DATATRACE®

OPERATOR'S MANUAL

Mesa Laboratories, Inc.
12100 West 6th Avenue
Lakewood, Colorado 80228
303-987-8000

www.mesalabs.com

124766-001 REV. E

TABLE OF CONTENTS

CHAPTER IV

CHAPTER V

INTRODUCTION

The United States Federal Communications Commission (in 47CFR15.838) has specified that the following notice be brought to the attention of users of this product.

FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE
STATEMENT

"This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to communications. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

'How to Identify and resolve Radio-TV Interference Problems.'

This booklet is available from the US Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4."

NOTICE OF COPYRIGHT

1985-2008 MESA LABORATORIES, INC.

NOTICE OF PATENT

The DataTrace TEMP® products herein described and/or aspects thereof as to subject matter of, has a patent protection under patent #4,718,776 issued by the U.S. Patent and Trademark Office.

NOTICE OF TRADEMARK

DataTrace TEMP, DataTrace are registered trademarks of MESA LABORATORIES, INC. DataTrace MICROPACK, MICROPACK, MICROPACK III, MPIII, DataTrace FLATPACK, FLATPACK, LOTEMP AND HITEMP are trademarks of MESA LABORATORIES, INC.

All other brand names and product names used in this manual are Trademarks, Registered Trademarks, Service Marks, or Trade Names of their respective holders.

DataTrace® SYSTEM
OPERATOR'S MANUAL

Mesa Laboratories, Inc. provides this manual as a customer aid in the use of the DataTrace® System. Mesa Labs may make improvements and/or changes in the product(s) and/or the program(s) described in this manual at any time and without notice.

While every reasonable effort is made to eliminate and/or correct errors, this publication could contain technical inaccuracies or typographical errors. As a result, changes are periodically made to the information contained in this manual; such changes will be incorporated in subsequent editions of this publication. In addition, these changes will be described in an enhancement file that may be included with the current version of the software.

Suggestions for changes from users are appreciated. Mesa Labs may use or distribute any of the information supplied by others in any way it believes appropriate without incurring any obligations whatsoever.

WARRANTIES

MESA LABORATORIES, INC. (MESA LABS) EXPRESSLY WARRANTS THE DataTrace® EQUIPMENT MANUFACTURED BY IT AS SET FORTH HEREIN. MESA LABS MAKES NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED. NO WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. IN ADDITION, THE FOLLOWING SHALL CONSTITUTE THE EXCLUSIVE REMEDIES OF BUYER FOR ANY BREACH BY MESA LABS OF ITS WARRANTIES HEREUNDER.

A. MATERIAL AND WORKMANSHIP: MESA LABS warrants that all equipment manufactured by MESA LABS shall be free from defects in material and workmanship, under normal use and service, for a period of twelve (12) months, except the Tracer batteries and the Humidity Sensors which are warranted for 90 days from date of shipment. If any part of the equipment is returned within this time and found by MESA LABS to be defective in workmanship or material, it will be replaced or repaired, free of charge and returned F.O.B. your plant. Any equipment or part thereof so replaced or repaired shall be warranted by MESA LABS for the remainder of the original warranty period. All replacements or repairs necessitated by inadequate preventative maintenance, or by normal wear and usage, or deterioration under unsuitable environmental conditions shall be at Buyer's expense. Buyer will pay normal DataTrace service charge for evaluation of returned equipment not found to be defective. MESA LABS shall not be obligated to pay any charges incurred by Buyer except as may be agreed upon in writing in advance by MESA LABS.

B. SYSTEM PERFORMANCE: MESA LABS warrants that the DataTrace® System will meet the specifications as defined in the literature and agrees to correct any equipment which Buyer can demonstrate does not meet the applicable specifications, provided written notice is given to MESA LABS within 12 months from date of shipment of the System. Software manufactured by MESA LABS is warranted per the respective software license. This warranty is void in the event of influencing deficiencies, including but not limited to, incomplete or inaccurate process data supplied to MESA LABS by Buyer, and unauthorized modification by Buyer.

C. CHARGES: All dismantling, reinstallation, and the time and expenses of MESA LABS personnel for site travel and diagnosis under this warranty clause shall be borne by Buyer.

LIMITATION OF REMEDY: MESA LABS SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE. THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF CONTRACT SHALL BE LIMITED TO REPAIR OR REPLACEMENT UNDER THE STANDARD WARRANTY CLAUSE. IN NO CASE SHALL MESA LABS' LIABILITY EXCEED THE PRICE TO BUYER OF THE SPECIFIC GOODS MANUFACTURED BY MESA LABS GIVING RISE TO THE CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL MESA LABS' LIABILITY EXTEND TO INCLUDE INCIDENTAL OR CONSEQUENTIAL DAMAGES.

HOW TO USE THIS MANUAL

New technology fascinates us, so one of the first things you'll do is open the carton and examine the DataTrace® equipment. Before you go further, please read "INSTALLATION AND SETUP," CHAPTER II in this manual. It will save you time and potential difficulty.

Next, read and do the short tutorial in "HOW TO OPERATE THE DataTrace SYSTEM," CHAPTER III. The time spent here will put you at ease with operating the DataTrace System including the graphics capabilities.

As time and/or interest permits, you may wish to review the "REFERENCE" section in CHAPTER IV. This chapter provides detailed information on each function, window, operation, and option of the program.

CHAPTER V describes how to maintain the primary DataTrace® components. The various APPENDIX sections provide explanations of error messages and other special features and functions.

We have tried to make the text clear without depending upon technical jargon. Where this was not possible, explanations appear in the Glossary and context sensitive Help screens can be implemented from any point in the program. Illustrations support the text, pointing out the location of features and making clear the components under discussion.

The DataTrace® for Windows program may include a PDF file containing DTW Enhancements. This file is provided to describe recent enhancements, modifications, and corrections to the software and/or this operator's manual from the last DataTrace® for Windows version. Please review and make note of any changes to the DataTrace® program and/or manual.

CHAPTER I

WHAT IS THE DataTrace® SYSTEM?

The DataTrace® System is comprised of two primary components. First are the miniaturized data recording devices, called MICROPACK III, FRB MICROPACK™, MICROPACK™ and FLATPACK™ Tracers, and, second, the PC Interface System for programming and reading the Tracers.

The innovative development are the Tracers--small sensors which can be programmed to begin recording process temperatures, humidity, or pressure on a particular date at a specified time, and continue recording up to 16,000 data points at specified intervals until given further instructions.

The DataTrace® PC Interface and the Tracers work together collecting data from your process and create permanent records of that process. The Tracer is designed to travel with products inside containers as these proceed through a processing environment. This vital information is obtained without depending upon external connections; the Tracers are completely self-contained sensors.

The Tracers take and store up to 16,000 data samples during any programmed cycle. By following the instructions displayed on your computer, you program the Tracer to capture the required information. Place the Tracer in your process. When the run is completed, remove the Tracer from the process. Clean it off, then reinsert it in the Interface Module and recover the collected data. Data can be reviewed in tabular or graphical form. The Tracer can then be reprogrammed for its next assignment.

Accurate knowledge of processing times and critical parameters gives you increased confidence that your products and processes satisfy your operational requirements and meet applicable regulatory requirements.

OPERATING ENVIRONMENT:

The DataTrace PC Interface System's operating environment limitations are the same as the PC to which it is attached. If you are interested, please refer to the specifications of your computer or the PC Interface specification for this information.

STORAGE REQUIREMENTS:

Store the DataTrace System in an area where the ambient temperature remains within the range of 10 to 50 degrees Celsius (50 to 122 degrees Fahrenheit); relative humidity should stay between 0 to 99 percent, non-condensing.

CHAPTER II

INSTALLATION AND SETUP

The DataTrace® system is designed to be easy to use in day-to-day operations. It is also designed to be very easy to install on your system using an automated installation program. It is even easy to remove from your computer should the need ever arise.

SYSTEM REQUIREMENTS:

Since you've acquired the DataTrace® System, what do you need in the way of hardware (physical equipment) to get your system up and running? This section will provide you with the answer to that question. Your computer's Guide to Operations and/or your computer supplier can explain the correct set up your system hardware if you have any questions.

The DataTrace® for Windows (DTW) program is designed for use under a Windows 32-bit or 64-bit Operating System, such as, Windows 2000, Windows XP, or Windows Vista.

The following is the minimum system requirements for operating the DTW program.

> Pentium 133MHz
> 32MB RAM
> 40MB of free hard disk space
> Windows 2000, XP, or Vista Operating System
> 1 Free USB Port
> 1 CD ROM drive
> 1 Mouse

As indicated, these are minimum requirements; we strongly recommend additional system capabilities, especially the processor and RAM. They will greatly enhance the performance and usability of your DataTrace® system along with other programs on your computer.

IMPORTANT NOTE:

Users should be aware that when Microsoft released Vista they changed how and where application programs like DataTrace were allowed to write to files. In earlier Windows versions, the application programs were located under the Program Files folder and writing to these files was permitted. With Vista, Microsoft no longer allows any writing to the Program Files folder. We are now required to write to another location, preferably in the Documents and Settings folder. As a result of these new requirements DataTrace now writes all data, reports, etc. to the following default location for Windows Vista:

C:\ProgramData

For Windows XP and Windows Server 2003 default location is:

C:\Documents and Settings\All Users\Application Data\DATATRACE\

The files are then stored into one of five directories: Archives, Backups, Data, Exports, or Reports. Older files from previous DTW versions (4.xx) will be saved and relocated into the new structure automatically.

INSTALLING THE DataTrace® for Windows PROGRAM:

DataTrace® for Windows includes an automatic installation program that will start the Installation when the CD is inserted into the CD-ROM drive. If you have installed other Windows programs you are familiar with this process. After the installation of the DTW program, leave the CD in the drive and connect the Interface to the USB port. This will start the installation of the USB drivers for your DataTrace system.

Starting the INSTALL program

1. Insert the DataTrace for Windows CD-ROM into your computer's CD-ROM drive. The installation program starts and the "DataTrace for Windows Installation" window is displayed with the following options: "Install DataTrace for Windows", "What's new in DTW", "DTW Password Procedure", "DataTrace Operator Manual (Acrobat PDF)", "Install Adobe Acrobat Reader", and "Exit".

2. Click "Install DataTrace for Windows".

3. The installation program will start and a "Preparing to install..." status box will be displayed. After a slight delay, the "Welcome to the DataTrace for Windows Installation Wizard." screen is displayed. Click Next.

4. The "Security Information" screen appears discussing security systems for DTW. **Read this procedure if you are considering using any Password Protection or Enhanced Security!** Click Next.

5. The "Security Selection" screen appears with three options: "None", "Simple", and "Complete". The program requests you define the level of security that you wish the program to operate under. Select "None" unless you are required to define a higher level of security, then click Next.

6. Choose the "Destination Folder." from the next screen. The default is C:\Program Files\DataTrace. Normally accept this default. Click Next.

7. The "Ready to Install DataTrace for Windows." screen is displayed. At this point, the Installation program has completed all of its initial procedures. It is now ready to automatically complete the installation. When you press Next, the "Updating System." screen is displayed with bars reflecting the progress of the installation.

8. The final installation screen, "DataTrace for Windows has been successfully installed." appears after the installation is complete. Press Finish to return to the original DTW Install screen.

9. Clear an area next to your computer as a work area. You will need access to the USB port on your computer.

10. Lay the PC Interface System components next to your computer for easy reference. These components include: the Interface Module and the USB Interface Cable.

11. Connect one end of the Interface Cable to the plug on the rear of the Interface Module. Then connect the Interface Cable to the USB port of your computer.

12. When the connection is made a yellow "balloon" will appear on the lower right side of your screen indicating new hardware has been found. Click this balloon to start the installation wizard for the USB Interface. Be aware that there are two installation procedures that will occur, so don't be concerned if the wizard seems to start a second time. This is normal.

Congratulations. Now that your DataTrace® hardware is connected to your computer and you have installed the DataTrace® for Windows program, you are ready to work with your system. As easy as the DataTrace® system setup was, using your new DataTrace® system is even easier.

Double click the DataTrace® for Windows icon, which will start your DTW program.

If this is an upgrade installation from a previous DTW version, the existing data, reports, configuration and logs have already been located correctly in the new file structure. If this is a new installation after you start the DTW program you will be asked if you want to create the new data directory in the default location (C:\Documents and Settings\All Users\Application Data\DATATRACE\) or you can select another location. We recommend that you use the default location unless you are using a network.

NETWORK INSTALLATION

For any new Network installation, create a folder on the server in the appropriate location named whatever is appropriate. This location must be read/write capable and all users of the server must have permissions for this drive location.

Next, perform the standard workstation installation, as indicated above. When you start the DTW program on the workstation for the first time the program asks for the path to store the data, backups, archives, etc. Point the program to the designated folder. DTW will remember the location for all future data storage needs.

For existing network DTW installations the recommended procedure is:

- Backup the data currently on the server.
- Uninstall DTW from the server.
- Install DTW on the workstation.
- Create a network data directory.
- Run DTW for the first time and, when asked, point to the network path.
- Restore the data from the previous network installation.

UNINSTALLING THE DataTrace® for Windows PROGRAM:

Starting the Uninstall program is very simple and utilizes the standard Windows Uninstall routine.

Click the Windows Start button then select Control Panel. One of the listings is Add or Remove Programs. Double click on this option, select the DataTrace for Windows program and click on Remove. DTW will be removed from your computer.

Note that during the Uninstall procedure your data files are left intact in the created directories under either C:\ProgramData for Vista or for the other supported Windows versions C:\Documents and Settings\All Users\Application Data\DATATRACE\.

CHAPTER III

HOW TO OPERATE THE DataTrace® SYSTEM

INTRODUCTION TO THE DataTrace® SYSTEM:

The DataTrace® system allows you to collect process data with minimal disruption because your Tracers can be placed directly into the target application. The DataTrace® for Windows (DTW) software provides the interface for your computer to program and read Tracers. Then the program can be used to analyze and manage the collected data. The DataTrace® system provides this vital information without depending upon external connections; the Tracers are completely self-contained sensors.

Accurate knowledge of processing times and process parameters gives you increased confidence that your products and processes satisfy your operational requirements and meet any applicable regulatory requirements.

Your computer is the input device to program and retrieve data from your process via the DataTrace System. The DataTrace® System, software and hardware, provides the means for you to directly interface with your production process. Most entries are made by clicking on a tab, command button, check box, or option button. The only keyboard entry that is necessary is in a few text boxes.

Should you ever need help as you work through the DataTrace® for Windows program, it is as near as pressing <F1>. The DataTrace® for Windows Help program is context sensitive and utilizes Hypertext functionality. Any green, underlined words or phrases on a Help screen can be used to "jump" directly to the Help screen on that subject or procedure. Just place the cursor over the target object and the cursor arrow turns into a selection hand. Press and release the left mouse button. You are transported to the Help screen for that subject.

This brief tutorial moves directly through the process of starting the DataTrace® System on your computer, programming and retrieving data from a Tracer and onto creating, displaying and manipulating data reports and graphs.

Please enter the requested information just as it appears in the tutorial. Your display will agree, then, with the examples shown, except for the date and time and your company's name on printed reports.

For this tutorial, we will assume that you have already configured your DataTrace System, have selected "None" for your security option, and correctly attached the system to your computer as discussed in CHAPTER II, INSTALLATION AND SETUP. If you have not completed the INSTALLATION AND SETUP, do it now.

We also have assumed that all factory defaults were left in force. Any settings that need to be changed for the tutorial will be modified as necessary.

Just as a final reminder before you start the tutorial; you can obtain help from any point in the program by simply pressing <F1>.

DataTrace® for Windows TUTORIAL

Start the program by double-clicking the DataTrace® for Windows icon displayed on your Desktop. The program loads and presents you with the DataTrace Control Panel.

The DataTrace Control Panel is the first screen that appears when DataTrace® for Windows starts. From this screen all of the most frequently used functions are less than 5 "clicks" away. In fact many are only one or two "clicks" away.

You will note that there are four "Tabs" across the top of the Control Panel. Think of these tabs like tabs on file folders. Everything you can do in DataTrace® for Windows is done from one of these three tabs.

> The **MAIN** Tab provides access to where most of the action is: Programming and Reading Tracers and Analyzing collected data. The MAIN Tab is active when the DataTrace® for Windows program starts.
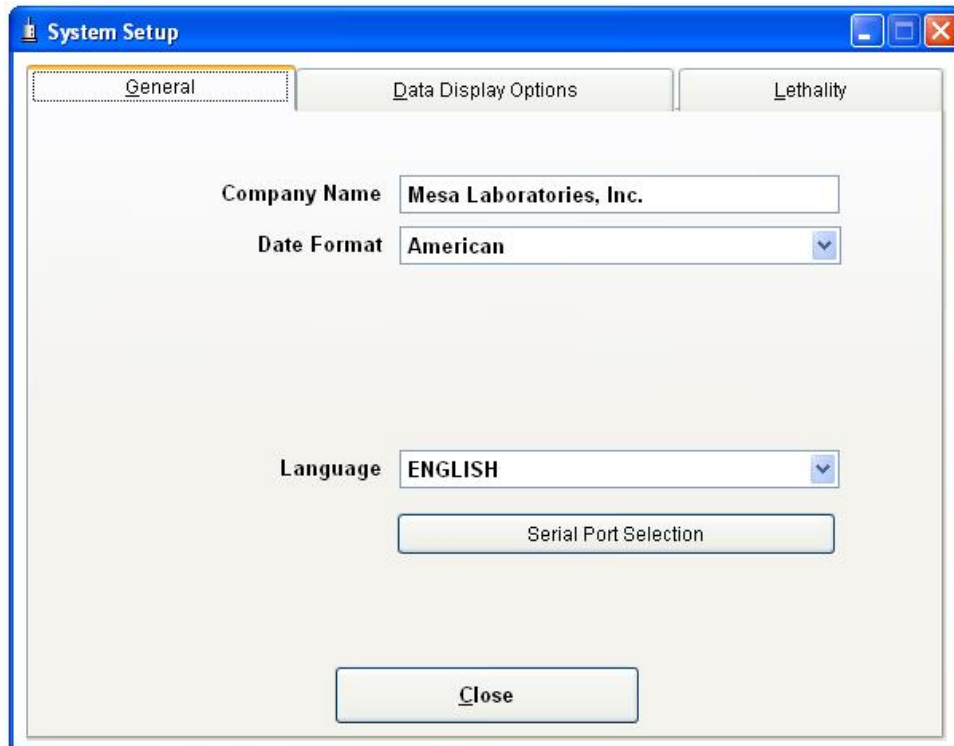
UTILITIES tab provides access to infrequently used file handling and "housekeeping" functions. These include Exporting files into spreadsheets, databases, etc., Archiving or Deleting old or no longer needed profiles, and Reindexing the program's databases, as necessary. These functions may only be accessed periodically.

REPORTS Tab accesses the graphing module and special reports.

The **SETUP** Tab accesses default settings and configuration functions, as well as some special calculations, for the DataTrace® for Windows program. Once established, you may never need to visit this section again.

For this tutorial, we will not use the UTILITIES Tab option. For descriptions of using these functions, review CHAPTER IV, REFERENCE.

Several options under the SETUP Tab will be modified for this tutorial. Click on the SETUP Tab. When the SYSTEM SETUP screen appears, the General tab will be active.

The cursor is now located in the "Company Name" text box. Change the text displayed to your company's name. You have 35 characters to work with. Verify the other options are as displayed above. If they are different, modify them so they match.

Click on the Serial Port Selection button. The Select COM Ports screen appears with one or more COM ports identified. DTW determines which serial ports Windows believes are active on your computer. Select the one that your DataTrace equipment is attached to.

At this point we will not make any changes to the display settings found under the Data Display Options Tab or to the lethality values found under the Lethality Tab. Click on the Close button. This takes you back to the DataTrace Control Panel and also saves the settings you just made. Click on the MAIN Tab.

PROGRAMMING THE TRACER

Click on the Program Tracer button from the MAIN Tab. The Program Tracer screen will appear displaying all of the settings necessary to program a Tracer or group of Tracers.

Program Tracer		
Current System Time	09/27/2006 03:24:53	Sample Interval
		0 Hours
Last Unit Programmed		0 Minutes
# Units Programmed	0	20 Seconds
Battery Remaining		
Run ID	DT100	Auto-Number
Start Time	09/27/2006 03:26:00	
User Comments		
Batch Mode Programming	☐	
⦿ Tracer Program Mode	◯ Calibrate Mode	

Tracer Type	Duration	Last Reading
1000 Reading	0:05:33:20	09/27/2006 08:59:20
2000 Reading	0:11:06:40	09/27/2006 14:32:40
4000 Reading	0:22:13:20	09/28/2006 01:39:20
8000 Reading	1:20:26:40	09/28/2006 23:52:40
16000 Reading	3:16:53:20	09/30/2006 20:19:20

Program   Test Tracer   Close

The Current System Time is displayed on the top of the page. Verify that the system time is correct. If the time is not correct, set it by double clicking on the clock displayed on the Window's Task Bar. Changing the System Time displayed on the Program Tracer window will not change your computer's system time. The System Time can be changed by using the Windows utility to match the process clock for the target application. We will not change anything now.

Insert a Tracer into the PC Interface Module.

You are now ready to edit the program that will be loaded into your Tracer(s).

19

RUN ID:

The first text box assigns the identification code known as a "Run ID". The code can identify a specific batch, run, or shipment of your product. The default entry is based on the Auto-Number Options which are established by pressing the "..." button to the right of the Run ID box. If we were to program multiple Tracers we would use this setting to sequentially number each Tracer. However, in this case we will program only one Tracer, so we will give it a unique Run ID.

Click on the left side of the Run ID text box. Type "TEST24" for this example. The "DT" remains from the previous entry. Press the Delete key twice to remove them.

NOTE:

Spaces can be part of a RUN ID. If you tap the space bar twice after entering "TEST24" to eliminate the "DT", the System will read the identification as TEST24(space)(space). Check that the Cursor comes immediately after the "4" in TEST24. If you have inadvertently added spaces, use the delete or backspace key to eliminate them.

Now press the Tab button twice. The cursor will move to the "Start Time" text box.

START TIME:

You can change either the date or time by typing over the current entry.

The "Start Time" is approximately 10 minutes ahead of the Current System Time. However, it will probably be something less at this point. Let's change it to a Start Time that is 2 or 3 minutes from now. Press Enter to accept the date and time shown.

SAMPLE INTERVAL:

The next options specify the time interval between samples.

The twenty second interval is the factory default. Let's use the twenty second interval for this tutorial.

We'll ignore the Batch Mode Programming and the User Comments options during this tutorial, but you can find out more about them in CHAPTER IV, REFERENCE.

Notice the table towards the bottom of the Program Tracer screen. This table displays the maximum duration that the Tracer can collect data based on the Sample Interval you selected and the memory capacity of your Tracer. This is displayed in the second column. The third column shows the time that the last data point will be collected based on the current program.

You are now ready to transfer the program you just created from your computer to the Tracer. The Program Tracer window should look like this (except for the dates, times, battery life information, and Tracer serial number):

Press the Program button. After a slight pause, a status window appears on the screen stating that the Tracer has been programmed. Press OK to remove the status window. If you are using MPIII Tracers, the Serial Number of the programmed Tracer will appear as the "Last Unit Programmed" and the Battery Remaining will be displayed.

If time has gotten away from you, and the 2 or 3 minute lead time in the example has expired, you will notice that the Program button has "dimmed" and you can not program the Tracer. Change the Start Time to a minute or so into the future and press the Program button. The Tracer is now programmed.

Remove the Tracer from the Interface Module.

If you had wished to program another Tracer with the same program, you would put the second Tracer in the Interface Module and press the Program button again. It's that easy.

You can program a group of Tracers with the instructions contained in the original program. However, in that case, you might want to retain the Auto-Numbering default option for your Run ID to sequentially number each Tracer. To find out more about this function look in CHAPTER IV, REFERENCE.

Click on the Close button to return to the MAIN Tab.

Allow the Tracer to sit until it has passed the start time you programmed by at least two minutes. To make the profile more interesting, dunk the Tracer into some warm water. (Only do this if the Tracer is not a Humidity or mA Tracer.)

READING TRACER DATA

As simple as programming a Tracer is, reading a Tracer is even easier.

Reinsert the Tracer in the PC Interface Module. Then, click the Read Tracer button to activate the data retrieval process.

VIEWING A DATA REPORT

After the data transfer is complete the Profile Analysis screen appears with three display options available. You can move between each of these views by clicking on the appropriate tab. The factory default screen is the Summary Data Tab which displays the Tracer header information and summary data for the Tracer just read. Note, that the screen that is active when you close Profile Analysis will be the screen that will appear initially the next time Profile Analysis is opened.

The second screen available displays the detail data report for the profile you just collected. If this were a multiple parameter Tracer such as a Humidity Tracer, both parameters would be listed in separate columns. Furthermore, any calculated values like lethality or dewpoint would also be displayed in additional columns in this data listing.
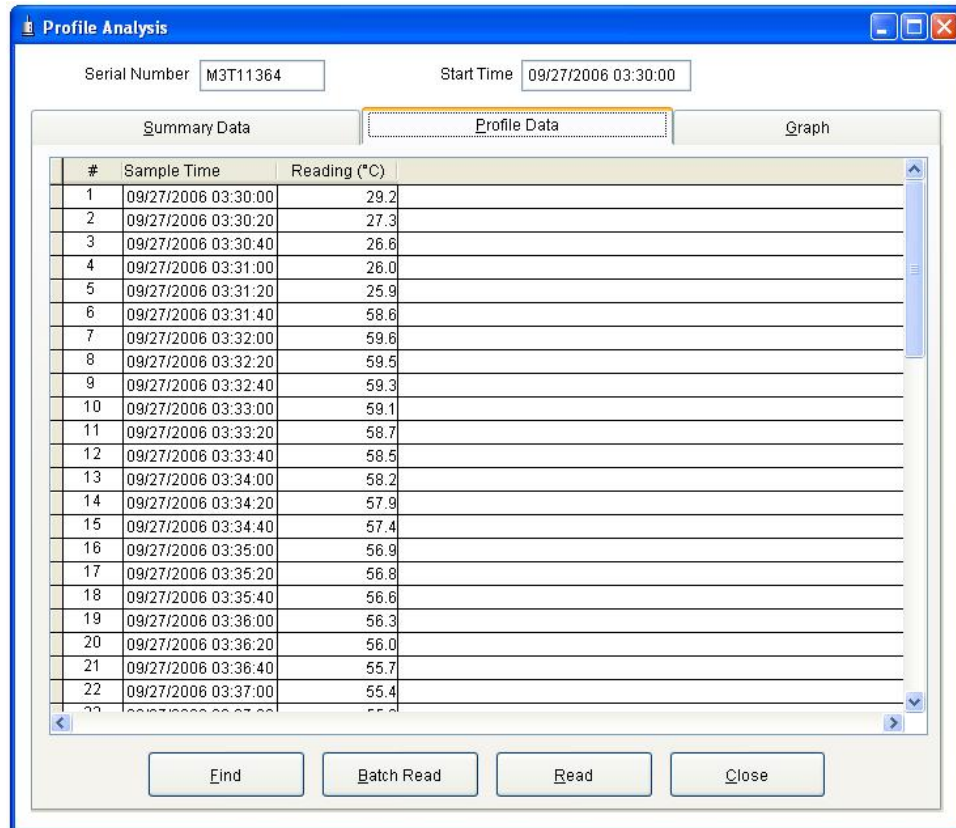
The final tab, Graph, displays a graph of the data just collected. The graphical screen is the most popular quick review of data during the read process because you can more easily identify if the profile "looks" right or not with a graph than reviewing a data list.
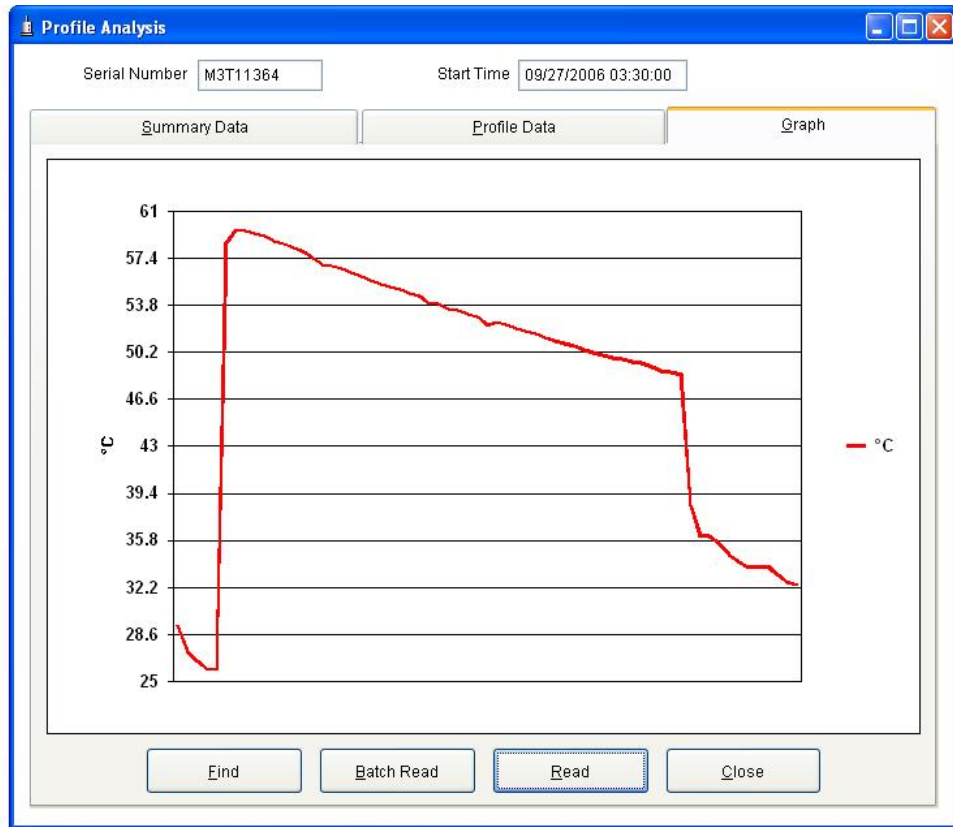
Note that this profile is already saved to your hard drive. All profiles are saved automatically when you read a Tracer. This ensures that data security and integrity is maintained. In addition, each profile is saved with a security code that will alert you if the file is different than when it was originally collected. This "Data Validation" status appears under the Summary Data Tab whenever the profile is retrieved or printed.

