Users Manual	UM-115
Group: **Controls**	
Part Number:	
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MicroTech®
Open Protocol Monitor™ Software

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Introduction

McQuay International MicroTech® product is a centralized communication, direct digital control, microprocessor based monitor and control system. MicroTech provides for additional system monitoring and control through a personal computer connected via twisted pair or modem and running Monitor™ software.

Monitor software is a DOS based custom application designed for use with MicroTech control systems. The software is designed to be user friendly for ease of operation. It is provided in different configurations for varied applications.

Open Protocol Monitor software provides access to a Model 100 or Model 200 series controller acting as an Open Protocol Master (OPM). The software is typically used to commission the MicroTech portion of Open Protocol applications by service personnel, manufacturer's representatives, or McQuay International employees trained in the Open Protocol commissioning process.

What You Need to Run Open Protocol Monitor

The recommended hardware and software requirements your system needs to run the Open Protocol Monitor program successfully are summarized in this section.

Hardware Requirements

The Open Protocol Monitor program operates on a personal computer with the appropriate associated hardware. Because the program is usually required only for commissioning, the PC is typically a laptop. Guidelines for the hardware required to operate the Monitor software include the following (minimum requirements):

- A 386SX CPU (Central Processing Unit)
- 640 KB base RAM (Random Access Memory)
- VGA monitor
- Keyboard.
- 1.44 MB (3½") floppy disk drive.
- 20 MB hard disk drive (minimum 5 MB free)
- RS-232C serial communications port

The PC must have a minimum of 640 KB Random Access Memory (RAM) to run Open Protocol Monitor software. Memory resident programs running in the background on systems with only 640 KB must be disabled. Disk drives are

utilized to install software, create backup copies of Open Protocol Monitor software and for mass storage of collected data. Serial communication is required between the PC and the Open Protocol Master or equivalent controller.

Software Requirements

The following software and associated materials are required:

- MS-DOS 5.0 or greater, including DOS reference manual and other operating manuals supplied with the computer.
- Open Protocol Monitor software, Version 1.1 or greater.

Open Protocol Monitor software is supplied on a single 720 KB (3½") floppy diskette. An installation program is provided to facilitate software transfer to the computer system. A "Read-Me" file giving on-line instructions for use of the installation program is also included on the disk.

Chapter 1, "Setting Up the Monitor Program" of this manual gives detailed instructions for software handling and installation.

About the Monitor Program

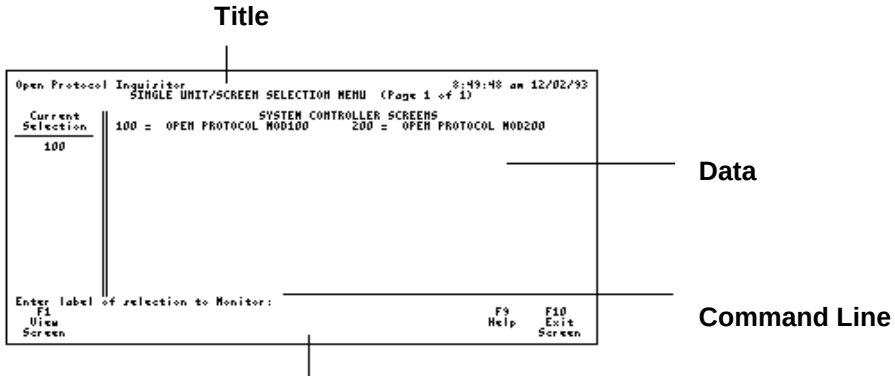
The Open Protocol Monitor program contains selection screens (for Model 100 and Model 200 series controllers), administrative capabilities and an advanced feature support menu. Each display screen in the selection section provides important information on the chosen controller. Administrative and Support Menu sections provide integrated setup and maintenance capabilities.

Chapter 2, "Running the Open Protocol Monitor Program", describes each part of the program in detail along with associated display screens, how to access different parts of the program, and most important, how to control setpoints and monitor real-time operation. Support Menu capabilities are further detailed in Chapter 3, "Using the Open Protocol Support Menu."

At any point in the program, you can press the F9 (Help) key to display on-line information and instructions for the screen currently being displayed.

Understanding the Display Screen Format

The Monitor display is divided into four sections. The sections are defined as follows:



1. **Title**
   The title section is found along the top of each display screen. It gives the title of the application or system being monitored, in this case "Open Protocol Inquisitor," the area or screen of the Monitor program which is currently being displayed, and the time and date. The time and date shown are provided by the computer. Therefore, ensure the computer is set for the correct time and date.

2. **Data**
   The data section is located in the center of each display screen. It includes the graphic and tabular information being displayed.

3. **Command Line**
   The command line is located immediately below the data section in each display screen. It includes a prompt statement and a flashing underscore waiting for user input.

4. **Options**
   The options section is found along the bottom edge of each display screen. It gives those options available from the screen currently being displayed. Available options are referenced with a function key (F1-F10) and text describing the option.

Important Keys for You to Know

Function keys are used extensively throughout the Monitor program to facilitate user interaction. These keys are located on the left side of the keyboard (labeled F1-F10), along the top edge of the keyboard (labeled F1-F12), or both. Most function keys will represent different functions depending on the screen currently being displayed.

However, two important function keys, F9 and F10, will represent the same function throughout the entire Monitor program.

F9 F9 is always the "Help" key. It is available from any screen in the Monitor program for on-line assistance. You can press the F9 key to access help text pertaining to the screen currently being displayed. A choice between two types of information is necessary each time you initially press the F9 key. Pressing <Enter> displays additional information on the screen currently being displayed, while pressing any function key (F1-F10)

displays information on that function key's function within the screen currently being displayed. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 F10 is always the "Exit Screen" key. It is used to exit any screen currently being displayed. Repeated pressing of the F10 key will result in "backing out" of the display screens one at a time until the Main Menu is reached, and then ultimately out of the Monitor program itself. However, exit from the Monitor program must be confirmed prior to the actual exit. Refer to the "Logoff" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

A reference to F9 and F10, with associated text describing the option, will always be present on each display screen.

About Your Monitor Documentation

The Open Protocol Monitor (Version 1.1) documentation consists of the *MicroTech User's Manual for Open Protocol Monitor Software* and an on-line Help function that is part of the Open Protocol Monitor software copied to your computer during the installation process.

- The *MicroTech User's Manual for Open Protocol Monitor Software* (this manual) includes information on how to install Monitor software on your computer. It also includes information and instructions for basic use of the program as well as a guide to the advanced features for use by troubleshooting and commissioning personnel.
- The on-line Help function provides informational text pertaining to all of the screens displayed in the Open Protocol Monitor program.

Conventions

To help you find and understand information easily, this manual uses consistent typographical conventions and visual cues.

This convention	Represents these items
bold	Prompts from the Open Protocol Monitor Program. Entries and keystrokes that you must type exactly as they appear. For example, if you are directed to type **install**, you should type all the bold characters as they appear. Function keys which can be pressed to execute different functions.
italic	Variables for information you must provide. For example, if you are directed to type <*F(x)*>, you should press the Function Key for the selection you want. The title of a display screen or the name of a command in the Open Protocol Monitor program.
	The beginning of a procedure.

Chapter 1

Setting Up the Monitor Program

This chapter covers procedures for setting up your computer system to run the Open Protocol Monitor program.

Setting Up Your Hardware

The scope of this manual does not include detailed procedures for initial hardware setup and configuration. Refer to the documentation supplied with your computer system for information pertaining to these preliminary procedures.

Working with Software

It is assumed your computer hardware is assembled, the hard disk is formatted, and MS-DOS 5.0 (or greater) is installed and operating properly. For information on these procedures, refer to the MS-DOS manuals supplied with your computer system. For best results, Open Protocol Monitor software should be installed onto the hard disk. Making a backup copy of the Open Protocol Monitor software is recommended *prior* to installation or use of the software.

Making Backup Disks

Format one 3½" 72O KB floppy disk for each copy of Open Protocol Monitor software required. For instructions on formatting disks, refer to the MS-DOS manuals supplied with your computer system.

To copy the Open Protocol Monitor Software Disk

1. Insert the Open Protocol Monitor software diskette into the 1.44 MB (3½") floppy disk drive. (Note, because hardware setup can vary, this drive may be designated as drive A or drive B. In this manual it will be assumed the drive is designated drive A.)

2. From the DOS prompt (C:\>) type **diskcopy a: a:** **<Enter>**

   The computer will display the following message:
   Insert SOURCE diskette in drive A: Press any key to continue. . .

3. Because the diskette is already in the A drive, press any key.

   After a short delay, the computer will display the following message:
   Insert TARGET diskette into drive A: Press any key to continue. . .

4. Remove the Open Protocol Monitor software diskette from drive A and insert a formatted diskette into drive A. Press any key.

   The computer will create a duplicate diskette of the original Open Protocol Monitor software diskette. When the process is complete, the computer will display the following message:

   Copy another diskette (Y/N)?

If desired, make additional copies. After all copies are complete, create a label for each diskette using information supplied on the original Open Protocol Monitor software diskette label.

Place the original Open Protocol Monitor software diskette in a safe place for storage. Use the backup diskette as a working copy to load Open Protocol Monitor software onto the hard disk.

Installing the Open Protocol Monitor Program

The Monitor Installation program installs necessary files from the Open Protocol Monitor software diskette onto a hard disk. The program will automatically create a new sub-directory, C:\MTECH (default) and transfer all required files to this directory. An option to customize installation for an alternate drive or sub-directory is provided.

