

DASWIN
Data Acquisition Software
for
Microsoft Windows Environments

User's Manual

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TABLE OF CONTENTS

LIST OF ILLUSTRATIONS.....	v
PRECAUTIONS.....	vii
1.0 INTRODUCTION.....	1
2.0 SOFTWARE INSTALLATION	2
3.0 OPERATION	3
3.1 <i>LAUNCHING DASWIN</i>	3
3.2 <i>DASWIN INSTRUMENT DATA DISPLAY MENU FUNCTIONS</i>	3
3.2.a Menu Lock	4
3.2.b Addition of User Comments	4
3.2.c The <u>F</u> ile Menu.....	5
3.2.d The <u>C</u> onfig Menu.....	6
3.2.d.1 <i>Data <u>L</u>ogging Parameters</i>	8
3.2.d.2 <i>Data <u>T</u>ransmission Parameters</i>	8
3.2.d.3 <i>Data <u>D</u>irectory</i>	8
3.2.d.4 <i>Calib<u>r</u>ation Files</i>	8
3.2.d.5 <i>Options</i>	11
3.2.e The <u>V</u> iew Menu.....	12
3.2.f The <u>D</u> ata Menu	13
3.2.g The <u>I</u> nstrument Menu	13
3.2.h The <u>W</u> indow Menu	14
3.2.i The <u>T</u> est Menu	14
3.3 <i>DASWIN STATUS MESSAGES MENU FUNCTIONS</i>	14
3.3.a The <u>F</u> ile Menu.....	15
3.3.b The <u>E</u> dit Menu.....	15
3.3.c The <u>W</u> indow Menu.....	15

LIST OF ILLUSTRATIONS

FIGURE 3.1 THE DASWIN ICON IS LOCATED IN THE DASWIN PROGRAM GROUP OF THE PROGRAM MANAGER.	3
FIGURE 3.2 THE PRIMARY DASWIN MENU CONSISTS OF THE INSTRUMENT DATA DISPLAY AND STATUS MESSAGES SUB-WINDOWS. THE WINDOW DISPLAYS ERROR MESSAGES, CURRENT DATA, DATA STATISTICS, DATA FILE HEADER INFORMATION AND DIFFEY WEIGHTINGS OF IRRADIANCE.	4
FIGURE 3.3 THE MENU LOCK FUNCTION CAN BE TOGGLED ON BY HIGHLIGHTING THE LOCK MENU BUTTON AND TYPING "MENU ON".	4
FIGURE 3.4 THE USER MAY ADD COMMENTS TO THE COMMENT FILE BY STRIKING ANY NUMERICAL OR ALPHABETICAL CHARACTER.	5
FIGURE 3.5 THE FILE MENU ALLOWS THE USER TO OPEN OR CLOSE DATA FILES, OR TO PAUSE DATA RECORDING.	5
FIGURE 3.6. AFTER CHOOSING <u>O</u> PEN FROM THE <u>F</u> ILE MENU, THE USER WILL BE GIVEN CHOICES AS TO FILENAME, DIRECTORY, AND SAMPLING FREQUENCY FOR THE DATA TO BE STORED.	6
FIGURE 3.7 THE <u>C</u> ONFIG MENU SELECTION PROVIDES <u>S</u> AVE AND <u>E</u> DIT FEATURES FOR THE CURRENT CONFIGURATION FILE, DASWIN.INI.	7
FIGURE 3.8 EDITING WINDOW FOR EDITING CALIBRATION AND CONFIGURATION FILES.	7
FIGURE 3.9 THE CALIBRATION FILE EDIT MENU.	9
FIGURES 3.10.A AND 3.10.B THE CALIBRATION FILE EDITING SCREEN HAS TWO PULL-DOWN MENUS: " <u>F</u> ILE" AND " <u>E</u> DIT".	9
FIGURE 3.11 EDITING SCREEN FOR DIFFEY DOSE PARAMETERS.	11
FIGURE 3.12 THE <u>V</u> IEW MENU OPTION ALLOWS PRINTING OF THE CURRENT SCREEN OR VIEWING OF A REAL-TIME PLOT OF THE DATA BEING COLLECTED.	12
FIGURE 3.13 PLOTTING PARAMETERS FOR A REAL-TIME PLOT OF THE DATA BEING COLLECTED.	12
FIGURE 3.14 TIME SERIES PLOT OF A 320 NM CHANNEL (SEMI-DARK READINGS).	13
FIGURE 3.15 THE <u>D</u> ATA MENU ALLOWS THE USER TO COPY THE INSTRUMENT DATA DISPLAY TO THE WINDOWS CLIPBOARD.	13
FIGURE 3.16 THE <u>I</u> NSTRUMENT MENU PROVIDES A MEANS FOR RE-INITIALIZING THE INSTRUMENT AND RE-SYNCHRONIZING DATA ACQUISITION, SHOULD THE PROGRAM AND INSTRUMENT SYSTEM NEED REBOOTING.	14
FIGURE 3.17 THE <u>W</u> INDOW MENU PROVIDES A TOGGLE BETWEEN THE INSTRUMENT DATA DISPLAY MENU BAR AND THE STATUS MESSAGES MENU BAR.	14
FIGURE 3.18 THE <u>T</u> EST MENU FEATURES ARE ONLY APPLICABLE IF AUTOMATIC DATA TRANSMISSION HAS BEEN ENABLED AND PROCOMM PLUS IS INSTALLED. CONSULT THE FACTORY FOR DETAILS.	14

FIGURE 3.19 THE STATUS MESSAGES SUB-WINDOW CONTAINS ALL SYSTEM AND USER MESSAGES TO BE STORED IN THE COMMENT FILE.....	14
FIGURE 3.20 THE <u>F</u> ILE MENU PROVIDES AN OPTION TO PRINT ALL MESSAGES THAT ARE CURRENTLY IN THE STATUS MESSAGES SUB-WINDOW.....	15
FIGURE 3.21 THE EDIT MENU FOR THE STATUS MESSAGES SUB-WINDOW ALLOWS THE USER TO ENTER A MESSAGE TO BE RECORDED IN THE COMMENT FILE.	15

PRECAUTIONS

MAINTAIN PROPER CALIBRATION. The proper conversion of the voltages for the sensors to engineering units is determined by data contained on the calibration certificate issued with an instrument, which is updated on subsequent recalibrations. It is ultimately the user's responsibility to ensure that the proper calibration factors are entered in the calibration file used by DASWIN.