Click on the Close button to return to the MAIN Tab window.

PRINTING TRACER DATA

Click on the REPORTS Tab, and then click on the Graph and Data Reports button. The Data Set window appears which is where you select the appropriate profile for printing.
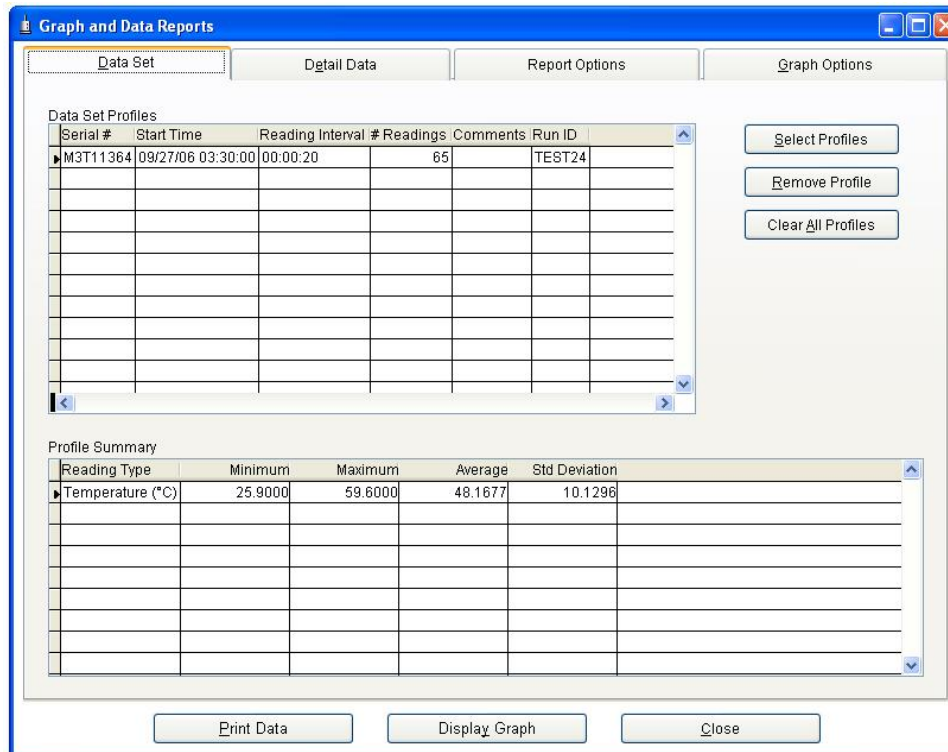
Click Select Profiles and highlight the profile that we just collected from the list. Click OK. If you were to select multiple reports from this listing, they would automatically be generated sequentially.

Click Print Data and the Print Options screen appears. This screen requests you to make a choice between two print options: to do a printout or to preview the printout. Select Print and click OK. You can also choose to print only a summary report without the detail data by checking the Summary Report check box. Click OK.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports. Close the Adobe Reader screen.

The Groupings Tab is used to enter "Lab Notebook" information for a study and to define various phases or profile segments during a study. In this case we will not make any entries under this tab.

As you can see, the printout you received from your printer includes all of the Tracer data displayed on the screen along with the complete data set, plus some additional information. At the top of the first page is your company's name, just as you entered it in the first Setup screen. The profile print lists the Tracer header information just below your company's name. The data detail is listed sequentially in two columns for as many pages as necessary. The footer of each page includes the date printed, a space for the preparer's name, and page information. On the last page of the data report, summary information for this profile is printed.

The context is returned to the Data Set Tab following the printing operation.

GRAPHING TRACER DATA

As you may have noticed, there are two places in the DataTrace® program where Tracer data is graphed. The first is immediately after the Tracer has been read, under Profile Analysis. The second is by selecting the Graph and Data Reports button under the REPORTS Tab.

While they are both graphing functions, there are major differences. The Graph option under Profile Analysis does not allow you to graph multiple Tracer profiles or allow printing of the data; it only displays the profile of the most recently read Tracer. Also, there are no editing capabilities available for the Profile Analysis|Graph. Keep in mind, that this option was not intended to provide you with presentation graphics, just a quick graphical review of the collected data. The Graph and Data Reports module under the REPORTS Tab allows multiple profiles to be plotted and the graph format and design can be customized as required, including presentation quality graphs.
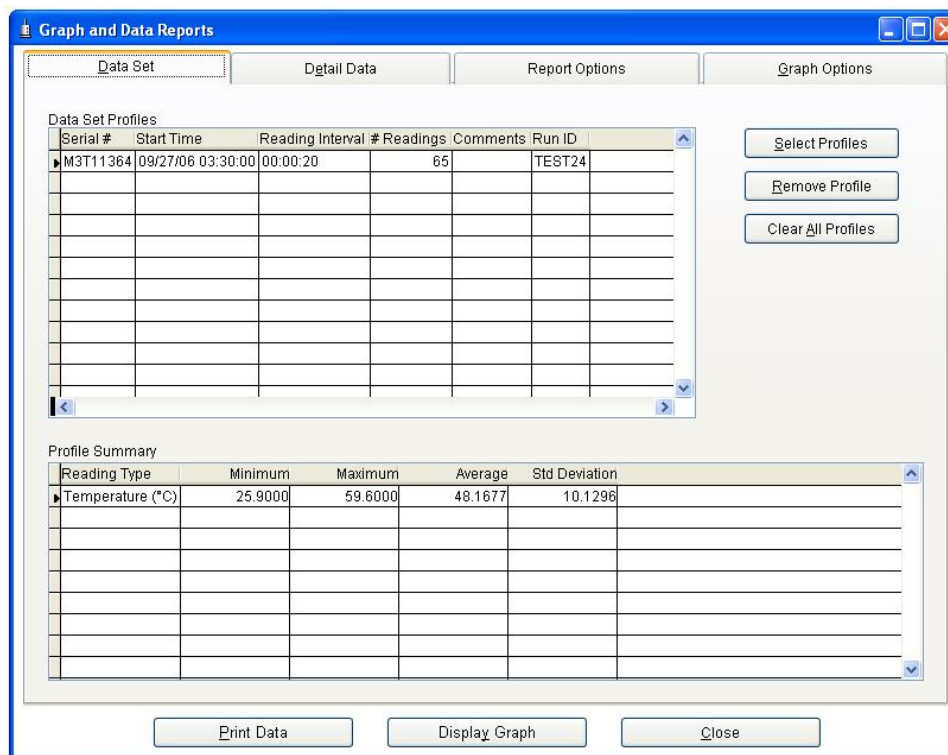
Now that we have selected your profile, you can click on the Display Graph button and a graph will appear using the default graph template. While your data is accurately presented on this graph, it would be much more interesting to modify and customize the template by using some of the other graphing features under the Graph Options Tab. Click the Close button to return to the Data Set screen.

After clicking on the Graph Options Tab a new set of tabs appear with the Template Tab active.
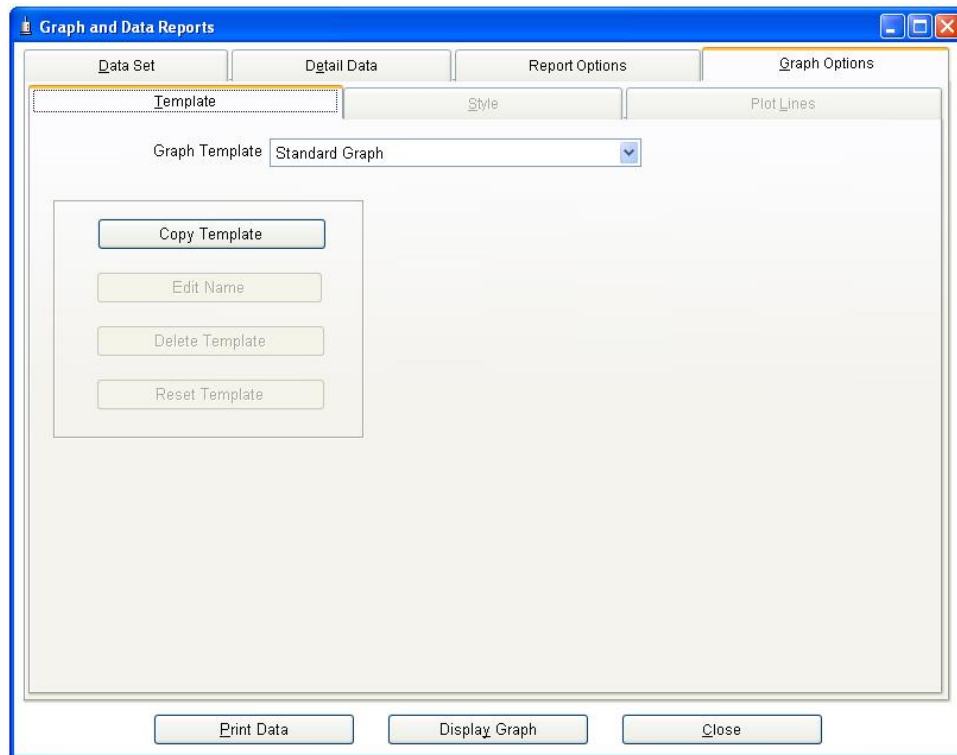
Near the top of the Template Tab you will notice a drop down text box labeled "Graph Template". If you click on the arrow you'll notice that only the "Standard Graph" template is available. This is the default template as the program comes from the factory, and is the basis for all future templates that you create. As you create new templates they will appear in this listing.

You can not modify the default template, the editing options are disabled. To make modifications you must copy a template which will enable the editing capabilities.

So let's start by making a copy of the standard template. Click on the Copy Template button. Notice that you now have "Copy Template Standard Graph" displayed in the name text box.

That's kind of a goofy name, so let's change it. Click on the Edit Name button. The cursor is now on the left side of the text box. Click and drag over the current name to highlight it, then type "DataTrace TEST". Press ENTER.

Now we have a new template on which to create our graph.

You can maintain as many graph templates as you wish. You can use a new template once then delete it or, if you like it, save it so it can be used in the future.

Click on the Style Tab. You are now presented with a list of graph styles or types to select.
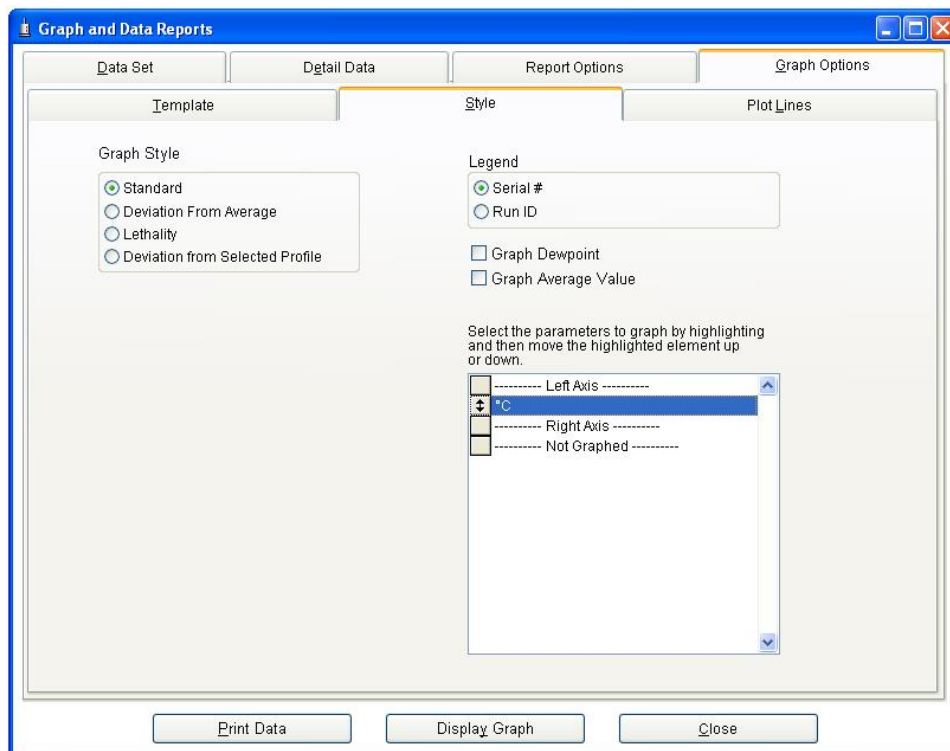
There are several options on this page that we can modify to define the template's basic format. The "Standard" option is selected and we'll stay with it. We selected a single profile but if you selected multiple profiles you can even have an average profile calculated and displayed.

Next, make your selection of a legend. You can display either the Serial Number or the Run ID. The default is Serial Number; let's change it to Run ID.

Notice on the lower right side of the Style screen an option that allows various parameters to be displayed on either the left or right Y Axis. In this case since only temperature is active it is the default left Y Axis. If multiple parameter Tracers and/or calculated values like lethality were active, they would appear on this listing and could be selected for display.

Now click on the Plot Lines Tab. The "Line Style Format" options allow selection of the Line Color or Line Style to be used as the primary default in your graphs. You can also match line colors for multi-parameter Tracers with the "Match Colors To Tracers" option. The Iterate Colors Then Line Styles option is the default setting. This means the lines will cycle through the color options before moving to the line style options. In this case, with only one profile to graph, it makes no difference which choice is selected, so we'll leave it on the default setting. The options displayed here allow you to define how your graph's axis will be displayed. Let's set the X Axis Format as "Elapsed Time" by clicking on that option. For this tutorial we will ignore the Set Lines function.
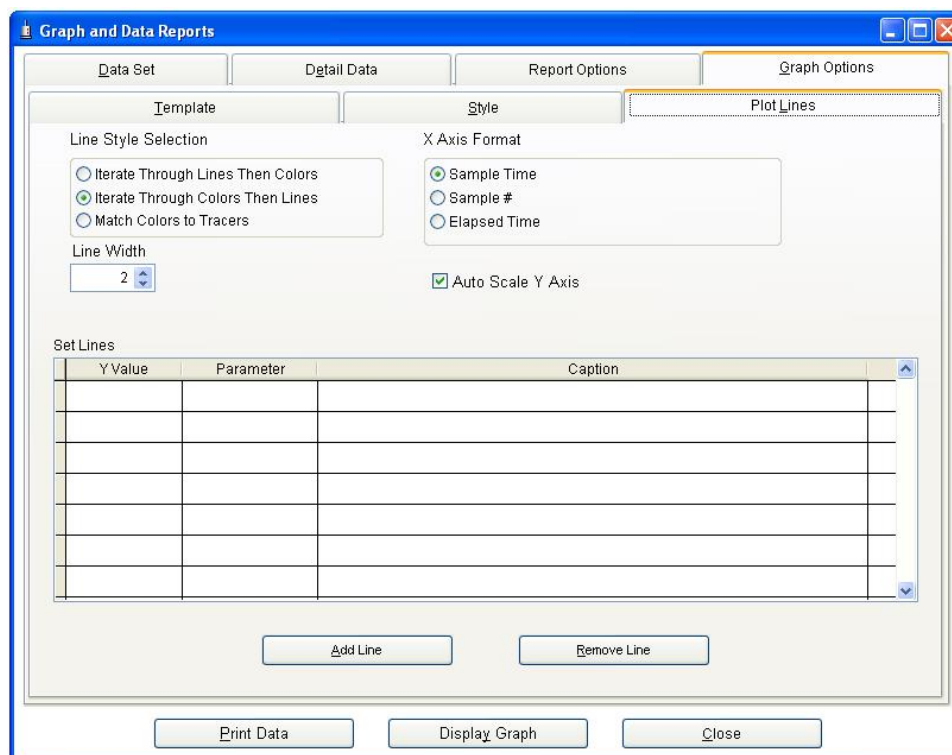
Click on the Display Graph button. After a slight delay, you have a graph displayed using the data you collected earlier and the format you just finished defining. (Hopefully, you placed the Tracer in a cup of warm water to collect the data; otherwise it's a pretty boring graph.)
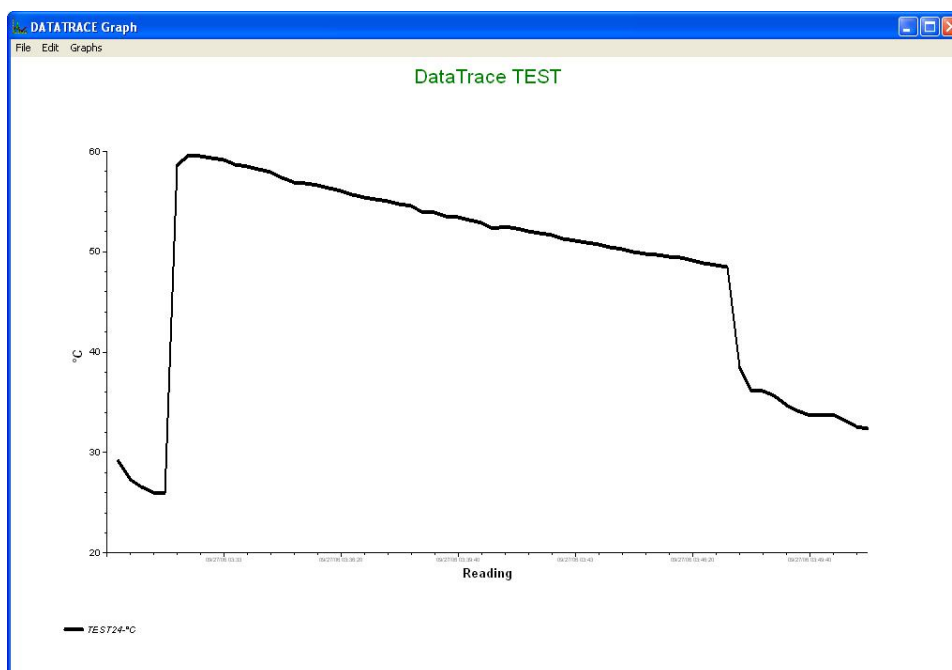
OK, so far you have the basic format of your graph. Note that at no time did we save the template, the program saved the graph as you created it. And, now for the good news, you've done the hard part. Now for some fun! (Well, some people think its fun.)

29

We'll do some editing and "fine tuning" now. Each graph element is easily changeable. Just right click on whichever element you wish to implement edit mode (except the Axes which are accessible under the Edit menu). It will flash to confirm that it is in edit mode and an edit menu will appear. You can modify anything that is displayed in these windows and when you close the edit window, the changes appear immediately on your displayed graph. Any changes you make will be saved with the template (with some limitations) for future use when you exit the Graph module.

We'll only make a couple of changes here so you get an idea of the possibilities. Let's add a graph title and change the titles on both axes.

First, right click on the current graph title (DataTrace TEST) to enter the edit mode, it flashes its confirmation, and the Text Parameters window appears. The text box with the current title is selected, so just type in the new title. Enter "DataTrace TEST PROFILE". Next, change the color of the text to red, click the Bold check box. Click OK.

The window disappears and your changes are displayed. It's that simple.

Right click on one of the axis labels to change it. The same window we saw when we edited the title appears again, in fact, that same window appears anytime text is edited in the graphics module. Title the horizontal axis "Elapsed Time" and the vertical axis "Degrees C". Make whatever other changes (i.e., color, style, etc.) you wish and click OK.

Obviously there are other graph elements that you could edit such as Graph Background colors, Graph Borders and Colors, etc. But, before we get too far out of control, let's pause here to see and admire what you've created. It should look like the graph below.
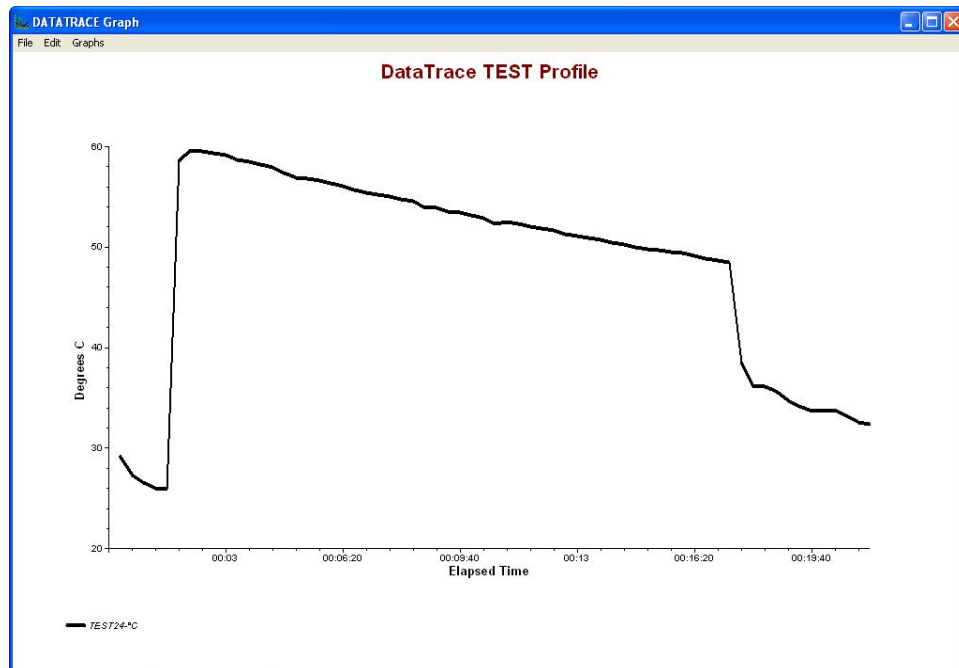
Notice on the graph screen a conventional menu bar appears with several drop-down menus for operational selections. Because of all of the on-screen editing options and graphical capabilities, we used the more traditional drop-down menu display in the graph module for the operational functions like printing.

DTW has a Zoom function that allows you to focus on a segment of your graph in more detail. In order to Zoom, you click and drag your cursor over the segment of interest. As you drag, a dotted line box appears highlighting your selection. When you release the mouse button, a new window appears below the original graph displaying the selected graph segment. Notice also that the selection box still appears on the original graph to provide you with a point of reference for the Zoom.
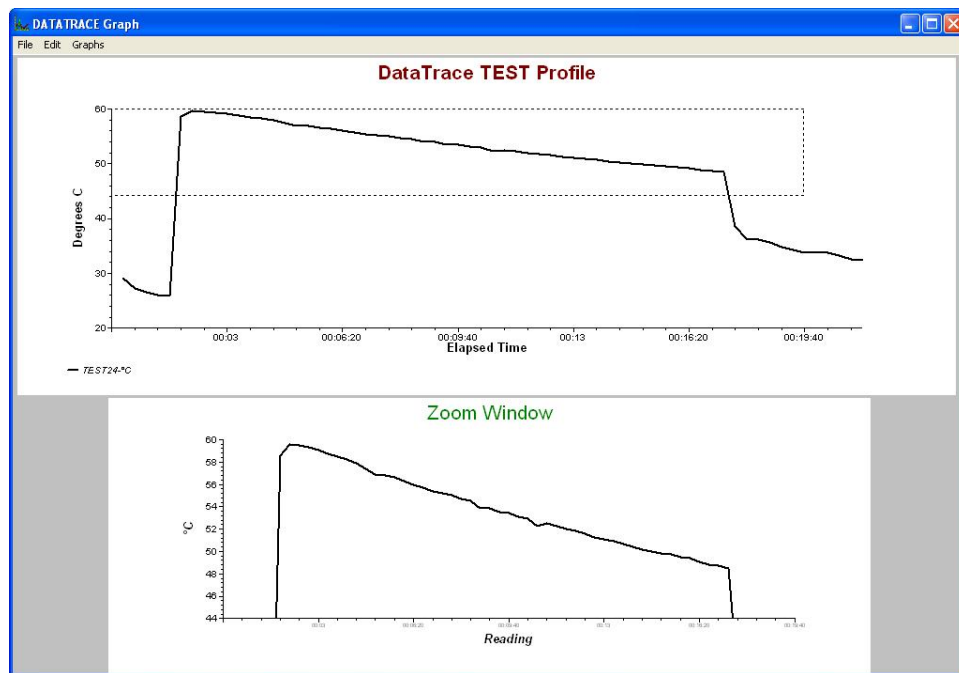
You can Zoom repeatedly on either of these windows to obtain smaller graph segments. The most recent "zoom" is displayed in the Zoom window and the original graph always remains at the top of the screen.

To remove the Zoom window select Graphs|Show Zoom from the menu bar. This removes the check mark and the Zoom window disappears.

Let's do one more thing; print the graph. Cursor up to the menu bar and click on File|Print. Again, the printout is converted to a PDF. Click the print icon on the Adobe Reader screen and the OK on the printer screen. You should now be gazing at your masterpiece. One thing to keep in mind about the colors displayed on your screen; if you do not have a color printer, they will appear in shades of gray on your printout. Your ability to differentiate shades of gray may be limited by the print quality and printer resolution.

Note at the bottom of the printed graph you have summary data for the profile displayed. The same summary information will appear for each profile displayed on your graph.

Close the Adobe Reader screen, and then select the File|Exit menu option to exit the graph module. Then click on the Close button to return to the MAIN Tab on the Control Panel. Don't worry; your Template was saved automatically with all of its settings. Now click on the red-lettered Exit Program button. The DataTrace® for Windows program shuts itself down and you are back to where you started.

(END OF TUTORIAL)

As you can see, there are many options and capabilities available to you in the DataTrace® for Windows program that we did not discuss. This Tutorial was meant to show you how easy the most frequently used functions are to work with.

Now you can wander around the program without fear, safe in the knowledge that the program is easy to use, there is context-sensitive Help available by pressing <F1>, and you have a good manual with a large Reference section sitting on your shelf. And, oh yeah, Customer Service is always there to help you.

CHAPTER IV

REFERENCE

This section describes in detail those forms and functions discussed in the tutorial and explore capabilities not previously explained.

The DataTrace® for Windows Menu structure is largely based on a "Form" or "Tab" format. The Tab format does not present the user with pull-down menus from which they select a function. Rather it provides tabs like a file drawer with each tab providing access to one or more functions, avoiding the potential for distraction and confusion. This design simplifies use of the program by novices and experts alike.

The forms utilized by DataTrace® for Windows are specialized Dialog Boxes. On the forms, four types of input are possible:

1. Check boxes - Turns on or off an option. It displays a check mark when implemented.

2. Option buttons - Selects only one of several options. When activated, the selected option looks like a target.

3. Text boxes - A text string or program instruction.

4. Command buttons - Click on these buttons to initiate a function or implement the options selected.

Forms are used throughout the program to enter user input. The only exception is within the Graphing module where a limited number of drop down menus are used to accommodate the unique options available.

All forms can be sized as necessary for your computer monitor. However, we recommend that the screen resolution of your monitor (found in the Display Properties|Settings) be no less than 1024 by 768. This will ensure that all of the screens are completely viewable. To size a form, place the cursor on the border of the form. When the cursor becomes a two-headed arrow, click and drags the border until the desired size is attained. The form will retain this configuration until it is subsequently modified.

DataTrace® for Windows
Control Panel

The DataTrace Control Panel is the first screen that appears in the DataTrace® for Windows program. The tabs along the top of the window display the four functional modules of the program.

> **MAIN** Tab provides access to the most frequently used functions in the program and is active when DataTrace® program is started. Its primary functions are Tracer Programming, Tracer Reading or data retrieval, and Analysis of the collected data through tabular display, calculations, and/or graphical presentation.

> **UTILITIES** Tab accesses infrequently used file handling and "housekeeping" functions. Included in these utilities are functions to Export Tracer profiles for applications such as spreadsheets and databases. Other capabilities include the Archiving and Restoring of old profiles, and the Deleting of profiles that are no longer needed.

> **REPORTS** Tab provides access to several useful reports, including tabular and graphical. These selected reports include the ability to print a complete list of stored profiles, print any Program Setup, and access the Audit Trail report.

> **SETUP** Tab provides access to default settings and configuration functions. Once established these may never need to be accessed again.

To access these functions, click on the tab in which you are interested, and you are immediately taken to that screen.

You can exit the DataTrace® for Windows program by clicking on the Exit Program button.

DataTrace® for Windows
MAIN Tab

The MAIN tab is the first screen that appears in the DataTrace® for Windows program. From this screen you can access the two most frequently used functions of DTW: Program Tracer and Read Tracer.

Preliminary analysis of previously collected data is also available through the Profile Analysis button. Review of collected data in summary, through a tabular presentation, or graphically can be performed with this function.

Program Tracer. The Program Tracer button transports the user to the window that creates the Tracer program, tests Tracer functionality, and loads the program into the Tracer. Humidity and MPIII Temperature Tracers can also be calibrated through this function.

Read Tracer. Pressing the Read Tracer button allows you to retrieve collected data from a Tracer following a process run. This can be done one-at-a-time using the Read button or multiple Tracers can be read sequentially using the Batch Read button.

To Read a Tracer, insert a Tracer in the PC Interface that is correctly attached to your computer. Click on the Read Tracer button. The Tracer is then interrogated by the program and the data is automatically stored in your database. A message that the Tracer was successfully read is then displayed.

After the data is stored, it can be reviewed by the Profile Analysis function or retrieved and manipulated through the Reports Tab.

Profile Analysis. The Profile Analysis button provides access to the Tracer profiles that has been collected. These functions include viewing a profile summary, a complete data listing, and a graphical format.

Exit Program. The Exit Program button appears on all Tabs displayed on the DataTrace® Control Panel. By clicking on this button you exit from the DataTrace® for Windows program and return to your desktop.