Using the Monitor Installation program will not alter the AUTOEXEC.BAT or CONFIG.SYS files of the computer system. However, it will search for an existing file named RUN.BAT in the root directory. If found, this file will be renamed RUN.OLD, and a new RUN.BAT will be created. The new RUN.BAT calls another RUN.BAT located in the C:\MTECH directory, which is the file used to begin execution of the Open Protocol Monitor program. This allows the Open Protocol Monitor program to be run from the root (C:\) directory by typing "RUN." For information on altering PATH statements in the AUTOEXEC.BAT file to accomplish this same effect, refer to the MS-DOS manuals supplied with your computer system.

To install the Open Protocol Monitor program

1. Insert a working (backup) copy of the Open Protocol Monitor software diskette into the 1.44 MB (3½") floppy disk drive.

2. From the DOS prompt (C:\>) type **a:** **<Enter>**

3. From the DOS prompt (A:\>) type **install** **<Enter>**

   The Monitor Installation program will prompt for the disk and sub-directory in which to place the Open Protocol Monitor program. The default drive and sub-directory is (C:\MTECH).

4. Make any changes desired to the default disk and sub-directory. To accept the entry type **<Enter>**

   When the process is complete, the computer will return to the DOS prompt. At this time it is recommended you start the Open Protocol Monitor program to ensure installation was successful.

5. From the DOS prompt (A:\>) type **c:** **<Enter>**

6. From the DOS prompt (C:\>) type **run** **<Enter>**

   This will initiate loading of the Open Protocol Monitor program. If the program loads successfully, it will prompt on the command line of the *System Initialization and Startup* screen with the following:

   Press <Esc> to bypass Communications Initiation,
   <Enter> to continue. . .

7. Press the Escape Key **<Esc>**

   The program should now display the *Log-In Screen for the Monitor* screen and prompt on the command line with the following:

   Enter user name: _

   If you want to continue working with the Open Protocol Monitor program, refer to Chapter 2, "Running the Open Protocol Monitor Program," for further instructions. To exit the program do the following:

8. Press the F10 function key **<F10>**

9. Press the Enter key **<Enter>**

   The Open Protocol Monitor program will terminate and the computer will return to the DOS prompt.

After successful installation of the software, place the working (backup) diskette in a convenient location with easy access. Ensure the original Open Protocol Monitor software diskette is in a safe place for storage.

Chapter 2

Running the Open Protocol Monitor Program

The Open Protocol Monitor program is software that allows an operator to interact with an Open Protocol Master controller (OPM) through the use of a personal computer. The computer runs the program, which allows the operator to view, change, or gather information from unit controllers.

Although the Open Protocol Monitor program is designed to be user friendly for ease of operation, basic computer knowledge is required to operate it. For information on basic operating instructions for the computer system and MS-DOS operating system, refer to the User's Guide and MS-DOS manual supplied with the system.

Starting the Program

To begin working with the Open Protocol Monitor program, initiate loading of the Open Protocol Monitor software from the DOS prompt.

To start the Open Protocol Monitor program

- From the DOS prompt (C:\>) type **run** **<Enter>**

  If the computer responds with "Bad command or file name," ensure the directory is set to either the root directory (C:\) or the MTECH directory (C:\MTECH). When the program is loaded, it will display the *System Initialization and Startup* screen and prompt on the command line with the following:

  Press <Esc> to bypass Communications Initiation,
  <Enter> to continue. . .

  At this point you must decide whether communications with a controller are to be established prior to, or after the log-in sequence. In either case the objective is to proceed through the log-in sequence and gain access to the Main Menu.

Bypassing Communications

If your computer is not connected directly to an Open Protocol Master controller (OPM) and modem access is not available, or communications with the OPM are unachievable at this time, communications should be bypassed to log in and reach the Main Menu.

To bypass communications and begin the log-in sequence

- Press the Escape Key **<Esc>**

This will bring up the *Log-In Screen for the Monitor* screen and begin the log-in sequence described below.

Establishing Communications

If your computer is directly connected to an Open Protocol Master controller (OPM) or modem access is available, and communications with the OPM are achievable, communications can be initiated prior to the log-in sequence.

To initiate communications and begin the log-in sequence

- Press the Enter Key **<Enter>**

This will bring up the *Communications Initiation* screen. See Figure 4.4 If you are connected to a controller directly, the program will sequence through a series of baud rates (data transmission speeds) beginning with the rate specified in the baud rate setup parameter. If you are attempting to establish remote communications via modem, the program will initialize the modem, dial the telephone number specified in the auto-dial telephone number setup parameter, and display the status of the modem initiated call. Refer to the "Connecting to a Controller" section in Chapter 3, "Using the Open Protocol Support Menu," for additional information on communications initiation.

If communications are properly established, the *Communications Initiation* screen will be replaced with the *Log-In Screen for the Monitor* screen and the log-in sequence described below will begin. If the attempt to establish communications fails at this point, you will need to perform communications diagnostics using the advanced features found in the Support Menu. Refer to the "Changing Setup Parameters" section in Chapter 3, "Using the Support Menu."

If the attempt to establish communications has failed, the program will prompt at the command line of the *Communications Initiation* screen with the following:

Press, <Enter> to try again or use F10 to exit: _

Unless you know the nature of communications failure, and can remedy it immediately, it is recommended you complete the log-in sequence and establish communications at a later time using the advanced features found in the Support Menu.

To reach the log-in sequence when communications cannot be established

- Press the F10 function key **<F10>**

The Log-In Sequence

Following either of the two above alternatives associated with establishing communications will bring up the *Log-In Screen for the Monitor* screen and begin the log-in sequence. The program will prompt on the command line with the following:

Enter user name: _

The log-in sequence requires a user name and associated password. For initial log-in, use the default User ID "MCQUAY" and the associated default password "SGC". These will provide you access to the system until personalized identities and passwords for others who will operate the system can be entered. Refer to

the "Edit User I.D.s" section of Chapter 2, "Running the Open Protocol Monitor Program," for information on editing user identification.

To log in and reach the Main Menu

1. Type **MCQUAY** **<Enter>**

   The program will prompt on the command line with the following:
   Enter password: _

2. Type **SGC** **<Enter>**

   Note that as the password is entered, it will not be displayed. At this point, the *Main Menu* screen will appear. See Figure 3.1

The Main Menu

The *Main Menu* screen provides access to five different sections of the Open Protocol Monitor program. See Figure 3.1. Each section provides a different function and can be entered from the Main Menu by pressing its assigned function key. The different sections can only be entered by returning to the Main Menu and selecting the appropriate function key. From the Main Menu, the options available are F1, F4, F7, and as always, F9 and F10.

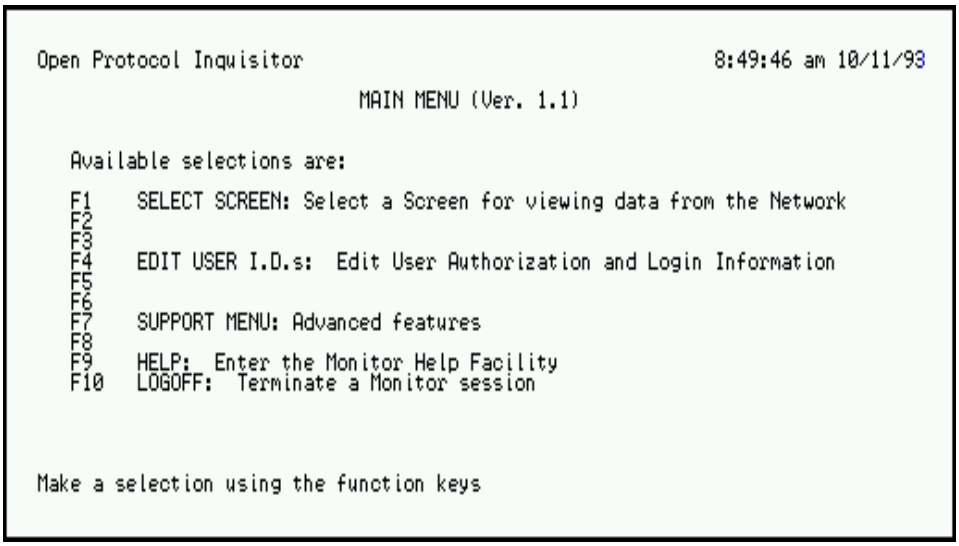


Figure 3.1

F1 SELECT SCREEN: Select a Screen for viewing data from the network
The Select Screen function provides access to either model 100 or model 200 controllers in the Open Protocol network and allows the operator to view, change or gather information from these controllers.

F4 EDIT USER ID's: Edit User Authorization and Login Information
The Edit User ID's function permits Authorization Level 1 users to add, delete, and modify information for other users of the system.

Caution: Do not eliminate or modify the default User ID "MCQUAY" and its associated password, "SGC."

F7 SUPPORT MENU: Advanced Features
The Support Menu function provides access to several advanced features of the Open Protocol Monitor program. Refer to Chapter 3, "Using the Support Menu," for detailed information about these advanced features.