CARRY SPARE COPIES OF PROGRAM. Before attempting to install or use DASWIN software, the user should make at least two copies of the software disks. These copies should then be taken on deployments, preferably stored in an airtight Ziploc bag, to provide back-up if the primary software on the computer goes awry.

CARRY SPARE CABLES AND POWER SUPPLIES. It is strongly recommended that the user maintain spare cables and power supplies for the entire instrument system.

1.0 INTRODUCTION

DASWIN is a Microsoft Windows 3.1X based program designed to display and log data for Biospherical Instruments systems which produce serial data streams. DASWIN includes advanced features which make it possible to automate data collection and form distributed instrumentation networks. DASWIN can be configured to collect data at specified time intervals during long, unattended data collection sessions. Data files can then be transferred to a central location via dial-up telephone lines. Data can be displayed with standard statistics (mean, min, max and standard deviation), in either raw sensor voltage or calibrated engineering units. The program can calculate spectrally weighted dose integrals and can record time-based or numerically averaged data to disk. Finally, DASWIN can be configured to automatically upload data to a host system at preset intervals in conjunction with PROCOMM Plus. For more information on the use of PROCOMM Plus, please contact the factory for details.

It is imperative that this instruction manual be read carefully so that the user can properly install the software and understand its full potential. The software is easy to use and is a valuable tool for collecting and analyzing data from many of Biospherical Instruments' sensor models.

2.0 SOFTWARE INSTALLATION

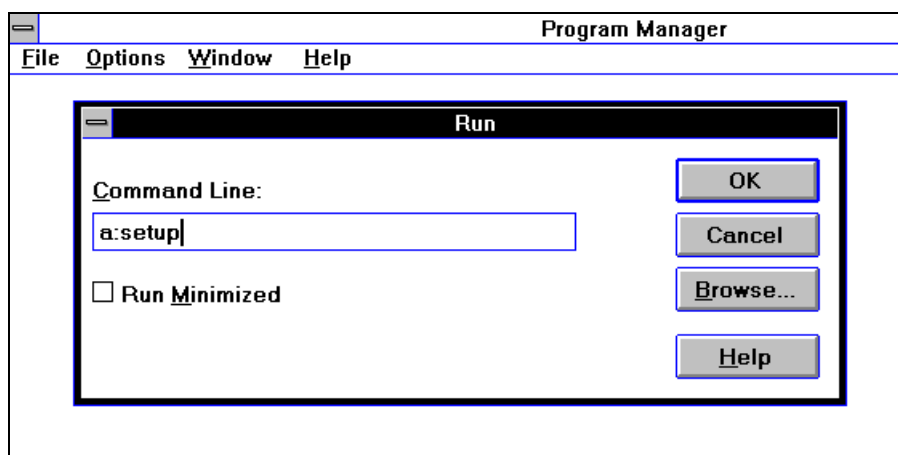
DASWIN is a Microsoft Windows 3.1X based program and will only operate on a IBM-PC or clone running version 3.1 or later of Microsoft Windows or Windows for Workgroups. Although DASWIN will operate on any PC running Windows 3.1 or later, we recommend that the computer be equipped with the following:

- 386 microprocessor,
- operating speed greater than 25 MHz, and
- a minimum of 4 Mbytes of memory.

To install DASWIN on a hard drive:

1. Launch Microsoft Windows.
2. Insert the software distribution disk in the computer's 3½" floppy disk drive.
3. From the program manager select File, then Run (<alt><F><R>).
4. If the computer's 3½" floppy disk drive is designated A:, type "a:setup" then <ENTER> in the dialog box, otherwise type "b:setup" then <ENTER> (see Figure 2.1). Setup will create the directory, program group and program items that are needed for DASWIN, and will copy all of the applications and calibration files to the proper directory (e.g., C:\DASWIN). There will now be a DASWIN icon in a program group titled DASWIN. A program initialization file, "DASWIN.ini" will be copied to the WINDOWS directory.

Figure 2.1 To install the software, first type <ALT><F><R> to achieve the Run menu, then type either "a:setup" or "b:setup" and <ENTER>.



3.0 OPERATION

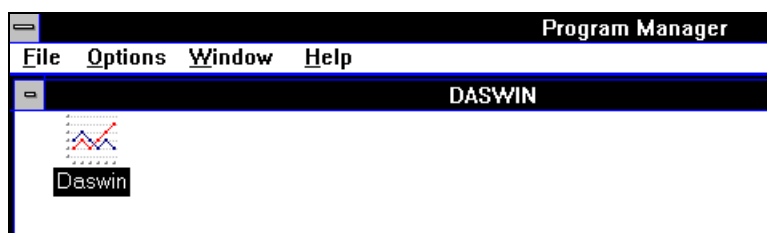
The DASWIN program is easy to use, particularly for those already familiar with Microsoft Windows and Windows-based programs. The following sections describe how to launch the software and explain the various program options and menu functions. Before attempting to start the program, fully connect the instrument system and attach the appropriate data cable to the logging computer's COM Port. (Connection instructions should be included in the instrument user's manual(s).) Finally, power on the instrument and launch the program.

3.1 LAUNCHING DASWIN

To launch the DASWIN program, choose the DASWIN icon from the DASWIN program group (see Figure 3.1). The program should initiate the primary display window illustrated in Figure 3.2. If it does not, try to reinstall the program or contact the factory. The primary window should display readings from each of the instrument channels. If the screen shows only error messages in the Status Messages sub-window, try the following troubleshooting techniques:

1. If applicable, check that the "POWER" light on the deckbox is on, indicating that the power is on. If it is not on, recheck the power cable connections.
2. Ensure that the "DATA" light on the deckbox is flashing, indicating that data is being transmitted. If it is not flashing, recheck the instrument cable connections.
3. Check the COM Port setting for the system using the Config edit menu (see section 3.2.b).
4. If error messages continue, or if the program seems to crash or lock up when menu functions are used, reboot the computer to clear the system operating memory.