DataTrace® for Windows
Program Tracer

The Program Tracer window provides access to Tracer programming and calibration functions. The initial settings displayed reflect the default settings that are defined in System Setup. The following items are defined and loaded into the Tracer and are programmable by the user.

Run ID
Start Date & Time
Sample Interval

Current System Time. In addition to the programmable items, the Current System Time is also displayed. You will notice that the cursor jumped over the Current System Time because it is not normally changed by the user, it is only displayed to let you know the current computer time while you are programming Tracers.

Changing these values do not change the computer's time and will appear only during the current programming session. If you need to change the actual computer time, you can change it through the normal Windows procedures at any time.

The Current System Time is entered into the Tracer at the exact moment the program is loaded into the Tracer and will define the Program Time after the Tracer is read.

Last Unit Programmed. Provides the Serial Number of the most recent Tracer programmed during this programming session.

38

 # Units Programmed. Provides a total count of Tracers successfully programmed during this programming session. To the right of this counter is a Preview button that accesses the Programming Report for this session.

Battery Remaining. (MPIII only.) Estimates the remaining battery life of the last MPIII Tracer programmed. The battery life algorithm is based on the elapsed time since the last battery change, modified by temperature exposure during that period. The percentage of remaining battery life is displayed over a colored bar; green above 30%, yellow between 10% and 30%, and red below 10% remaining battery life.

Run ID. When the Program Tracer window appears the cursor is located in the Run ID Text Box. To enter a new Run ID type up to eight (8) characters in the text box. Be sure, however, if your new Run ID has fewer characters than your old Run ID that you delete the excess characters rather than space over them. When finished, press ENTER.

Auto Number. The Run ID displayed is eight characters long and defaults to "DT100" unless the Auto-Numbering Prefix, Length, and Initial Value were modified. The Autonumbering functions are implemented by clicking on the Auto-Number button to the right of the Run ID text box.

Start Time. The Start Time displayed has a delay offset from the Current System Time. The delay allows the programmer to avoid the error of trying to program a Start Time that has already passed. The offset is calculated from the computer time when the Program Tracer button was originally pressed, plus the Start Time Delay established during the last programming session then rounded to the next highest full minute. The factory default is 10 minutes after the Current System Time.

If, however, you would like to change the Start Date or Time, the program allows you to do so. Move the cursor to the value you want to change and just type over the current values. Press ENTER.

User Comments. (MPIII only) The User Comments text box is active when each new Tracer is ready to be programmed. User Comments can include any alpha or numeric preprocess information that you wish to store with the profile and can be up to 48 characters long. The comments are stored in each Tracer and are stored with each Tracer profile. They will also be printed whenever a Tracer profile report or a graph is printed.

Sample Interval. The Sample Interval values displayed are the default established by the last programming session. If you wish to change the value, cursor to the text box you want to change. Either overwrite the value or click and hold on the spinner in the direction (up or down) that you want to change the value. Stop when the value is attained. Press ENTER.

Batch Mode Programming. This option allows multiple Tracers to be programmed with the same program automatically. To enable this option, click on the box. The option remains enabled during the programming session or until the option is disabled. Batch Mode Programming is best used with the Auto-Numbering procedure. (See Run ID above.)

Tracer Program Mode/Calibrate Mode. These options provide the user with the option to do a normal Tracer program (Tracer Program Mode) or calibration of a Humidity or MPIII Temperature-only Tracer (Calibration Mode). The default setting is Tracer Program Mode. Unless you need to calibrate Tracers, leave it in Tracer Program Mode. The Calibration option will create and load a special program unique to the calibration process.

The table on this screen displays the maximum duration that the Tracer can collect data based on the Sample Interval selected and the Tracer type (memory size). This is displayed in the second column. The third column shows the time the last point will be collected.

Program. The Program button loads the Tracer program that has been created on this screen into the Tracer that is currently in the PC Interface. Make sure that a Tracer is installed in the PC Interface and the PC Interface is correctly attached to your computer. To physically program a Tracer, click on the Program button. The program is loaded into the Tracer and a message that the Tracer was successfully programmed is then displayed.

Multiple Tracers can be loaded with the same program by enabling the Batch Mode Programming option. Remove the first programmed Tracer from the PC Interface after the program completion message. Replace the programmed Tracer with the next Tracer when told to do so. Continue this process until all of your Tracers are programmed. If the Auto-Number option is implemented, each of the Tracers will have a sequentially numbered Run ID.

Test Tracer. The Test Tracer button automatically performs a functional test on the Tracer's electronics. The functions tested include creating and loading a program, collecting data, and retrieval of the data from the Tracer.

As important as what the Test Tracer function does do, is what it does not do.

This procedure does not verify or imply anything about remaining battery life, nor does it verify the Tracers measurement accuracy.

If you are concerned about this Tracer's remaining battery life, have the battery replaced before any critical process run.

To initiate the testing process, place a Tracer in the PC Interface and click on the Test Tracer button. When the Tracer passes the test, a dialog box indicating that it passed will appear.

If the Tracer fails, a message indicating that the Tracer failed will appear along with some suggested remedies for the problem.

Following the successful completion of the Test Tracer procedure, a Tracer Status report can be printed which will provide Tracer specific information on Tracer type, calibration, battery change information, etc. This information can be printed, if desired.

40

Close. The Close button closes the Program Tracer window and returns you to the MAIN Tab window. This will end the current programming session. The next time you return to the Program Tracer window, all of the program values will be reset to the default values established under Setup.

DataTrace® for Windows
Auto Numbering Options
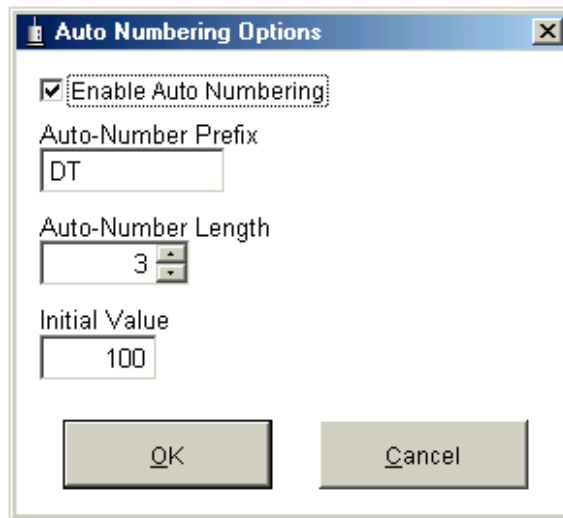
In order to simplify working with multiple Tracers, DataTrace® for Windows allows the Run ID to be customized and automatically sequence a numeric value to help track each Tracer.

Enable Auto-Numbering. The auto-numbering function default is enabled. To disable this function, click on the checkbox to eliminate the check mark.

Auto-Number Options. The Auto-Number options allow you to instruct the program to create an auto-sequencing number scheme based on the selections in these options. These options allow the Run ID programmed into the Tracer to enter an alpha-prefix followed by an automatically incrementing number. The number can be defined to start at any point and will continue to increment with each Tracer successfully programmed until you leave the programming session. The factory defaults are "DT" and "100".

Each time you start a new programming session, the Run ID will reset to the Auto-Number Initial Value and start to increment for each Tracer successfully programmed.

The only limitation to the Auto-Numbering routine is that the total number of characters (Auto-Number Prefix + Auto-Number Length) can not exceed eight (8) characters.

Click on the Auto-Number Prefix text box. Enter the prefix of your choice up to four (4) characters.

Use the Auto-Numbering Length option to establish the length of the numeric value. Allow a sufficient number of spaces to accommodate the expected number of Tracers. For example, if you expect to use 15 Tracers and want to start the numbering sequence with "1", enter "2" in the Auto-Numbering Length text box, not "1".

In the Initial Value text box enter the number you want the programming sequence to start with. This will be the first number programmed into the Run ID of the first Tracer programmed.

OK. Click the OK button to implement the Auto-Numbering scheme, close this window and return to the Programming screen.

Cancel. Click on the Cancel button to close this window without implementing the auto-numbering scheme. You are returned to the Programming screen.

DataTrace® for Windows
Profile Analysis
SUMMARY DATA Tab

Profile Analysis provides access to data on the most recently Read Tracer in several display formats including a summary display of the profile, the profile's detail data, and a graph of the collected profile data. These optional displays can be selected by clicking on the tabs identified below.

The Summary Data screen presents the most recently collected Tracer's header information, along with summary data from this profile and any second parameter. This is the active screen when Profile Analysis is initiated.

The DataTrace® program will not allow the data or any of the header information to be changed. If you try to change any of these fields, a status message appears stating that this information is "Read Only".

Comments. The Comments text box is active on the Summary Data page. Comments can include any alpha or numeric information that you wish to store with the file and can be up to 80 characters long. The comments are printed whenever a Tracer profile report or a graph is printed.

Find. Analysis of data can only be performed on an active profile, that is, one displayed in the Tracer Data window. The Find button allows you to review a listing of all profiles stored in your database, select one for retrieval, then load a copy of it as the active profile. This would be similar to what a Browse button does when you look at directories. Click the Find button to access this listing.

Batch Read. This allows multiple Tracers to be read automatically. To enable this option, click on the button. The option remains enabled during the current Read session.

Read. Pressing the Read button retrieves collected data from a single Tracer following a process run.

Close. The Close button closes the Profile Analysis window and returns you to the MAIN Tab window.

DataTrace® for Windows
Profile Analysis
PROFILE DATA Tab
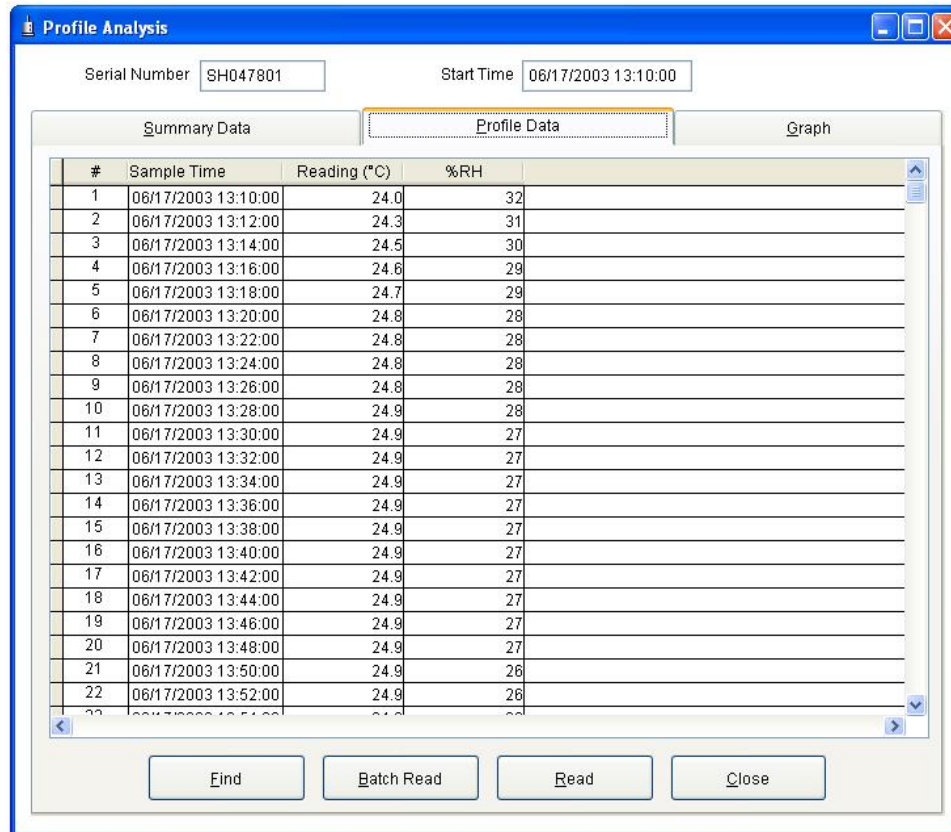
Profile Analysis provides access to data on the most recently Read Tracer in several display formats including a summary display of the profile, the profile's detail data, and a graph of the collected profile data. These optional displays can be selected by clicking on the tabs identified below.

The Profile Data format displays a detail listing of the collected data from the active Tracer including any second data or calculated parameter. The Profile Data tab presents the current Tracer's data in a tabular format including any second parameter. The current Tracer data is the most recently read or retrieved Tracer profile.

Find. Analysis of data can only be performed on an active profile, that is, one displayed in the Tracer Data window. The Find button allows you to review a listing of all profiles stored in your database, select one for retrieval, then load a copy of it as the active profile. This would be similar to what a Browse button does when you look at directories. Click the Find button to access this listing.

Batch Read. This allows multiple Tracers to be read automatically. To enable this option, click on the button. The option remains enabled during the current Read session.

Read. Pressing the Read button retrieves collected data from a single Tracer following a process run.

Close. The Close button closes the Profile Analysis window and returns you to the MAIN Tab window.

DataTrace® for Windows
Profile Analysis
GRAPH Tab

Profile Analysis provides access to data on the most recently Read Tracer in several display formats including a summary display of the profile, the profile's detail data, and a graph of the collected profile data. These optional displays can be selected by clicking on the tabs identified below.

The Graph format displays a graph of the collected profile data. The Graph tab presents the current Tracer's data in a graphical format including any second parameter. The current Tracer data is the most recently read or retrieved Tracer profile. Graphical review can be most helpful when reviewing a large amount of data.

Find. Analysis of data can only be performed on an active profile, that is, one displayed in the Tracer Data window. The Find button allows you to review a listing of all profiles stored in your database, select one for retrieval, then load a copy of it as the active profile. This would be similar to what a Browse button does when you look at directories. Click the Find button to access this listing.

Batch Read. This allows multiple Tracers to be read automatically. To enable this option, click on the button. The option remains enabled during the current Read session.

Read. Pressing the Read button retrieves collected data from a single Tracer following a process run.

48

Close. The Close button closes the Profile Analysis window and returns you to the MAIN Tab window.

DataTrace® for Windows
Locate Tracer Profile
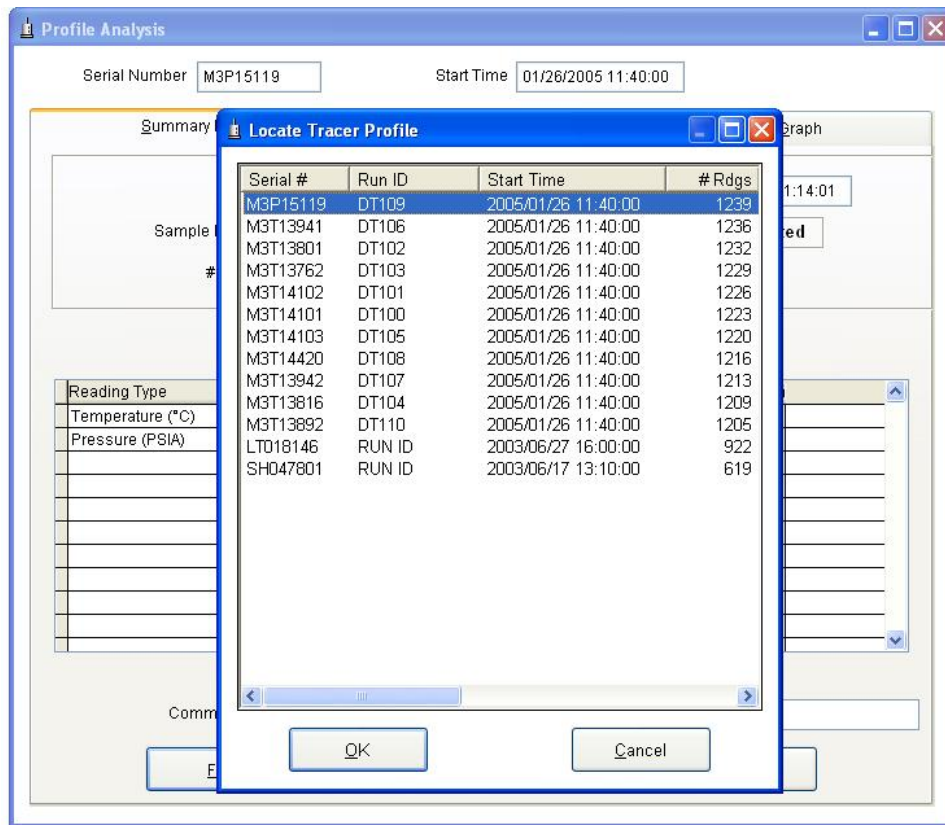
When the Find button is pressed, the Locate Tracer Profile screen appears. This screen lists the Serial Number, Run ID, and Start Date and Time of the currently active Tracer profile across the top. Below this is a listing of all the profiles stored on your computer. This window can be sized to view additional profiles by dragging the border or use the up and down scroll bar to view other profiles. Only part of the header information is visible in the window. You can see the rest of a profile's header information by scrolling to the right.

Profiles can be sorted by any of the column headings in ascending or descending order. The default profile sorting is based on Tracer Start Time. To change the sort, click on the column heading that you wish to sort on. This will provide an ascending sort; the second click will create a descending sort.

Click on any item in the target profile's row to make that profile active.

OK. Click OK to retrieve the selected profile and return to the Tracer Data page.

Cancel. Click on the Cancel button to close this window without selecting a new profile. You are returned to the Profile Analysis screens.

DataTrace® for Windows
UTILITIES Tab

The UTILITIES Tab is visible along the top of the Control Panel screen that appears in the DataTrace® for Windows program. From the Utilities page you can access various file handling options. The file handling capabilities include exporting, deleting, archiving, and restoring profiles. In addition, some "housekeeping" functions such as reindexing the databases, doing a field calibration on selected Tracer models, and creating a backup are also included.

Calibration Utility. The Calibration Utility button opens the calibration function for those Tracers that can use the field calibration function. Review APPENDIX VI for details of the calibration procedure.

Reindex Tables. The Reindex Tables button reindexes, refreshes, and packs the database tables used for storing Tracer profiles, report and graph formats, and other elements in the DataTrace® program. These functions occur automatically when the Reindex Tables button is clicked. These are standard database "housekeeping" routines that we recommend performing periodically.

Archive/Restore Profiles. The Archive/Restore Profiles button provides access to the archiving, deleting, and restoring functions for Tracer profiles in the DataTrace® program. Archived profiles can be retrieved at a later date, if necessary, with the Restore function. Deleted profiles are permanently removed.

51

Export Profiles. The Export Profiles button provides access to the function that converts profiles into other file formats so they can be imported into or used directly by other programs (e.g., EXCEL or standard ASCII formats).

mA Tracer Configuration. The mA Tracer Configuration function allows the defining, scaling and configuration of a mA Tracer so that mA sensors can be connected and the data can be maintained under the DataTrace for Windows data system.

Backup/Restore Data. The Backup/Restore button provides a quick backup system to protect all of the profile data and logs on the DTW system. Once backed up they can be retrieved to this computer or sent to another computer for their use. For just profile data security, use the Archive button and the Restore button. As with any backup system, previous data in the current database will be lost when the backed up data is returned.

Exit Program. The Exit Program button appears on all Tabs displayed on the DataTrace® Control Panel. By clicking on this button you exit from the DataTrace® for Windows program and return to your Desktop.

DataTrace® for Windows
Archive/Restore Profiles
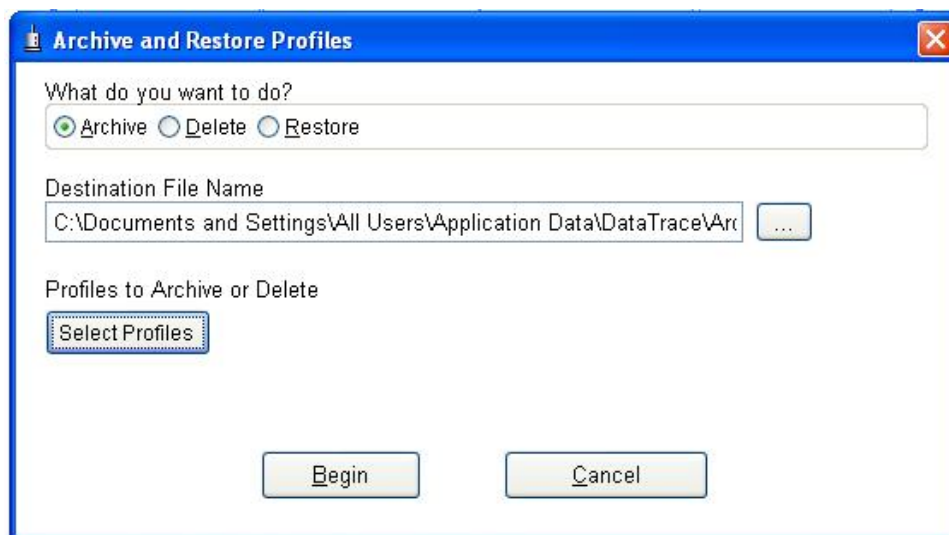
The DataTrace® for Windows program provides you with the ability to Archive or Delete profiles and Restore previously archived profiles. Archiving your files will compress older, less used files and store them in an archive file. At a later date they can be retrieved, if necessary, by the Restore function. You can also delete profiles permanently from your computer. However, once deleted, these files may not be recoverable.

To Archive or Delete profiles, you must define which file or files are to be operated on, and for archiving, you must specify the destination path and filename. Restoration of previously archived profiles requires the source path and filename.

What do you want to do? Select which of the functions you wish to activate: Archive, Delete or Restore.

Destination (or Source) File Name. A path and filename must be entered as a destination or source for this operation. This option is dimmed if Delete was selected above. Click in the File Name text box and enter the path and name. The program default path and filename is:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Archives\ ARCHIVE(date code).ZIP.

The date code helps to avoid overwriting any previous Archive files currently on your system. If you wish to change the name, the .ZIP filename extension will be added automatically. All of the files (*.DAT, *.DA~, and *.FPT) necessary for retrieval are stored in the ZIP file. Do not edit the filename extension. Press ENTER.

Browse. You can use the Browse button to help define the directory path, as with other Windows programs. If you need help with the Browse button, please review your Windows documentation.

Profiles to Archive or Delete. Before you can Archive or Delete a profile you must select which files you want to archive or delete. Click the Select Profiles button and select the appropriate profiles from the list displayed. This option is dimmed if Restore is selected above.

Begin. Press the Begin button to start the selected process. As the files are archived, deleted, or restored, a status box indicates the progress. After the process is complete, a message appears stating the number of profiles successfully processed.

Please take extreme care when you Delete profiles. It may not be possible to recover any profiles that you delete with this procedure.

Cancel. The Cancel button will return you to the UTILITIES Tab screen. You can exit the Archive/Restore Profiles function without performing an Archive, Delete, or Restore by pressing the Cancel button before you press the Begin button. You can also click the Windows Close button.

DataTrace® for Windows
Export Profiles
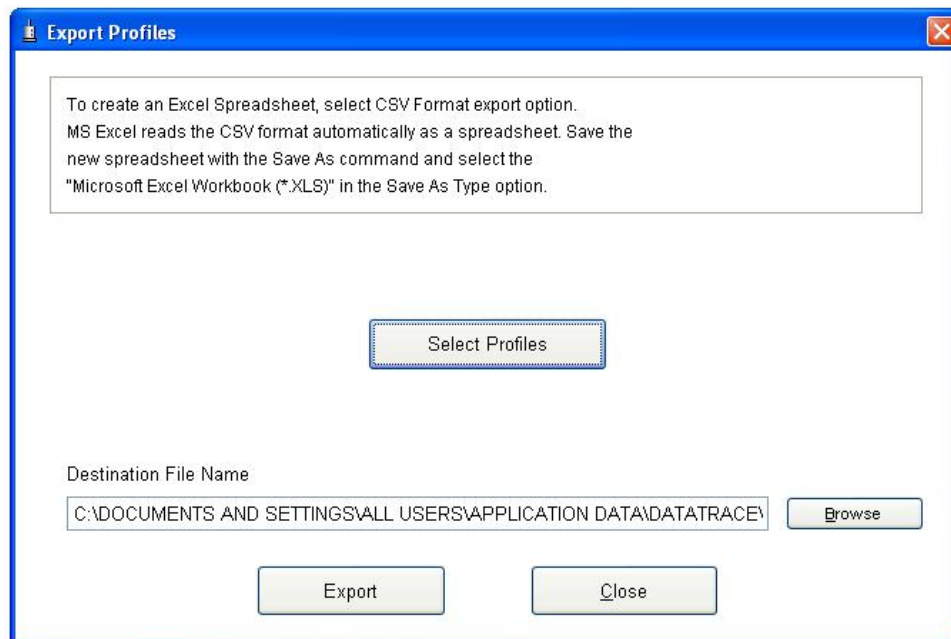
The DataTrace® for Windows program provides you with the ability to export profiles. To export a profile or profiles, you must define the export file format, which file or files are to be included, and the destination path and filename.

Select Profiles. Click on the Select Profiles button and a list of all the DataTrace® profiles currently available on your system will appear. Select as many files as you want to export. Click OK. If you do not want to select any files, click on the Cancel button and you will be returned to the Export Profile screen.

Destination File Name. A path and filename must be entered as a destination for the export operation. Click in the Destination File Name text box and enter the path and name. The program default path and filename is:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Export\ EXPORT(date code).CSV.

Make sure that the filename selected is unique to avoid unintentionally overwriting any previously exported files. The CSV filename extension is added automatically. Use the Browse button to help select a path, if necessary. Press ENTER to enable the destination selection and make the Export button active.
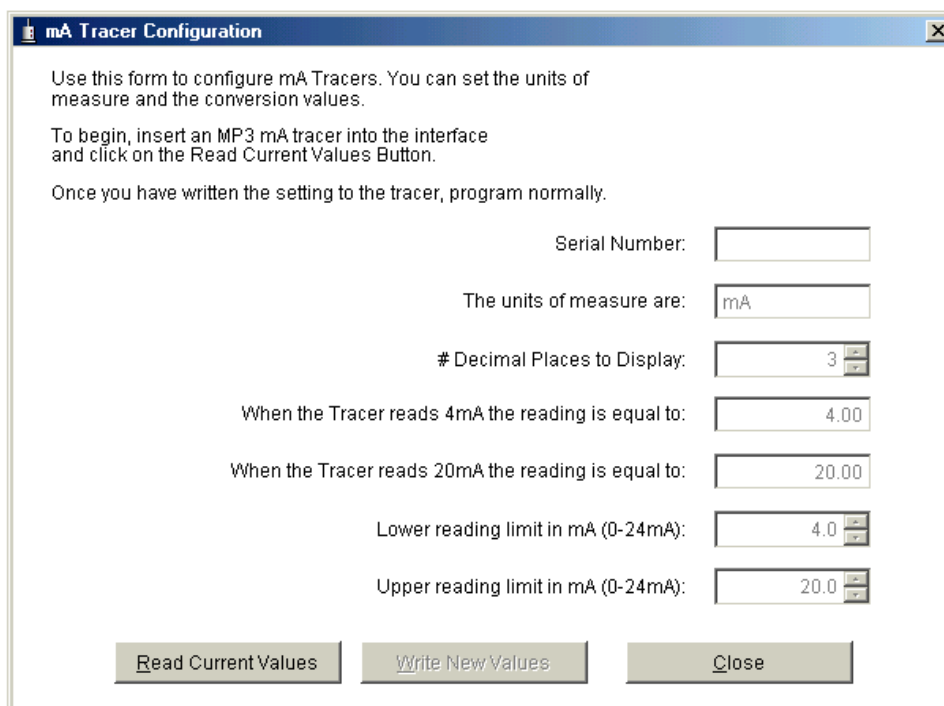
Browse. You can use the Browse button to help define the directory path, as with other Windows programs. If you need help with the Browse button, please review your Windows documentation.

Export. After the export format is selected and the Destination Filename is defined, the Export button becomes active. Press the Export button to export the selected profiles. As the files are exported a status box indicates the progress. After the export process is complete, a message appears stating the number of successfully exported profiles.

Close. The Close button will return you to the UTILITIES Tab screen. You can exit the Export function without performing an Export by pressing the Close button before you press the Export button.

DataTrace® for Windows
mA Tracer Configuration

The DataTrace® for Windows program provides the ability to collect data profiles using many different sensors that generate a 4 - 20 mAmp (mA) signal. To collect this data, the mA Tracer must be configured with the units of measurement being collected (e.g., pH) and the scaling of the sensor's range relative to 4 to 20 mAmps.

To initiate the configuration process, place a mA Tracer in the PCIF and press the Read Current Values. This loads the information into the text boxes on the screen. When new values are ready to configure the mA Tracer, press the Write New Values button, then program the Tracer normally under Main|Program Tracer.

Serial Number: This text box identifies the serial number of the mA racer that just had its values collected by the Read Current Values button. This value can not be changed.

The units of measure are: This text box defines the units of measure to display for the sensor attached to the mA Tracer. Enter the appropriate unit of measurement for this sensor.

 # Decimal Places to Display: This text box defines the number of decimal places to display for the data collected by the mA Tracer. The range limit is 0 to 3 decimal places.

When the Tracer reads 4mA the reading is equal to: This text box defines the lower value for scaling the data collected by the mA Tracer. Enter the appropriate low value from the sensor to be related to 4mAmps.

When the Tracer reads 20mA the reading is equal to: This text box defines the upper value for scaling the data collected by the mA Tracer. Enter the appropriate low value from the sensor to be related to 20mAmps.

Lower reading limit in mA (0-24mA): This text box defines the lowest possible mA value for a given sensor that is appropriate for the mA Tracer. This will not be modified often.

Upper reading limit in mA (0-24mA): This text box defines the highest possible mA value for a given sensor that is appropriate for the mA Tracer. This will not be modified often.

Read Current Values. This button reads the current configuration from a mA Tracer. When reading is complete the text boxes are populated with the stored information.

Write New Values. You enter the new configuration into the mA Tracer for units of measure and the 4 to 20 mA scaling entered in the text boxes by pressing the Write New Values button. This button is dimmed and inoperative until a Tracer configuration is defined. After the configuration is completed you can program the mA Tracer normally.