F9 HELP: Enter the Monitor Help Facility
The Help function provides on-line assistance for any screen in the Monitor program. A choice between two types of information is necessary each time you initially press the F9 key. Pressing <Enter> displays additional information on the screen currently being displayed, while pressing any function key (F1-F10) displays information on that function key's function within the screen currently being displayed. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 LOGOFF: Terminate a Monitor session
The Logoff function is provided by pressing the exit screen key. Pressing the F10 key a second time will terminate the Monitor program itself. However, exit from the Monitor program must be confirmed prior to the actual exit. Refer to the "Logoff" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

The program will prompt on the command line of the Main Menu screen with the following:

Make a selection using the function keys _

To enter one of the five sections from the Main Menu

- Press the function key for the selection desired. *<F(x)>*

Selecting Screens

Selecting F1 from the Main Menu invokes the Select Screen function. The Select Screen function will bring up the *Single Unit/Screen Selection Menu* screen. See Figure 3.2. The Single Unit/Screen Selection Menu provides you with a choice between working with a Model 100 or a Model 200 series controller.

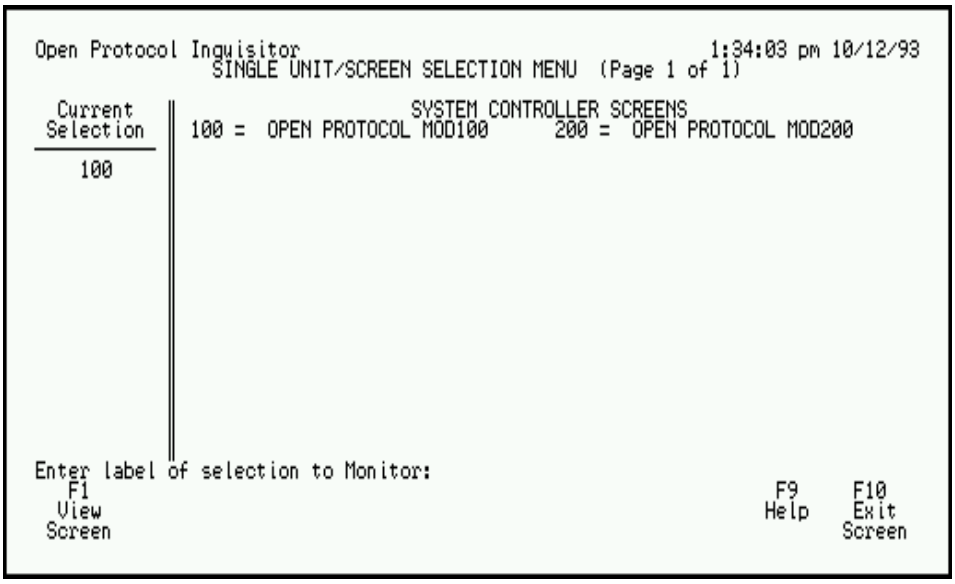


Figure 3.2

There are three functions on the option line of the *Single Unit/Screen Selection Menu* screen:

F1 View Screen
The View Screen function will display an information screen for the controller listed in the "Current Selection" column of the *Single Unit/Screen Selection Menu* screen. See Figure 3.3.

F9 Help
Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen
Exit Screen function as previously described. Refer to the "Logoff" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

If the controller listed in the "Current Selection" column of the *Single Unit/Screen Selection Menu* screen is not the controller for which you want information, another choice can be made by entering the appropriate controller code on the command line. The program will prompt on the command line of the *Single Unit/Screen Selection Menu* screen as follows:

Enter label of selection to monitor: _

To view controller information from the Single Unit/Screen Selection Menu

- Press the function key assigned to the selection desired. *<F(x)>*
  or
  Type the code for the controller desired: ***100*** or ***200*** **<Enter>**

  The information screen for the controller chosen will appear. See Figure 3.3.

Controller Information Screen

Selecting F1, or entering a controller code directly, from the *Single Unit/Screen Selection Menu* screen displays an information screen for the controller. See Figure 3.3. The *Information* screen contains information needed by the start-up technician to communicate with the desired controller(s).

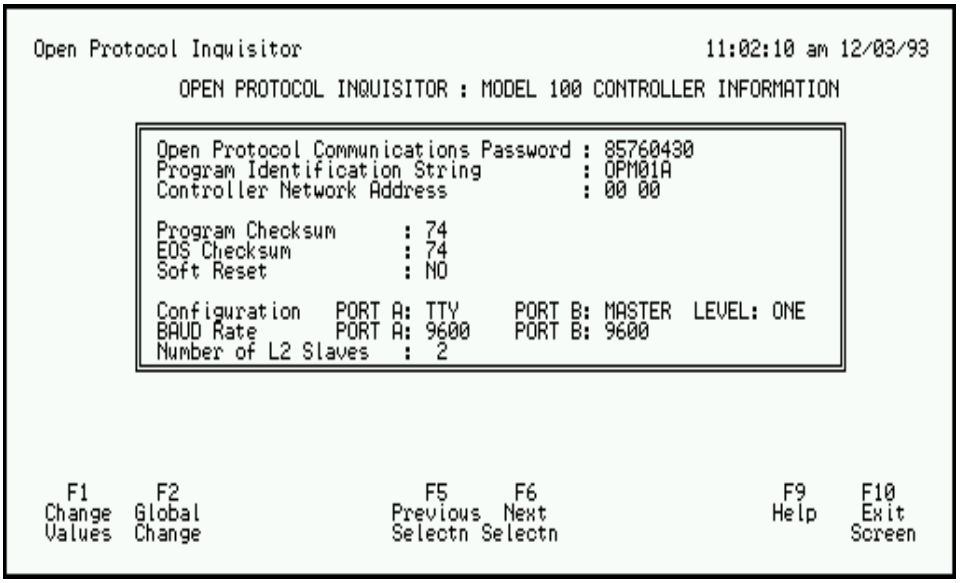


Figure 3.3

There are six functions on the option line of the controller *Information* screen:

F1 Change Values

The Change Values function will display the Information screen in a change value mode, and allow changes to be made in the following six areas:

Program Checksum

The Program Checksum is a single byte (00-FF) of information whose value must match the EnGinn™ Operating System (EOS) Checksum in order for the controller program to operate. It is necessary to change the Program Checksum to match the EOS Checksum after any other changes are made.

Soft Reset

The Soft Reset is a software command to reset the controller. Change the value to "Yes" to cause a soft reset. The value will automatically revert to "No" after the reset is complete.

Port Configuration

The Port Configuration is the combination of port types of the controller for which information is currently being displayed. Configuration options include TTY, Master and Slave combinations for Level 1, 2 or 3 controllers.

Baud Rate Port A
The Baud Rate for Port A is the communication speed for Port A. It can be set for a baud rate of 1200, 2400, 4800, or 9600.

Baud Rate Port B
The Baud Rate for Port B is the communication speed for Port B. It can be set for a baud rate of 1200, 2400, 4800, or 9600.

Number of Slaves
The Number of Slaves is the level (L2 or L3) and total number of slaves attached to the controller for which information is currently being displayed. The level of the slaves is determined by the port configuration of the controller to which they are attached, and cannot be directly changed. The total number of slaves can be changed.

The program will prompt on the command line of the *Information* screen in change value mode with the following:

Use CURSOR keys to select, PLUS/MINUS keys to modify

To make changes on the controller information screen in change value mode

1. Use the cursor keys to select the parameter **< ← ↑ → ↓ >**
2. Use the plus and minus keys to change the parameter **< + - >**
3. Use the enter key to accept a change **<Enter>**
   or
   Use the escape key to leave a parameter unchanged **<Esc>**

   From the change value mode, use the F1 function key, Resume Monitor, to return the program to the active *Information* screen.

F2 Global Change
The Global Change function is not used at this time.

F5 Previous Selection
The Previous Selection function will display an information screen for the controller listed previously in the *Single Unit/Screen Selection Menu* screen.

F6 Next Selection
The Next Selection function will display an information screen for the next controller listed in the *Single Unit/Screen Selection Menu* screen.

F9 Help
Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen
Exit Screen function as previously described. Refer to the "Logoff" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

To use one of the six functions from the controller *Information* screen

- Press the function key for the selection desired. *<F(x)>*

When the program is in the change value mode it will not update the *Information* screen. You must return to the active *Information* screen to monitor dynamic values. *After changes, the controller must be reset to initialize software for proper configuration as a result of the changes.*

Changes made will affect the EnGinn™ Operating System (EOS) Checksum after the controller is reset. It is necessary to change the Soft Reset parameter to "Yes" and observe the new EOS checksum after *any change* is entered. Then, change the Program checksum to match the EOS checksum. Finally, change the Soft Reset parameter to "Yes" for a second time and insure the Program checksum matches the EOS checksum.

THE OPERATING PROGRAM WITHIN THE CONTROLLER WILL NOT EXECUTE IF THE PROGRAM CHECKSUM DOES NOT MATCH THE EOS CHECKSUM.

