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PM32

Permeometer Graphing Program

**AUTOMATED DATA ACQUISITION AND RECORDING
FOR THE CREATECH MODEL 201T PERMEOMETER™**

VERSION 1.4

(Revised September 2, 2011)

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SECTION 1 SOFTWARE LICENSE AGREEMENT

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A copy of the SOFTWARE LICENSE AGREEMENT is on the sealed disk package.

SECTION 2 INTRODUCTION

Overview

The PM32 software provides a means of automatically capturing the data from the Createch Model 201T Permeometer™ and recording the data to a graph. The graph window can be printed to provide a permanent record.

This manual provides a quick overview of the program. Refer to the Help feature of the program for more detailed information.

Packing List

The following items should be in the shipping carton:

1. Manual with distribution CDROM
2. Serial cable (8-wire RJ45 for data)
3. 25-pin male connector (Instrument)
4. 9-pin female connector (Computer)

If any of these items are missing see User Support below for contact methods.

Equipment Requirements

The instrument must be equipped with the serial data output option. The 25-pin connector at the rear of the instrument identifies that the option is installed.

The PM32 software is designed to operate on any IBM PC or compatible clone equipped with a serial port and disk drive. The program is a 32-bit application and must be run with Windows 98/NT/2000/XP/VISTA.

Files Included On Disk

The files included on the disk are:

- README.TXT Text file that includes revisions and changes to the manual and program.
- INSTALL.EXE The installation program.

Getting Started

REVIEW THE README.TXT FILE ON THE DISTRIBUTION CDROM FOR ADDITIONS AND CORRECTIONS TO THIS MANUAL.

Quickly read the entire contents of this manual. Thorough understanding of all topics is not important, just become familiar with its layout and contents.

Perform the hardware and software installation described in Appendix A.

User Support

The program was developed to be user friendly by providing extensive error messages and help windows. Also the documentation addresses all questions that users have raised. However, if after reviewing the documentation, you are unable to resolve a problem please email a detailed description of the situation to trdavis@znet.com or dave@rehder-dev.com. Please provide the instrument and software serial numbers, and your email address or fax number for the response.

User Feedback

User feedback on the program and documentation will be greatly appreciated. Not only are documentation/program errors and omissions of interest, but also improvements and "wish list" items will assist in defining future releases of the program.

SECTION 3 OPERATING INSTRUCTIONS

Getting Started

Before running the program, perform the proper power up sequence and tests on the instrument and check to make sure the communications cable is properly connected.

Overview

The measurement process with the Createch instrument remains the same. Rather than hand recording information, the computer is used to automatically graph the Current and Temperature values, and to provide a means of entering the Range Switch setting. When the measurement process is complete, the Print button is pressed to print the graph window. The data recorded from the Permeometer can be written to a file with the Save button.

The computer automatically reads the Current and Temperature values. However, there is no electronic means of automatically "reading" the position of the RANGE switch. Therefore, the user must enter the Range Switch selection.

***** IMPORTANT *****

MAKE CERTAIN THAT THE RANGE SELECTION MATCHES THE RANGE SWITCH SETTING ON THE INSTRUMENT. THE RANGE SELECTION CAN NOT BE CHANGED WHILE GRAPHING. SEE RANGE SWITCH BELOW.

Range Switch

Select the same range as that of the Permeometer. If this is not set correctly then the graph data will be wrong.

Note: If the Range Switch on the Permeometer is typically changed during a measuring session then set the program's Range Switch entry to the final setting that will be used on the Permeometer at the completion of the session. This method will ensure that the final readings have the proper units for the Current values.

Start Graphing

Select the Range Switch setting to match the setting on the Permeometer.

Selecting the Start button starts graphing. When the button is "pushed" the display panels above the graph will display data as it is collected and the graph will plot the Current and Temperature values.

If the program detects an error, a message window will appear. If this occurs, follow the instructions. The program constantly checks the communications with the instrument; therefore error windows may pop up on the screen without typing any keys.

Stop Graphing

To stop graphing, select the Stop button. Note that graphing will automatically stop when the time limit on the graph axis has been reached. When graphing is stopped, the Save and Print buttons will be enabled.

Saving Data To A File

When graphing is stopped and there is data on the graph, the Save button is enabled. Select this button to open a dialog window to specify the path/name of the file. Refer to the on-line help on the format of the file. Depending on the setup configuration, a message will appear if the Start button is selected without first saving or printing the current graph.

Printing The Graph

When graphing is stopped and there is data on the graph, the Print button is enabled. Select this button to print the window. Depending on the setup configuration, a message will appear if the Start button is selected without first saving or printing the current graph.