Close. The Close button will return you to the UTILITIES Tab screen. You can exit the mA configuration function without performing any Tracer configuration by pressing the Close button before you press the Write New Values button.

DataTrace® for Windows
Backup and Restore Data
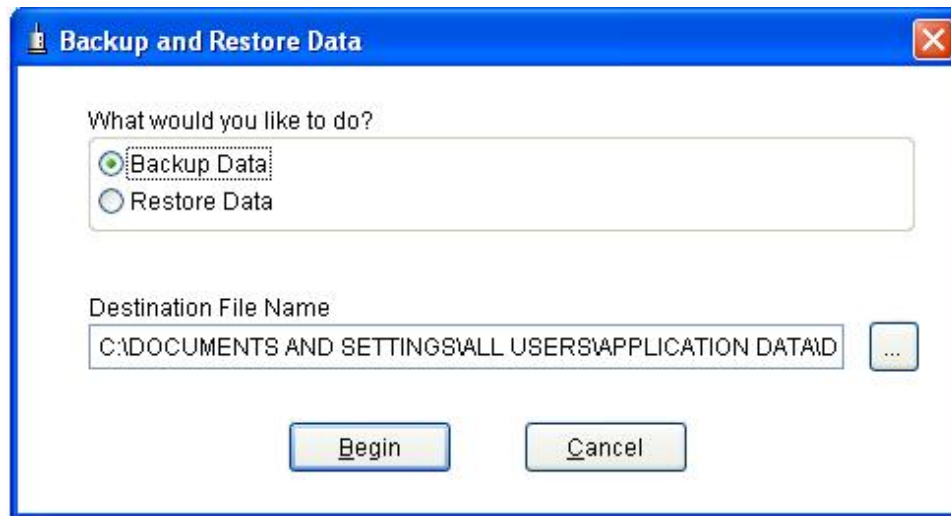
The Backup and Restore option provides a quick and easy backup procedure to safeguard all data profiles and logs on the DTW system. The logs include the Audit Trail, Calibration Logs and Program Logs. These records are secured in a Zip file which can be stored in a safe location or used to transfer information to another computer. This does not compromise any of the built-in security measures of the DTW program

What would you like to do? This item allows the Backup Data or Restore Data function to be selected.

Destination (Source) File Name. Depending on the selection made above, the label is Destination File Name or Source File Name. A path and filename must be entered as a destination for the backup operation and the file source for the restoration. The program default path and filename is:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Backups\ DTW-BACKUP(date code).ZIP.

Click in the Destination File text box and enter the path and name. The appropriate filename extensions are added automatically. Press ENTER to enable the destination selection.

Browse. You can use the Browse button to help define the directory path, as with other Windows programs. If you need help with the Browse button, please review your Windows documentation.

Begin. Press the Begin button to start the backup or restoration process. After the backup or restoration process is complete, a message appears indicating a successfully completion.

Cancel. The Cancel button will return you to the UTILITIES Tab screen. You can exit the Backup and Restore function without performing either function by pressing the Cancel button before you press the Begin button. You can also click the Windows Close button.

DataTrace® for Windows
REPORTS Tab

From the REPORTS Tab you can access report options including various pre-formatted reports.

Graph and Data Reports. The Graph and Data Reports function allows creation of graphical and/or data reports using one or more DataTrace profiles that were previously collected. Graphs can be customized as desired and data reports provide for some customization.

Programming Report. The Programming Report logs all Tracer programming operations and allows the Tracer Setup Report to be printed at any time, not just immediately following a programming session.

Set Point Report. The Set Point Report is a special report developed for the USDA.

Audit Trail. The Audit Trail button accesses the Audit Trail log which documents all significant activities on the DTW system. This log can be printed out for future reference.

Calibration History. The Calibration History button accesses the calibration log and provides a listing of all field calibrations that have been performed on Tracers. It will provide information on reference standard value(s), pre-calibration value(s), post-calibration value(s), and calibration dates.

Profile Listing. Profile Listing provides a listing of all profiles currently stored in the DataTrace® for Windows database.

Tracer Diagnostic. The Tracer Diagnostic button accesses a technical Tracer diagnostic analysis report that can help determine problems with a certain Tracer. Print this report when requested by the factory.

Exit Program. The Exit Program button appears on all Tabs displayed on the DataTrace® Control Panel. By clicking on this button you exit from the DataTrace® for Windows program and return to your Desktop.

DataTrace® for Windows
DATA SET Tab

Graph and Data Reports

| Data Set | Detail Data | Report Options | Graph Options |

Data Set Profiles

Serial #	Start Time	Reading Interval	# Readings	Comments	Run ID
M3T14420	01/26/05 11:40:00	00:00:05	1216	Penetration - Bag C	DT108
M3T14103	01/26/05 11:40:00	00:00:05	1220	Penetration - Bag B	DT105
M3T14102	01/26/05 11:40:00	00:00:05	1226	Distribution - Right, front	DT101
M3T13762	01/26/05 11:40:00	00:00:05	1229	Distribution - Right, rear	DT103
M3T13801	01/26/05 11:40:00	00:00:05	1232	Distribution - Left, front	DT102
M3T13941	01/26/05 11:40:00	00:00:05	1236	Distribution - Left, rear	DT106
M3P15119	01/26/05 11:40:00	00:00:05	1239	Pressure - front, center	DT109

Buttons: Select Profiles | Remove Profile | Clear All Profiles

Profile Summary

Reading Type	Minimum	Maximum	Average	Std Deviation
Temperature (°C)	25.3000	122.5000	72.3113	32.6386
Pressure (PSIA)	0.5000	31.1000	13.9135	10.6343

Buttons: Print Data | Display Graph | Close

The Data Set Tab provides the means to select profiles for the graphing module and data report listings. It displays a listing of all profiles included in a graph and/or data report, and is the default screen. This screen also provides a summary of each profile selected.

Data Set Profiles. This table provides a listing of each profile selected for inclusion in the graph and/or data report. The profile listing includes the Serial Number, Start Time and Interval, the number of Readings and any comments stored with the profile data.

Profile Summary. The summary of a selected profile is displayed on this table. Click on the left-most box of the Data Set Profiles table to display the profile summary for the selected Tracer. The reading type (data units), the minimum, the maximum, average, and standard deviation are calculated and displayed.

Select Profiles. The Select Profiles button opens the Locate Tracer Profile screen and allows you to select the profile(s) that you wish to include in the graph.

Remove Profile. The Remove Profile button becomes active when profiles are listed in the Data Set Profiles table. Click on the left-most box of the Data Set Profiles table to select profile(s) for removal from the graph.

Clear All Profiles. The Clear All Profiles button becomes active when profiles are listed in the Data Set Profiles table. Clicking on this button removes all profiles from the Data Set Profiles table.

Print Data. The Print Data button prints a data report that includes all of the selected profiles. This button appears on all of the Graph screens along with the Display Graph and Close button so that the data report can be printed and/or the graph can be displayed from any point in the Graph module.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Display Graph. The Display Graph button creates graphs for the DataTrace® program. The graphs are based on the template and configurations developed by you. Single or multiple Tracer profiles can be generated graphically. Like the Print Data button, the Display Graph button appears, and can be implemented from, all Graph screens.

Close. The Close button closes the Graph window and returns you to the REPORTS Tab window.

DataTrace® for Windows
DETAIL DATA Tab

The DETAIL DATA Tab provides data listings for each profile selected for graphing under the Data Set Tab.

The table provides a listing of each profile selected for inclusion in the graph. The detail listing includes the date and time, data point sequence number, and the data for each profile selected.

Print Data. The Print Data button prints a data report that includes all of the profiles selected. This button appears on all of the Graph screens along with the Display Graph and Close button so that the data report can be printed and/or the graph can be displayed from any point in the Graph module.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Display Graph. The Display Graph button creates graphs for the DataTrace® program. The graphs are based on the template and configurations developed by you. Single or multiple Tracer profiles can be generated graphically. Like the Print Data button, the Display Graph button appears, and can be implemented from, all Graph screens.

Close. The Close button closes the Graph window and returns you to the REPORTS Tab window.

65

DataTrace® for Windows
REPORT OPTIONS Tab
Basic Information Tab

The BASIC INFORMATION Tab is one of three configuration functions used to generate customized data reports in DataTrace for Windows. Another function, Profile Phases, allows the user to define time-based phases or segments. The Basic Information Tab, along with the Comments Tab, allows you to enter specific information related to a report or study that will be printed in the report. This information is similar to, and includes the notes that would be placed in a "Lab Notebook". Some of the entries define BI (Biological Indicators). The BI information can be entered in situations where BIs and DataTrace are used together in the same study, such as, in validations. It is not necessary to complete any or all of these items to generate a data report. These items are here for user convenience.

Study Title. This text box contains the study or report title selected for this document.

Protocol. This text box is available to define the protocol used to conduct this study.

Population. This text box describes the BI spore population used in the study.

Organism. This text box describes the type of BI spore organism used in the study.

D121 Value. This text box describes the thermal destruction value at 121°C of this BI spore population used in the study.

D132 Value. This text box describes the thermal destruction value at 132°C of this BI spore population used in the study.

Z-Value. This text box describes the number of degrees required for the thermal destruction curve of this BI spore population to traverse one log cycle.

Expiration Date. This text box describes the date code from the lot of BIs used in the study.

Lot Code. This text box describes the lot code for the BIs used in the study.

Print Data. The Print Data button prints a data report that includes all of the profiles selected. This button appears on all of the Graph screens along with the Display Graph and Close button so that the data report can be printed and/or the graph can be displayed from any point in the Graph module.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Display Graph. The Display Graph button creates graphs for the DataTrace® program. The graphs are based on the template and configurations developed by you. Single or multiple Tracer profiles can be generated graphically. Like the Print Data button, the Display Graph button appears, and can be implemented from, all Graph screens.

Close. The Close button closes the Report Options window and returns you to the Graph and Data Reports window.

DataTrace® for Windows
REPORT OPTIONS Tab
Profile Phases Tab
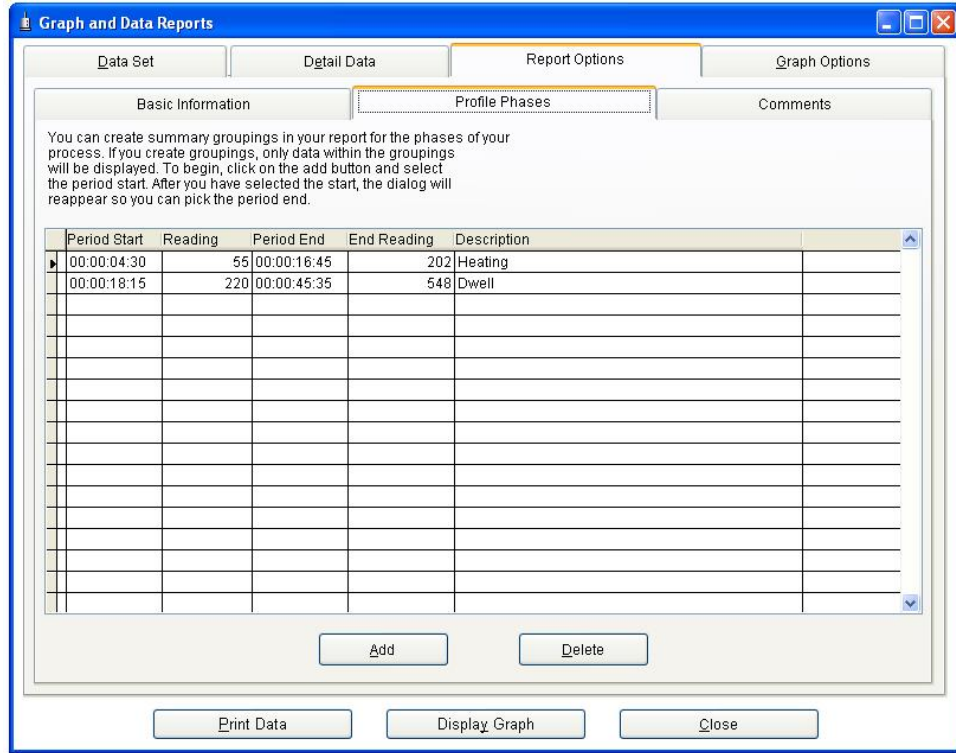
The PROFILE PHASES Tab is one of three configuration functions used to generate customized data reports in DataTrace for Windows. The other functions, Basic Information and Comments, allow the user to enter "Lab Notebook" data to store with the report. The Profile Phases Tab allows you to enter time-based phase or segment periods related to a report or study. These phases will have summaries associated with each phase that will be printed in the report. The phases do not need to be contiguous, but can not overlap. It is not necessary to define any phases to obtain a data print out. The default is a single phase that includes all of the collected data.

Add. The Add button creates an additional phase or segment grouping for this study. A phase is defined by identifying a Start Time an End Time and a description of the phase.

Delete. The Delete button eliminates a phase or segment grouping from this study

Print Data. The Print Data button prints a data report that includes all of the profiles selected. This button appears on all of the Graph screens along with the Display Graph and Close button so that the data report can be printed and/or the graph can be displayed from any point in the Graph module.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Display Graph. The Display Graph button creates graphs for the DataTrace® program. The graphs are based on the template and configurations developed by you. Single or multiple Tracer profiles can be generated graphically. Like the Print Data button, the Display Graph button appears, and can be implemented from, all Graph screens.

Close. The Close button closes the Report Options window and returns you to the Graph and Data Reports window.

DataTrace® for Windows
REPORT OPTIONS Tab
Comments Tab
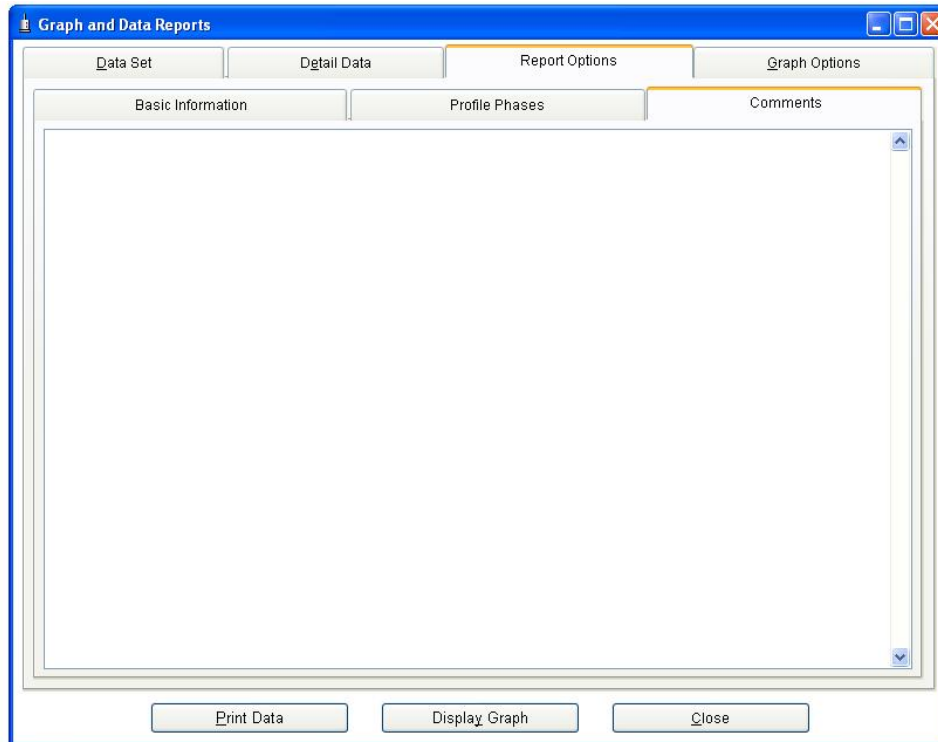
The COMMENTS Tab is one of three configuration functions used to generate customized data reports in DataTrace for Windows. Another function, Profile Phases, allows the user to define time-based phases or segments. The Comments Tab, along with the Basic Information Tab, allows you to enter specific information related to a report or study that will be printed in the report. This information is similar to, and includes the notes that would be placed in a "Lab Notebook". Enter as much information as desired into the text box and it will be displayed in the final report. The Comments section is limited to 900 characters.

Print Data. The Print Data button prints a data report that includes all of the profiles selected. This button appears on all of the Graph screens along with the Display Graph and Close button so that the data report can be printed and/or the graph can be displayed from any point in the Graph module.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Display Graph. The Display Graph button creates graphs for the DataTrace® program. The graphs are based on the template and configurations developed by you. Single or multiple Tracer profiles can be generated graphically. Like the Print Data button, the Display Graph button appears, and can be implemented from, all Graph screens.

Close. The Close button closes the Report Options window and returns you to the Graph and Data Reports window.

DataTrace® for Windows
GRAPH OPTIONS Tab
Template Tab
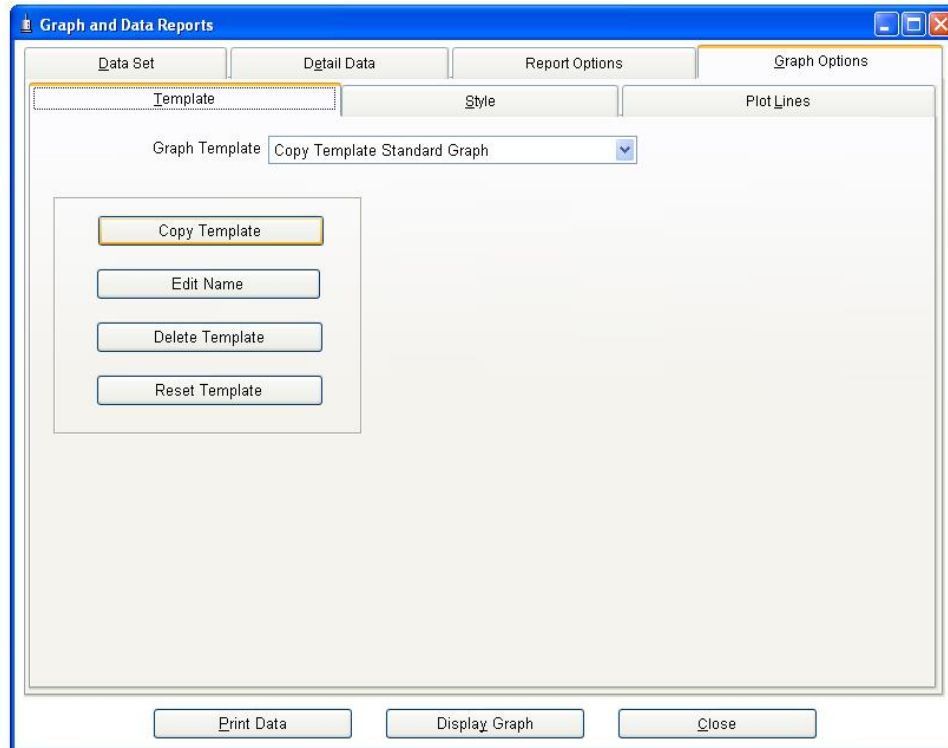
The GRAPH OPTIONS Tab provides access to the graphical configuration functions of the DataTrace® for Windows program. These functions allow graphical analysis of single or multiple Tracer profiles and are accomplished through graph templates that you create or edit. The Tracer profiles are selected under the Data Set Tab.

Selection of the GRAPH OPTIONS Tab presents a new window with the TEMPLATE Tab active. The TEMPLATE Tab, along with the STYLE and PLOT LINES Tabs provide the basic configuration for each template. Templates are the format of your graphs and define what is included on the graph, how it looks, whether any special calculations are performed, and which profiles are displayed.

Once created, the templates are used to generate the graph you display or print when the Display Graph button is clicked. The Display Graph button is accessible from any of the tabs under Graph Options.

Graph Template Name. Graphics design in the DataTrace® program is based on a Graph Template. These templates can be created, duplicated, and edited as necessary. When the TEMPLATE Tab is activated, a drop down text box displays the current Graph Template Name. The names of all saved graph templates are listed, including the default Template, "Standard Graph".

Click on the down arrow to display the listing of saved templates then scroll to the name of the template you wish to select. Click on the target profile. This will make your selection the active template.

If you can not find the appropriate template, select one that is close to what you want and make a copy of it. Rename the copy and complete the new design. When you are finished, it will be saved automatically.

Copy Template. Copying a Template creates a duplicate of the active template identified in the Graph Template Name drop down text box. The copy will display the name "Copy Template" plus the original template's name in the Graph Template Name text box and have the same Style, Data and other elements as the original.

Select the template that you want to copy from the Graph Template Name drop down text box.

Press the Copy Template Button. A new template with "Copy Template" plus the original template's name appears in the Graph Template Name text box as the active template.

Once created, the copy can be renamed with the Edit Name. You may also want to change the style and data, along with "fine tuning" the graph elements. The new template is saved automatically when you close the page.

Edit Name. The Edit Name button allows you to change the name of an existing graph template. This is true for all templates except the "Standard Graph" template, which can not be edited. Usually, you rename a duplicate of another template when you create a new graph template.

Select the template that you want to change the name of from the Graph Template Name drop down text box. Press the Edit Name button. The Graph Template Name text box becomes active, just type over the existing template name with the new name. Press ENTER.

After the graph template is renamed you can edit the graph format as necessary. However, it is not necessary to rename a template to edit a graph, except the "Standard Graph".

Delete Template. Deleting a Template removes the selected template identified in the Graph Template Name text box from the system. The deleted template is not recoverable.

Select the template that you want to delete from the Graph Template Name drop down text box. Press the Delete Template Button. The selected template's name will disappear from the Graph Template Name text box. The factory "Standard" Template can not be deleted.

Remember, once deleted, the template can not be recovered. However, if you have a good memory, it can be recreated.

Reset Template. The Reset Template button removes most changes to your current template, resetting those graph elements modified in the current session to the values in the last saved version. Changes made to Style and Data are not reset. If no previous version exists, the template returns to the factory defaults for each setting in the template.

Print Data. The Print Data button prints a data report that includes all of the profiles selected. This button appears on all of the Graph screens along with the Display Graph and Close button so that the data report can be printed and/or the graph can be displayed from any point in the Graph module.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Display Graph. The Display Graph button creates graphs for the DataTrace® program. The graphs are based on the template and configurations developed by you. Single or multiple Tracer profiles can be generated graphically. Like the Print Data button, the Display Graph button appears, and can be implemented from, all Graph screens.

To create a graph using the current template, click on the Display Graph button. After a slight delay a graph will appear on the screen. The Display Graph button is accessible from any of the tabs under Graph Options.

Close. The Close button closes the Graph window and returns you to the REPORTS Tab window.
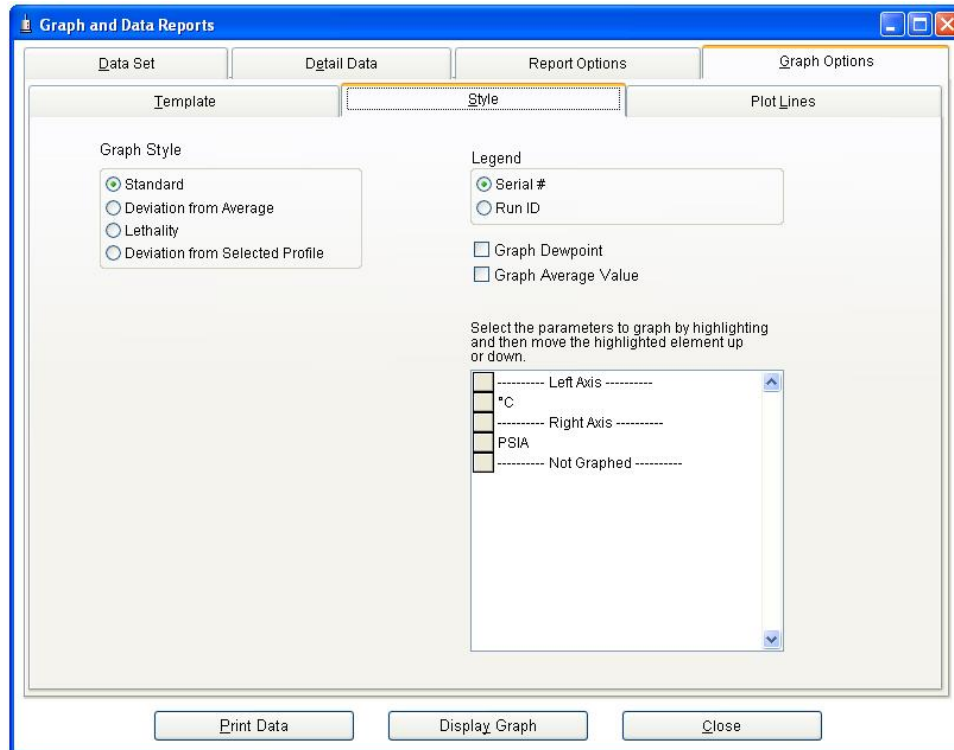
The STYLE Tab provides you with the ability to select the style or type of graph to be generated. Profiles are always presented as line images.

The graph style, in conjunction with the PLOT LINES Tab option, defines the Template format. After the format is defined, you can "fine-tune" the graph's appearance with the "real time" graph editing options.

Graph Style. You must select one Graph Style from the choices presented by clicking on it.

"Standard" is the default graph option and would be the most common type of graph.

The "Deviation from Average" graph style displays a variance from a calculated average profile, where the average profile is the average of all included profiles for each corresponding point in time.

"Lethality" graph style adds a lethality calculation profile with a right Y-axis to the "Standard" profile graph.

The "Deviation from Selected Profile" graph style displays a variance from a "Master" profile. The "Master" profile is selected from existing profiles.

Legend. You can select the legend to be displayed with each profile. The legend options are the Tracer's Serial Number or the Tracer's Run ID. Click on the option you would like for the graph profile's legend. Additional changes to the Legends can be made on the graph. (See DataTrace Graph.)

Graph Dewpoint. You can choose to display a Dewpoint temperature profile on your graph for each temperature profile. To display the Dewpoint profile, click on the Graph Dewpoint check box, a check mark will appear in the box to indicate that a Dewpoint profile will be calculated and displayed.

To disable the Dewpoint profile display, click on the Graph Dewpoint check box, and the check mark will disappear in the box to indicate that the Dewpoint profile option is no longer active.

Graph Average Profile. You can choose to display an Average profile on your graph. Multiple profiles must be selected in the Data To Graph option and the Graph Average Profile check box must be selected. If only the Current Profile option is selected in the Data To Graph options, the Graph Average Profile check box is "dimmed" and therefore not available.

Assuming an appropriate option was selected in Data To Graph option, click on the Graph Average Profile check box, a check mark will appear in the box to indicate that an average profile will be calculated and displayed.

To disable the average profile display, click on the Graph Average Profile check box and the check mark will disappear in the box to indicate that the average profile option is no longer active.

Parameters to Graph... This option allows the user to define multi-parameter Y Axis for the graph. For example, the right Y Axis might have Pressure and Lethality scales while the left axis is temperature.

The listing can have more than one parameter defined for each Y Axis, for a maximum of two (2). To place a parameter on a Y Axis, click on the parameter to highlight and drag it to the appropriate section of the Y-Axis listing where you wish it displayed; for example, "Left Y Axis". We recommend that the most important parameter appear on the left Y Axis, e.g., temperature. Those in the "Not Graphed" section will not appear on the graph.

If you wish to change the parameters displayed, return to this option and move the parameters. After the changes have been made, click Display Graph to view the modifications.

Print Data. The Print Data button prints a data report that includes all of the profiles selected. This button appears on all of the Graph screens along with the Display Graph and Close button so that the data report can be printed and/or the graph can be displayed from any point in the Graph module.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Display Graph. The Display Graph button creates graphs for the DataTrace® program. The graphs are based on the template and configurations developed by you. Single or multiple Tracer profiles can be generated graphically. Like the Print Data button, the Display Graph button appears, and can be implemented from, all Graph screens.

Close. The Close button closes the Graph window and returns you to the REPORTS Tab window.

DataTrace® for Windows
GRAPH OPTIONS Tab
Plot Lines Tab
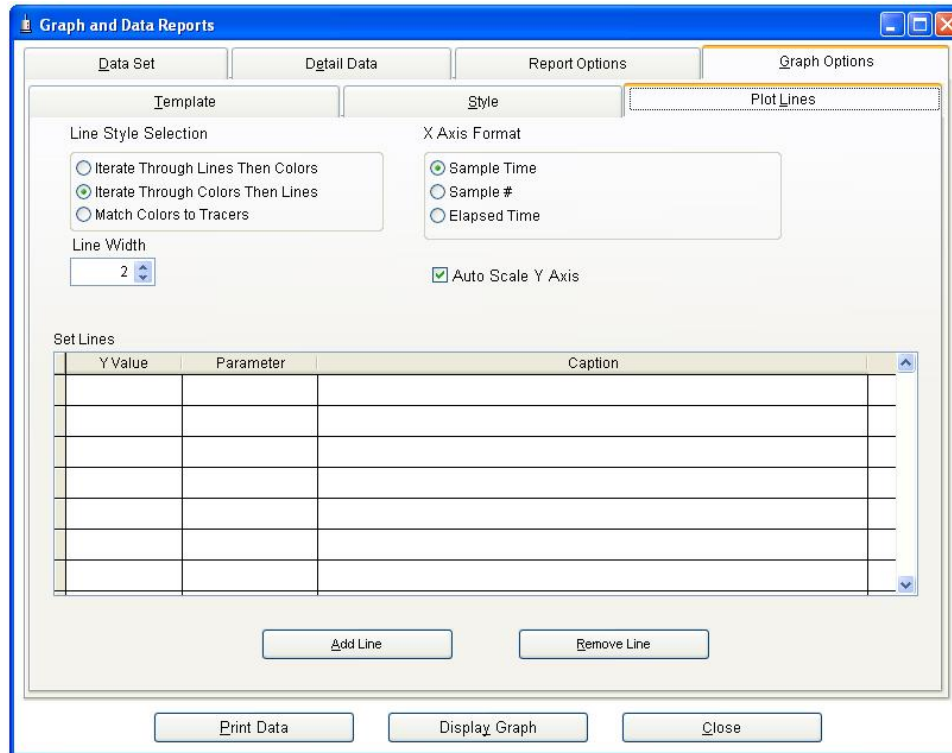
The PLOT LINES Tab allows you to select the best option to display the profile or profiles that will be graphed for printing or display on your computer monitor. In addition to Line Style options, you can select the default size of all profile lines for the best display. Individual profile line sizes can be defined or modified with the graph editing options.