Figure 3.1 The DASWIN icon is located in the DASWIN program group of the Program Manager.



3.2 DASWIN INSTRUMENT DATA DISPLAY MENU FUNCTIONS

The primary DASWIN window (Figure 3.2) consists of the Instrument Data Display and Status Messages sub-windows along with seven pull-down menus. The menus allow changes to the Instrument Data Display, instrument configuration and data acquisition. For example, the user may choose to display each sensor channel in either raw volts or calibrated units, together with its cumulative minimum, maximum, standard deviation and mean data. A separate menu bar is available for the Status Messages window, which

displays errors and other system messages. This window is described in Section 3.3. The following sections describe the Instrument Data Display menu functions.

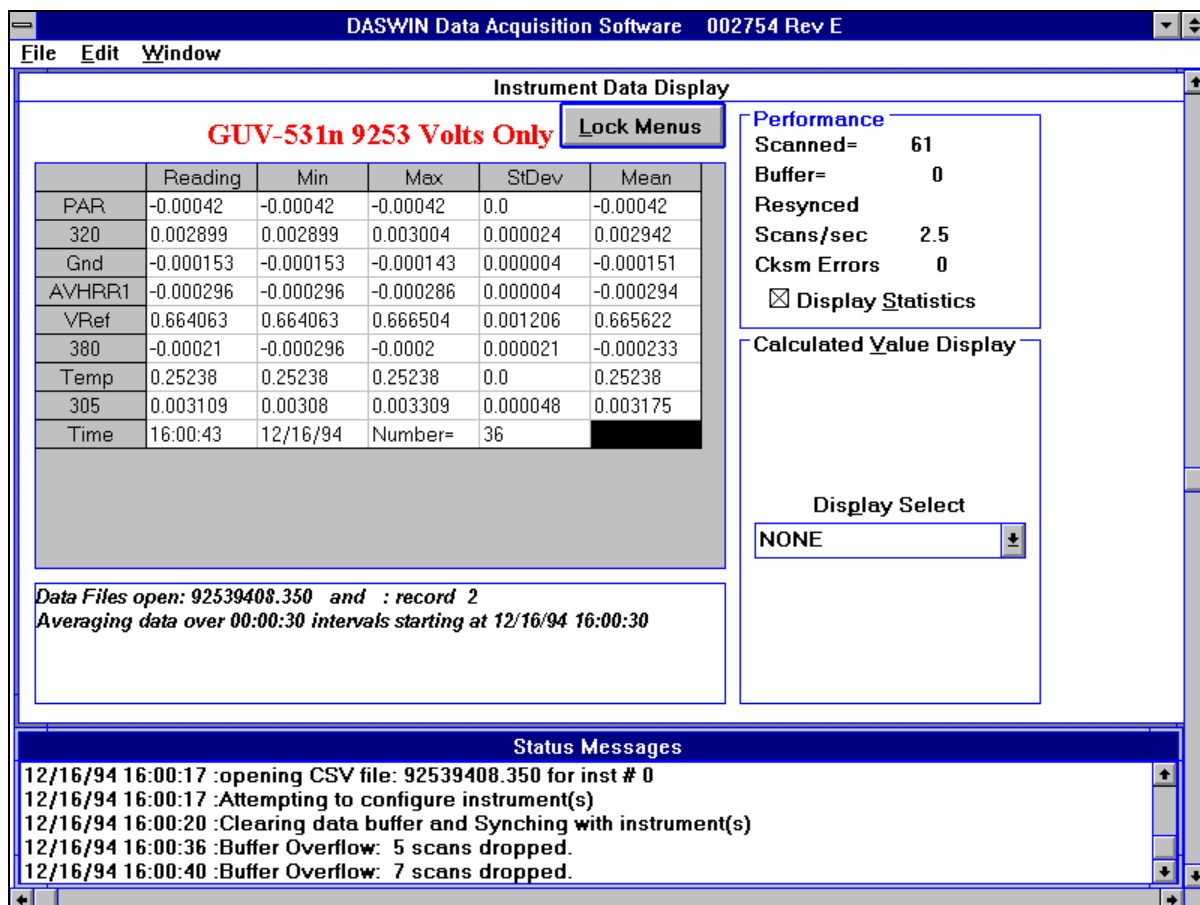
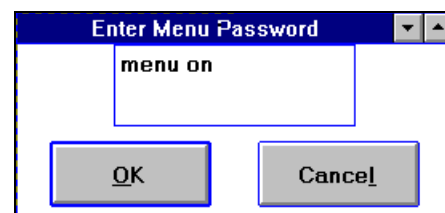


Figure 3.2 The primary DASWIN menu consists of the Instrument Data Display and Status Messages sub-windows. The window displays error messages, current data, data statistics, data file header information and Diffey weightings of irradiance.

3.2.a Menu Lock

At the top of the primary display menu, there is a "Lock Menus" button. Whenever the program is configured to automatically log data, it provides a menu lock to prevent any disruption of data acquisition. This lock can then be toggled on or off by selecting the button and entering "menu on" (see Figure 3.3).

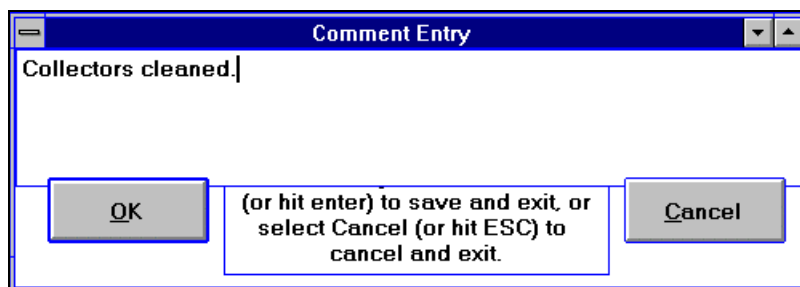
Figure 3.3 The Menu Lock function can be toggled on by highlighting the Lock Menu button and typing "menu on".