Editing User I.D.s

Selecting F4 from the Main Menu invokes the Edit User ID's function. The Edit User ID's function will bring up the *Edit User Authorization and Logon Information* screen, (see Figure 3.4) and permit any user assigned an authorization level of 1 to add, change, or delete information for other user identities. As many as eight identities may be established for access to the system. The Open Protocol Monitor program is supplied with the default User ID "MCQUAY," and its associated default password "SGC." An authorization level of 1 is assigned to this identity. The default User ID and password provide access to the system until personalized identities and passwords are entered.
DO NOT eliminate or modify information for the default User ID "MCQUAY" and its associated password, "SGC."

```
Open Protocol Inquisitor                                  12:52:02 pm 10/14/93
                Edit User Authorization and Logon Information

   User ID  Password Auth.      Name      Comm.   Last Logon  Last Logoff  Auto
                     Level                Pwd.                            Logoff
 1 MCQUAY   SGC        1 SNYDERGENERAL CORP. 1 12:50 pm 10/14 12:48 pm 10/14 120
 2                     2 FIRST TIME USER     2 12:00 am       12:00 am       120
 3                     0                     0 12:00 am       12:00 am         0
 4                     0                     0 12:00 am       12:00 am         0
 5                     0                     0 12:00 am       12:00 am         0
 6                     0                     0 12:00 am       12:00 am         0
 7                     0                     0 12:00 am       12:00 am         0
 8                     0                     0 12:00 am       12:00 am         0


Commands Available:
E - Edit a User I.D.                    D - Display/hide logon passwords
U - Undo last Edit User I.D. command
P - Purge (eliminate) a User I.D.

Enter command or use fcn. key:
                                                                F9     F10
                                                               Help   Exit
                                                                     Screen
```

Figure 3.4

The information section of the *Edit User Authorization and Logon Information* screen displays user information and a list of commands available for entry on the command line. The user information contains eight pieces of information.

User I.D.
The User I.D. is an identity each user must enter when attempting to log on. The User I.D. can be up to 8 characters long, and any character may be used. A User I.D. might represent a name, code name, or a position description for a group of users, such as "maintenance."

Password
The password is a word, name, number, or set of characters unique to the identity of the user logging on. Passwords can be up to 8 characters long, and any character may be used. Ideally, the password would be known only by individuals with access to the system through the associated User I.D. Passwords can be displayed on the *Edit User Authorization and Logon Information* screen by an Authorization Level 1 user.

Authorization Level
The Authorization Level controls the amount of access a User I.D. has to various functions in the Open Protocol Monitor program. (This is different from the Communication Password, which determines the amount of access a person using the Open Protocol Monitor program has to the controller.) Levels 1-4 may be assigned for each User I.D. according to the amount of access deemed necessary.

Authorization Level 1
An Authorization Level 1 user can access all information and alter any programmable parameters in the Open Protocol Monitor program. In addition, the Authorization Level 1 user is the only user authorized to edit information in the *Edit User Authorization and Logon Information* screen.

Authorization Level 2
An Authorization Level 2 user can only view information.

Authorization Level 3
An Authorization Level 3 user can only view information.

Authorization Level 4
An Authorization Level 4 user can only view information.

Name
The Name field stores information used to identify the actual person or group assigned the associated User I.D. A name can be up to 19 characters long and might include a name, telephone number, or employee identification number. Information entered into the Name field does not appear and is not used in any other part of the program.

Communication Password
The Communication Password controls the amount of access a User I.D. has to the controller. (This is different from the Authorization Level, which determines the amount of access a User I.D. has to various functions in the Open Protocol Monitor Program.) Passwords 1-4 may be assigned for each User I.D. according to the level of access deemed necessary. Usually, the

Communication Password corresponds to the associated Authorization Level. The Communication Password assigned will be included by the Open Protocol Monitor program in all commands sent to controllers.

Last Log-on
The Last Log-on displays a time and date stamp corresponding to the last log-on occurrence for each User I.D. listed. The program does not maintain a record of all log-on activity.

Last Log-off
The Last Log-off displays a time and date stamp corresponding to the last log-off occurrence for each User I.D. listed. The program does not maintain a record of all log-off activity.

Auto Log-off
The Auto Log-off controls the amount of time (in minutes) the program will allow each User I.D. listed before automatically logging off. The feature is triggered by inactivity of the keyboard. Values may be entered in one minute increments up to 120 minutes.

There are four commands available for entry on the command line of the *Edit User Authorization and Logon Information* screen. Authorization Level 1 access is required to use any of the commands. After a selection is made, you must press <Enter> to execute the command.

E Edit a User I.D.
The *Edit a User I.D.* command permits information for new identities to be added to the system or changes to be made to information for existing identities. When <E> is entered on the command line and <Enter> is pressed, the *Edit a User I.D.* command will first prompt for the line number (1-8) to be edited, and then will prompt for entry through a series of requests corresponding to the required pieces of information described above. After each piece of information is entered or changed, press <Enter> to record the entry or change. ***Caution: Do not change the default User ID "MCQUAY" and its related information.***

U Undo last Edit User I.D. command
The *Undo last Edit User I.D. command* command returns user authorization and log-on information to its setting prior to the last Edit a User I.D command issued during the current *Edit User Authorization and Logon Information* screen. This function is a quick way to erase unwanted or incorrect editing.

P Purge (eliminate) a User I.D.
The *Purge (eliminate) a User I.D.* command eliminates an identity from the user list. When <P> is entered on the command line and <Enter> is pressed, the *Purge (eliminate) a User I.D.* command will first prompt for the line number (1-8) to be purged, and will then eliminate the chosen identity along with all related information. ***Caution: Do not purge the default User ID "MCQUAY."***

D Display/hide logon passwords
The *Display/hide logon passwords* command displays the passwords for all user identities listed. A second use of the command is required to once again hide the passwords during the current *Edit User Authorization and Logon Information* screen.

There are two functions available on the option line of the *Edit User Authorization and Logon Information* screen:

F9 Help
Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen
Exit Screen function as previously described. Refer to the "Logoff" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

The program will prompt on the command line of the *Edit User Authorization and Logon Information* screen with the following:

Enter command or use fcn. key: _

To edit user authorization and log-on information

- Type an available command ***E U P*** or ***D*** **<Enter>**
  or
  Press the function key assigned to the selection desired *<F(x)>*

Getting to the Support Menu

Selecting F7 from the Main Menu invokes the Support Menu function. The Support Menu function will bring up the *Support Menu: Advanced Features* screen. From the *Support Menu: Advanced Features* screen you have access to several additional features of the Open Protocol Monitor program. Complete information for the Support Menu function is provided separately in Chapter 3, "Using the Support Menu."

Getting Help

Selecting F9 from the Main Menu (or from any screen in the Open Protocol Monitor program) invokes the Help function. The Help function will access information pertaining to the screen currently being displayed. A choice between two types of information is necessary each time you initially press the F9 key. When F9 is pressed, the program will prompt on the command line of the screen currently being displayed with the following:

Press F1-F10 for help on that key or <Enter> for help
on the current screen _

To access help information for the screen currently being displayed

1. Press the Enter key **<Enter>**
   or
   Press any function key for which information is desired *<F(x)>*

   Pressing <Enter> displays additional information on the screen currently being displayed while pressing any function key (F1-F10) displays information on that function key's function within the screen currently being displayed. Once in the help mode for function keys, information for any number of the available functions keys may be obtained by sequentially pressing the function keys.

2. To exit the Help mode press the Enter key **<Enter>**

Logging Off

Selecting F10 from the Main Menu invokes the Log-off function. (F10 from any other screen in the Open Protocol Monitor program is considered the Exit Screen function, and when pressed will result in "backing out" of the display screens one at a time until the Main Menu is reached.) The Log-off function will terminate the current Monitor session and display the *Log-In Screen for the Monitor* screen. A message will be displayed showing the User ID logged off along with the corresponding time and date. There are two functions available on the option line of the *Log-In Screen for the Monitor* screen:

F9 Help

Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit To DOS

The Exit To DOS function will leave the Monitor program completely and return to the MS-DOS prompt. However, you must confirm exit from the Monitor program prior to the actual exit. The program will prompt on the command line of the *Log-In Screen for the Monitor* screen as follows:

(Exit Monitor) Are you sure? (Yes or No, <Enter>=Y): _

To exit the Monitor program and go to the DOS prompt

- Press the Enter key. **<Enter>**
  or
  Type Y and press Enter **Y** **<Enter>**

To remain in the Monitor program and return to the *Log-In Screen for the Monitor* screen

- Type N and press Enter **N** **<Enter>**

Chapter 3

Using the Support Menu

The Support Menu contains advanced features of the Monitor program that allow you to conduct the most basic application and program development steps. Typically, these features are used by troubleshooting and commissioning personnel.

The Support Menu: Advanced Features

Selecting F7 from the Main Menu invokes the Support Menu function. The Support Menu function will display the *Support Menu: Advanced Features* screen (see Figure 4.1) and provide you with access to eight different options in the Support Menu. Each option provides a different function and can be entered from the *Support Menu: Advanced Features* screen by pressing its assigned function key. The different options may only be entered by returning to the *Support Menu: Advanced Features* screen and selecting the appropriate function key. From the *Support Menu: Advanced Features* screen, command options available are F1, F2, F3, F4, F5, F7, and as always, F9 and F10.

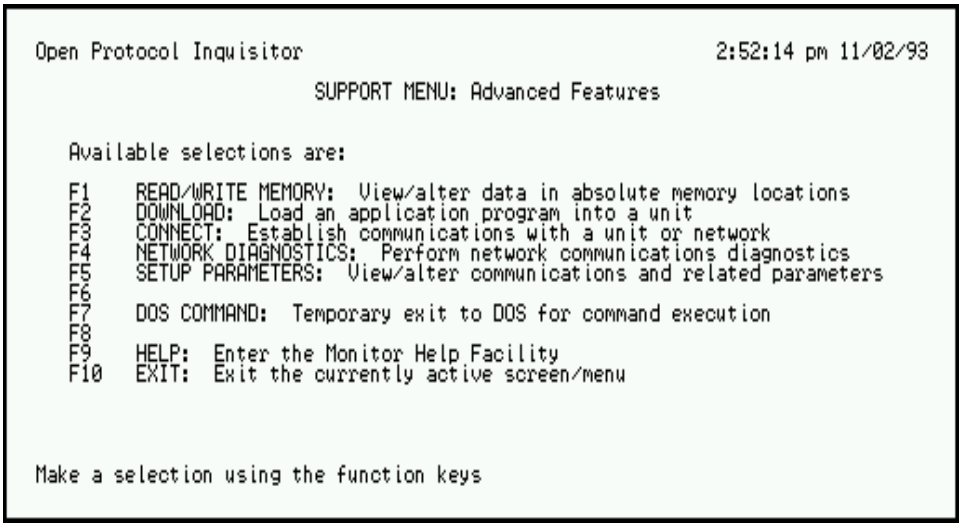


Figure 4.1

F1 READ/WRITE MEMORY: View/alter data in absolute memory locations
The Read/Write Memory function allows you to access memory locations in the MicroTech controller. Contents of read memory locations may be viewed only, while contents of read/write memory locations may be viewed

and changed. Authorization Level 1 access is required to use the Read/Write Memory function.