The PLOT LINES option, in conjunction with the STYLE Tab option, defines the Template format. After the format is defined, you can "fine-tune" the graph's appearance with the "real time" graph editing options.

Line Style Selection. This option allows you to set the profile line format for the best display on color monitors and/or printers or for standard black on white printing. The default setting of "Iterate Colors Then Line Styles" is best for color-capable presentations.

If, however, normal black on white printing is necessary, select "Iterate Line Styles Then Colors". This option provides various line styles that may be easier to differentiate than the shades of grey colors become when converted to a non-color printout.

Match Colors to Tracers maintains the same line colors for a two parameter Tracer. For example, a Humidity Tracer would display a humidity line and a temperature line of the same color, but different line styles. This simplifies in the analysis of the data.

Line Width. This option allows the defining of a default profile line width for the graph. Sizing the line width may allow better viewability on graphical print outs.

X Axis Format. This option defines which of four types of X Axis formats will be used in your graph.

> "Sample Time" is the default value for the Data To Graph options of Current Profile Only and All Like Profiles and will display real time and date values. Multiple Tracer graphs need to have a common time element for this option to be available.

> "Sample #" generates the X Axis based on the sequential number of all data readings collected.

> "Elapsed Time" calculates the elapsed time for all data points. This would be the most likely X Axis format for multiple profiles that do not have a common Start Time and Sample Interval such as when the Data To Graph option of Select Profiles is active.

Auto Scale Y Axis. When enabled, the Y Axis will autoscale to accommodate the full range of all included Tracer profiles. This will be true for both the right and left Y Axis. When disabled, the Y Axis will stay fixed at the current scale, values outside the currently defined Y Axis will not be displayed. Again, this will be true for both Y Axes.

Set Lines. To add a set value, click the Add Line button. This activates a new Set Line to be defined with the cursor in the Value cell. Enter an appropriate value in this box. The parameter cell allows selection of the Y Axis parameter to attach the Set Line to.

The third cell provides the Set Line's annotation or caption. Enter any text information you wish to appear on the Set Line. It is best to keep this description short, e.g., Min, Max, etc. The color, type, and size of the Set Lines can be modified in the same way as any other graphical element in this module. If you right click on the Set Line when the graph is displayed, an editing window will appear.

Add Line. The Add Line button creates the Set Line for the graph including any caption you wish to use. These values can be established on either the left or right Y-Axis.

Remove Line. The Remove Line button eliminates the selected Set Line from the graph including any caption associated with it.

Print Data. The Print Data button prints a data report that includes all of the profiles selected. This button appears on all of the Graph screens along with the Display Graph and Close button so that the data report can be printed and/or the graph can be displayed from any point in the Graph module.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Display Graph. The Display Graph button creates graphs for the DataTrace® program. The graphs are based on the template and configurations developed by you. Single or multiple Tracer profiles can be generated graphically. Like the Print Data button, the Display Graph button appears, and can be implemented from, all Graph screens.

Close. The Close button closes the Graph window and returns you to the REPORTS Tab window.

DataTrace® for Windows
DataTrace GRAPH

The Graph screen provides access to the graph editing capabilities and is opened by clicking on the Display Graph button. All elements of the graph can be modified from this window. Because it is in real time, the changes that you make are presented as soon as you implement them.

Among the graph elements that can be modified are:

Graph Title	Axis Titles	Background Colors
Grids	Legends	

Text: Font Styles, Colors, Sizes, and Types
Line: Colors, Styles, Sizes

To modify any element, right click on that element to activate the edit mode. This will cause that element to blink or flash, confirming that it is in edit mode. A window will appear, presenting you with the options available for customizing the selected element. Modify the element parameters you wish. Click on OK to accept the new settings and implement the changes.

After the window disappears, you will notice that the graph has been modified as you defined.

There are two exceptions to this procedure; one involves editing the individual profile lines, while the other relates to configuring the overall graph.

To modify individual profile lines, Ctrl-Right click on the target profile line. An edit window for Plot Parameters will appear allowing the profile line to be modified for color. You can also select a profile and move it left or right on the graph by clicking Graphs|Move Profile. This option is useful to help compare profiles of the same process that were collected at different times. Unlike most other parameters edits in DTW, modifications to individual profile lines are not saved when the graphics module is closed.

The other exception to the on screen editing described above is in configuring the overall graph; these options are set in Graphs|Parameters.... We do not recommend modifying the size parameters to any great extent. However, color changes are fine.

Zooming On a Graph. To examine a subset of the complete graph obtained from a Tracer profile, you can Zoom on the target segment of interest. The Zoom window will appear on the bottom of the screen displaying the target segment.

Press the left mouse button and drag diagonally until you include the entire target segment within the selection window that appears as you drag the mouse. Release the mouse button.

When you release the mouse button the zoom segment appears in the Zoom window below the original graph. The selection box is retained on the original graph to highlight the location of the Zoomed segment. You can perform additional "Zooms" on either window. The new Zoom graph image will replace the current Zoom view.
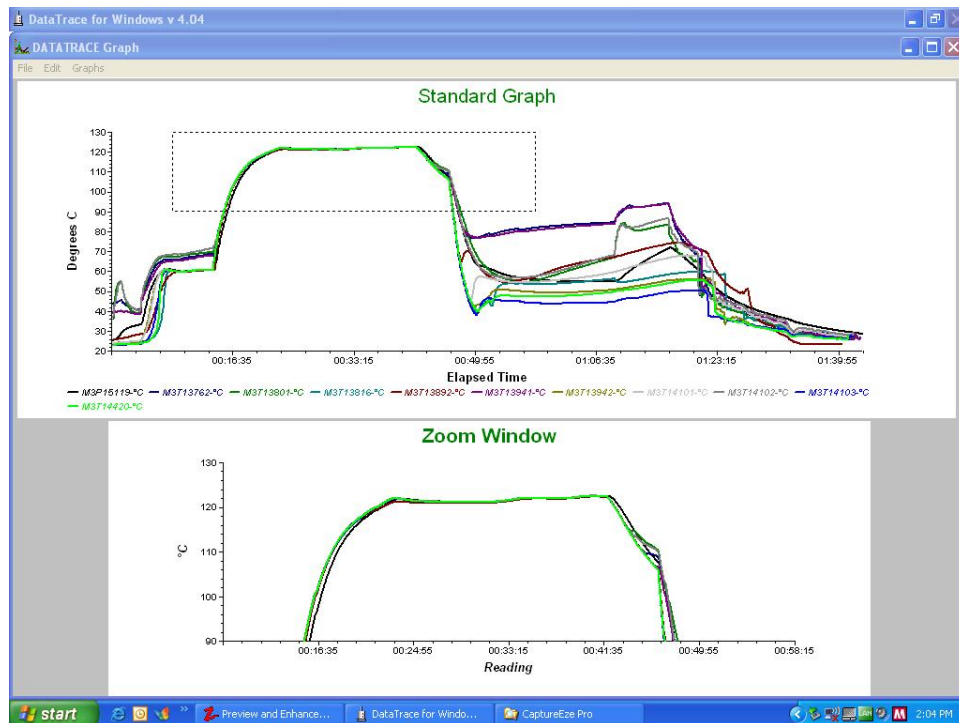
To remove the Zoom window from the screen, select Graphs|Show Zoom. This eliminates the Zoom window and resizes the original graph to full size.

Graph Data. To see the data values at any point along a profile, right click on that point. A new data window will appear on the right side of the screen with the original graph screen (and Zoom, if present) on the left side. A vertical cursor bar will appear on the graph at the selected location. The new window displays a listing of data with the data point closest to where you clicked highlighted.

In addition to the time and process parameter data for the profile you selected, the data for all profiles displayed on the graph is listed. You can scroll as necessary to see other points. You can copy the data list of all profiles and calculated values displayed on this table. The table can then be inserted into another application program.

When the data window is displayed press CTRL + C to generate a copy of the complete data table. This creates a copy of the complete table and stores it on the Clipboard. You can then Paste the data table into any target application that supports the Windows paste function.

To remove the Graph Data list, click the Close box on the data window and the graph window expands to full size.

The following options appear from the menu items under File:

Save As ... You can save the displayed graph in two formats using the File|Save As ... option. The first option is as an Enhanced Metafile, the second is as a bitmap image.

Printing Graphs. Several graph print formats are available under the File drop down menu. In addition, graph printing options are available to modify the overall appearance of the graph.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Print. When you are satisfied with the format, click on the File|Print menu option to receive a printed copy of your graph. The printed graph provides a summary listing for each profile displayed on the graph.

Print Selected Graph Only. If you wish to only print the displayed Zoom graph without any summary data, click on the zoomed graph image then click on File|Print Selected Graph Only option to receive a printed copy of that image.

Print Page Only. If you wish to print the displayed graphics page, without any summary data, click on File|Print Page Only option to receive a printed copy of that image, again without any summary data.

The following options appear from the menu items under Edit:

Copying To the Clipboard. You can also copy the graph to the Windows clipboard by selecting Edit|Copy Page. This will capture the original graph and the Zoom graph, if it is displayed. However, the Graph Data list will not be saved to the Clipboard since it is not on the same "page". The Graph Data table can be saved to the Clipboard as described in Graph Data above.

Graph Annotations. To add annotations to the graph (e.g., text, arrows, or vertical lines) click on Edit|Add Text, Edit|Add Arrow, or Edit|Add Line. These options place the selected element on the graph. These items can then be edited by right clicking on them to open an editing window like those mentioned earlier. An edit window for Plot Parameters will appear allowing the profile line to be modified for color. Unlike most other parameter edits in DTW, these modifications are not saved when the graphics module is closed.

Axes. The Axes option allows you to modify any of the axes for Display Range, Tick Marks, and Grids. Each Axis displayed on the graph is listed for selection.

The following options appear from the menu items under Graphs:

Parameters... Parameter option allows the configuration of some elements of the overall graph. We do not recommend modifying the size parameters to any great extent. However, color changes are fine. Remember, these options are not saved.

Move Profile. You can "move" a profile in time so you can compare profiles which were not collected at the same time. A profile can be moved based on the Tracer's Sample Interval (e.g., moved 1 sample interval, moved 10 intervals, -10 intervals, etc.)

Show Zoom. To remove the Zoom window from the screen, select Graphs|Show Zoom. This eliminates the Zoom window and resizes the original graph to full size.

Exit the Graph Window. When you are finished with the graph window, click the Close button or select File|Exit. When the window closes, all of your editing is saved to your current template.

DataTrace® for Windows
PROGRAMMING REPORT

The Programming Report logs and displays all programming sessions since the installation of DataTrace® for Windows. Each Programming Event describes Start and Program Times and how many profiles were programmed during that session. The output of this program is the same as the Print Programming Report generated immediately after you program a group of Tracers in the Program Tracer window.

To select a programming session, click on the Include? column for each report that you want to receive. This will activate the Print Report button.

Print Report. The Print Report button becomes active when one or more Programming Events are selected. The report generated is the same as the Setup report available immediately after you programs a group of Tracers in the Program Tracer window.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Select All. The Select All button includes all programming sessions to be printed.

Close. The close button closes the Programming Report screen and returns you to the REPORTS Tab screen.

DataTrace® for Windows
SET POINT REPORT

The Set Point Report is a unique program developed for USDA for handling of analysis for 100+ Tracers.

DataTrace® for Windows
AUDIT TRAIL REPORT

The Audit Trail displays a summary listing of all significant activities that occurred in the DTW program since the program was installed. The data is stored and includes for each logged event the User ID, the date/time the action occurred, a description of the action, and a hidden encrypted code to deter tampering. The following actions are automatically logged in the Audit Trail table:

- ➢ User Login (elevated security levels only).
- ➢ User Exit.
- ➢ Add/Edit of User Record (elevated security levels only).
- ➢ Failed Login Attempts (elevated security levels only).
- ➢ Tracer Program (description contains Serial Number, Run ID, and Start Date/Time).
- ➢ Tracer Read (description contains Serial Number and Run ID).
- ➢ Tracer Calibration (description contains Serial Number and Calibration Type).
- ➢ Profile Export (description contains Serial Number, Run ID, and Start Date/Time).
- ➢ Creation of New User (elevated security levels only).
- ➢ Deactivation of a User (elevated security levels only).
- ➢ Test Tracer (description contains Serial Number and Test Result).
- ➢ Battery Changes (description contains Serial Number).
- ➢ Archive Occurrences (description contains Serial Number, Run ID, Operation Performed, and Start Date/Time).
- ➢ Delete Occurrences (description contains Serial Number, Run ID, and Operation Performed).
- ➢ Archive Restored (description contains Source Path/Filename, # Profiles Restored, # Profiles Attempted, and # Data Points Restored, # Data Points Attempted).
- ➢ Data Backup (description contains Output Path/Filename).
- ➢ Data Restored (description contains Source Path/Filename).

Export. The Export button will generate an Audit Trail log for review or auditing based on user filter selections. A CSV file is generated that can include the complete listing or filtered by dates or the user name.

Print. The Print button will generate a complete listing of the Audit Trail log for review or security auditing.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Close. The close button closes the Audit Trail screen and returns you to the REPORTS Tab screen.

DataTrace® for Windows
CALIBRATION HISTORY REPORT

The Calibration History button accesses the calibration log. This log provides a listing of all Temperature or Humidity Tracer field calibrations that have been performed. Information is stored by Tracer Serial Number for each element of the procedure, including standards used, calibration dates, and the results of the completed one or two point calibration procedures. In addition, the user comments from the process are included. The data is stored as Read Only and therefore can not be modified or changed.

Print. The Print button will generate a complete listing of the Calibration History log for review or auditing.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

Close. The close button closes the Calibration History screen and returns you to the REPORTS Tab screen.

DataTrace® for Windows
PROFILE LISTING REPORT

Profiles Report

DATATRACE

Mesa Laboratories, Inc.

Printed: 11/01/2007 16:39:25

				Reading Interval		
Serial Number	Run ID	Program Time	Start Time	Hours	Minutes	Seconds
SH047801	RUN ID	06/17/2003 13:01:04	06/17/2003 13:10:00	0	2	0
LT018146	RUN ID	06/27/2003 15:04:16	06/27/2003 16:00:00	0	1	0
M3T13892	DT110	01/26/2005 11:14:10	01/26/2005 11:40:00	0	0	5
M3T13816	DT104	01/26/2005 11:13:14	01/26/2005 11:40:00	0	0	5
M3T13942	DT107	01/26/2005 11:13:44	01/26/2005 11:40:00	0	0	5
M3T14420	DT108	01/26/2005 11:13:52	01/26/2005 11:40:00	0	0	5
M3T14103	DT105	01/26/2005 11:13:24	01/26/2005 11:40:00	0	0	5
M3T14101	DT100	01/26/2005 11:12:36	01/26/2005 11:40:00	0	0	5
M3T14102	DT101	01/26/2005 11:12:48	01/26/2005 11:40:00	0	0	5
M3T13762	DT103	01/26/2005 11:13:06	01/26/2005 11:40:00	0	0	5
M3T13801	DT102	01/26/2005 11:12:58	01/26/2005 11:40:00	0	0	5
M3T13941	DT106	01/26/2005 11:13:30	01/26/2005 11:40:00	0	0	5
M3P15119	DT109	01/26/2005 11:14:01	01/26/2005 11:40:00	0	0	5
M3T11364	IMALIVE	10/17/2007 08:36:51	10/17/2007 08:36:52	0	0	2
M3T11364	IMALIVE	10/22/2007 11:54:01	10/22/2007 11:54:02	0	0	2
M3T11364	DT100	10/22/2007 15:04:55	10/22/2007 15:05:00	0	0	2
M3T21651	CUR0001	10/22/2007 16:52:53	10/22/2007 17:01:00	0	0	30
M3T11364	IMALIVE	10/26/2007 10:02:17	10/26/2007 10:02:18	0	0	2
M3T21650	IMALIVE	10/26/2007 10:08:06	10/26/2007 10:08:08	0	0	2
M3T21649	IMALIVE	10/26/2007 10:09:12	10/26/2007 10:09:13	0	0	2
M3T11364	IMALIVE	11/01/2007 10:11:30	11/01/2007 10:11:32	0	0	2

Verified By: _____   Date: _____   Prepared By: _____

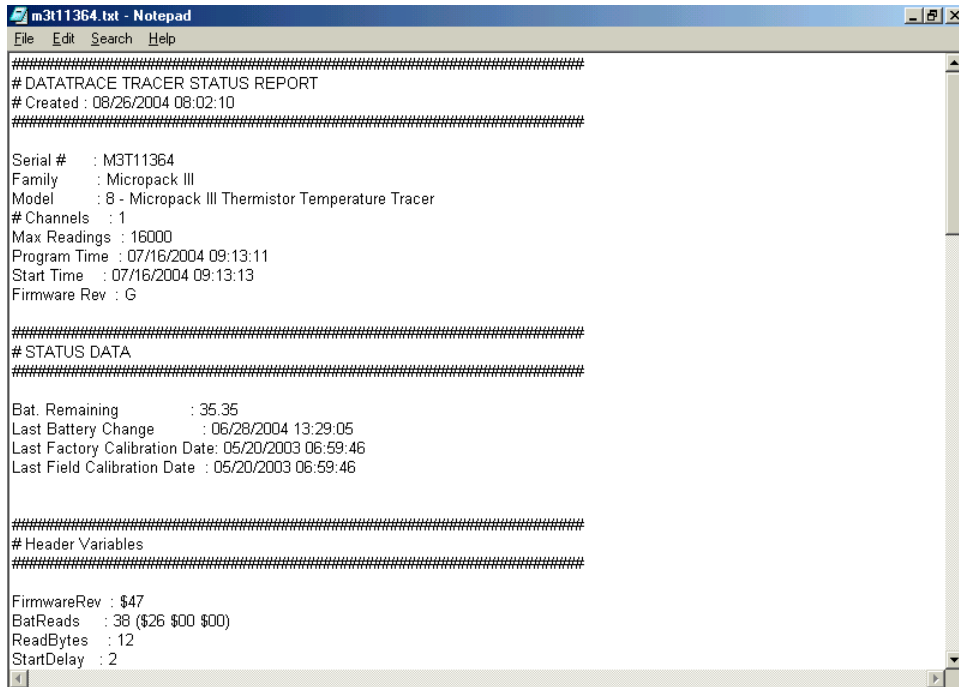Date Printed: 11/01/2007   SW Version: 4.05   Page 1 of 1

The Profile Listing displays a summary of all profiles that are currently stored in the DataTrace® for Windows database.

The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

DataTrace® for Windows
TRACER DIAGNOSTIC REPORT

```
m3t11364.txt - Notepad                                          _ | 8 | X
File   Edit   Search   Help

#############################################################
# DATATRACE TRACER STATUS REPORT
# Created : 08/26/2004 08:02:10
#############################################################

Serial #      : M3T11364
Family        : Micropack III
Model         : 8 - Micropack III Thermistor Temperature Tracer
# Channels    : 1
Max Readings  : 16000
Program Time  : 07/16/2004 09:13:11
Start Time    : 07/16/2004 09:13:13
Firmware Rev  : G

#############################################################
# STATUS DATA
#############################################################

Bat. Remaining           : 35.35
Last Battery Change       : 06/28/2004 13:29:05
Last Factory Calibration Date: 05/20/2003 06:59:46
Last Field Calibration Date : 05/20/2003 06:59:46

#############################################################
# Header Variables
#############################################################

FirmwareRev  : $47
BatReads     : 38 ($26 $00 $00)
ReadBytes    : 12
StartDelay   : 2
```

The Diagnostic Report displays technical information regarding the current status of the Tracer along with internal system codes. Most of the information displayed in this report is for factory analysis and troubleshooting and is of limited value to a user. A Tracer Status Report showing information more meaningful and useful to a user can be obtained following the Test Tracer procedure.

If a problem occurs with your Tracers, you may be requested to e-mail a copy of this report to the factory to facilitate Tracer diagnosis of the problem. Press the Diagnostics Report button to initiate the report generation. Following interrogation of the Tracer the program asks if it should save the report and suggests using the Tracer Serial Number as the name and to store it in the DataTrace folder as a text file. After the file is Saved, you are asked whether you want to view the file. If you do, the file appears as a Windows Notepad document and can be handled or printed as any other Notepad file.

DataTrace® for Windows
GENERAL Tab
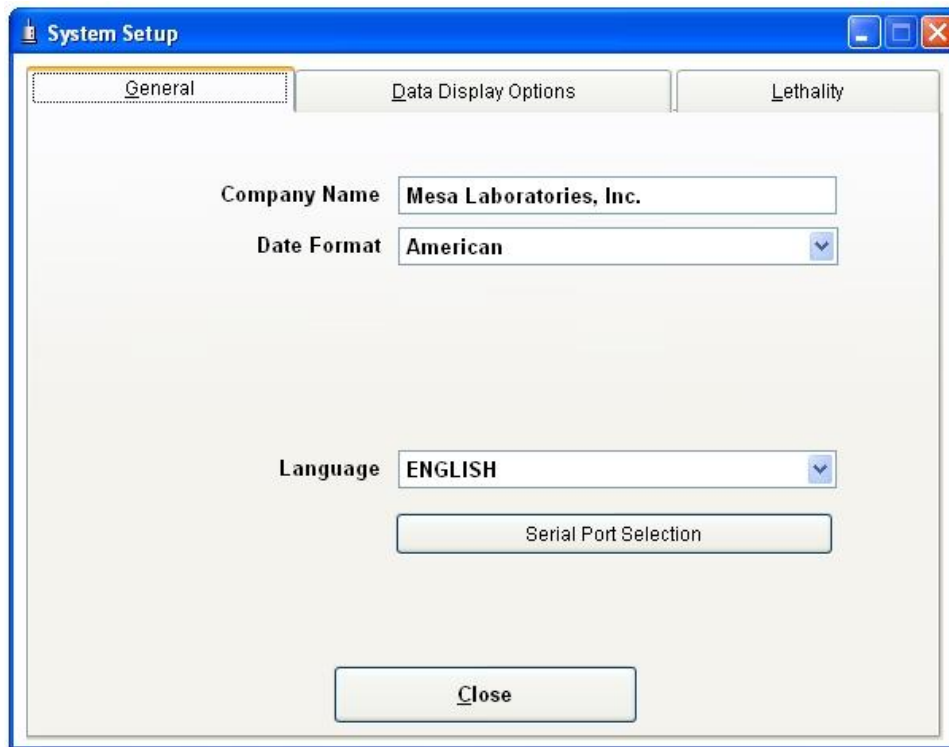
With the DataTrace® for Windows program, you can customize the software configuration to conform to your needs and preferences. The SETUP|GENERAL Tab under System Setup provides the first of two program configuration settings and defaults for the DataTrace® program.

Company Name. Data tables and graph output can be customized with the inclusion of your company's name. "Your Company, Inc." is the factory default.

The Company Name is the first option activated when you implement System Setup. The cursor is positioned in the Company Name text box. Start typing over the current entry. You can enter up to 35 characters. Press ENTER when the entry is complete.

Date Format. The date format can be selected to conform to the style with which you are most comfortable. "American" is the default.

Click on the down arrow of the drop down Date Format text box to display the date format options. Click on the date format style desired.

Language. You can select the language in which most of the program is displayed and reports generated. The factory default is English.

Click on the down arrow of the drop down Language text box to display the language options available. Click on the language desired. The language will convert to the selected language after you click on the Close button.

Serial Port Selection. The DataTrace® for Windows program automatically finds the Serial Ports on your computer through which you communicate with Tracers. This option reviews all active Serial Ports. Once found, select which port(s) you wish to use for the DataTrace system by clicking on the appropriate port. When selected, the program will "remember" the connection.

Close. The close button closes the GENERAL Tab screen under System Setup, implements the selections made in that window, and returns you to the Control Panel.

DataTrace® for Windows
GENERAL Tab
Serial Port Selection
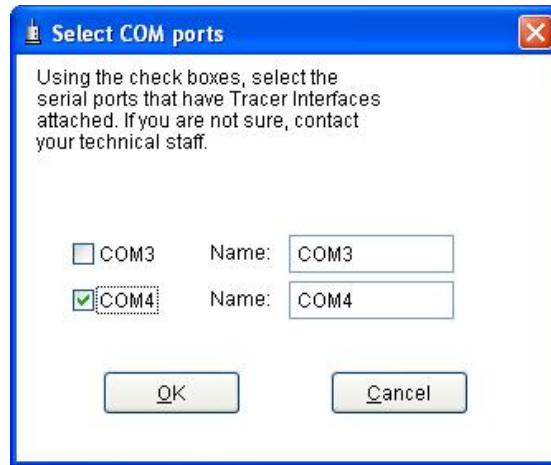
The DataTrace® for Windows program determines the serial ports that Windows believes are active. These ports can be either RS-232 or USB ports. The port that appears to be connected to the PC Interface will have a check mark, indicating that it has the DataTrace system active.

If more than one port has an interface connected to it, click on the second check box to place a check mark. This tells the program that multiple Interfaces could be connected. In this situation, when you communicate with Tracers you will be asked which port to use. If you use the Batch Program or Read functions, DTW will interrogate each Interface until it finds a new Tracer (Serial Number).

DataTrace® for Windows
DATA DISPLAY OPTIONS Tab
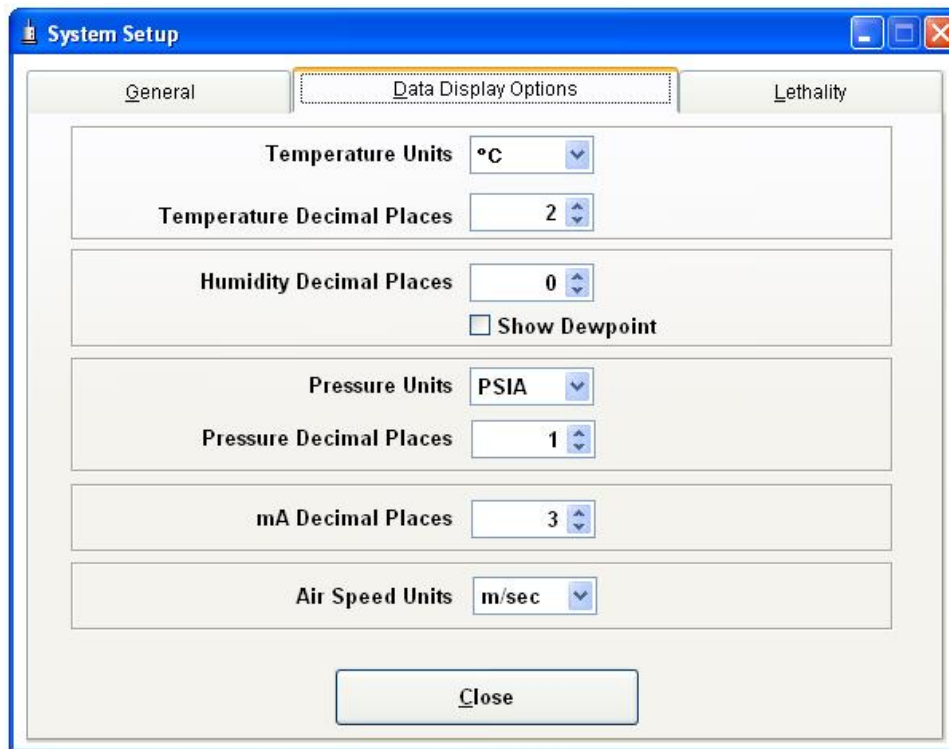
As mentioned earlier, with the DataTrace® for Windows program, you can customize the configuration of the software to conform to your desires and preferences. The SETUP|DATA DISPLAY OPTIONS Tab provides the second group of settings and defaults for the DataTrace® program.

Temperature Units and Temperature Decimal Places. You can define the temperature units as either C or F (C is the default setting). Click on the down arrow of the drop down Temperature Units text box to display the temperature options and click on the format desired. The display resolution for temperature can be defined with the Temperature Decimal Places option for 0 to 3 decimal places. It should be noted that the display resolution does not change the specified accuracy of the data; only how many decimal places are displayed.

Humidity Decimal Places. The display resolution for humidity can be defined with this option for 0 to 1 decimal places. It should be noted that the display resolution does not change the specified accuracy of the data; only how many decimal places are displayed. To change the displayed decimals for humidity, click on the spinner to increase or decrease the value.

Show Dewpoint. The Dewpoint Temperature can be calculated and displayed for Humidity Tracers. The factory default is disabled.

Click the Show Dewpoint check box, when a check mark appears the dewpoint temperature for each humidity/temperature data pair will be calculated and displayed on data reports. You can disable the display of the Dewpoint data by clicking on the check box to remove the check mark.

Pressure Units and Pressure Decimal Places. You can define the pressure units as PSIA, BAR, mmHg, inHg, or inH$_2$O. (PSIA is the factory default.) Click on the down arrow of the drop down Pressure Units text box to display the pressure unit options then click on the pressure format desired.

The display resolution for each can be defined with the Pressure Decimal Place option. The number of decimal places will vary depending on the units selected. Note that the display resolution does not change the specified accuracy of the data; only how many decimal places are displayed.

mA Decimal Places. The display resolution for mA Tracer parameters can be defined with this option for 0 to 3 decimal places. It should be noted that the display resolution does not change the specified accuracy of the data; only how many decimal places are displayed. To change the displayed decimals for humidity, click on the spinner to increase or decrease the value.

Air Speed Units. You can define the air speed units as ft/sec or m/sec. (m/sec is the factory default.)