3.2.b Addition of User Comments

The Status Messages screen indicates all system messages. These messages are automatically stored in a comment file (see section 3.3). The user may wish to add to this file other messages and comments during data acquisition. Comments may be added at any time by striking any alphabetical or numerical character as shown in Figure 3.4. After completing the message, choose "OK" to return to the primary window. The comment will appear in the Status Messages sub-window and will be saved to the comment file.

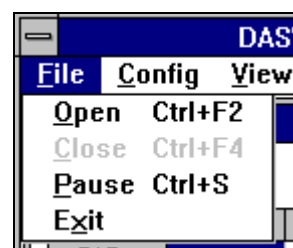
Figure 3.4 The user may add comments to the comment file by striking any numerical or alphabetical character.



3.2.c The File Menu

The File menu (Figure 3.5) is used to manually Open and Close logging files, to Pause logging, and to Exit the program. The Pause option allows the user to pause data acquisition. To restart data collection, simply press <ENTER>. DASWIN can be configured to automatically log data when launched, or to log data on demand (i.e., log only when a file is manually opened). Automatic configuration must be selected in the configuration file (see section 3.2.d). A new logging file can be opened manually using the Open command (<Ctrl><F2>).

Figure 3.5 The File menu allows the user to open or close data files, or to pause data recording.



Automatic Naming of a Data File

All data are stored in comma-separated value (*.csv) files. Automatic logging stores data in files labeled #####yyff.ddd (e.g., 92519401.300), where

- ##### is the four digit serial number for the instrument,
- yy is the current year,
- ff is the current number of files (e.g., 01, 02, etc.) recorded for that day, and
- ddd is the current Julian date (i.e., 1 to 365).

Manual Opening of a Data File

In order to open a new data file, use the Open command. The user will be presented the screen shown in Figure 3.6. Choose any filename and directory, or accept the default selections. If an existing filename is selected, click on the box next to "Append to existing

file". Otherwise, the existing file will be overwritten. Finally, choose the sampling frequency for the data to be stored. If "No Averaging" is selected, data will be collected and recorded continuously. As indicated in the Sampling scroll bar of Figure 3.6, "Time Based" sampling allows the user to choose a certain time interval over which to average data. That averaged reading will then be recorded. Finally, "Numerically Based" sampling allows the user to choose a specific number of data points over which to average (e.g., 1, 10, 100, etc.).

After all selections have been made, choose "Continue" or strike <Alt><C> to return to the primary window and begin recording data. The name of the opened file and sampling frequency will be listed directly below the Data Display (Figure 3.2). This information will also be included in the header of the data file. To return to the primary window without opening a file, choose "Cancel" or strike <Alt><N>.

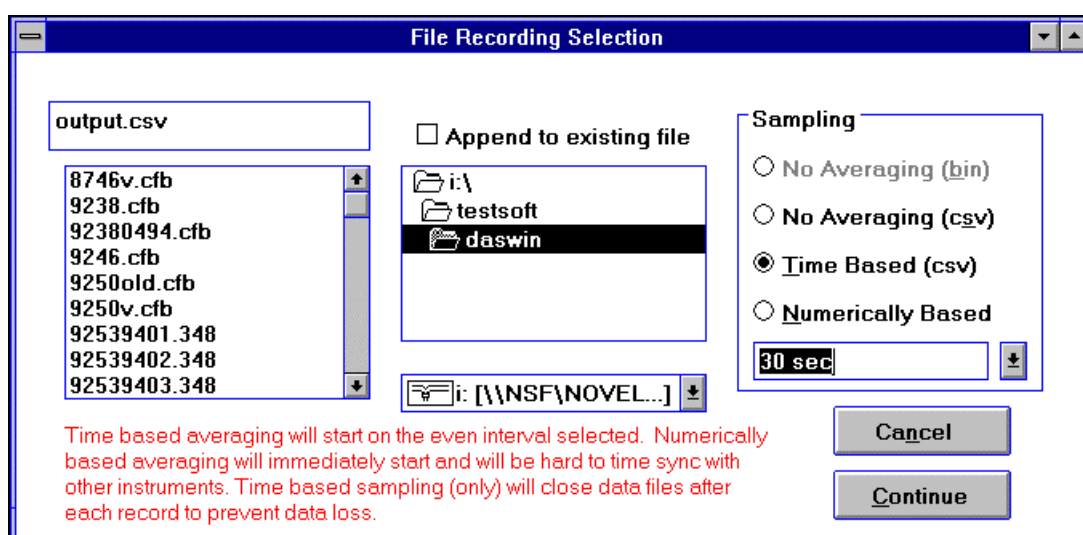


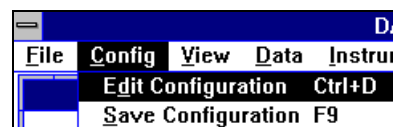
Figure 3.6. After choosing Open from the File menu, the user will be given choices as to filename, directory, and sampling frequency for the data to be stored.

3.2.d The Config Menu

The DASWIN configuration file, DASWIN.ini, contains all general default information for data collection: data directory path, COM Port to use, networking information, etc. This file may be edited using the Config menu (Figure 3.7), which has two options. The Save feature may be used to permanently save the current configuration file. The Edit feature provides the functions shown in Figure 3.8. There are five primary sections in the Edit window:

- Data Logging Parameters
- Data Transmission Parameters
- Data Directory
- Calibration Files
- Options

Figure 3.7 The Config menu selection provides Save and Edit features for the current configuration file, DASWIN.ini.



All editing parameters may be accessed either by using a mouse or by striking <Alt><underlined character in the parameter name>. For example, a choice of <Alt><N> would highlight the “Enable Logging” feature. A choice of <Alt><2> would allow editing of the data logging end time. Pressing <Alt><N> again will disable logging.

To return to the primary window without making changes, choose “Cancel”. To accept current parameters, choose “OK”. The user will then be asked whether to save the new configuration parameters. A choice of “Yes” will permanently save the new configuration in the DASWIN.ini file. A choice of “No” means that the new configuration should only be used for the current logging session; the DASWIN.ini configuration file will not be permanently changed. This temporary configuration will be erased when the DASWIN program is exited. It can be permanently saved at any time by choosing “Save” from the Config menu.