F2 DOWNLOAD: Load an application program into a unit
The Download function permits you to download operating software to MicroTech controllers. Under normal circumstances, this function is constrained by the requirement for special files (.COD) to be provided to you. Authorization Level 1 access is required to use the Download function.

F3 CONNECT: Establish communications with a unit or network
The Connect function attempts to initiate communication to the direct or remote connected MicroTech controller using the communication's current setup parameters.

F4 NETWORK DIAGNOSTICS: Perform communications diagnostics
The Network Diagnostics function provides a summary of network communications through an available series of reliability tests. Analysis of the communication network is possible from the summary obtained.

F5 SETUP PARAMETERS: View/alter communications and parameters
The Setup Parameters function allows you to alter communication parameters for use in establishing communications between the computer and the direct or remote connected MicroTech controller.

F7 DOS COMMAND: Temporary exit to DOS for command execution
The DOS command function permits temporary access to the DOS command line without leaving the Monitor program. All DOS commands normally available can be used.

F9 HELP: Enter the Monitor Help Facility
The Help function provides on-line assistance for any screen in the Monitor program. A choice between two types of information is necessary each time you initially press the F9 key. Pressing <Enter> displays additional information on the screen currently being displayed while pressing any function key (F1-F10) displays information on that function key's function within the screen currently being displayed. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 EXIT: Exit the currently active screen/menu
The Exit Screen function is used to exit any screen currently being displayed. Repeated pressing of the F10 key will result in "backing out" of the display screens one at a time until the Main Menu is reached, and then ultimately out of the Monitor program itself. However, exit from the Monitor program must be confirmed prior to the actual exit. Refer to "Logging Off" in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

The program will prompt on the command line of the Support Menu: Advanced features screen with the following:

Make a selection using the function keys _

To enter one of the eight features from the Support Menu

- Press the function key for the selection desired. *<F(x)>*

Reading and Writing to Controller Memory Locations

Selecting F1 from the *Support Menu: Advanced Features* screen invokes the Read/Write function. The Read/Write function will bring up the *Read/Write Controller Memory Locations* screen. See Figure 4.2. The *Read/Write Controller Memory Locations* screen permits you to view (read) and change (write) data in absolute memory locations of each controller in the network. Authorization Level 1 access is required to use the Read/Write Memory function.

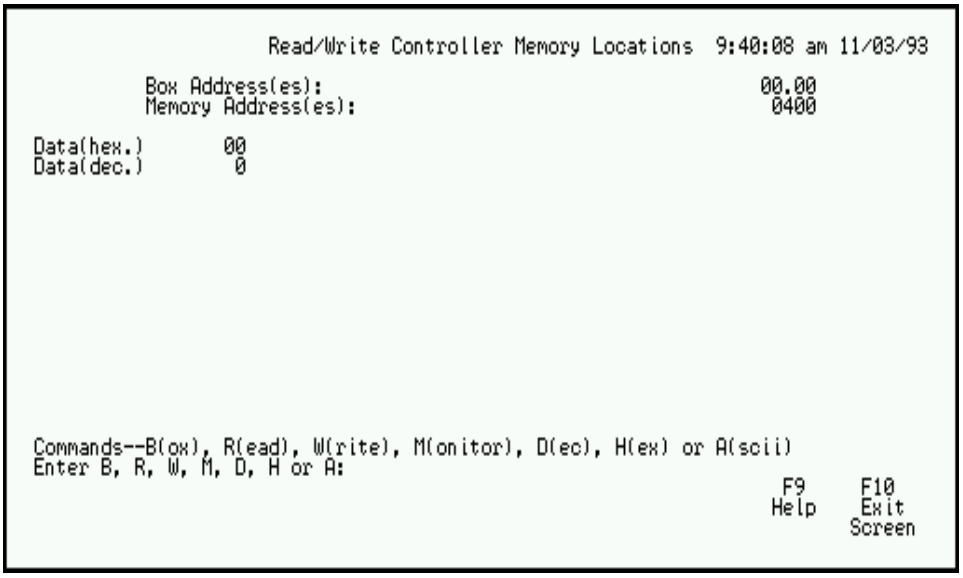


Figure 4.2

The information section of the *Read/Write Controller Memory Locations* screen displays two variables, data associated with the variables, and a description of the commands available for entry on the command line. At the top of the information section, the two variables displayed are the controller's address (box) from which data will be read and the specific memory address for which information is desired. Both variables are assigned by the operator, and can display multiple addresses simultaneously. At the left side of the information section, actual data from the memory address(es) specified is displayed.

There are seven commands available for entry on the command line of the *Read/Write Controller Memory Locations* screen. They are summarized in the lower portion of the information section, and indicate the corresponding function. Syntax and sequence of entry for the various commands varies. For multiple addresses, a comma (,) separates additional memory locations and a hyphen (-) is used to define a range of values. *Note: Hexadecimal addresses shown in the procedures outlined below are for illustrative purposes only. The actual addresses entered will depend on the specifics of your application.*

B Box

The Box command is used to define the box address (controller address) or addresses for which information is to be read from or written to. On the command line, enter the command letter followed by the hexadecimal address(es) of the controller(s) desired and press enter. Separate multiple addresses with a comma (,).

To specify controller address(es)

- Type **B***0000* **<Enter>**
  or for multiple box addresses
  Type **B***0100***,***0200* **<Enter>**

R Read

The Read command displays data from the specified memory location(s) within the defined box address(es). On the command line, type the command followed by enter to display data from the memory location currently selected, or type the command letter followed by the hexadecimal address(es) of the memory location(s) desired and press enter. Separate multiple addresses with a comma (,) and a range of addresses with a hyphen (-).

To read data from memory location(s)

- Type **R** **<Enter>**
  or to read a memory address different from that being displayed
  Type **R***0400* **<Enter>**
  or to read multiple memory addresses
  Type **R***0400***,***0401* **<Enter>**
  or to read a range of memory addresses
  Type **R***0400***-***0410* **<Enter>**

W Write

The Write command first displays data from the specified memory location(s) within the defined box address(es) and then permits a new value to be written to the location(s). ***Caution: Careless write commands can result in significant controller problems. Ensure all write commands are carefully considered.*** On the command line, type the command followed by enter to display and change data from the memory location currently selected, or type the command letter followed by the hexadecimal address(es) of the memory location(s) desired and press enter. Separate multiple addresses with a comma (,) and a range of addresses with a hyphen (-).

To write data to memory location(s)

1. Type **W** **<Enter>**
   or to change a memory address different from that being displayed
   Type **W***0400* **<Enter>**
   or to change multiple memory addresses
   Type **W***0400***,***0401* **<Enter>**
   or to change a range of memory addresses
   Type **W***0400***-***0410* **<Enter>**

   In all cases after displaying the current value(s) for the location(s) specified, the program will prompt on the command line of the *Read/Write Controller Memory Locations* screen with the following:

   New value for XX.XX YYYY or <Enter> for no change _

   where XX.XX YYYY is the box address and memory location specified. If multiple box addresses and multiple, or a range, of memory locations are specified, the initial command line prompt will reflect the first memory location within the first box address specified. The command line will then prompt in sequence through the multiple, or range, of memory locations for each box address specified, pausing at each location for a new value to be entered. At each prompt, enter the hexadecimal value (00-FF) to be written to the location indicated and press enter, or press enter to leave the indicated location unchanged.

2. Type *FF* **<Enter>**
   or to leave unchanged
   Type **<Enter>**

During the Write command, there is an additional function available on the option line of the *Read/Write Controller Memory Locations* screen:

F1 Cancel Command
At any time during the Write command, you can use the Cancel Command function to cancel the Write function. However, using Cancel Command will not undo Write commands that have already been processed (enter has been pressed).

M Monitor

The Monitor command displays dynamic (changing) data from the specified memory location(s) within the defined box address(es). On the command line, type the command followed by enter to monitor data from the memory location currently selected, or type the command letter followed by the hexadecimal address(es) of the memory location(s) desired and press enter. Separate multiple addresses with a comma (,) and a range of addresses with a hyphen (-).

To monitor data from memory location(s)

- Type **M** **<Enter>**
  or to monitor a memory address different from that being displayed
  Type **M***0400* **<Enter>**
  or to monitor multiple memory addresses
  Type **M***0400***,***0401* **<Enter>**
  or to monitor a range of memory addresses

Type **M***0400-0410* **<Enter>**

During the Monitor command, there is an additional function available on the option line of the *Read/Write Controller Memory Locations* screen:

F1 Cancel Command
The Cancel Command function is used to deactivate the Monitor command which is continuous in nature.