Close. The close button closes the DATA DISPLAY OPTIONS Tab screen under System Setup, implements the selections made in that window, and returns you to the Control Panel.

DataTrace® for Windows
LETHALITY Tab

Fo, PU, and CV calculations are special calculations for food and pharmaceutical applications. If you need them, they are established on this page. The lethality calculations are based on the "General Method" procedure.

The default temperature settings used in the various lethality calculations are defined in the Constants text boxes displayed for the temperature units selected under the General Tab. The lethality defaults are generally accepted "standard" values. If you have developed your own values, the factory defaults can be changed by overwriting the current value.

Lethality Display Style. You can display cumulative lethality values on profile data and graph printouts as well as on the Profile Analysis screens. The settings on this configuration screen allow you to enable or disable the calculation process and enable the display of the lethality values.

These values are calculated when the data is displayed and are stored with the data. Since they are stored, it is possible to Archive or Export the calculated lethality values.

There are four options that can be selected in the Lethality Display Style section.

* (None) disables the display and/or printing of either Fo or PU values and is the factory default.

* To display the Fo values, click on the Fo option.

* To display the PU values, click on the PU option.

* To display the CV values, click on the CV option.

The Tx, Tmin, and z values displayed in the Constants boxes are industry "standards" for lethality calculations. You may change these values by overwriting them.

Reset Defaults. If you have elected to change the Tx, $Tmin$, and/or z values, the Reset Defaults button becomes active so you can reset the factory defaults. The factory lethality Tx, $Tmin$, and z defaults are generally accepted "standard" values. To reset the current settings to the default values, click on the Reset Defaults button.

Display Lethality in Scientific Notation. This option allows the calculated lethality values to be displayed in Scientific Notation instead of standard integers (default). To enable the data to be displayed in scientific notation, click on the check box; a checkmark indicates this option is enabled.

Close. The close button closes the LETHALITY Tab screen under System Setup, implements the selections made in that window, and returns you to the Control Panel.

CHAPTER V

MAINTAINING THE DataTrace® SYSTEM

Maintaining the Tracers and the PC Interface is primarily a matter of applying common sense.

HANDLE THE DataTrace COMPONENTS CAREFULLY.
THESE ARE PRECISION INSTRUMENTS AND SHOULD BE CARED FOR AS SUCH.

The Tracers are designed for harsh environments and the rigors of traveling with your products through the process, recording data profiles. The greatest risk to a Tracer is being dropped onto a hard surface. The sensing probe or the electronics could be damaged by the impact.

CARING FOR THE TRACERS:

1. The Tracers should be kept in their Storage Modules when not in use. The storage modules protect the Tracers from damage.

2. Use a mild detergent and warm water to wash the Tracers between tasks. If non-water soluble residue remains on the Tracer, use an appropriate solvent followed immediately by a warm water and detergent bath. Stubborn materials can be removed from the Tracers with plastic scrubbing pads or soft copper wool dipped in alcohol.

   Keep Tracers as clean as you would any other object coming in contact with your products. Failure to do so may cause communication problems between the Tracers and your computer.

3. A Tracer's probe is its most vulnerable component. It can be bent, nicked, dinged, and/or broken if not cared for properly. Tracer probes are not punches, ice picks, or awls; so please don't treat them as if they were! Keep the Tracers in their storage modules when not in use and handle them carefully to prolong their lives.

4. It is a good policy and good common sense to periodically check all instrumentation against a known standard. We recommend that you have your DataTrace® units checked against a National Institute of Standards and Technology (NIST) standard to verify their calibration. The total system uncertainty should not be more than 25% of the accuracy desired for the calibration. (Reference: ANSI Z540-1-1994 10.2b.) This can also be done at the DataTrace factory if you do not have access to an appropriate standard.

CARING FOR THE PC INTERFACES:

MPIII Interface Module:

1. The MPIII Interface receives its operating power through the USB Port connection. It is advisable to maintain the connection in order to keep the Interface "charged".

   Cleaning procedures for the DataTrace® MPIII PC Interface are similar to those for your computer. Refer to your computer's Guide to Operations for information on caring for your PC. These same procedures will be sufficient to care for your PC Interface.

Non-MPIII Interface Module:

1. Periodic cleaning of the PC Interface contacts is advisable. Clean all contacts with a cloth or scrubbing pad dipped in Isopropyl Alcohol. The cloth should be damp, not wet, to avoid getting moisture into the PC Interface electronics.

2. As the 9 volt battery in the interface module reaches the end of its life, the "Interface Battery Low" LED will glow red. Replace the battery as soon as possible to avoid disruption of your DataTrace® operations. Note that some batteries as they become marginal may not cause the LED to glow initially, it may take awhile. We recommend replacing the 9 volt battery in the interface at least once a year, or more frequently with heavy usage.

   To replace the Interface Module battery, follow these simple instructions:

   • Disconnect the Interface Cable from the Interface Module.

   • Position the Interface Module with the rear panel accessible.

   • Open the Battery Compartment cover by inserting a coin under the cover on the right side and pry it up gently.

   • Remove the old battery and replace with a fresh 9 volt battery.

   • Reinsert the battery into the battery compartment and close the cover, making sure that the battery wires are not obstructing the compartment cover.

   • Reconnect the Interface Cable to the port.

TRACER SERIAL NUMBERS:

The Tracer's Serial Number can be found in two places. The first is etched into the case of each Tracer. Second, the memory of each Tracer contains the serial number. This number is displayed and/or printed when the System reports the data collected by the Tracer. Printed reports clearly identify which Tracer collected the data.

Whenever you contact Customer Service, please have the serial number(s) of the subject Tracers on hand. This will help the Customer Service representative assist you.

PC INTERFACE MODULE IDENTIFICATION:

Each type of PC Interface has an identification plate which is mounted on the bottom panel of the Interface Modules. The plate displays the Serial Number of your DataTrace® PC Interface.

Record these numbers and store them in a safe place for future reference. All future software upgrades will require the Serial Number to be reported to Customer Service.

APPENDIX I

ERROR MESSAGES / FREQUENTLY ASKED QUESTIONS / TECHNICAL NOTES

DataTrace® for Windows error messages cause a Dialog Box to appear on your computer's screen. In most cases, suggestions for correcting the situation are provided by either the error message on the screen. Additional information may be available from the DTW Enhancements file that may have been included with your program.

There is also a built-in "self-diagnostics" module in the DTW program that generates an error screen when an unknown or unexpected problem occurs, commonly referred to as a "Grey Screen". The error logs and files are transmitted directly to Mesa Labs if your computer is connected to the internet. We will try to respond as quickly as possible to these problems. If we have diagnosed this problem previously the response could be immediately.

Current versions of various Frequently Asked Questions (FAQ) and Tech Notes which can help you address any problems that come up are available on our web site:

http://www.mesalabs.com/datatrace/downloads.html

If a window with an error message appears that is not discussed, it may be a Windows or system error. Consult the Operator's Manual that came with your Windows program or computer for the appropriate action you should take to correct the problem.

APPENDIX II

ACCESSORY INFORMATION

- Installation Instructions for FRB Internal Retainer

- Installation Instructions for MPIII Internal Retainer

- Installation Instructions for Screw Coupling

- Installation Instructions for Adhesive Disk

INSTALLATION INSTRUCTIONS FOR Micropack or FRB INTERNAL RETAINER

The Internal Retainer Assembly is for use with the DataTrace® System. By utilizing components of an existing container fitting (O.F. Ecklund NO. C-5), the Internal Retainer Assembly can internally mount a DataTrace® Micropack or FRB Tracer to a container lid or cap.

1. Place the Gasket on the Threaded Stud.

2. Punch a hole in the container lid as usual for installation of a Thermocouple Receptacle.
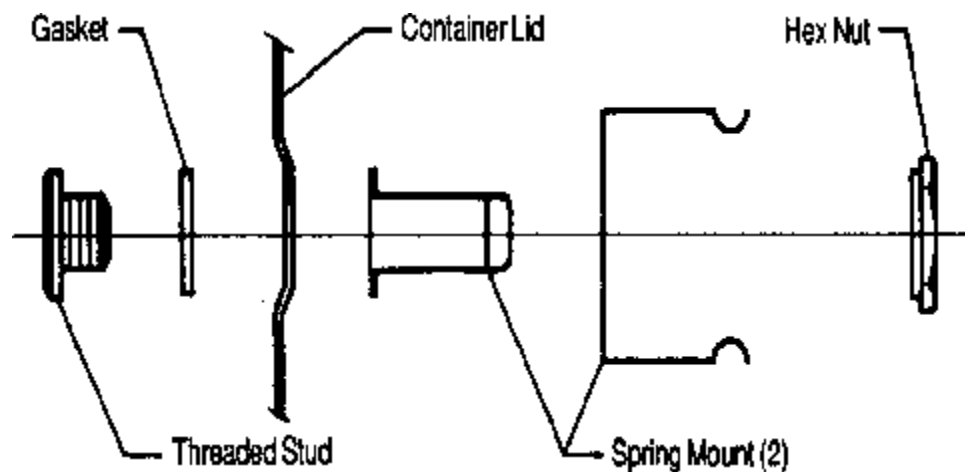
3. Install the Threaded Stud and Gasket assembly through the hole in the container lid.

4. Place the two (2) Tracer Spring Mounts over the Threaded Stud approximately at 90° from each other.

5. Finger tighten the Hex Nut from the C-5 unit onto the Threaded Stud.

6. Using a 3/4" socket or wrench to hold the Hex Nut and a large screwdriver to turn the Threaded Stud, tighten the assembly until it is secure.

INSTALLATION INSTRUCTIONS FOR Micropack III INTERNAL RETAINER

The MPIII Internal Retainer Assembly is for use with the Micropack III DataTrace® System. By utilizing the MPIII Internal Retainer the MPIII Tracer can be mounted internally to a container body, lid, or cap.

1. Punch a hole in the container lid, cap, or body as usual for installation of an Ecklund C-5 Thermocouple Receptacle.

2. Install the Threaded Clip through the hole in the container lid, cap, or body with the threads pointed to the outside of the container lid, cap, or body.
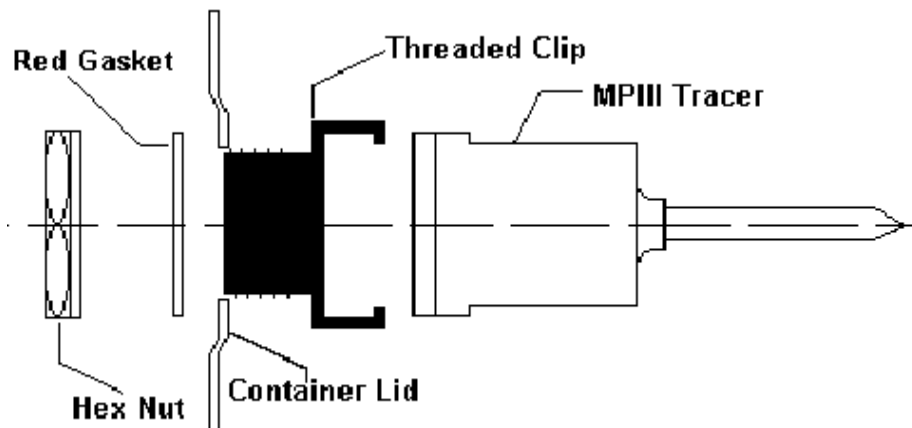
3. Place the Gasket over the threads of the Threaded Clip that projects through the container lid, cap, or body.

4. Finger tighten the Hex Nut onto the Threaded Clip until snug.

5. While holding the Threaded Clip from the inside of the container lid, cap, or body with your fingers, tighten the Hex Nut using a 3/4" socket or wrench until secure.

6. Insert the programmed MPIII into the clips on the Threaded Clip. The tabs on the two clips will engage the lip of the MPIII and hold it securely during the process.

INSTALLATION INSTRUCTIONS FOR
MICROPACK III INTERNAL RETAINER WITH STANDOFFS

The Micropack III (MPIII) Internal Retainer w/Standoffs Assembly is for use with the MPIII DATATRACE® System. By utilizing the MPIII Internal Retainer, the MPIII Tracer can be mounted internally to a container body, cap, or lid and the Standoffs allow sensor positioning at the optimal location in the container.
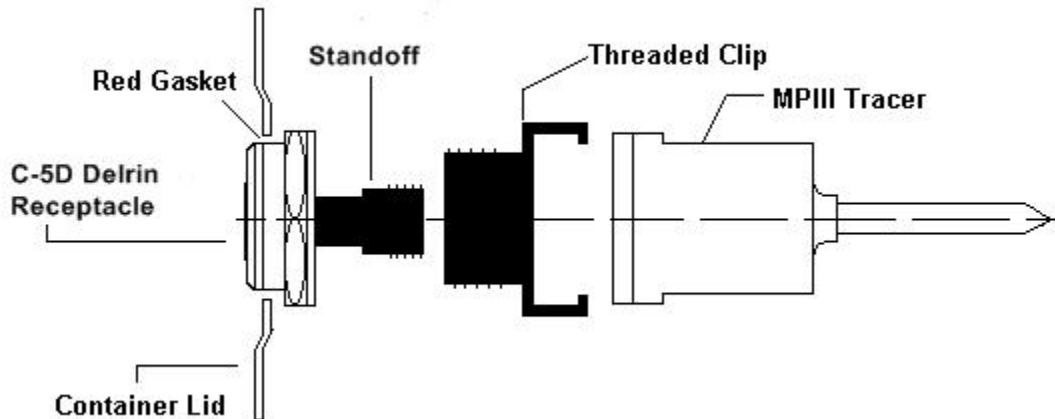
1. Punch a hole in the container as usual for installation of an Ecklund C-5 Thermocouple Receptacle.

2. Install the C-5D Receptacle through the hole in the container with the threads pointed to the inside of the container and the Red Gasket on the outside of the container.

3. Finger-tighten the Hex Nut onto the C-5D Receptacle until snug then tighten the Hex Nut using a ¾" socket or wrench until secure.

4. Insert the appropriate Standoff for the target container into the C-5D Receptacle and screw until snug.

5. Insert the MPIII into the clips on the Threaded Clip by **sliding** the Micropack III between the clips from the side. The tabs on the Threaded Clip will engage the lip of the MPIII and hold it securely during the process. **DO NOT PUSH THE MPIII TRACER OVER THE TABS AS THIS CAN WEAKEN OR BREAK THE TABS.**

6. Screw the Threaded Clip with the MPIII Tracer onto the Spacer until snug.

7. Removal of the Micropack III from the Internal Retainer is accomplished by sliding the Tracer to the side until the tabs on the Threaded Clip disengage from the Micropack III. **DO NOT PULL THE MPIII TRACER OVER THE TABS AS THIS CAN WEAKEN OR BREAK THE TABS.**

INSTALLATION INSTRUCTIONS FOR SCREW COUPLING

The Screw Coupling assembly is for use with the DataTrace® System. By using an existing container fitting (O.F. Ecklund No. C-5), the Screw Coupling Assembly can externally mount a DataTrace® Micropack, FRB, or Micropack III Tracer.

1. Remove and discard the 1/2 inch Hex Cap from coupling.

2. Retain the Sealant and the Follower.
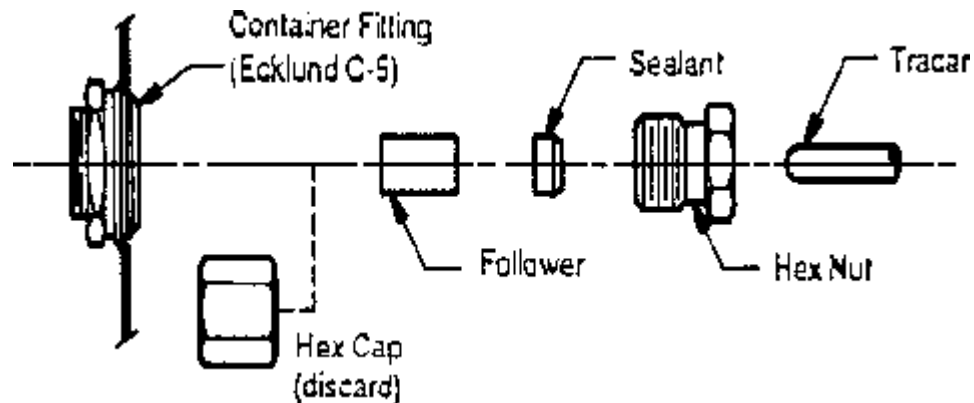
3. Position the Sealant and the Follower as shown and insert into the container fitting. Finger tighten the Hex Nut until snug.

4. Insert the Tracer into the Screw Coupling Assembly and adjust to the desired position.

5. Using a half-inch wrench, tighten the Hex Nut 1/2 to 3/4 turn.

NOTE: You may be required to use Teflon tape on the Hex Nut threads if any leaking occurs during use.

INSTALLATION INSTRUCTIONS FOR ADHESIVE DISK

The adhesive disk is for use with the DataTrace® Micropack, FRB, or Micropack III Tracer.

1. Clean and dry the base of the Tracer.

2. Peel off the brown paper and affix adhesive disk to the Tracer's base. Note the adhesive disks used for the Micropack and FRB are the same. The adhesive disks used for the Micropack III are smaller.

3. Peel off paper from other side of disk.

4. Degrease and dry inside of can and position the Micropack against its base.

Micropack   Adhesive Disk   Can
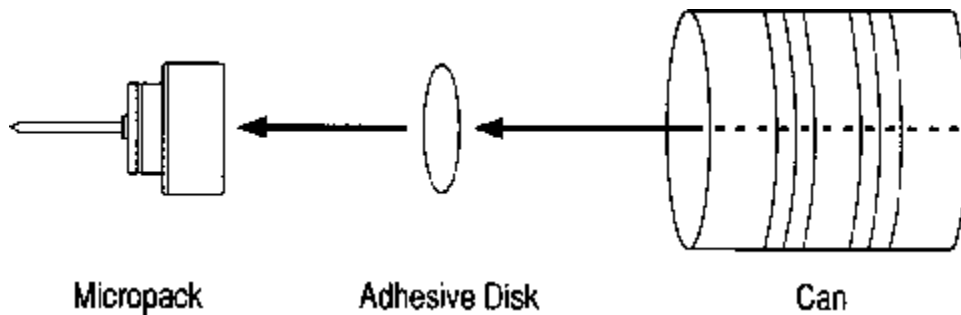
After Use:

1. Remove Micropack from inside of can by holding Tracer by its base and using a twisting motion.

2. Peel off used disk.

3. Use new disk for next application, making sure to repeat first 4 steps.

APPENDIX III

DataTrace® SALES AND TECHNICAL SUPPORT

To order or reorder any DataTrace® equipment, please contact your local DataTrace representative for prices and availability. The DataTrace® SYSTEM and its components evolve as new applications generate additional options. Your representative can explain these developments.

TO ORDER EQUIPMENT OR FOR TECHNICAL SUPPORT, CALL CUSTOMER SERVICE AT:

Mesa Laboratories, Inc.
DataTrace® Division
12100 West Sixth Avenue
Lakewood, Colorado 80228
TELEPHONE: 800-525-1215 (U.S.A. Only)
303-987-8000
FAX: 303-987-8989

INTERNET: www.mesalabs.com

For Technical Support, please have the following information available:

For Hardware problems:

- Tracer and/or PC Interface serial number(s).
- Type of PC, including model number.
- Peripheral equipment installed on computer.
- Description of failure and/or any error messages received.

For Software problems:

- DataTrace® for Windows software version number.
- Type of PC, including model number.
- Amount of RAM memory.
- Peripheral equipment installed on computer.

APPENDIX IV

HiTemp™ SYSTEM INSTRUCTIONS

THERMAL PACK ASSEMBLY:

Materials Needed

- HiTemp™ Tracer
- HiTemp™ Thermal Pack
- Silicon Grease (for Model 3000 TP only)

WARNING - Ensure all components of the HiTemp™ System are completely dry before the assembly procedure is started. Any moisture present on any component will become steam at temperatures above 212°F (100°C). Steam can cause severe burns or injury if vented during disassembly.

IMPORTANT - Before assembly, all parts of the HiTemp™ System must be inspected for any signs of wear or deterioration. Any parts showing deterioration or wear should be replaced. The O-ring (P/N: 124635-500) on the Stainless Steel Cap should be replaced when it appears to be nicked or cracked. (See next page.)

WARNING - DATATRACE® uses genuine SWAGELOK® tube fittings and ferrules on the probe sheaths of various HiTemp™ Thermal Packs. SWAGELOK® warns "Do not mix or interchange parts of tube fittings made by other manufacturers with SWAGELOK® tube fitting parts. Damage or injuries may result from interchanging or mixing of parts of tube fittings made by other manufacturers."

WARNING - No alkaline metals should come in contact with TEFLON under any circumstances. These alkaline metals include, but are not limited to, Lithium, Magnesium and Sodium. These metals REACT VIOLENTLY with TEFLON!!!

An alkaline metal will also react violently with water.

The following table will provide dwell time estimates of thermal protection for Tracers at various temperatures in a dry environment. These are for estimates only. Before using a Tracer in a specific high temperature application, contact the factory for verification of appropriate protection.

DATATRACE® HiTemp THERMAL BARRIER OPTIONS

THERMAL BARRIER	MODEL #	SIZE (D x L)	STYLE	ESTIMATED DWELL TIME AT TEMPERATURE (Minutes)		
				250°C	350°C	400°C
FRB/MPIII						
124633-500/502	3000	3 x 6	SS Canister, TEFLON	59	42	38
124670-514/714	3140	2 x 6	SS Dewar, TEFLON	109	77	68
124670-520/720	3200	2 x 8	SS Dewar, TEFLON	195	135	120
124670-540/740	3400	2 x 16	SS Dewar, TEFLON	380	240	205
124873-175	3175	1.182 x 7	SS Dewar, TEFLON	93	61	53
MPIII						
124876-500	3080	1.8 x 3.2 x 3.7	Aluminum, TEFLON (3 MPIII Tracers)	36	27	24

The Dwell Time listed above is an example and for estimation only. Contact factory for actual Thermal Barrier specification.

Estimated dwell time is based on a dry environment. Depending on application certain Thermal Barriers may require use of the stainless steel probe sheath (P/N 124631-xxx).

April 27, 2006

ASSEMBLY INSTRUCTIONS FOR THE MODEL 3000 THERMAL PACK

IMPORTANT - When tightening the SWAGELOK® fittings, DO NOT turn the fitting body, hold the body (with a wrench, if necessary) and turn the nut.

1. Refer to Figure B for HiTemp Assembly. Place the TEFLON Base inside the Stainless Steel Thermal Pack Case with the hollowed out section toward the top.
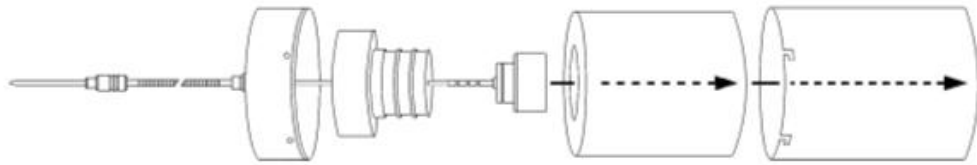
2. Position the programmed HiTemp Tracer into the TEFLON Base with Flexible Tracer tip extending out of the top of the TEFLON Base.

3. Insert the Tracer tip through the hole in the TEFLON Top and slide the TEFLON Top down the Flexible Tracer tip. Screw the TEFLON Top into the TEFLON Base until it seats completely. Care should be taken to ensure the TEFLON Top does not hang up on the metal edges on the Tracer cable.

4. Apply a thin film of silicon grease to the Stainless Steel Cap's O-ring and the adjacent metal with your finger tip. The silicon provides both lubrication and helps seal the Stainless Steel Cap and Case. Damage to the O-ring and other mating parts may occur if assembly is attempted without the silicon grease.

5. Thread the HiTemp Tracer tip into the Stainless Steel Cap assembly.

6. Seat the Stainless Steel Cap assembly onto the Stainless Steel Case, aligning the pins over the slots.

7. Firmly press straight down on the Cap assembly while holding the Base steady. A "click" will be heard and felt when the Cap is properly seated.

8. Turn clockwise to lock the Cap into place. If the Cap will not turn, it is not seated completely. Determine which pins have not seated, and press on the Cap firmly at that location. If the Cap continues to resist seating, additional silicone grease may be necessary around the O-Ring.

9. The HiTemp Tracer is now ready to be placed into the product/process.

IMPORTANT - Do not lift or carry the HiTemp package by the Probe assembly. This could severely damage the HiTemp Tracer. Carry the HiTemp package by supporting the Stainless Steel Case assembly.

ASSEMBLY INSTRUCTIONS FOR THE
MODEL 3080 MPIII THERMAL PACK

1. Refer to the diagram below for Model 3080 MPIII Thermal Barrier assembly.

2. Position the programmed HiTemp MPIII Tracers into the TEFLON Molded Base with Flexible Tracer tip extending out of the side of the TEFLON Molded Plate and the Aluminum Bottom case.

3. Place the case top over the Tracers, and when seated, screw the thumb screws until they engage the sides of the case base. They do not need to be tight.

IMPORTANT - Do not attempt to lift or carry the MPIII HiTemp package by the Probe assembly. This could cause severe damage to the HiTemp Tracers. Carry the HiTemp package by supporting the Aluminum Case assembly.

ASSEMBLY INSTRUCTIONS FOR MODEL 3140, 3175 (MPIII only), 3200, AND 3400 THERMAL PACKS

IMPORTANT - When tightening the SWAGELOK fittings, DO NOT turn the fitting body, hold the body (with a wrench, if necessary) and turn the nut.

1. Refer to the diagram below for HiTemp Assembly. Place the TEFLON Washer inside the Dewar Thermal Pack Case.
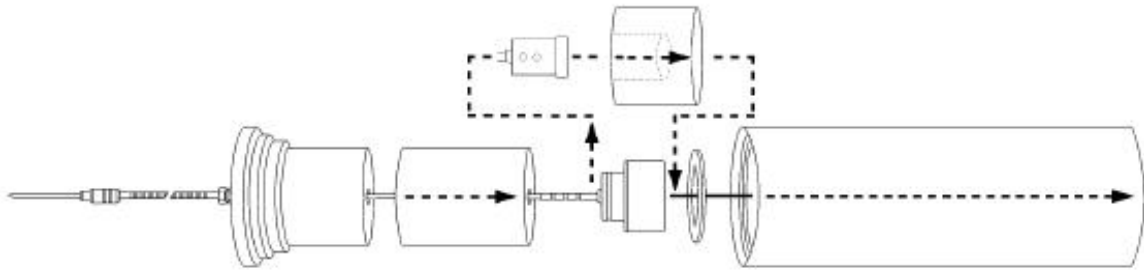
2. Position the programmed HiTemp Tracer on the TEFLON Washer with Flexible Tracer tip extending out of the top of the Dewar Thermal Pack Case. If using a MPIII HiTemp Tracer, position the Tracer inside the MPIII Adaptor TEFLON Cylinder (P/N 124837-170). This Adaptor fills the space taken up by the body of the MPII or FRB Tracer in Figure E.

3. Insert the Tracer tip through the hole in the TEFLON Cylinder(s) and carefully slide them down the Flexible Tracer tip. There are 1 to 3 TEFLON cylinders depending on the Model. Care should be taken to ensure the TEFLON Cylinder(s) do not hang up on the metal edges on the Tracer cable.

4. Thread the HiTemp Tracer tip into the Stainless Steel Cap assembly which includes an attached TEFLON cylinder.

5. Tighten the Stainless Steel Cap assembly onto the Dewar Case, by turning in a clockwise direction. Do not over tighten, finger tight is tight enough.

6. The HiTemp Tracer is now ready to be placed into the product/process.

IMPORTANT - Do not lift or carry the HiTemp package by the Probe assembly. This could severely damage the HiTemp Tracer. Support the HiTemp package by holding onto the Stainless Steel Case assembly when carrying.

THERMAL PACK DISASSEMBLY

Materials Needed

- Gloves

WARNING - All components will be hot following removal from the process and may retain that heat for extended periods of time. Use protective, insulated gloves to handle the HiTemp equipment. The Thermal Pack components may be hot and could cause severe burns to unprotected hands.

WARNING - Any moisture that may have been inside the HiTemp package when assembled will have turned to steam if the package was exposed to a temperature of 212°F (100°C) or higher. Extreme caution needs to be exercised during disassembly.

Any steam that may exist inside the HiTemp assembly may try to escape when any seal is released - Direct the probe away from your body to avoid the possibility of scalding.

IMPORTANT -Do not lift or carry the HiTemp package by the Probe assembly. This could severely damage the HiTemp Tracer. Support the HiTemp package by holding onto the stainless steel assembly when carrying.

DISASSEMBLY INSTRUCTIONS FOR THE
MODEL 3000 THERMAL PACK

1. Press down firmly on the Stainless Steel Cap and turn counter clockwise to unlock the Cap from the Case.

2. Carefully raise the Cap from the Stainless Steel Case slots while holding the Case and slide the Cap assembly off the Tracer flex tip. If the Cap resists removal, rock the Cap back and forth while lifting.

3. Slowly remove the TEFLON Top by unscrewing it from the TEFLON Base. Lift the TEFLON Top over the Tracer flex tip, being careful to avoid catching the TEFLON Top on the metal edge of the Tracer tip.

4. Remove the Tracer from the TEFLON Base and allow to cool for 10 - 15 minutes until it is comfortable to handle without gloves. Once cooled, the Tracer can be read in the PC Interface. Do not attempt to read a hot Tracer.

5. Remove the TEFLON Base from the Stainless Steel Case.

6. Allow the HiTemp Thermal Package components to cool completely before reassembling for another process run. This should be less than 15 minutes for the stainless steel components but up to 4 hours for the TEFLON components.

DISASSEMBLY INSTRUCTIONS FOR THE
MODEL 3080 MPIII THERMAL PACK

1. Carefully unscrew the thumb screws on either side of the aluminum case assembly until the two halves separate.

2. Remove the MPIII Tracers from the TEFLON Molded Plate and allow cooling for 10 - 15 minutes until they are comfortable to handle without gloves. Once cooled, the Tracers can be read in the PC Interface. Do not attempt to read a hot Tracer.