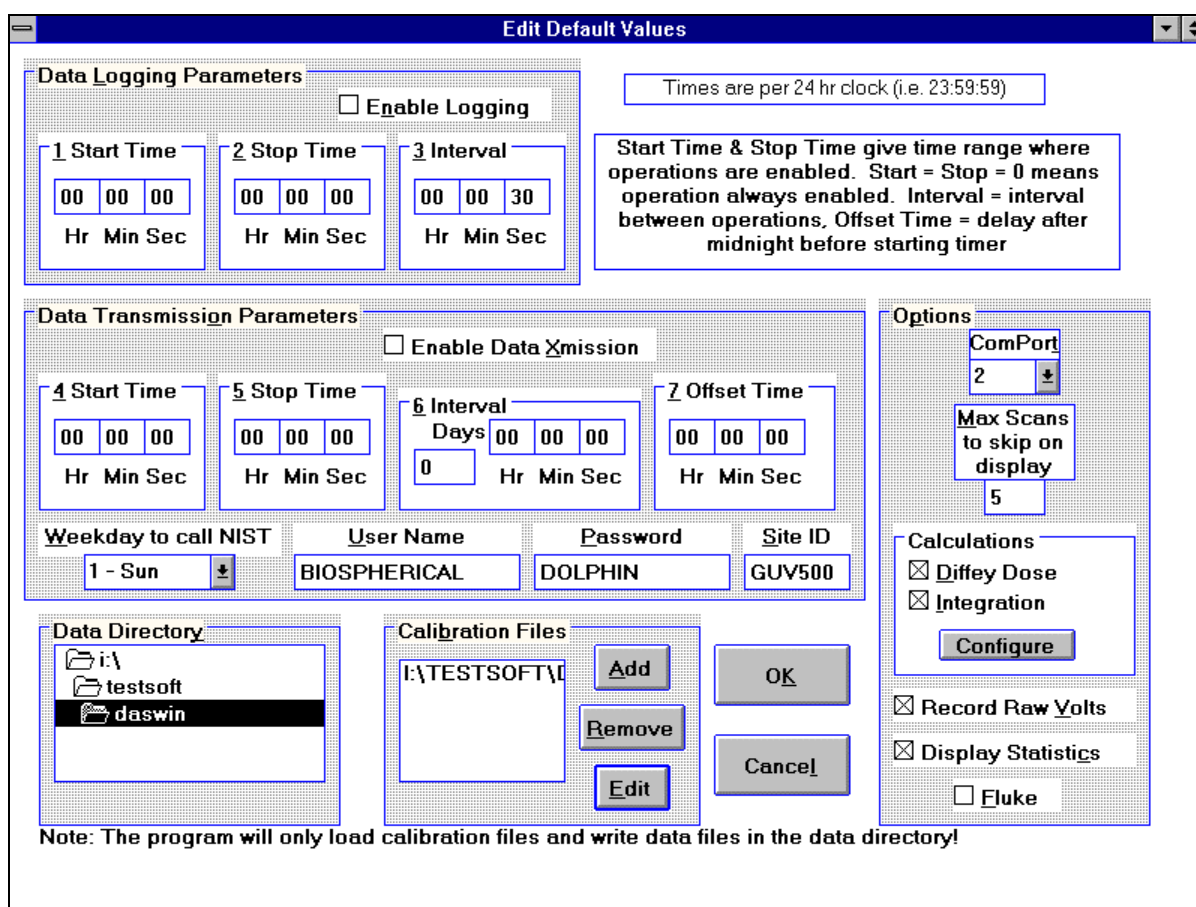


Figure 3.8 Editing window for editing calibration and configuration files.

The following sub-sections describe the five primary sections of the configuration editing menu.

3.2.d.1 Data Logging Parameters

To configure the program for automatic data logging, choose the “Enable Logging” function. Next, enter both a start and stop time to indicate when to begin and end data logging. Finally, choose the sampling interval over which to automatically average and log data.

3.2.d.2 Data Transmission Parameters

Data Transmission Parameters are used only when remote logging is required. The system on which DASWIN is operating must have PROCOMM Plus. Also, the user must have additional networking files for DASWIN. These are free of charge, and are available upon request; consult the factory for details.

The Data Transmission features allow the user to specify the start and end time for data transmission, the interval over which to transmit data, and the time offset of the host computer. Note that if both the host and logging computers are set to Greenwich Mean Time (GMT), the time offset is 0. To have the computer's GMT time periodically updated, choose a Weekday for the system to call NIST. The current time in the logging computer will then be resynchronized to true GMT time. Finally, the user must select a User Name and Password for accessing the host computer, and a Site name for the logging computer.

3.2.d.3 Data Directory

Simply choose the directory in which to store data. The default directory is DASWIN. Note, however, that a remote host computer may not have a directory titled DASWIN, so a different directory may need to be specified.

3.2.d.4 Calibration Files

The user must choose the proper calibration file(s) for the instrument(s) being used. There should be one calibration file per instrument being used except in the case of PUV-500/511 combinations, which use only one calibration file. Calibration files may be added, removed or edited. A choice of Remove removes the highlighted calibration file. After a choice of Edit or Add, the user will be presented with all available configuration files in the current directory. Simply choose which file to add or edit. If the user is editing a file, he/she will be presented with the screen shown in Figure 3.9. Within this screen, the user may alter the serial number, type of instrument, instrument tag, and channel parameters for an instrument. Figures 3.10 illustrate the File and Edit menus which have been added to facilitate editing of the calibration file. The following describe how to change each parameter. Note that as each parameter is selected, a prompt is offered at the bottom of this section of the screen. The user may exit this file at any time by choosing Exit from the File menu. A file may be saved by choosing Save from the File menu.

1. **Type of Instrument.** In the bottom right corner of the screen, choose the appropriate instrument type. There are different versions of some instruments (e.g., GUV-511 and MER-2040), so be certain to choose the correct type. The correct type should be indicated on the user's manual, calibration sheet and/or packing slip.