D Decimal
The Decimal command directs the program to display data from the specified memory location(s) in a decimal format. The default display shows the decimal value of the data for the specified memory location(s) on the second line of information. After the Decimal command is entered, data must be read again for the display to update with decimal information.

To display data in a decimal format

1. Type **D** **<Enter>**

   Then, to update the display:

2. Type **R** **<Enter>**

H Hex
The Hex command directs the program to display data from the specified memory location(s) in a hexadecimal format. The default display shows the hexadecimal value of the data for the specified memory location(s) on the first line of information. After the Hex command is entered, data must be read again for the display to update with hexadecimal information.

To display data in a hexadecimal format

1. Type **H** **<Enter>**

   Then, to update the display:

2. Type **R** **<Enter>**

A ASCII
The ASCII command directs the program to display data from the specified memory location(s) in an ASCII format. Some memory locations are better displayed in ASCII format. The default display does not show data for the specified memory location(s) in ASCII format. After the ASCII command is entered, data must be read again for the display to update with ASCII information.

To display data in an ASCII format

1. Type **A** **<Enter>**

   Then, to update the display:

2. Type **R** **<Enter>**

In addition to commands, there are always two functions available on the option line of the *Read/Write Controller Memory Locations* screen:

F9 Help
Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen
Exit Screen function as previously described. Refer to the "Logging Off" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

The program will prompt on the command line of the *Read/Write Controller Memory Locations* screen as follows:
Enter B, R, W, M, D, H or A: _

To perform Read/Write functions from the *Read/Write Controller Memory Locations* screen

- Type an available command using the appropriate syntax as described above. ***B R W M D H*** or ***A*** **<Enter>**
  or
  Press the function key assigned to the selection desired. *<F(x)>*

Downloading to Controllers

Selecting F2 from the *Support Menu: Advanced Features* screen will bring up the *Download Application Program From A Disk File* screen (see Figure 4.3) and allows you to download operating software and controller configuration parameters to MicroTech controllers individually or on a global basis. In addition, the Download function facilitates backup of controller configuration parameters either globally or on an individual basis. Authorization Level 1 access is required to use the Download function.

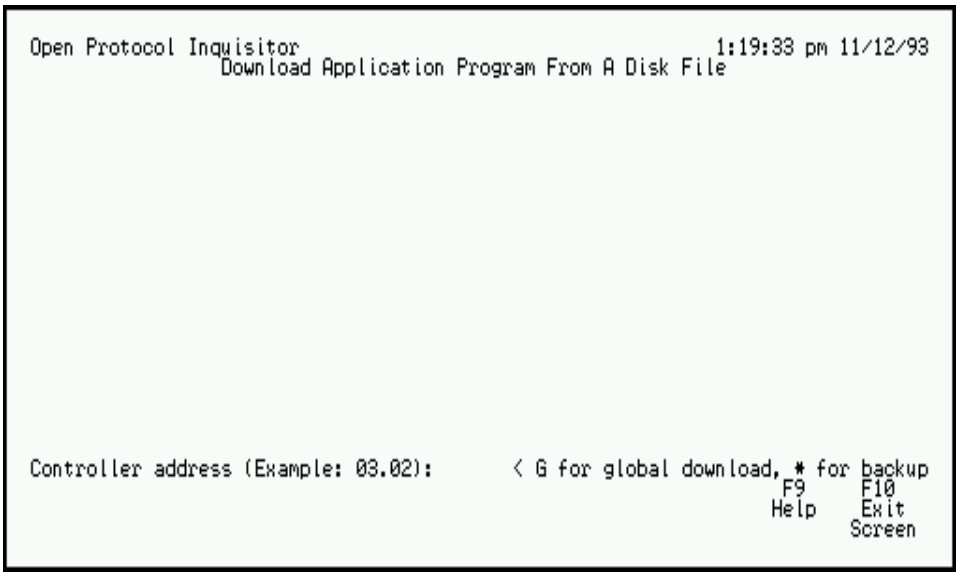


Figure 4.3

Downloading Control Code and Configuration Parameters

New control code and controller configuration parameters can be downloaded to an individual controller or to a series of controllers on a global basis. The information line "< G for global download, * for backup" is displayed to remind you of options to direct entry of a controller address. The program will prompt on the command line of the *Download Application Program From A Disk File* screen with the following:

Controller address (Example: 03.02): _

To download to a single controller

1. Type the address of the controller *00FF* **<Enter>**

   Any legitimate network address can be specified. 00FF is a default address used to specify the controller to which the computer is connected (either direct or remote), regardless of the controller's actual hexadecimal address. The program will display the controller to be programmed in the information section, and prompt on the command line with the following:

   Save/Restore local configuration data? (Yes or No, <Enter>=N): _

2. To utilize the Save/Restore option type **Y** **<Enter>**
   or
   To bypass the Save/Restore option type **N** **<Enter>**

   For information and detailed instruction on Backup/Restoration of Controller Configuration Data refer to the "Backup/Restoration of Controller Configuration Data" section below. *Decisions with regard to backup/restoration of controller configuration data must be made prior to continuing with the download procedure.* When your selections have been made with regard to Backup/Restoration of Controller Configuration Data, the program will prompt on the command line of the *Download Application Program From A Disk File* screen as follows:

File name to download (.COD assumed): _

You must now enter the name of the DOS file in which the control code to be downloaded is stored. The prefix name must be typed exactly as it appears on your computer's hard disk, or the floppy disk on which it is supplied, and no extension is required. (A .COD extension is assumed.)

3. Type the DOS filename *filename* **<Enter>**

   The program will display the name of the file being downloaded, a line identifying the controller, "Saving data in controller XX.XX" and the total number of bytes of information being saved for that controller in the information section of the *Download Application Program From A Disk File* screen. It will then deactivate the program currently running in the controller and display the number and activity of bytes being downloaded to the controller. When the download is completed, the program will prompt on the command line of the *Download Application Program From A Disk File* screen as follows:

   Restart controller(s)? (Yes or No, <Enter>=Y): _

4. Type the desired option ***Y*** or ***N*** **<Enter>**

   To return immediately to the Support Menu without restarting the controller use the "No" option. If the "Yes" option is selected the program will restart the controller, and indicate if the restart was successful. After a successful restart the program will prompt on the command line of the *Download Application Program From A Disk File* screen as follows:

   Press <Enter> to leave function _

5. Type <Enter> to return to the Support Menu **<Enter>**

To download code to a series of controllers on a global basis

On the command line of the Download Application Program From A Disk File screen:

1. Type "G" for a global download **G** **<Enter>**

   The program will prompt on the command line of the *Download Application Program From A Disk File* screen as follows:

   High addr. of string (0 for L2 string): _

2. Type the HI address of the string *XX* **<Enter>**

   where XX represents the hexadecimal HI byte address of the string of controllers to which you want to download code. Use 00 to download to the level 2 controllers. The program will prompt with the following:

   List of slaves (Hex) to download-to: _

3. Type *XX,XX,XX* **<Enter>**
   or to download to a range of slaves
   Type *XX-XX* **<Enter>**

   where XX represents the hexadecimal LO byte address of each controller in the string to which you want to download code. The program will prompt with the following:

Save/Restore local configuration data? (Yes or No, <Enter>=N): _

From this point, the program will operate in the same manner as the download procedure for a single controller described above, except decisions will now pertain to the *series of controllers* specified. Refer to steps 2-5 of the procedure for downloading code to a single controller described immediately above for detailed instructions. For information and detailed instruction on Backup/Restoration of Controller Configuration Data refer to the "Backup/Restoration of Controller Configuration Data" section below. As with downloading to a single controller, *Decisions with regard to backup/restoration of controller configuration data must be made prior to continuing with the global download procedure.*

In addition to the screen prompts and associated commands discussed with regard to downloading controller code, there are always two functions available on the option line of the *Download Application Program From A Disk File* screen:

F9 Help
Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen
Exit Screen function as previously described. F10 in the *Download Application Program From A Disk File* screen also functions as an escape during any part of the download routine. Refer to the "Logging Off" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

Backup/Restoration of Controller Configuration Data

Configuration data includes the passwords, setpoints, communication port configurations, control variables, and tables set up in each controller. Each controller can be configured with different values for these parameters. For future reference, as a precaution, and to minimize reconfiguration time it is recommended you use the backup-save-restore capability built into the Download function following initial setup, after any changes are made, and in conjunction with each download of control code. You can use the backup-save-restore capabilities in one of these ways:

Global Save: Configuration data can be saved for all controllers on the network automatically using the "∗" command from the *Download Application Program From A Disk File* screen. The program will prompt on the command line of the *Download Application Program From A Disk File* screen with the following:
Controller address (Example: 03.02): _

To save configuration parameters for all controllers on the network

1. Type **∗** **<Enter>**

The program will prompt as follows:
File name prefix for Save/Restore: _
You must now enter the name of the file in which the configuration data should be stored. This name should follow DOS convention (eight characters maximum). No extension is required. The program will

automatically append/replace/truncate any name with more than eight characters and add the appropriate extension.

2. Type *filename* **<Enter>**

   The program will prompt as follows:
   Data to Save: P=Pwds, N=Port Config, S=spts,
   C=Ctl vars, T=tbls, A=All: _

   P - The P option will save communication passwords for each controller.
   N - The N option will save port configurations for each controller.
   S - The S option will save setpoints associated with each controller.
   C - The C option will save control variables associated with each controller.
   T - The T option will save any tables associated with each controller.
   A - The A option will save all of the configuration parameters associated with each controller.