3. Allow the HiTemp MPIII Thermal Package components to cool completely before reassembling for another process run. This should be less than 15 minutes for the aluminum components but up to 4 hours for the TEFLON components. Do not submerge into a liquid to speed the process; liquid will damage the insulation.

DISASSEMBLY INSTRUCTIONS FOR THE MODEL 3140, 3175 (MPIII only), 3200, AND 3400 THERMAL PACKS

1. Grasp the Stainless Steel Cap and turn counter clockwise to remove the Cap from the Dewar.

2. Carefully raise the Cap while holding the Dewar Case and slide the Cap assembly off the Tracer flex tip.

3. Slowly remove the TEFLON Cylinder(s). There will be 1 to 3 cylinders depending on the Model of Thermal Pack used. Lift the TEFLON Cylinder(s) over the Tracer flex tip, being careful to avoid catching the TEFLON Cylinder(s) on the metal edge of the Tracer tip.

4. Remove the Tracer from the Dewar and allow cooling for 10 - 15 minutes until it is comfortable to handle without gloves. Once cooled, the Tracer can be read in the PC Interface. Do not attempt to read a hot Tracer.

5. Allow the HiTemp Thermal Package components to cool completely before reassembling for another process run. This should be less than 15 minutes for the stainless steel components but may be up to 4 hours for the TEFLON components.

APPENDIX V

CALIBRATION PROCEDURES

The following procedures provide instructions for performing field calibrations on DataTrace equipment. There are two types of calibrations that are possible. The first is for temperature in the Micropack III version temperature-only Tracers, and the second is for humidity in all Humidity Tracer versions.

Both procedures depend on a set of instruction screens to guide the user through the process. These screens present simple instructions to enter information and then the program automatically generates new field calibration coefficients for the target Tracer. The instruction sets for both the temperature-only and the humidity calibration procedure are very similar in order to avoid user confusion.

Normally, if the instructions are followed and the calibration environment is stable and appropriate there is no problem with the successful completion of the calibration procedure. However, if problems are encountered, you can abort the field calibration procedure at any time by clicking on Cancel.

Should you complete the field calibration procedure, and, for some reason, you are not satisfied with it, you can revert to the last factory calibration by pressing the "Reset Factory Calibration" button on the first Calibration Utility screen. The Reset Factory Calibration button removes any field calibration data from a Tracer and returns the Tracer to the last factory calibration. The button is active only if the current Tracer has been calibrated in the field. Otherwise, the button is dimmed. This procedure applies to both Temperature and Humidity Tracer field calibrations.

It is important to note that field calibration will invalidate the factory calibration certification (Report of Calibration) that was originally shipped with the Tracer. The best calibration results will be provided from a factory calibration.

TEMPERATURE CALIBRATION

The following instructions allow you to perform a temperature sensor recalibration on the DataTrace® Micropack III (MPIII) Tracer.

We recommend that a field calibration be performed on a Tracer **only** when you detect and verify a drift in it's temperature accuracy. Furthermore, there are some considerations related to the reference environment that must be adhered to. If these requirements can not be met in the field, it is best to return the Tracers to the factory for calibration and certification.

> 1) The minimum calibration dwell time in a **stable** environment is 20 minutes per point. This means that the bath or isothermal block must have attained the target temperature and stay at that temperature for at least 20 minutes at each point for an acceptable calibration to be performed.
>
> 2) The stability of the reference environment is critical to a good calibration. The field calibration requires 0.05°C environmental stability for the calibration to be completed successfully. The factory calibration stability is 0.003°C.

The DataTrace® Calibration Utility allows the user great flexibility with respect to selecting the appropriate calibration points to match the requirements of the application and also accommodate changing needs and capabilities in the future. Once the procedure is initiated, instructions must be followed explicitly to complete the calibration process successfully. However, you can abort the field calibration procedure at any time with no ill affect on the Tracer by clicking on Cancel.

The temperature calibration procedure is initiated from the Program Tracer window under the MAIN Tab of the DataTrace Control Panel. Select Calibrate Mode by clicking on that option. Calibrate Mode installs a special temperature field calibration program that is used to create, verify, and install new calibration coefficients into a temperature Tracer in either a One Point or a Two Point Calibration cycle. The calibration process starts when the Program button is pressed. However, the field calibration procedure's operator screens will not appear until the Tracer is retrieved from the reference environment and then read in the Calibration Utility.

A One or Two Point Calibration optimizes a Tracer to a particular process or application. In most cases it is best to perform a two point field temperature calibration. In a two point calibration plan for the lower target calibration temperature to be 10°C below the lowest process temperature and the higher temperature should be 10°C above the highest process temperature. As a rule of thumb, do not use a two point calibration where the range of interest is less than 75°C. For this small of a range, use a one point calibration where the critical target temperature value is defined to "focus" the calibration on that critical temperature. If a two point calibration with a range less than 20°C is attempted a Range Error will be generated and the calibration will be aborted.

Procedure for a One or Two Point Temperature Calibration

The procedure for a One or Two Point Calibration is virtually the same. The primary difference is that for a two point calibration you must be prepared to expose the target Tracer to two temperature environments during the process, and the Calibration Utility will request information on two references rather than just one. The appropriate steps are listed in the following section of this document.

1) Select the Calibrate Mode option on the Program Tracer screen. The temperature calibration procedure starts by automatically programming the Tracer with a special program called "CALBRATE". (Note the missing "i" in calibrate.) Press the Program button.

When initiated, a dialog box appears, stating that the calibration program has been loaded into the Tracer and that the Tracer must be placed into the appropriate reference environment(s). Do this as soon as possible as the Tracer starts taking readings once each minute beginning at the time it was programmed.

If a two point calibration is being performed, allow sufficient time to transfer the target Tracer between the two reference environments and/or to allow the first bath to stabilize at the second point.

Note that a calibration requires at least 20 minutes in a stable environment for each point. It is always best to error on the side of allowing too much time rather than too little.

2) Place the target Tracer into the selected calibration reference environment for the specified amount of time.

Please note the reference temperature value(s) used and the time when each target reference temperature is attained and is stable. It is a good idea to write these values down so they are not forgotten.

Retrieve the target Tracer from the reference environment after the required minimum stabilization time. Prepare to read the Tracer.

3) Go to the UTILITIES Tab of the DataTrace Control Panel, and then click the Calibration Utility button. Place the Tracer in the PC Interface and press the Read Tracer button.

4) On the Calibration Information screen, select the type of field calibration, either a One Point or a Two Point. Select either the One Point or the Two Point option.

5) You will note two text boxes titled "When the Tracer's X reading was:" which include a listing of the data collected during the field calibration run. Depending on your previous entry defining the number of points, either the first or both text boxes will contain entries.

Skip down to the next text box(es) titled "It should have read:" and enter the reference value(s) from the environment(s) that you placed the Tracer into.

124

6) Now select from the data listing in the first text box the temperature value that is closest to the time that the Reference value(s) entered above were determined. Click on that value to highlight it. If this is a two point field calibration, do the same for the second point.

7) Drop down to the last text box(es) and enter the references' identifying Lot # or Certification #. This data is used to document the calibration and will be stored in the Calibration History log located under the REPORTS Tab of the DataTrace Control Panel. Click Next.

8) On the second screen a summary appears that displays the results of the field calibration procedure. The first value is the reference that the field calibration was performed in. The second item in the list is the value that you selected as the most appropriate value from the Tracer's collected data. Next, the difference between the first two values is calculated and displayed. The Corrected Value is the new value following the field calibration. Lastly, the value that the last factory calibration would have reported is displayed. All of this information is also logged into the Calibration History log under the REPORTS Tab.

9) On the Finish screen of the field calibration procedure, you may enter any comments you would like in the space provided. The program enters the Operator's Name automatically for documentation purposes. You may edit this if you wish.

You can also elect to have a calibration report generated for this Tracer. This report displays a summary of this Tracer's field calibration procedure; it is not the same as the Report of Calibration supplied following a factory calibration.

1. A Report of Calibration can be generated by checking the Print Report of Calibration box. The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under

   C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

2. The temperature field calibration procedure is now complete. Press Finish. A calibration complete message will appear, press OK. Please note the warning about removing the Tracer from the PC Interface before pressing the Finish button. The field calibration procedure is not complete until the Finish button is pressed and the Calibration Complete message appears.

If, for some reason the completed field calibration needs to be removed, you can restore the last factory calibration by placing the Tracer in the PC Interface and then start the Calibration Utility. At the bottom of the first calibration screen there is a Restore Factory Calibration button. When this button is clicked, the field calibration is removed and the last factory calibration is restored.

HUMIDITY CALIBRATION

The following instructions allow you to perform a sensor field calibration on the DataTrace® Humidity Tracer. The procedure does not provide for calibrating temperature or pressure Tracers or the temperature sensor of humidity Tracers.

We recommend that a field calibration be performed on a Tracer **only** when you detect and verify a drift in its humidity accuracy or when a humidity sensor needs to be replaced. Accuracy drift rate and sensor life expectancy are process related.

The DataTrace® Calibration Utility allows the user great flexibility with respect to selecting the appropriate procedure to match the requirements of the application and also accommodate changing needs and capabilities in the future. However, once a procedure is initiated, instructions must be followed explicitly to complete the calibration process successfully. Each procedure has advantages and disadvantages based on cost, time, and complexity. Therefore, it is incumbent on the user to select carefully the procedure to be implemented.

There are three elements that can help define the appropriate procedure:

- **Sensor Status** (Existing Humidity Sensor, New Humidity Sensor)

  Sensor Status is defined by whether you are field calibrating an existing humidity sensor or calibrating a new, replacement humidity sensor.

- **Reference Environment** (Salt Solutions, Humidity Generator)

  Reference Environment is defined by the reference standards and/or equipment you have available to perform the calibration process. Remember that a calibration can be no more accurate than the reference environment; use the best available references to obtain the best possible calibration.

- **Calibration Process** (One Point, Two Point, or New Sensor Calibration)

  Calibration Process is defined by the application and the level of accuracy the application requires. One and Two Point Calibrations optimize the humidity sensor for use in a particular application, while a New Sensor Calibration is a special calibration to optimize a new humidity sensor to the Tracer's hardware.

Decide which Reference Environment and Calibration Procedure is right for you given the Sensor Status, available equipment, time, and required accuracy. The best possible calibration will require using not only the target humidity of the process but also the target temperature of the process. If it is not possible to calibrate at or near the process temperature, you should, at the very least, ensure that the temperature remains stable during the entire field calibration.

PLEASE NOTE THAT UNDER NO CIRCUMSTANCES SHOULD A HUMIDITY SENSOR THAT WAS CALIBRATED IN ONE HUMIDITY TRACER BE MOVED TO ANOTHER HUMIDITY TRACER!!

THE HUMIDITY CALIBRATION PROCESS WILL MOST LIKELY FAIL!!

The humidity calibration procedure is initiated from the Program Tracer window under the MAIN Tab of the DataTrace Control Panel. Select Calibrate Mode by clicking on that option. Calibrate Mode installs a special humidity field calibration program that is used to create, verify, and install new calibration coefficients into a humidity Tracer in either a One Point or a Two Point Calibration cycle. It also provides the field calibration for a replacement humidity sensor. The calibration process starts when the Program button is pressed. However, the field calibration procedure's operator screens will not appear until the Tracer is retrieved from the reference environment and then read in the UTILITIES|Calibration Utility.

CALIBRATION OF AN EXISTING HUMIDITY SENSOR:

A One or Two Point Calibration optimizes a Tracer to a particular process or application. A target humidity value (One Point) or a range (Two Point) is defined by the user on which to "focus" the calibration. If the critical humidity range of the process is ± 10% rH, a One Point Calibration would be adequate. A wider process range would suggest a Two Point Calibration may be best.

When a One Point Calibration is used, a reference humidity value should be selected very close to the "most important" humidity value in the process. When a Two Point Calibration is used, the reference humidity values should bracket the complete process humidity range. Humidity reference values can be obtained from either salt solutions or a humidity generator.

A reference guideline for future calibrations would suggest that if accuracy drifts is detected that is consistently high or consistently low over the range, use a One Point Calibration. Use the Two Point Calibration if an accuracy drift varies over the range.

Note that if a humidity generator is to be used, turn it on, set the appropriate humidity value, and allow it to stabilize before you start the calibration procedure. If your humidity generator allows a temperature to be set, use a temperature close to your process temperature for best accuracy.

Procedure for a One or Two Point Calibration - Existing Sensor

The procedure for a One or Two Point Calibration is virtually the same. These steps are listed in the following section of this document. The differences between the One and Two Point process are indicated in the following procedures.

1) Select the Calibrate Mode option on the Program Tracer screen. The humidity calibration procedure starts by automatically programming the Tracer with a special program called "CALBRATE". (Note the missing "i" in calibrate.) You can also just create a program normally with a one (1) minute Sample Interval and accomplish the same thing as the "CALBRATE" program. Press the Program button.

2) When initiated, a dialog box appears, stating that the calibration program has been loaded into the target Tracer and that the Tracer must be placed into the appropriate reference environment(s). Do this as soon as possible as the Tracer starts taking readings once each minute beginning at the time it was programmed.

   Note the different time requirements for each type of calibration reference environment. For Salt Solutions this is a minimum of 170 minutes. For a humidity generator it is at least 30 minutes, depending on the generator's capabilities. Remember that these are **minimum** time periods. Depending on the ambient environment, it may take longer to attain stability. For example, it is not uncommon for a much longer period of time to be necessary for stabilization to be achieved at a lower-than-ambient humidity level than it does when you calibrate at a higher humidity level. It is always best to error on the side of allowing too much time.

   Please note the reference humidity value(s) to be used, the documentary information (such as Lot #, supplier, etc.) for the reference(s), the current computer time, and the minimum time requirement for stability. It is a good idea to write these values down so they are not forgotten. Press OK to continue the calibration process.

3) Place the target Tracer into the selected calibration reference environment(s) for the specified amount of time. The temperature during the calibration procedure should be as stable as possible. Fluctuating temperatures will cause errors in the calibration.

   Retrieve the target Humidity Tracer from the reference environment after the required stabilization time. If this is to be a two point field calibration, place the Tracer in the second environment. After final Tracer retrieval, prepare to read the Tracer.

4) Go to the UTILITIES Tab of the DataTrace Control Panel, click on the Calibration Utility button. When the Calibration Information screen appears, place the Humidity Tracer in the PC Interface and press the Read Tracer button.

5) On the Calibration Information screen, select the type of field calibration, a Single Point, a Two Point, or a Sensor Replacement. Select either the One Point or the Two Point option. The 2 SR option is a special procedure that is used when a humidity sensor replacement is required.

6) You will note two text boxes titled "When the Tracer's X reading was:" which include a listing of the data collected during the field calibration run. Depending on your previous entry defining the number of points, either the first or both text boxes will contain entries.

   Skip down to the next text box(es) titled "It should have read:" and enter the reference value(s) from the environment(s) that you placed the Tracer into.

7) Now select from the data listing in the first text box the value that appears to demonstrate stability closest to the reference value entered. Click on that value to highlight it. Be sure that the value selected is near the middle of this stable range. If this is a two point field calibration, do the same for the second point.

8) Drop down to the last text box(es) and enter the references' identifying Lot # or Certification #. This data is used to document the calibration and will be stored in the Calibration History log located under the REPORTS Tab of the DataTrace Control Panel. Click Next.

130

9) On the second screen a summary appears that displays the results of the field calibration procedure. The first value is the reference that the field calibration was performed in. The second item in the list is the value that you selected as the most appropriate value from the Tracer's collected data. Next, the difference between the first two values is calculated and displayed. The Corrected Value is the new value following the field calibration. Lastly, the value that the last factory calibration would have reported is displayed. All of this information is also logged into the Calibration History log under the REPORTS Tab.

10) On the Finish screen of the field calibration procedure, you may enter any comments you would like in the space provided. The program enters the Operator's Name automatically for documentation purposes. You may edit this if you wish.

You can also elect to have a calibration report generated for this Tracer. This report displays a summary of this Tracer's field calibration procedure; it is not the same as the Report of Calibration supplied following a factory calibration.

a. A Report of Calibration can be generated by checking the Print Report of Calibration box. The print out is converted automatically to a PDF file and displayed in Adobe Reader. Click the print icon and then the OK button on the print screen to print the report. The report is also automatically saved under:

C:\Documents and Settings\All Users\Application Data\DATATRACE\Reports\.

b. The field calibration procedure is now complete. Press Finish. A calibration complete message will appear, press OK. Please note the warning about removing the Tracer from the PC Interface before pressing the Finish button. The field calibration procedure is not complete until the Finish button is pressed and the Calibration Complete message appears.

If, for some reason the completed field calibration needs to be removed, you can restore the last factory calibration by placing the Tracer in the PC Interface and then start the Calibration Utility. At the bottom of the first calibration screen there is a Restore Factory Calibration button. When this button is clicked, the field calibration is removed and the last factory calibration is restored.

CALIBRATION OF A NEW HUMIDITY SENSOR:

While the physical replacement of a Humidity Sensor is simple, there are a number of important considerations of which you should be aware. The following instructions should be followed when the replacement of a humidity sensor is required.

DO NOT ALLOW THE HUMIDITY SENSOR TO BE CONTAMINATED BY DIRT, DUST, FINGER OILS, SALTS, OR LIQUIDS AS IT COULD DAMAGE THE SENSOR AND/OR IT'S CALIBRATION.

WE RECOMMEND THAT POWDER-FREE, LATEX SURGICAL GLOVES ARE WORN AFTER THE SENSOR COVER IS REMOVED TO AVOID SENSOR CONTAMINATION.

1) The new Humidity sensors are shipped with a cover to protect the sensor from mechanical shocks and contamination. Do not remove the cover until instructed to do so.

2) Unscrew the Tracer probe cover and gently remove the old humidity sensor. Avoid unnecessary contact with the temperature sensor (green bead) at the base of the humidity sensor.

3) On the new humidity sensor, partially remove sensor cover until the lead connections are visible. Do not completely remove the sensor cover.

4) Carefully insert the humidity sensor leads into the open sensor sockets from which the old sensor was removed.

5) Carefully remove the sensor cover.

6) Seat the sensor completely with gentle pressure on the top edge. Do not force the sensor as damage may result.

7) Reinstall Tracer probe cover.

The humidity sensor replacement is now complete. You may now calibrate the new sensor if desired. For many applications additional calibration may not be necessary.

When a new humidity sensor is installed, a special calibration is needed to configure and optimize the new sensor to the Tracer's hardware. The reference values for this special calibration should be a wide range, even if the target process does not require a wide range. The reference values used in this calibration process should be less than 45% rH for the low point and greater than 80% rH for the high point. Ideal new sensor calibration values would be 30% rH and 90% rH. Humidity reference values can be obtained from either salt solutions or a humidity generator.

The calibration procedure for a new humidity sensor is identical to that of the Two Point field calibration for an existing sensor described above. Instead of selecting the 2 point option on the Calibration Information screen, select the 2 SR option. Everything else is the same.

APPENDIX VI

FIELD REPLACEABLE BATTERY PROCEDURES

The Field Replaceable Battery for Micropack Tracers allows the user to change the Lithium battery of the unit without the necessity of sending the Tracer to the factory.

This section describes the disassembly, battery installation, and reassembly for the Micropack. Also included, is a "QUICK-START" procedure which can be used by experienced users as a quick review of the detailed procedures.

While the procedures for changing the battery are simple and straight forward, adherence to these procedures is necessary to protect the Tracer from damage.

Please note that replacement of the battery does not automatically recalibrate the Tracer. Normal calibration procedures should be instituted to have each Tracer factory calibrated at least once each year or in conformance with your in-house procedures.

CAUTION:

Caution needs to be paid to the handling, storage, and disposal procedures of Lithium batteries. The appropriate procedures are described in this document. Follow these instructions completely. Variations to this procedure could damage the battery, or DataTrace® equipment, and/or cause operator injury. Note carefully the battery warning labels on the batteries or battery trays and disposal of spent batteries must comply with local regulations.

NOTE:

The batteries used in the DataTrace® equipment are specially designed for this application. USE ONLY BATTERIES SUPPLIED BY DataTrace®. Trying to use any other lithium battery will void the DataTrace® equipment warranty and could damage DataTrace® equipment.

MICROPACK III QUICK-START BATTERY CHANGE:

Use this "Quick-Start" procedure if you are already familiar with the battery changing procedure for MPIII. While the fundamentals are reviewed here, it is strongly recommended that you read the entire procedure in this document before attempting to change a battery or disassemble and reassemble your Tracers for the first time. Refer to Figure 1.

1. Starting with a clean and dry Tracer, loosen the battery cover with the Tracer Grippers by twisting the cover counterclockwise using the silicone gripper supplied in the Maintenance Kit and a coin, if necessary.

2. Lift off the battery cover.

3. Remove the old battery by turning the Tracer over until the old battery falls out. Dispose of the battery appropriately per local regulations.

4. Examine the battery compartment and threads, and make sure that the springs located in the cover and inside the battery compartment are in place. If one of the springs has fallen out, reinsert it.

5. Remove and discard the old O-ring. Clean the O-Ring groove with a clean, lint-free cloth, verify that both springs are in place, and check for any damaged components before reassembly. If damage is detected or contamination is noted, return the Tracer to the factory for repair.

6. Place a fresh battery in the battery compartment, taking care to put the "**+**" side of the battery up.

7. Apply silicone grease to a new O-ring and place in the O-Ring groove.

8. Install the battery cover by rotating it in a clockwise direction. Use the gripper and a coin in the cover groove, if necessary. Tighten the cover until snug. Wipe away any excess silicone grease that may have been pressed out during closure.

9. **Wait 20 seconds then perform the Test Tracer procedure to assure the battery is functioning properly, the electronics are reset correctly, and the Tracer is initialized. During the process you will be requested to supply the date that the battery was changed. Answer "Yes" and today's date will be automatically entered.**

Your Tracer is now ready for continued use.

DETAILED MPIII BATTERY REPLACEMENT PROCEDURES:

Materials Needed

- DataTrace® Micropack III Tracer(s)
- Lithium Battery(ies)
- O-Ring(s)
- Tracer Gripper
- A Supply of Clean, Dry Cloths

Battery replacement in the Micropack III is a simple and straight forward procedure. However, care must be taken that these procedures are followed completely to avoid equipment damage or personal injury. Refer to Figure 1.

We recommend that battery replacement for the MPIII Tracers take place in a dry, well-lit workstation. The best place for this activity would be close to the location that Tracers are stored and programmed and that Tracer batteries are stored.

DO NOT USE ANY WRENCHES, PLIERS, VICES, OR ANY OTHER MECHANICAL MEANS TO LOOSEN OR UNSCREW THE TRACER BATTERY COVER. THE TRACER GRIPPER AND A COIN PLACED IN THE MPIII COVER GROOVE IS ADEQUATE TO OPEN AND CLOSE THE BATTERY COMPARTMENT. USING ANY OTHER DEVICE MAY DAMAGE THE TRACER AND MAY MAKE REASSEMBLY IMPOSSIBLE.
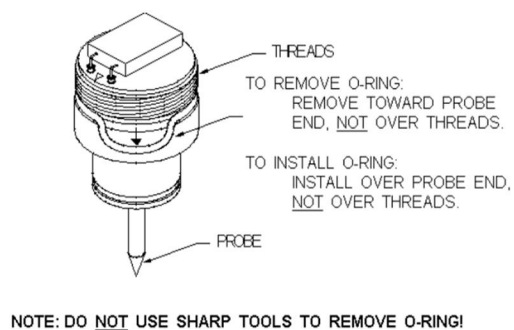
1. Clean and dry the Tracer body completely. Make sure no process residue remains on the Tracer body that could cause the Tracer to slip from the your grasp during the battery change procedure or could contaminate the battery compartment during battery replacement.

2. Grasp the Tracer with the Tracer Gripper in one hand, clasping the base (probe end) firmly. With your other hand, twist the battery cover counterclockwise. Use a coin in the cover's slot, if necessary.

3. Once loosened, remove the Gripper and the battery cover will unscrew easily.

4. Remove the old battery by turning the case over until it falls out.

5. Dispose of the battery appropriately per local regulations. DO NOT TRY TO RECHARGE, DISASSEMBLE, OR INCINERATE THE BATTERY.

6. Examine the battery compartment for any signs of contamination, and make sure that the springs located in the cover and inside the battery compartment are in place. If one of the springs has fallen out, reinsert it.

7. Examine the threads of both the battery cover and Tracer body for damage and cleanliness. If the threads show any damage (e.g., cross threading or "burrs"), do not continue with this procedure. Loosely reassemble the Tracer and return it to the factory for repair.

8. If damage is detected or contamination is noted, return the Tracer to the factory for repair.

9. Remove the old O-Ring. DO NOT USE O-RINGS THAT APPEAR DAMAGED. LEAKS COULD RESULT THAT MIGHT DAMAGE THE TRACER AND/OR SHORTEN BATTERY LIFE.

Figure 1
Exploded View of Micropack III Tracer
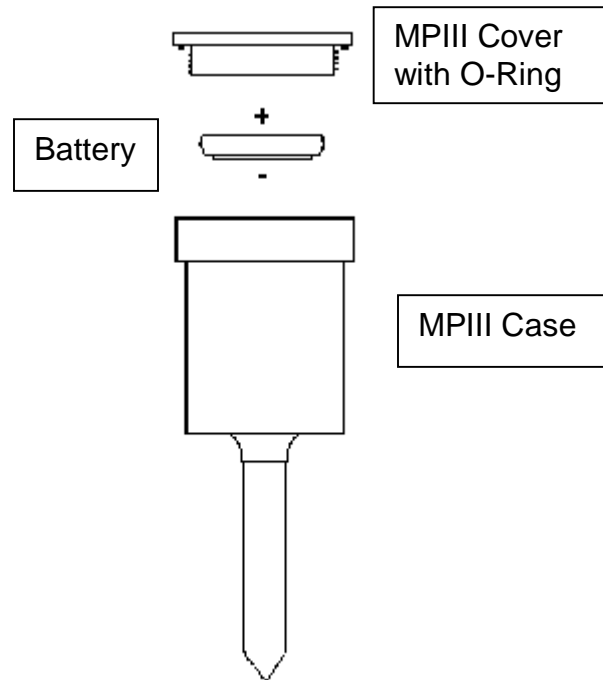
10. Clean any residue and grease from the threads and adjacent areas including the O-Ring groove on the Tracer body with a clean, lint-free cloth.

You are now ready to reassemble the Tracer with a new battery. We strongly recommended that you do **NOT** leave Tracers unassembled. Damage to components could occur making your Tracers unusable.

11. Obtain a fresh battery from the battery tray. Do not remove more batteries than you need.

12. Hold the battery + side up in the palm of your hand and place the battery cover over the battery, then, while holding the battery in place, turn this assembly over to access the threads.

Your battery installation is now complete. All that remains for you to do is reassemble the Tracer. The reassembly procedure, if followed completely, will seal the battery compartment, maintaining the waterproof and pressure-tight seal, as well as the intrinsically safe rating. **Always replace the O-ring when the Tracer battery compartment has been opened**.

13. Before you replace the O-Ring, apply a thin coat of silicone vacuum grease (in the Maintenance Kit) to the O-Ring.

   - Use a **very small** amount of grease on your thumb and index finger.

   - Place the O-Ring between these two fingers and gently pull the O-Ring through the grease until a light coating of grease completely covers the surface of the O-Ring.

14. Carefully place the O-Ring in the groove on the cap, centering it in the O-Ring groove.

15. Place the Tracer body squarely over the battery cover threads. Begin to screw the cover in a clockwise direction. Be careful to not cross thread the cover on the Tracer body threads. The cover should screw on smoothly and easily until the O-Ring becomes engaged.

16. Grasp your Tracer in one hand, clasping the base (probe end) firmly. With your other hand, twist the battery cover clockwise until resistance is felt. A coin can be used in the cover's groove to complete the tightening procedure.

   Never tighten the battery cover more than finger tight. Never use anything to hold the Tracer Case except the Tracer Gripper. Over tightening can cause damage to your Tracer cover threads resulting in possible leakage which may damage your Tracer. The design of the Tracer seal is not dependent on high torque to provide an effective seal.

17. With a clean, dry cloth, wipe away any excess Silicone Vacuum Grease that may have been pressed out during closure. Silicone can become extremely slippery in combination with water and could cause the Tracer to slip from your hand and be damaged.

18. Wait approximately 20 seconds after the Tracer is reassembled with a new battery before trying to communicate with the Tracer. This allows the circuitry to "re-boot" following the battery change.

The reassembly process is now complete and your Tracer(s) is ready for use in your process.

Following reassembly, <u>always</u> perform the Test Tracer procedure. This will assure that the battery is functioning properly, the electronics are reset correctly, and the Tracer is initialized. During the Test Tracer procedure, you will be requested to supply the date that the battery was changed. Answer "Yes", then today's date will be entered automatically.

If the Test Tracer procedure fails, remove the battery for 20 seconds, reinstall the same battery in the Tracer. Wait 20 seconds then perform the Test Tracer procedure again. Should the procedure fail a second time, remove the battery and replace it with a new one. Perform the Test Tracer procedure again. If it fails a third time, return the Tracer to the factory for service.

DETAILED FRB MICROPACK BATTERY REPLACEMENT PROCEDURE:

Materials Needed

- DataTrace® Micropack Tracer FRB Model(s)
- Lithium Battery(ies)
- Maintenance Kit
- Tracer Grippers
- A Supply of Clean, Dry Cloths

Disassembly of the FRB model Micropack for battery change is a simple and straight forward procedure. However, care must be taken that these procedures are followed completely to avoid equipment damage or personal injury. Refer to Figure 2.

We recommend that the disassembly of the DataTrace® Tracers take place in a dry, well-lit workstation. The best place for this activity would be close to the location that Tracers are stored and programmed and that Tracer batteries are stored and conditioned.