Instrument Calibration/Description

File Edit

Calibration File: 9250V.CFB

Serial Number ('0000'-'9999')
9246

Order	Addr	Label	Type	Gain	Equ	Scale	Offset	Format	Units	On	Cor
1	1	PAR	1	A	0	1	0	#0.0#####	Volts	on	
2	2	320	1	A	0	1	0	#0.0#####	Volts	on	
3	3	Gnd	1	A	0	1	0	#0.0#####	Volts	on	
4	4	340	1	A	0	1	0	#0.0#####	Volts	on	
5	5	VRef	1	A	0	1	0	#0.0#####	Volts	on	
6	6	380	1	A	0	1	0	#0.0#####	Volts	on	
7	7	Temp	1	A	0	1	0	#0.0#####	Volts	on	
8	8	305	1	A	0	1	0	#0.0#####	Volts	on	

Equation type (0=volts, 1=linear, 2-6=polynomial)

☐ HEX Display Averaged Recorded 10/13/94
 Instrument Tag

GUV-511C(New)
 GUV-510
 GUV-511A(Old)
 PUV-500&510
 MER-2040
 MER-2040BiPolar
 PRR
 PNF-500
 GUV-511C(New)

Figure 3.9 The calibration file edit menu.

Figures 3.10.a and 3.10.b The calibration file editing screen has two pull-down menus: "File" and "Edit".

File Edit

New Ctrl+F2
Open Ctrl+F3
Save Ctrl+F4
Print Ctrl+F5
Exit

File Edit

Ca **Insert** Ctrl+I

Copy Ctrl+Ins
Delete Ctrl+D
Paste Shift+Ins
Set All to Volts Type Ctrl+V
Initialize All Channels Ctrl+A
Activate All Channels
Inactivate All Channels
Fill Down Ctrl+F

- Serial Number.** In the upper right corner of the screen, enter the serial number of the appropriate instrument.
- Instrument Tag.** In the bottom center of the screen, choose an instrument tag number. Accept the default value (0) for most single instruments. For MER-2040, PRR or multiple instruments, consult the corresponding manual and calibration sheet for the correct tag number.

4. **Averaged.** This is used only in the case of MER instruments. Consult the user's manual, then indicate the number of internal readings you wish to average.
5. **HEX Display.** A choice of this function causes data in the Data Display window to be listed in hexadecimal form. This facilitates debugging of data acquisition errors.
6. **Channel Parameters.** In the center of the screen, you may change logging and analysis parameters for each instrument channel.
 - a) Addresses. Addresses and labels are automatically configured when the instrument type was selected at the bottom right of the screen. The user should consult the factory or user's manual before attempting to reconfigure channel addresses.
 - b) Labels. The user may alter the label for each channel. Please note that a change in the channel label will not affect which channel is being addressed. For example, changing a label from 305 nm to 320 nm will not change the channel to a 320 nm channel.
 - c) Type. This option is currently meaningless. This function is reserved for future development.
 - d) Gain. This is only useful for MER-2040 instruments. Consult the MER user's manual for assistance in selecting the proper gain (i.e., 1, 16 or 256) for each channel.
 - e) Equation. Enter the order of the calibration equation. To store each channel in volts, select 0. To calibrate each channel using a linear equation (i.e., with "Scale" as slope coefficient and "Offset" as y-intercept), choose 1. For higher order equations, enter the appropriate number. The user will then be prompted for the higher order coefficients, the first of which will be displayed under "Scale".
 - f) Scale. Enter the scale (calibration factor), dimensioned in Volts per Irradiance, for each channel. The correct calibration factors may be found on the calibration sheet issued for your instrument by BSI. Note that the scale for the ground and reference voltage channels is 1, and the scale for the temperature channel is 0.01. The scale and offset are then used as follows to calibrate data for each channel:
$$\text{Calibrated data} = (\text{Raw data} - \text{Offset voltage}) / \text{Scale factor}$$
 - g) Offset. This is the residual voltage of the instrument, which is measured when the instrument is exposed to complete darkness. Offsets are found on the calibration sheet. The offsets for ground, reference voltage and temperature are 0.
 - h) Format. The user may change the number of decimal places or number format of the data to be displayed in the Data Display window.
 - i) Units. Enter the appropriate units for each channel. This will be listed in the Data Display and in the header of each data file.
 - j) On. Indicate which channels to display and record. "Off" will prevent a channel from being displayed and recorded.

- k) Comment (Optional). Enter any comments about the calibration file.

3.2.d.5 Options

Here the user may select the appropriate COM Port to which the instruments are connected. Also, Instrument Data Display options may be selected. Instead of displaying every data reading, the user may wish to display only every fifth or tenth reading. The user may also select whether data should be displayed in raw or calibrated voltages. The "Display Statistics" option determines whether the cumulative standard deviation, minimum, maximum and mean data will be displayed. Finally, if the computer is connected to a fluke (i.e., multimeter or voltmeter) as well as or in place of an instrument, the "Fluke" feature should be enabled so that the readings will be displayed in the Instrument Data Display.

The user may also choose to calculate Diffey dosages or perform integrations between channels. To do this, select the Configure button. The user will then be presented the display shown in Figure 3.11. The user may add or delete integration channels, or may add or delete channels to be used in Diffey dose computations. If applicable, the user should be careful to use the appropriate Diffey Dose parameters. Choose instrument and channel numbers from the "List of Channels Available". In this list, the first value is the instrument or tag value, the second is the channel address, and the third is the channel label. When all changes have been completed, choose Close to return to the defaults editing screen. Make certain that the appropriate Diffey Dose or Integration option is selected so that the parameter will be displayed in the Data Display screen.

Diffey Dose Parameters

Integration Parameters

Instrur	Chann
0	1

Delete Integrated Value

List Of Channels Available

- 0, 1.PAR
- 0, 2.320
- 0, 3.Gnd
- 0, 4.AVHRR1
- 0, 5.VRef
- 0, 6.380
- 0, 7.Temp
- 0, 8.305

Diffey Dose Parameters

Instrument	Channel	Weight
0	2	.073105
0	4	.007159
0	0	1

Delete Term

Current Weighting Factor: .073105

Add Integ Channel Close Add Diffey Channel

Figure 3.11 Editing screen for Diffey Dose Parameters.