Graph Zooming

More detail can be displayed on the graph by zooming. To enlarge an area of the graph, move the cursor above and to the left of the desired block. Then while holding the left button down, move to the lower right of the desired area; an outline box is displayed indicating the area selected. When the left button is released the graph will display the selected area.

To return to the normal view (full) do just the opposite – press the left button and move the cursor in a up and left direction (size of outline box is not critical). Release the mouse and the full view of the graph will be displayed.

The graph window can be scrolled (panned) by holding down the right button and moving the mouse to display the desired area.

Note that the graph can be printed (several times) with different magnification (zoom) and scroll positions to provide any level of detail desired.

Current History list

An option listing of the Current values can be displayed. This listing is selected with menu item View | Current History. The list displays the last 25 readings, but can be manually scrolled to view any reading. When a new value is read from the Permeometer, the list will automatically update forcing the list to view the most recent reading. For this reason when manually scrolling, the list will “jump” when the current value is updated.

Help button

The Help button will open the help file. The on-line help contains more detail than this manual.

Current And Temperature Values

The current and temperature values are read from the instrument. The values may not always be exactly the same as the instrument's display. However, they should match within a couple of digits, which is well within the instrument's stated accuracy.

Communications Status Bar

At the bottom of the window is the Communications Status bar. While graphing, the Communications Status will be Active. The No Errors message should be displayed for both the Current and Temperature channels. The selected communications port is displayed after the Port field. Should there be a problem with the communications between the computer and the instrument, error messages will be displayed in either (or both) the Current and Temperature status panes. See Appendix B, Error Messages and Windows, for an explanation.

Running PM32 Minimized

When the program is minimized, the graphing will continue. The Permeometer button in the task bar will display the elapsed time if graphing is active.

SECTION 4 SETUP

The PM32 program features can be configured using the File and Setup drop down menus.

File Menu Items

Save To File

Saves the graph data to a file. This is the same as clicking the Save button.

Print

Prints current graph window. This is the same as clicking the Print button.

Printer Setup...

This is under the File menu and it displays the standard Windows printer dialog. Use this to choose the printer and its attributes.

Setup Menu

This menu item displays a window that provides configuration information for the PM32 program. This data is stored so that the next time the PM32 is started, the previous setup is used. Each field of described below.

NOTE: New setup parameters are uses for all subsequent graphing sessions. The current graph is not altered.

COM Port box

Selection box	Selects the communications port, which must be the port connected to the Permeometer.
Test button	Activates communications with the Permeometer. The status of the communication is displayed at the bottom of the Window. This button may have to be selected several times to “synchronize” the communications. Refer to Appendix B, Error Messages and Windows, for any red (error) messages.

Sample Interval (secs)

This value sets the update rate for graphing. A setting of 1 second will provide the best resolution for graphing. However, if the computer is running other computationally intensive programs (not recommended) then the interval should be set longer, 2 – 5 seconds, to minimize timing errors.

Graphing Time (mins)

This sets the maximum time for graphing (x-axis scaling). The value can be set in 30-minute steps.

Alarm After (mins)

When set to 0 (zero) there is no alarm. When set to any other value the computer will emit an “exclamation” sound (selected in Control Panel, Sounds) after graphing for the selected number of minutes.

Temperature Axis

This value determines the midpoint of the Temperature axis of the graph. The value will be applied to subsequent graphing sessions.

Suppress Print Messages

When checked, this will suppress all print messages related to “losing” data. For example, if a graph is completed (stopped), and the Start button is selected, then the program will not check if the graph has been printed. This item should be checked only if the final value is recorded by hand and no printout is required.

APPENDIX A HARDWARE AND SOFTWARE INSTALLATION

Before proceeding, review the README.TXT file on the distribution CDROM. This file may contain additions and corrections to this manual.

Equipment Arrangement

The maximum cable length between the computer and the instrument is 25 feet. However, the placement of the computer (at least the keyboard and monitor) and the instrument should be optimized for operator convenience. Make sure cables will not interfere with normal activities. Also, keep the serial cable from all other cables and electronic equipment. It is suggested that the computer and the instrument be connected to the same grounded power outlet box.

Hardware Installation

The only hardware to install is the serial communications cable that connects the computer to the instrument. A unique cable is supplied which is similar to the type used with telephones. Also two connectors are provided. Locate the 25-pin male connector labeled 'INSTR' and attach it to one end of the cable, then plug it into the socket on the back of the instrument. Attach the 9-pin female connector "COMP" to other end of the cable; this connector plugs into the Serial Port on the computer. Use the screws on the connectors to securely fasten them to the computer and the instrument.