3. Type the desired option ***P N S C T*** or ***A*** **<Enter>**

   For specific purposes, select the appropriate individual parameter. In most circumstances, and for archive purposes, it is recommended you select "A," for all parameters. The program will display "Saving data in controller XX.XX" and the total number of bytes for that controller in the information section of the *Download Application Program From A Disk File* screen. After sequencing through all controllers in the network, the program will prompt on the command line as follows:
   Press <Enter> to leave function _

4. Type <Enter> to return to the Support Menu **<Enter>**

Individual Controllers: Configuration data can be saved, restored, or saved and restored in conjunction with a download of control code for a single controller by entering the controller address on the command line of the *Download Application Program From A Disk File* screen. The program will prompt on the command line of the *Download Application Program From A Disk File* screen with the following:
Controller address (Example: 03.02): _

To save/restore configuration parameters for individual controllers

1. Type the address of the controller *XXXX* **<Enter>**

   where XXXX represents the hexadecimal address of the controller for which configuration data is to be saved, restored or saved and restored in conjunction with a download of control code. Use 00FF to access configuration data in the controller to which the computer is connected (either direct or remote), regardless of the controller's actual hexadecimal address. The program will prompt with the following:
   Save/Restore local configuration data? (Yes or No, <Enter>=N): _

2. To utilize the Save/Restore option type **Y** **<Enter>**
   The program will prompt as follows:
   B = Save before/Restore after download, S = Save only,
   R = Restore only: _

B Use the B option if configuration parameters are being saved/restored in conjunction with a download of control code. This option will save the selected configuration parameters currently in the controller, and restore them after the new control code has been downloaded. For information on downloading control code refer to the "Downloading Control Code and Configuration parameters" section above.

S The S option will save the selected configuration parameters for the controller specified to a disk file. No download of control code is performed when using this option.

R The R option will restore configuration parameters to the controller specified from a disk file containing configuration parameters previously saved. No download of control code is performed when using this option.

3. Type the desired option ***B S*** or ***R*** **<Enter>**

The program will prompt with the following:
File name prefix for Save/Restore: _

If the "B" or "S" option was chosen, the name of the file in which the configuration data should be stored must be entered. This name should follow DOS convention (eight characters maximum) and no extension is required. The program will automatically append/replace/truncate any name with more than eight characters and add the appropriate extension.

If the "R" option was chosen, enter the name of the DOS file in which the configuration parameters to be restored were saved. The prefix name must be typed exactly as it appears on your computer's hard disk, or the floppy disk on which it is supplied, and no extension is required.

4. Type the appropriate filename *filename* **<Enter>**

At this point the program will respond differently depending on the option selected for the type of Save/Restore configuration data desired, B, S or R.

B If a download was intended and the B option, "Save before/Restore after download," was chosen the program will prompt on the command line of the *Download Application Program From A Disk File* screen with the following:

Data to Save: P=Pwds, N=Port Config, S=spts,
C=Ctl vars, T=tbls, A=All: _

P - The P option will save communication passwords for each controller.
N - The N option will save port configurations for each controller.
S - The S option will save setpoints associated with each controller.
C - The C option will save control variables associated with each controller.
T - The T option will save any tables associated with each controller.
A - The A option will save all of the configuration parameters associated with each controller.

5. Type the desired option ***P N S C T*** or ***A*** **<Enter>**

For specific purposes, select the appropriate individual parameter. In most circumstances it is recommended you select "A," for all parameters. After saving the selected configuration data, the

program will continue with the download portion, and will prompt on the command line as follows:

File name to download (.COD assumed): _

For information on the download portion of this procedure refer to the "Downloading Control Code and Configuration Parameters" section above.

S If a download was not intended and the S option, "Save only," was chosen the program will prompt on the command line of the *Download Application Program From A Disk File* screen with the following:

Data to Save: P=Pwds, N=Port Config, S=spts,
C=Ctl vars, T=tbls, A=All: _

P - The P option will save communication passwords for each controller.
N - The N option will save port configurations for each controller.
S - The S option will save setpoints associated with each controller.
C - The C option will save control variables associated with each controller.
T - The T option will save any tables associated with each controller.
A - The A option will save all of the configuration parameters associated with each controller.

5. Type the desired option ***P N S C T*** or ***A*** **<Enter>**

For specific purposes, select the appropriate individual parameter. In most circumstances, and for archive purposes, it is recommended you select selecting "A," for all parameters. The program will display "Saving data in controller XX.XX" and display the total number of bytes for the controller in the information section of the *Download Application Program From A Disk File* screen. After saving the configuration parameters, the program will prompt on the command line as follows:

Press <Enter> to leave function _

6. Type <Enter> to return to the Support Menu **<Enter>**

R If the download intended was to restore configuration data only, and the R option, "Restore only," was chosen the Monitor program will deactivate the program currently running in the controller specified, display "Restoring config of controller XX.XX" and display the total number of bytes being restored in the information section of the *Download Application Program From A Disk File* screen. After completion of the restore, the program will prompt on the command line of the *Download Application Program From A Disk File* screen as follows:

Restart controller(s)? (Yes or No, <Enter>=Y): _

5. Type the desired option ***Y*** or ***N*** **<Enter>**

To return immediately to the Support Menu without restarting the controller use the "No" option. If the "Yes" option is selected the program will restart the controller, and indicate if the restart was successful. After a successful restart the program will prompt on the command line of the *Download Application Program From A Disk File* screen with the following:

Press <Enter> to leave function _

6. Type <Enter> to return to the Support Menu **<Enter>**

Multiple Controllers: Configuration data can be saved, restored or saved and restored in conjunction with a global download of control code for selected multiple controllers by entering "G" on the command line of the *Download Application Program From A Disk File* screen. The program will prompt on the command line of the *Download Application Program From A Disk File* screen with the following:

High addr. of string (0 for L2 string): _

To save/restore configuration parameters for multiple controllers

1. Type the HI address of the string *XX* **<Enter>**

   where XX represents the hexadecimal HI byte address of the string of controllers for which global configuration data is to be saved, restored or saved and restored in conjunction with a global download of control code. Use 00 to save/restore configuration data in the level 2 controllers. The program will prompt with the following:

   List of slaves (Hex) to download-to: _

2. Type *XX,XX,XX* **<Enter>**
   or to download to a range of slaves
   Type *XX-XX* **<Enter>**

   where XX represents the hexadecimal LO byte address of each controller in the string for which global configuration data is to be saved, restored or saved and restored in conjunction with a global download of control code. The program will prompt with the following:

   Save/Restore local configuration data? (Yes or No, <Enter>=N): _

   From this point, the program will operate in the same manner as the backup-save-restore capability for individual controllers as described above, except decisions will now pertain to the *series of controllers* specified. Refer to the "To save/restore configuration parameters for individual controllers" procedure above for detailed instructions.

In addition to the screen prompts and associated commands discussed with regard to backup/restoration of controller configuration data, there are always two functions available on the option line of the *Download Application Program From A Disk File* screen:

F9 Help
Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen
Exit Screen function as previously described. F10 in the *Download Application Program From A Disk File* screen also functions as an escape during any part of the download routine. Refer to the "Logging Off" section

in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

Connecting to a Controller

Selecting F3 from the *Support Menu: Advanced Features* screen will bring up the *Communications Initiation* screen. See Figure 4.4. The function will attempt to initiate communications with the controller connected using the information (direct or phone, communication port, baud rate, phone number) specified in the *Setup Parameters* screen. If communications are properly established, the *Communications Initiation* screen will be replaced immediately with the *Support Menu* screen. If the attempt to establish communications fails, you will have to perform communication diagnostics. Refer to the "Changing Setup Parameters" section in Chapter 3, "Using the Support Menu," for more on communication diagnostics.

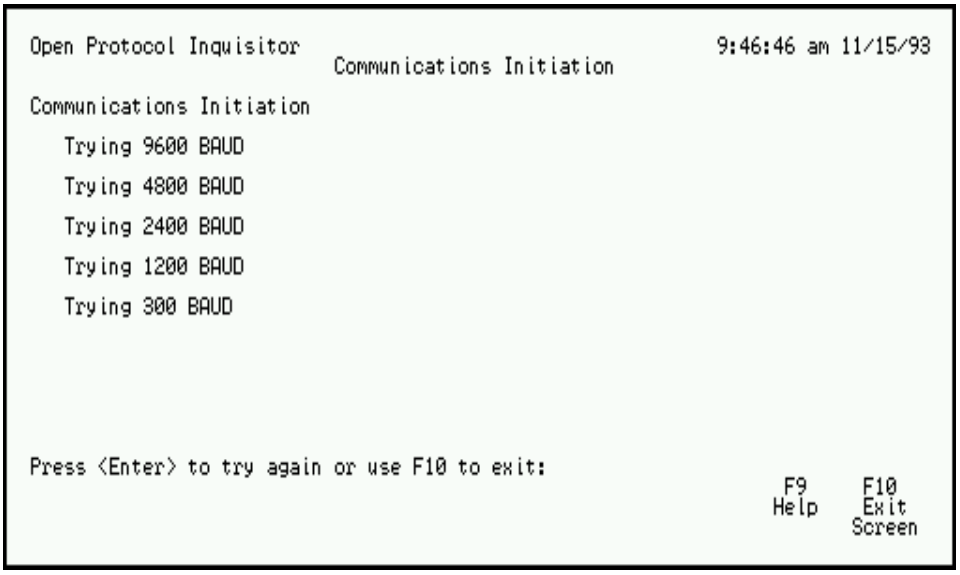


Figure 4.4

If your computer is connected to a controller directly, the connect function will sequence through a series of baud rates (data transmission speeds) beginning with the rate specified in the baud rate setup parameter. If you are attempting to establish remote communications via modem, the connect function will initialize the modem, dial the telephone number specified in the auto-dial telephone number setup parameter, and display the status of the modem initiated call. In either case, if communications initiation has failed, the program will prompt at the command line of the *Communications Initiation* screen with the following:

Press, <Enter> to try again or use F10 to exit: _

Unless you know the nature of communications failure, and can remedy it immediately, it is recommended you establish communications after using communications diagnostics found in the Setup Parameters function.