3.2.e The View Menu

The View menu (Figure 3.12) includes functions for printing the current window and viewing a real-time plot of the data being collected. Note that the print option should only be used if a printer is currently connected to the computer, and if the printer is properly set up in the Windows Print Manager. The View feature may be used at any point to view the time series of up to two channels of data. (**NOTE:** If there are several Windows programs being run concurrently, this feature may cause the memory to overflow.)

Figure 3.12 The View menu option allows printing of the current screen or viewing of a real-time plot of the data being collected.

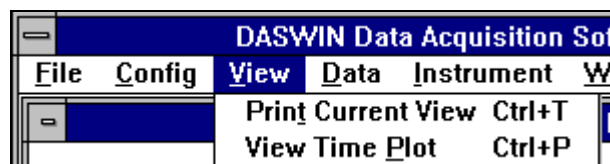


Figure 3.13 illustrates the plotting parameters window. From this menu, choose the channel(s) of data to be plotted, the range of data to plot and the scale(s) to use for the plot. Note that an appropriate scale for plotting a channel can be gleaned from monitoring the Instrument Data Display readings for that channel.

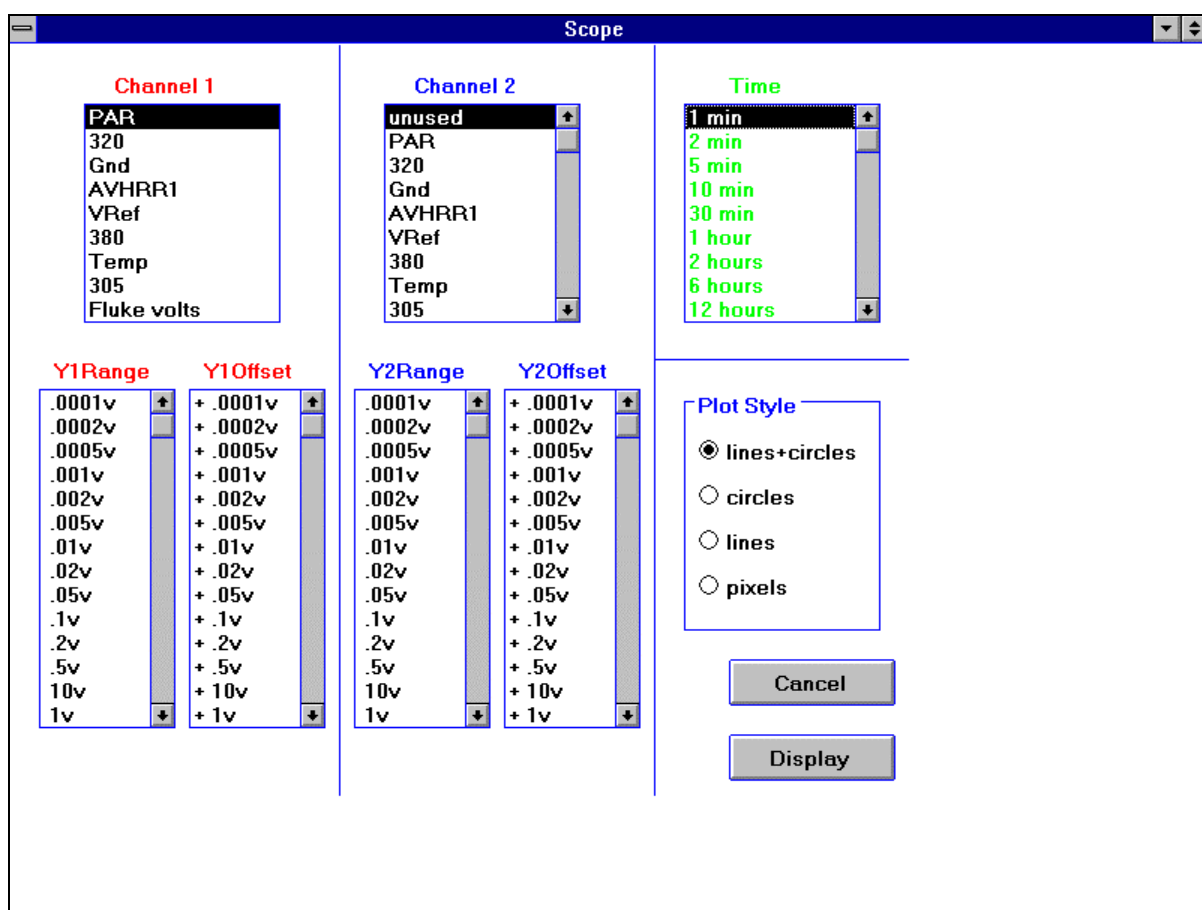


Figure 3.13 Plotting parameters for a real-time plot of the data being collected.

After all selections have been made, choose “Display” to create a time series plot of the data. A sample time series is pictured in Figure 3.14.