NOTE: A longer cable can be used with the connectors supplied. Make sure that the cable is specified with "RJ45 for data". RJ45 cables for telephone use will not work. If the proper cable can not be located, it can be ordered from the factory.

If a custom cable is needed, the connections are given below.

Computer			Instrument
25-pin (female)	9-pin (female)		25-pin (male)
2	3	TXD -----	RXD 3
3	2	RXD -----	TXD 2
4	7	RTS -----	CTS 5
5	8	CTS -----	RTS 4
6	6	DSR -----	DTR 20
7	5	GND -----	GND 7
20	4	DTR -----	DSR 6

Serial Port Selection

The serial port connected to the instrument can not be used for any other purpose. This may not be obvious since many internal cards may use the serial port(s) (modem, fax, mouse, etc.). The software will automatically detect all installed serial ports that are not already assigned to a program. However, only the serial port physically connected to the Permeometer will work. The best advice is to use a computer that does not have any internal cards (modems) which use serial ports.

PC Considerations

The PM32 program is a 32-bit Windows application that must be run on a compatible operating system – Windows 98, NT, 2000, XP or Vista. The PM32 program uses timers to read data from the Permeometer, therefore other applications that may “hog” the system should not be run concurrently. If the PM32 program is not permitted to execute promptly, then the graphing will not match an actual time line.

Software Installation

Place the CDROM in its drive. The program should automatically start. If it does not, use Windows Explorer and find the INSTALL.EXE file on the disk. Double click this file to start installation.

Follow the instructions on the screen. This program is not Digitally Signed so you may have to “Accept” or “Continue” for installation to start.

Initial Operation

When PM32 is first run, the communications port is verified. If it is not valid, then a window will pop up prompting for another selection. Select one of these, preferably the correct one!

Select the Setup menu item. On the Setup window there is a Test button that verifies communications with the instrument. Select the Test button, and note the messages in the Status Bar at the bottom of the main window (it may be necessary to drag the Setup window to a new position so that the Status Bar is visible). If communications is successful then the No Errors (green) message will be present for both the Current and Temperature channels. It may be necessary to select the Test button several times before the No Errors message appears. If any other message is present (red) then refer to Section 3, Setup, on customizing the PM32 application and Appendix B, Error Messages and Windows, to facilitate troubleshooting.

System Date And Time

A system date and time value is displayed in the Start Date and Time panel. This value is read from the Windows operating system. The format is determined by the Control Panel settings, however if a two-digit year is defined, it will be expanded to four digits. The day and months fields are fixed at two digits.

Uninstalling PM32

The PM32 program can be removed by clicking on the UNINSTALL.LNK file in the same directory as the PM32.EXE file. This will remove the program but not data (*.csv) files.

APPENDIX B ERROR MESSAGES AND WINDOWS

The PM32 program incorporates extensive error checking to maximize the accuracy of data. As part of these checks, error messages and popup windows are included to help identify the problem.

Status Bar Messages

The Status Bar at the bottom of the program window displays the current status of the communications with the Permeometer. The status is updated only when using the Test button in the Setup window and while the program is graphing. Pane of the Status Bar is described below.

Communications Status:	Displays Inactive unless graphing, then it displays Active.
Port:	Followed by the current communications port assignment
Current:	Followed by the Current channel status. See below.
Temperature:	Followed by the Temperature channel status. See below.

Channel status messages:

No Error (green)	Normal status.
Unknown (red)	Port and Permeometer have not been queried to determine status.
Cable Error (red)	The cable is not connected to the computer or Permeometer
No Response (red)	The Permeometer is turned off, or the serial port selected is connected to the Permeometer and/or computer.
Over range (red)	The channel value is beyond the range of the instrument
Data error (red)	The response from the instrument is not valid. If this is the first use, try a different port in the Setup Menu. Noise or loose connection in the serial cable.

Communications Error popup window

If a communications error occurs while graphing this window will appear. Read the text and chose either the Continue or Abort button. The Continue button will ignore the current and all subsequent communication errors and will graph what it can. This could be used to start graphing even though the first readings are over-range for the range selected. Keep in mind that continuing when an error has been detected may produce a totally erroneous graph. Abort will terminate the current graphing session.

Termination Error popup window

An attempt to exit the program while graphing will invoke a popup window. The graphing must be stopped before the program can be terminated.

Printer errors

The PM32 uses the selected Windows print driver, so refer to the printer or Windows manuals for these messages.

Print Warning

If a graph has been completed but not printed, and a new graph is started or the program terminated, then a popup window will appear confirming the action. This is the last chance to print the graph. This message can be turned off in the Setup Menu.

