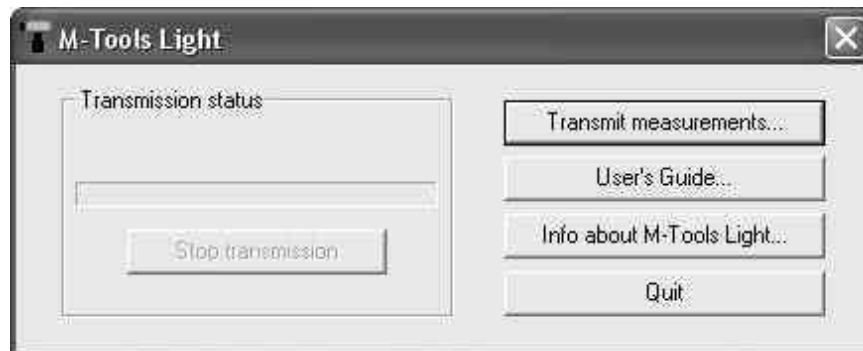
Please do not run any further functions of the Bluetooth driver. The electronic unit will establish the Bluetooth connection. See the chapter *System settings*, paragraph *Bluetooth* for further information.

5.2.3.2 Installation of an existing Bluetooth interface

The complete Bluetooth driver has to be installed on your PC if you want to use an existing Bluetooth connection. If you don't know for sure if the driver is installed on your system you have to install it according to the installation instructions of your system.

5.3 Functional Description

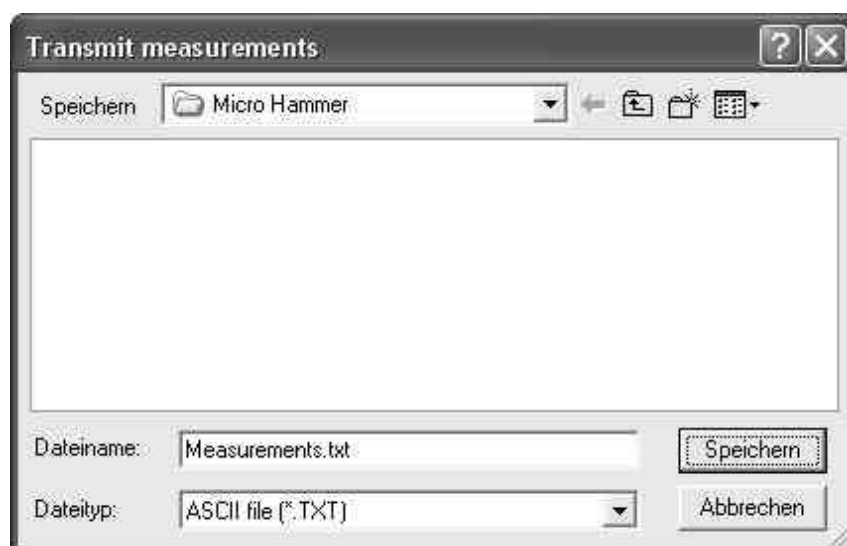
Upon start of the program, the following dialogue box will appear:



5.3.1 Transmit Measurements

This button serves for transmitting all of your data from the electronic unit to your PC.

Upon clicking the button **Transmit measurements**, a dialogue will appear, where you may select the target directory for transmission of the data:



The file name *Measurements.txt* is suggested. You may, however, change the name.

Upon selecting the desired directory, click the **Save** button. All data are now transmitted to the PC. You may abort the transmission by clicking on the **Stop transmission** button in the main dialogue.

After the data have been transmitted to the PC, the target directory will contain an ASCII file in the following format:

```
*****
*
*                               Micro Hammer Measurements
*
*   No. of  msmts. : 2
*   Period   : From 25.03.09 16:01:08 to 25.03.09 16:01:24
*
*****
```

Msmt. no.	Id number	Date	Time	Diameter	Value	Remark
1	ID TEST	25.03.09	16:01:08	020 cm	1256 m/sec	TEST
2	ID TEST	25.03.09	16:01:24	030 cm	1874 m/sec	TEST

5.3.2 User's Guide

Upon clicking on this button the User's guide will be shown.

5.3.3 Info about M-Tools Light

Upon clicking on this button you will be shown information on the software.

5.3.4 Close

Click on this button to exit the program.

Promat (HK) Ltd

901 New Trend Centre, 704 Prince Edward Road, San Po Kong, Kowloon, Hong Kong

寶時(香港)有限公司 香港九龍新蒲崗太子道東 704 號新時代商業中心 901 室

Tel.: (852) 2661 2392 Fax.: 2661 2086 e-mail: info@promat.hk Website: <http://www.promat.hk>



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