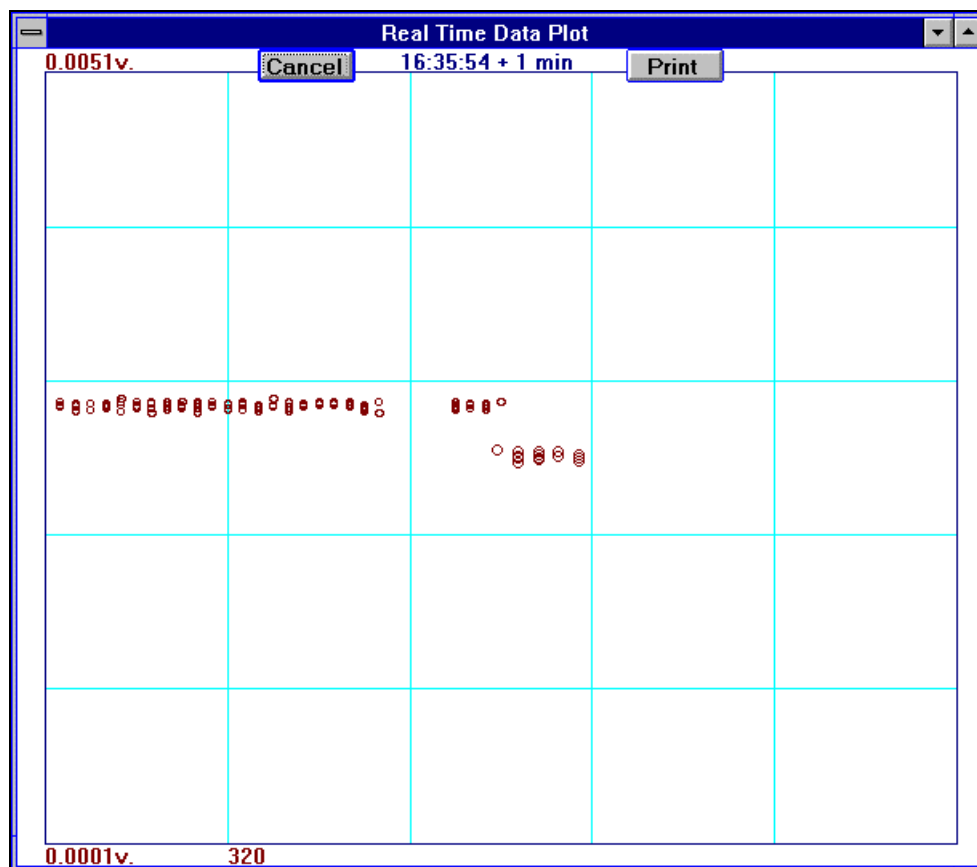


Figure 3.14 Time series plot of a 320 nm channel (semi-dark readings).

3.2.f The Data Menu

The Data menu (Figure 3.15) allows the user to copy the Instrument Data Display to the Windows clipboard. The user may copy the screen as it is or tell the program to wait until the end of the next sampling interval to copy the screen to the Clipboard. The data in the Clipboard can then be copied into any Windows word processing, drawing or spreadsheet program. For example, if the data are pasted into a Microsoft Excel spreadsheet, they are pasted as values that can be further manipulated or processed.

Figure 3.15 The Data menu allows the user to copy the Instrument Data Display to the Windows Clipboard.

DASWIN Data Acquisition Software			
Data	Instrument	Window	Test
Copy			Ctrl+Ins
✓ Copy	Next Completed Stats Cycle		Ctrl+N

3.2.g The Instrument Menu

The Instrument menu (Figure 3.16) provides a reset, or initialization, switch for the data acquisition system. In the event that the program and instrument system fail to

communicate properly or should the data acquisition system need rebooting, this feature will re-initialize the instrument and re-synchronize data acquisition.

Figure 3.16 The Instrument menu provides a means for re-initializing the instrument and re-synchronizing data acquisition, should the program and instrument system need rebooting.



3.2.h The Window Menu

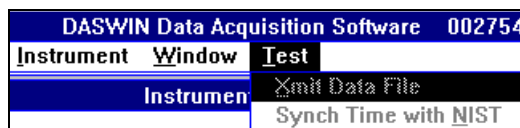
The Window menu (Figure 3.17) allows the user to toggle between the Instrument Data Display and Status Messages sub-windows. This may also be achieved by using a mouse to click on the respective title bars for these sub-windows.

Figure 3.17 The Window menu provides a toggle between the Instrument Data Display menu bar and the Status Messages menu bar.



3.2.i The Test Menu

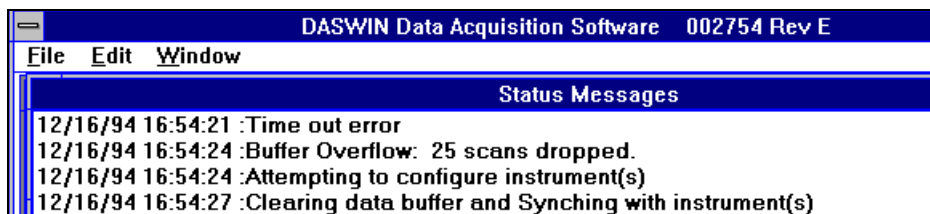
Figure 3.18 The Test menu features are only applicable if automatic data transmission has been enabled and PROCOMM Plus is installed. Consult the factory for details.



3.3 DASWIN STATUS MESSAGES MENU FUNCTIONS

The Status Messages sub-window (Figure 3.19) is located at the bottom of the DASWIN primary display (see Figure 3.2), below the Instrument Data Display. This window indicates any errors or other system messages that are experienced during data acquisition. For example, as the system clears the data buffer and attempts to synchronize data collection, a message will be indicated here. The status messages allow the user to track where errors are occurring in the data acquisition process. Notice that there is a scroll bar to the right of the message window. This can be used to scroll through all status messages for the current logging period.

Figure 3.19 The Status Messages sub-window contains all system and user messages to be stored in the comment file.



Note that the user can add messages to this window at any time, either by striking any character key (i.e., not <ENTER>) or by using the Edit menu for the Status Messages sub-window (see section 3.3.b).

All status messages are recorded in comma-separated value files. If automatically named by DASWIN, the filenames correspond to the current date. The filenames are formatted as #####yycm.ddd, where

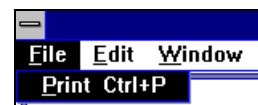
- ##### is the serial number of the instrument,
- yy is the current year,
- cm signifies a comment file, and
- ddd is the current Julian date.

There are three pull-down menus for the Status Messages sub-window: File, Edit and Window. These are described in the following sections.

3.3.a The File Menu

The File menu (Figure 3.20) allows the user to print all status messages. Before using this function, ensure that a printer is connected to the computer and is properly established in the Windows Print Manager.

Figure 3.20 The File menu provides an option to print all messages that are currently in the Status Messages sub-window.



3.3.b The Edit Menu

The Edit menu (Figure 3.21) provides an option for adding user messages to the Status Message sub-window. Messages may be added using this menu selection or by simply striking any character key. The program will then present the window illustrated in Figure 3.4. Type any message, then <ENTER> or "OK" and the message will appear in the Status Messages sub-window and in the stored comment file.

Figure 3.21 The Edit menu for the Status Messages sub-window allows the user to enter a message to be recorded in the comment file.



3.3.c The Window Menu

The Window menu provides a method for toggling between the Status Messages menu bar and the Instrument Data Display menu bar. This may also be achieved by using the mouse to click on the appropriate sub-window label bar.