DO NOT USE ANY WRENCHES, PLIERS, VICES, OR ANY OTHER MECHANICAL MEANS TO LOOSEN OR UNSCREW THE TRACER BATTERY COVER. THE TRACER GRIPPER IS ADEQUATE TO OPEN THE BATTERY COMPARTMENT. USING ANY OTHER DEVICE MAY DAMAGE THE TRACER AND MAY MAKE REASSEMBLY IMPOSSIBLE.

1. Clean and dry the Tracer body completely. Make sure no process residue remains on the Tracer body that could cause the Tracer to slip from your grasp during disassembly or could contaminate the battery compartment during battery replacement.

2. Grasp the Tracer with the Tracer Gripper in one hand, clasping the base (probe end) firmly. With your other hand, using the other Gripper, twist the battery cover counterclockwise.

3. Once loosened, remove the Grippers and the battery cover will unscrew easily.

4. Remove the old battery by lifting straight out. Do not twist or turn the battery while removing.

5. Dispose of the battery appropriately per local regulations. DO NOT TRY TO RECHARGE, DISASSEMBLE, OR INCINERATE THE BATTERY.

6. Examine the battery compartment for any signs of contamination, pay particular attention to the battery socket area. If any contamination is found, remove it, and clean the area with a dry cloth.

7. Examine the threads of both the battery cover and Tracer body for damage and cleanliness. If the threads show any damage (e.g., cross threading or "burrs"), do not continue with this procedure. Loosely reassemble the Tracer and return it to the factory for repair.

Figure 2
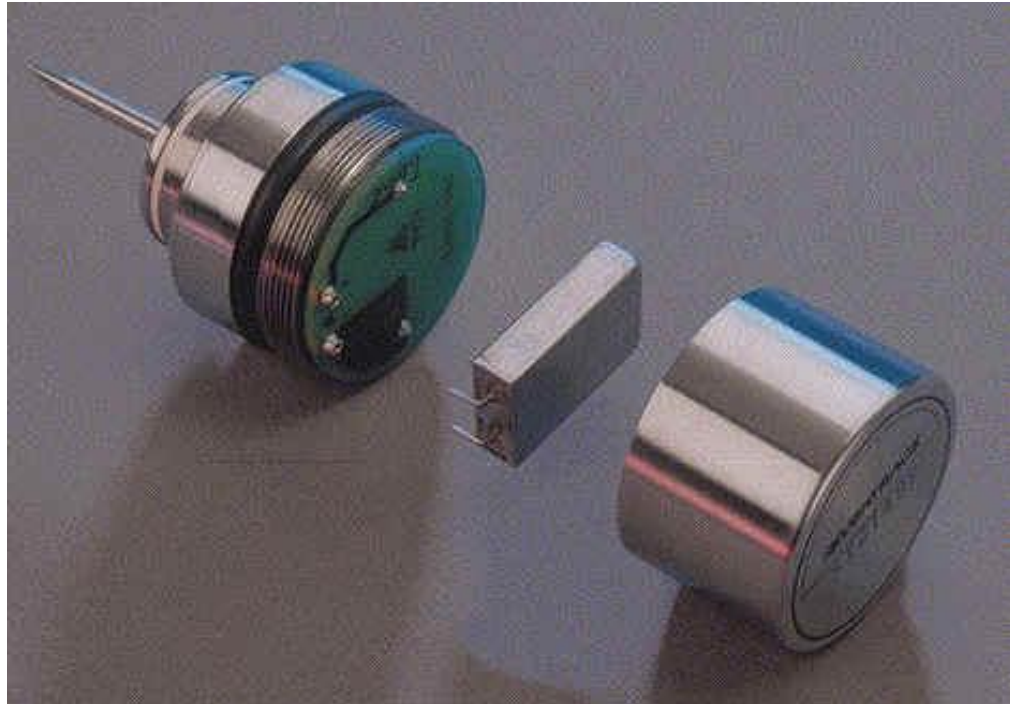
8. Remove the old O-Ring. Refer to Figure 3. DO NOT USE O-RINGS THAT APPEAR DAMAGED. LEAKS COULD RESULT THAT MIGHT DAMAGE THE TRACER AND/OR SHORTEN BATTERY LIFE.

Figure 3
FRB O-Ring Removal and Installation

THREADS
TO REMOVE O-RING:
     REMOVE TOWARD PROBE
     END, NOT OVER THREADS.

TO INSTALL O-RING:
     INSTALL OVER PROBE END,
     NOT OVER THREADS.

PROBE

NOTE: DO NOT USE SHARP TOOLS TO REMOVE O-RING!

9. Clean any residue and grease from the threads and adjacent areas including the O-Ring groove on the Tracer body with a clean, lint-free cloth.

You are now ready to reassemble the Tracer with a new battery.

We strongly recommended that you do **NOT** leave Tracers unassembled. Damage to components could occur making your Tracers unusable.

141

Battery installation and assembly of the FRB model Micropack after battery change is simple and straightforward. However, care must be taken that the procedure is followed completely to avoid equipment damage.

DO NOT USE ANY WRENCHES, PLIERS, VICES, OR ANY OTHER MECHANICAL MEANS TO SCREW ON OR TIGHTEN THE TRACER BATTERY COVER. THE TRACER GRIPPER IS ADEQUATE TO CLOSE AND SEAL THE BATTERY COMPARTMENT IF ALL PROCEDURES ARE FOLLOWED. USING ANY OTHER DEVICE MAY DAMAGE THE TRACER AND MAY MAKE IT UNUSABLE.

1. Obtain a fresh, conditioned battery. (See conditioning procedure in the next section.) Verify that the temperature range of the FRB Tracer and battery you plan to install are matched. Standard Temp batteries are rectangular and can be used in FRB Tracers with a **WHITE** or **RED** ring. LoTemp batteries are disk-shaped and should only be used in Tracers with a **BLUE** ring.

NOTE:

Standard Temp batteries (rectangular) and LoTemp batteries (round) have different pin configurations. The FRB Tracer sockets for Standard Temp and LoTemp Tracers are designed to accommodate only the appropriate batteries. So mixing up batteries and sockets is unlikely.

2. Holding the Tracer in one hand and the battery in the other, align the battery pins in the sockets on the Tracer.

3. Press the battery into the sockets until seated. This does not take much pressure. Do not twist or turn the battery as it is installed, as damage to the battery pins or Tracer sockets could result.

Your battery installation is now complete. All that remains for you to do is reassemble the Tracer. The reassembly procedure, if followed completely, will seal the battery compartment, maintaining the waterproof and pressure-tight seal, as well as the intrinsically safe rating. **Always replace the O-ring when the Tracer battery compartment has been opened**.

1. Before you replace the O-Ring, apply a thin coat of silicone vacuum grease (in Maintenance Kit) to the O-Ring.

   - Use a **very small** amount of grease on your thumb and index finger.

   - Place the O-Ring between these two fingers and gently pull the O-Ring through the grease until a light coating of grease completely covers the surface of the O-Ring.

2. Carefully place the O-Ring in the O-Ring groove at the bottom of the Tracer body threads. Refer to Figure 3. Avoid dragging the O-Ring across the threads, they could cut or nick the O-Ring, compromising it's sealing capability.

   The best method of O-Ring installation is to start from the probe side and place one part of the O-Ring in the O-Ring groove. **Slightly** stretch the O-

Ring with your fingers to position it completely over the O-Ring groove, and then release it.

DO NOT STRETCH THE O-RING ANY MORE THAN NECESSARY. DO NOT DEFORM THE O-RING.

3. When the O-Ring is seated in the O-Ring groove, use the O-Ring Tool from the O-Ring Kit to make sure it is not twisted or has become damaged during installation. Do not use any sharp tools with O-Rings.

4. Place the battery cover squarely over the Tracer body threads. Begin to screw the cover in a clockwise direction. Be careful to not cross thread the cover on the Tracer body threads. The cover should screw on smoothly and easily until the O-Ring becomes engaged.

5. Grasp your Tracer in one hand, clasping the base (probe end) firmly. With your other hand, twist the battery cover clockwise until the O-Ring seems to disappear.

    Never tighten the battery cover more than finger tight. Never use anything to tighten the Tracer Battery Cover except the Tracer Gripper. Over tightening can cause damage to your Tracer cover threads resulting in possible leakage which may damage your Tracer. The design of the Tracer seal is not dependent on high torque to provide an effective seal.

6. With a clean, dry cloth, wipe away any excess Silicone Vacuum Grease that may have been pressed out during closure. Silicone can become extremely slippery in combination with water and could cause the Tracer to slip from your hand and be damaged.

The reassembly process is now complete and your Tracer(s) is now ready for use in your process.

Following reassembly, <u>always</u> perform the Test Tracer procedure. This will assure that the battery is functioning properly, the electronics are reset correctly, and the Tracer is initialized.

FRB MICROPACK BATTERY PRECONDITIONING:

Materials Needed

- DataTrace® Modified Battery Clip Connectors
- Lithium Battery(ies)

Battery conditioning is a simple, straightforward procedure. We recommend that conditioning of DataTrace® Batteries take place at a dry, well-lit workstation, just prior to installation in your Tracer. The best place for this activity would be close to the location that Tracers are stored and programmed, Tracer batteries are replaced, and Tracers are assembled and disassembled.

Each set of DataTrace® Modified Battery Clip Connectors can prepare one battery at a time for installation into your Tracers. It is best to have as many Battery Clip Connectors available for the conditioning process as the number of batteries needed for replacement.

Batteries should be installed into Tracers within eight (8) hours of the conditioning procedure. Prepare only enough batteries for the current session of battery replacements.

Remember that replacement of the battery does not automatically recalibrate the Tracer. Normal calibration procedures should be instituted to have each Tracer factory calibrated at least once each year or in conformance with your in-house procedures.

NOTE:

The batteries used in the DataTrace® equipment are specially designed for this application. USE ONLY BATTERIES SUPPLIED BY DataTrace®. Using any other lithium battery will void the DataTrace® equipment warranty and could damage DataTrace® equipment.

We recommend that you do not try to condition batteries at the same time you are disassembling and reassembling your Tracers. It is very easy to confuse old batteries with new ones and you might reinstall an old battery into your Tracer by mistake.

1. Clear an area at your workstation to accommodate your DataTrace® Batteries you will need to prepare. Do not take any more batteries from their container than you intend to use at this session.

   Do not allow the battery pins of one battery to contact those of another. This will cause a short which could damage the battery.

2. Connect the Battery Clip Connectors to the battery terminals as indicated in Figure 4. It makes no difference which connector is attached to which of the indicated terminals.

3. The normal conditioning process takes 3 to 3.5 minutes. Allow the battery to lie undisturbed during this period.

4. Remove the Battery Clip Connectors from each battery and allow the battery to "sit" for approximately one (1) minute before installation into a Tracer.

The batteries are now ready for installation into your Tracers.

APPENDIX VII

DataTrace® DATA SECURITY

DataTrace® for Windows (DTW) can be installed with security capabilities that include password protection, data encryption, and audit trail. When enabled, access to various program functions can be strictly controlled. In addition, the program can enable "Electronic Signature" capabilities for compliance with USFDA's 21 CFR Part 11.

DO NOT USE A SECURITY LEVEL THAT IS NOT REQUIRED BY GOVERNMENT REGULATION OR CORPORATE REQUIREMENTS!

The level of password protection is determined during program installation and can not be modified when the installation is complete. If you do not wish to install DTW with enhanced security, when the Security Selection window appears during the installation procedure, make sure that "None" is selected and click OK to complete the installation of DataTrace® for Windows without enhanced security.

For the two levels of enhanced security available for DTW: "Simple" and "Complete", the Administrator of the system should make the initial installation of the DTW program. The Administrator should assign passwords and authorization levels and is responsible for system security. There are three levels of security: "None", "Simple", and "Complete".

> **None** allows the user or users to access all functions of the program without restriction and bypasses most of the cryptographic features of the program. DataTrace® for Windows provides a sophisticated verification of data integrity (SHA-1 algorithm) each and every time you collect and retrieve data. This level is adequate and appropriate for most users of the DataTrace system.

> **Simple** security, in addition to the SHA-1 algorithm, requires that the user login in order to access the program. Each user is then assigned one of three possible authorization levels: "Data Only", "Data and Utilities", or "Administrator". These authorization levels allow access only to those function levels of the program that the user has been approved for. This security level does not implement data signing necessary to meet USFDA's 21 CFR Part 11.

> **Complete** security complies with USFDA's 21 CFR Part 11 and, in addition to the password protection provided with Simple Security, provides for "Electronic Signatures" and an audit trail of user activities within the program. While the Audit Trail is required for 21 CFR Part 11 compliance, we include the Audit Trail logging with all levels of security.

As mentioned above, during installation, the level of security is selected. In either of the secure levels, it is imperative the user remember their User ID and Password. There is no salvation for a lost password. This is a requirement for the various US Government security systems.

The following provides an overview of the procedures for enabling the secure levels of DTW.

During installation a description of the security system for DataTrace appears. Please read this document before proceeding with the security level selection.

Security Information
The following information describes this installation.

```
IMPORTANT SECURITY INFORMATION ON DataTrace for Windows

THIS DOCUMENT CAN BE PRINTED FOR FUTURE REFERENCE
BY ACCESSING THE DTW PASSWORD PROCEDURE FILE
(DTW PASSWORD PROCEDURE.pdf) UNDER THE DATATRACE
FOLDER FOLLOWING INSTALLATION OF THE
DataTrace for Windows PROGRAM.

This version of DataTrace for Windows (DTW) was developed with a
sophisticated security system to protect data and to comply with US
Food and Drug Administration's regulation 21 CFR Part 11.

For those users who are not required or interested in this level of
security and the operational complexities that go along with it, DTW
can be installed without any additional security elements. However,
```

`< Back` `Next >` `Cancel`

Next, the user selects the level of security that the DataTrace® for Windows will function under. If "Simple" or "Complete" security is to be enabled, the individual that is assigned the "Administrator" or "Supervisor" role should be involved in the installation of the DTW program.

Security Selection
Select the security level to be used by DATATRACE for Windows.

Select None for no user security.

Select Simple for login only security.

Select complete for Digital Signature security compliant with CFR 21 Part 11.

○ None
○ Simple
◉ Complete

`< Back` `Next >` `Cancel`

When the DataTrace for Windows program is started following the completion of the installation process where an enhanced security level is designated, the Login screen appears.

The "admin" as the Login and "admin" as the Password (in lower case) are entered for you on this initial login. This only occurs the first time the program is used following installation. After you click the Login button a dialog box will appear and require that you change to a new Password. This is not negotiable! You must change your Password as instructed on the dialog box: with at least 8 characters and one or more of them must be numeric, no spaces.

When you click OK, the program saves the new password; there will be a delay while the new Password is recorded, encrypted, stored, and registered. This now is the only Password that will work at the Administrative level. The Administrator is the only one that has access to the SETUP Tab where new users are established and assigned authorization levels, as well as establishes security standards and configurations.
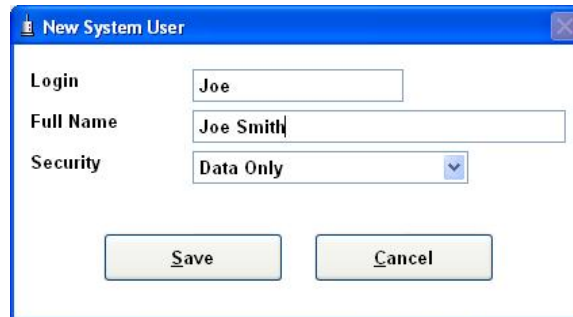
The SETUP Tab, in enhanced security modes, includes all of the original functions plus a new one: a USERS Tab. The USERS Tab allows the administrator to establish new users. This function is only accessible by the administrator.
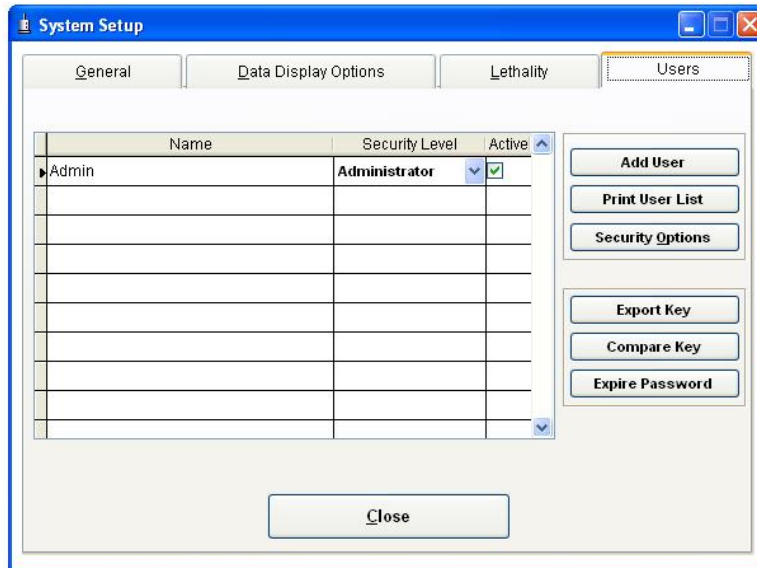
Now is a good time for the administrator to establish the operational criteria for the password system. Click the Security Options button. a new screen appears allowing the logging of failed Login attempts to be logged, establish the number of failed Login attempts before the user is kicked out of the DataTrace program, and also to establish a schedule for password expiration. Password expiration will require that after a specified period of time, the user will be required to create a new password before being granted access to the program. Typically these options are defined by an organization's SOP. An individual Password can be "expired" immediately by selecting the individual from the Users list and click on the Expire Password button.
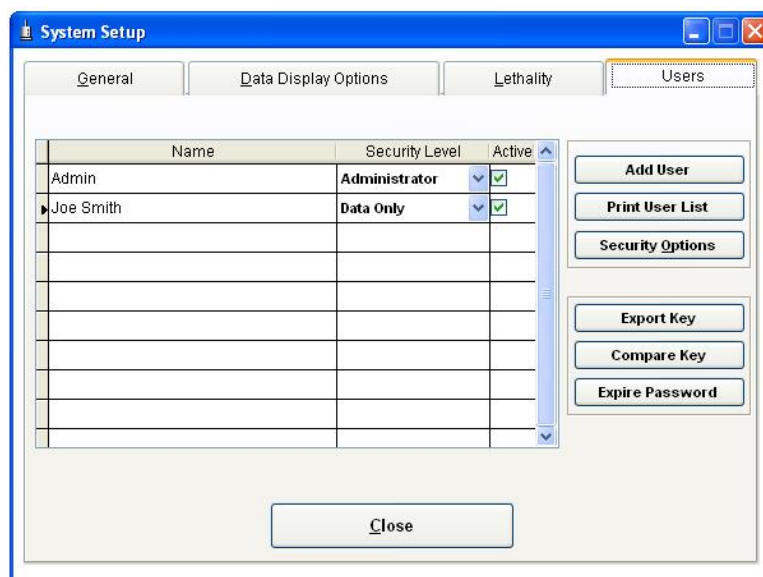
The administrator adds a user by clicking the Add User button. A dialog box appears asking for a user Login, the new user's full name, and authorized security level. Fill in the appropriate entries.

Click the Save button and the new user is added to the Users List. The new user is active and has access to his/her authorized levels when there is a check mark in the "Active" check box of their User data.
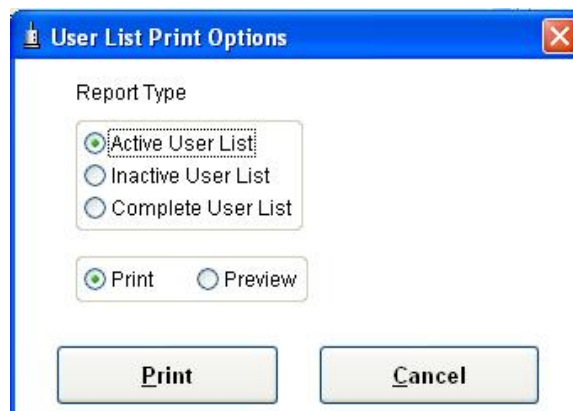
A user can not be removed from the Users List, only deactivated. They are deactivated by removing the check mark from the Active check box on the Users screen.

At any point in time, the administrator can obtain a listing of the Users in the DataTrace program through the Print User List option. The User List Print screen allows one of three listings to be generated: Active User List, Inactive User List, or Complete User List.

The first time a new user tries to enter into the program, they will be asked for the login information that was created by the Administrator (again, password is the lower case version of the Login). On the first time, and only on the first time, the new user enters the login entry for both the Login and Password. Again, a dialog box will appear and require that the new user change to a new Password. This, again, is not negotiable! You must change your Password as instructed on the dialog box: with at least 8 characters and at least one of them must be numeric, no spaces. Remember the delay during the save.

A regular user has only two options for authorization levels: "Data Only" or "Data and Utilities". No one has access to the Setup options except the Administrator.

While the above discussion defines the Password security that is enabled for both "Simple" security and "Complete" security in DataTrace® for Windows, it does not address the additional capabilities required for "Complete" security. This includes "Signing" and "Auditing" capabilities required by the USFDA 21 CFR Part 11, commonly referred to as "Electronic Signatures". The following functions occur only in "Complete" security mode. Note, however, that while the auditing function is required for 21 CFR Part 11 compliance, it is considered important enough to regular users that the DTW program maintains this logging function for use by all levels of security.

The System Auditing function generates and maintains an audit trail for certain system events and user activities and stores them in a secure, encrypted table, and includes all events since the DTW program was installed. This table includes: User ID, a date/time stamp, and an action description. The Audit Trail table can be reviewed and/or printed whenever necessary, but not modified or edited.

Data Signing in DataTrace® for Windows requires Tracer reads to be digitally "signed" by the user. When a Read is attempted, the user is prompted for his/her User ID and Password. The program then locates and verifies the user record in precisely the same manner as a login, then further verifies that the login information matches the user that is currently logged into the system. If successful, the user's private "signing key" is affixed to the profile along with the User ID.

"Signing Keys" are electronic pairs of encrypted codes that uniquely define that a user is who they say they are. These keys are a matched pair: one "public" and the other "private". By comparing and verifying the user's "private" key, the DTW program validates the target profile. Upon retrieval the profile exhibits the user's "public" key on the profile.

Remember, for those users who are not required or interested in higher levels of security and the operational complexities that go along with it, DataTrace® for Windows can be installed without any additional security elements beyond data profile security and Audit trail capabilities which are included in all installation modes.

DO NOT USE A SECURITY LEVEL THAT IS NOT REQUIRED BY GOVERNMENT REGULATION OR GOVERNMENT REQUIREMENTS!

Please keep in mind, if you forget your password not even your system administrator can help you.

GLOSSARY

A

Ambient: That which surrounds; the environment.

Audit Trail: A detailed log of the significant system events and user activities that is stored in a secure and encrypted state. It is available in DTW for all security modes.

Autoclave: Sterilization vessel that is used to create a lethal environment for microbiological pathogens using heat, time, and pressure, usually in pharmaceutical or medical applications.

C

Click: Term used most frequently to describe the method of selecting an item, action, or function with the left button on a mouse. To "click" on something you move the cursor onto that item then press the left mouse button and release it.

Com Port: Short name for the Communications Connection port on your computer. These ports are used for older versions of the DataTrace® PC Interface connection and can be used for a Fax/Modem, a Mouse, some networks, plotters, printers, and other instrumentation connections. It is also known as a Serial Port.

CRC: Cyclical Redundancy Check. An encryption scheme used in DataTrace for Windows where various data collected by a Tracer is combined with Tracer-specific data in an algorithm to create a security code that is verified through the same algorithm to verify that the data has not been modified. The CRC is stored in a hidden location with the profile data.

CV: Cook Value. Lethality units used typically in meat processing. The calculation is exactly the same as the F_o calculation, except the key temperature is one minute at 160°F (71.1°C).

D

Data Signing: In DTW Complete security mode, Tracer readings must be digitally "signed" by the user. The user is required to provide his/her User ID and Password which is verified via the User Record and verifies that this person is currently logged in to the system. If successful the signing data is affixed to the collected profile data and stored with the User ID.

Default: Preset program value or parameter. These can be set at the factory or by the user.

Dewpoint: The temperature at which water vapor starts to condense into liquid.

DES3: Digital Encryption Scheme. A "Triple DES" encryption scheme where data is encrypted with one key, decrypted with a second key, then re-encrypted with a third key. This is considered a very secure encryption method.

DES PBE: Digital Encryption Scheme with Passphrase-Based Encryption. The "Triple DES" scheme combined with Passphrase-based encryption. This is an extremely secure data encryption system implementing DES3 encryption where the three keys are mathematically derived from a user "passphrase" (or password). In DTW, the keys are derived from a combination of the User Login ID and Password.

Double Click: Two "clicks" in rapid succession. Double clicking usually initiates a process.

DSA: Digital Signature Algorithm. The algorithm used in DTW for all data signing and signature verification in Complete security mode.

E

Electronic Signature: A digital signature that is equivalent to a biometric signature for "signing" electronic files.

F

FLATPACK: "Flattened" version of the Micropack. It minimizes the single dimension profile for applications where height restrictions limit the size of the instrument package.

F_o: Symbol for the sterilizing value which is equivalent to one minute at 250°F (121.1°C). The lethality value is the summation of the time/temperature integration calculated above a certain, minimum threshold temperature (Threshold). Expressed mathematically as:

Lethality $= 10^{((Tp-Tx)/z)}$

Where

       Tx = Reference temperature. The lethality equivalent of one minute at Tx is taken as 1 unit of lethality.
       Tp = Process temperature as sampled.
       z = The number of degrees required for the thermal destruction curve to traverse one log cycle.

FRB: Field Replaceable Battery. This is a Micropack II Tracer version with a customer replaceable battery.

G

General Method: Process calculation used to determine the lethal heat of a process. Also known as the Graphical Method.

H

HACCP: Hazard Analysis and Critical Control Point. A process guideline adopted by USFDA and USDA to help processors identify those points in a process where potential hazards could occur, determine acceptable parameter levels, and methods for monitoring those parameters with appropriate recordkeeping.

Help: In most programs based on a Windows format, context-sensitive "help" is available from the program. Help may come in the form of suggestions on what to do next, how to do it, and/or why you are doing it. The Help function in DTW is always available by pressing F1. In some programs it may also be a menu option named "Help".

M

Mean: The mean of a series of numbers is calculated from the sum of those values divided by the number of values.

Mean = (Sum(x))/n

Metafile: A Metafile is a graphics image file used exclusively in Windows programs, the current version of which is an Enhanced Metafile (EMF). The Metafile will reduce the size of a saved graphic image compared to most alternative formats and will generally appear much "cleaner" when included in another Windows program. No loss of resolution or detail occurs as a result of the transfer.

Megabytes: The typical unit of measurement for computer memory. A megabyte would be roughly equivalent to 1000 printed pages.

Micropack: The original self-contained temperature measuring device in the DataTrace® system. The Micropack is available also in Humidity and Pressure versions.

Micropack III: The newest generation of the original self-contained temperature measuring device in the DataTrace® system.

N

NULL: An unknown value or one that can not be defined or calculated.

P

PC Interface: Total system necessary to allow communication between the Tracers and a personal computer. The system typically includes an Interface Module, the DataTrace® for Windows software disk (CD), and cable.

Port: A connector providing access to a system or circuit such as the serial or parallel port on your computer.

Profile: Time and temperature (or other parameter) data from a process collected by a Tracer.

PU: Pasteurization Units. Lethality units used in a pasteurization process. The calculation is exactly the same as the F_o calculation, except the key temperature is one minute at 140°F (60°C).

R

Retort: Sterilization vessel that is used to create a lethal environment for microbiological pathogens using heat, time, and pressure, usually in food applications.

Right Click: Pressing and releasing the right mouse button. Right clicking usually opens a "hidden" menu in Windows.

RS-232-C: Older standard by which Serial or Com Ports are based. The pinout configuration, signal direction, and magnitude are defined by this standard. The standard is maintained by Electronic Industries Association (EIA).

S

SHA-1: Secure Hashing Algorithm. A security coding system used in all security modes of DTW which is based upon executing a mathematical equation over a set of data the result of which is a long binary number. This number is stored with the data in a hidden location. If any character is changed in this set of data, a drastically different number is calculated and does not match the original, thereby indicating that the data has been modified. In DTW, SHA-1 is used both for data security in all security modes and for encryption of various security components in User and Complete security modes.

Signing Keys: Electronic pairs of encrypted codes that uniquely define that a user is who they say they are. These keys are a matched pair: one "public" and one "private". By comparing and verifying the user's "private" key, DTW in Complete security mode verifies the "Signature" of the user for the target profile. Upon retrieval, only the user's "public" key is displayed with the profile.

Standard Deviation: The standard measure of dispersion of a group of values.

Standard Deviation = sqrt((Sum(x^2)-(Sum(x)*2)/n)/(n-1))

T
Tracer: Common name used to describe the uniquely designed, small sensor manufactured by Mesa Laboratories, Inc. which records temperatures (or other parameters) at specified intervals of time, frequently from inside hostile environments.

U
USB: Universal Serial Bus. A newer protocol for Serial Port Communication than the RS-232-C protocol where the device installed to this port is "recognized" by Windows and certain configuration information is resident in the device.

**USFDA
21 CFR Part 11:** A guideline created by the USFDA for electronic data record security using Password Protection, Electronic Signature, and Audit Trail capabilities.

V
Variance: Variance is the square of the Standard Deviation.

Variance = (Sum(x^2)-(Sum(x)*2)/n)/(n-1)

W
Windows: Most popular computer interface for PC-based machines. It offers a graphical, object oriented interface to simplify computer operation. Windows was developed by Microsoft.

Z
z-value: Used in a lethality calculation, it is the number of degrees required for the thermal destruction curve to traverse one log cycle.

Zoom: Ability to focus on a segment of a graph and expand the view of that segment.

INDEX