To return to the Support Menu when communications initiation has failed

- Press the F10 function key **<F10>**

There are two functions available on the option line of the *Communication Initiation* screen:

F9 Help
Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen
Exit Screen function as previously described. Refer to the "Logging Off" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

Performing Network Diagnostics

Selecting F4 from the *Support Menu: Advanced Features* screen invokes the Network Diagnostics function, and will bring up the *Diagnostic Setup Parameters* screen. See Figure 4.5. The Network Diagnostics function is used to find the architecture of the communication network and check for system errors, non-responding controllers, and application program checksum problems. It tests the reliability of the communications network by communicating with each connected controller on the network, and then reporting errors encountered.

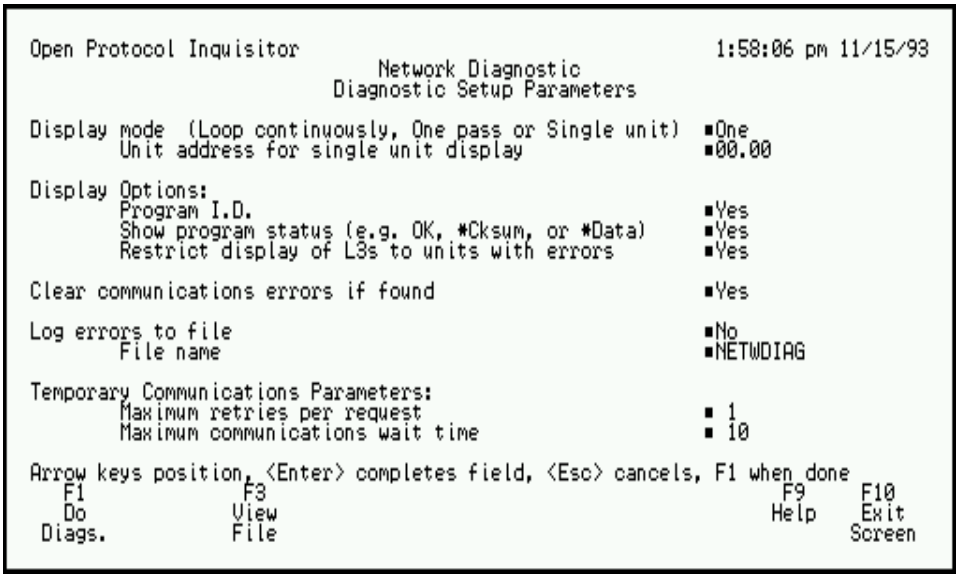


Figure 4.5

The *Network Diagnostics Setup Parameters* screen contains five areas of information which can be set each time diagnostics are to be performed.

Display Mode
You can set the display mode to loop continuously, perform one pass through all controllers in the network, or perform a single pass to a specified controller. In "Loop" mode, the entire network is scanned repeatedly. In "One" (pass) mode, a single sweep is made through all controllers in the

network. In "Single" mode, a single controller is repeatedly examined. Set the Display Mode to "Loop," "One," or "Single" for the type of diagnostic that meets your needs. If the Display Mode is set to "Single," an address for the desired controller must be specified. Enter the hexadecimal address (XX.XX) of the controller for which diagnostics are to be performed. Use 00.FF to access the controller to which your computer is connected, regardless of the controller's actual hexadecimal address.

Display Options
Display Options establish various items for display once the mode is specified. Each option may be toggled on (Yes) or off (No). The Program I.D. will display the program identity of those controllers responding. The Show Program Status will display the status (O.K., Checksum, Data, etc.) of the program in each of the displayed controllers. Finally, display of L3 controllers may be restricted to those found to have errors.

Communications Errors
Communication errors that have occurred can be cleared from the Open Protocol Monitor program during each network diagnostics pass by setting the "Clear communication errors if found" option to "Yes."

Log Errors to a File
Communication errors that are discovered during network diagnostics can be logged to a DOS file for future reference by setting the "Log errors to a file" option to "Yes." If this feature is used, you must specify a name for the DOS file. This name should follow DOS convention (eight characters maximum), and no extension is required. The program will automatically add the appropriate extension (.LOG).

Temporary Communications Parameters
The Temporary Communication Parameters set the amount of time and the number of retries necessary before an error is logged to the screen and the DOS file (if used). The maximum retries per request specifies the number of times each communication request will be attempted without response before an error is logged. The maximum communication wait time is the time that will elapse between each of these attempts.

The program will prompt on the command line of the *Network Diagnostics Setup Parameters* screen with the following:

Arrow keys position, <Enter> completes field,
<Esc> cancels, F1 when done

To set the network diagnostic parameters

1. Use the cursor keys to select the parameter **< ← ↑ → ↓ >**
2. Use the plus and minus keys to change the parameter **< + - >**
3. Use the enter key to accept a change **<Enter>**
   or
   Use the escape key to leave a parameter unchanged **<Esc>**

There are four functions on the option line of the *Network Diagnostics Setup Parameters* screen:

F1 Do Diags.
The Do Diagnostics function will bring up the *Network Diagnostic Error Display* screen (see Figure 4.6) and perform network diagnostics according to the parameters you have specified.

F3 View File
If errors from network diagnostics have been logged to a DOS file on disk, the View File function will bring up the *Open Protocol View File* screen and permit you access to the data on file. If the number of entries exceeds one page of display, you can view additional entries using the cursor keys < ↑ ↓ > to scroll, the plus/minus keys < + - > to add or subtract a quantity of entries, or by entering the line number of the entry to be displayed.

F9 Help
Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen
Exit Screen function as previously described. Refer to the "Logging Off" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

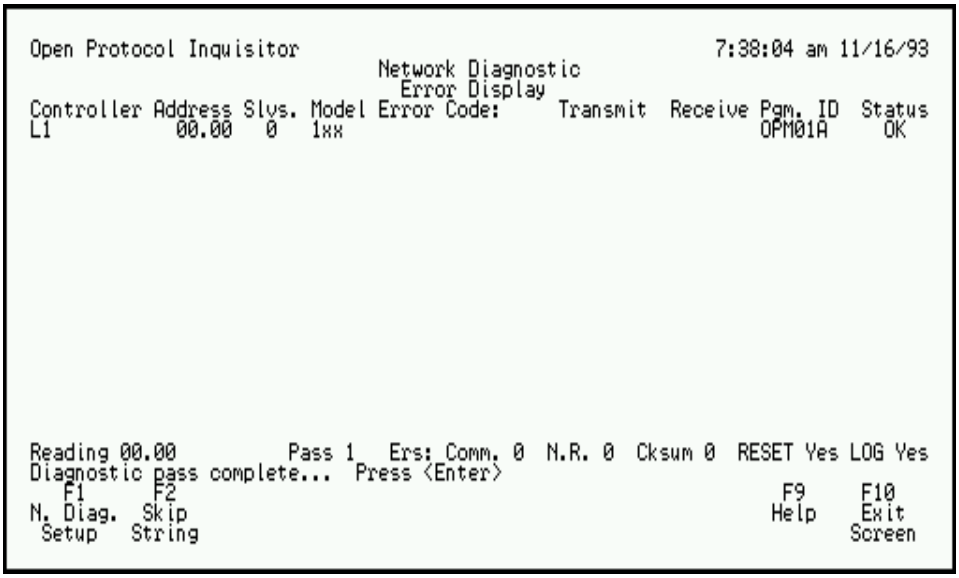


Figure 4.6

The information section of the *Network Diagnostics Error Display* screen contains a summary of the parameters selected for network diagnostics, the data read from the specified controller(s) in the diagnostic pass, and the status of the diagnostic in process. There are four functions available on the option line of the *Network Diagnostics Error Display* screen:

F1 N. Diag. Setup
The Network Diagnostics Setup function will return the program to the *Network Diagnostic Setup Parameters* screen. See Figure 4.5. If you

have set the Display Mode to either "Loop" or "Single," the diagnostic function will continue active until <F1> is pressed. When the display mode is set to "One," either <F1> or the <Enter> key may be used to return to the *Network Diagnostic Setup Parameters* screen after the diagnostic pass is complete.

F2 Skip String
The Skip String function directs the diagnostic in process to go on to the next L2 or L3 string in the network addressing scheme.

F9 Help
Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen
Exit Screen function as previously described. Refer to the "Logging Off" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

Changing Setup Parameters

Selecting F5 from the *Support Menu: Advanced Features* screen calls the Setup Parameters function and will initially display the first *Setup Parameters* screen in a series of three. See Figure 4.7. The Setup Parameters function provides you with the capability to specify alarm, event, and trend logging parameters. However, in Open Protocol applications the function is used primarily to select the communication parameters needed to establish communications with a controller.

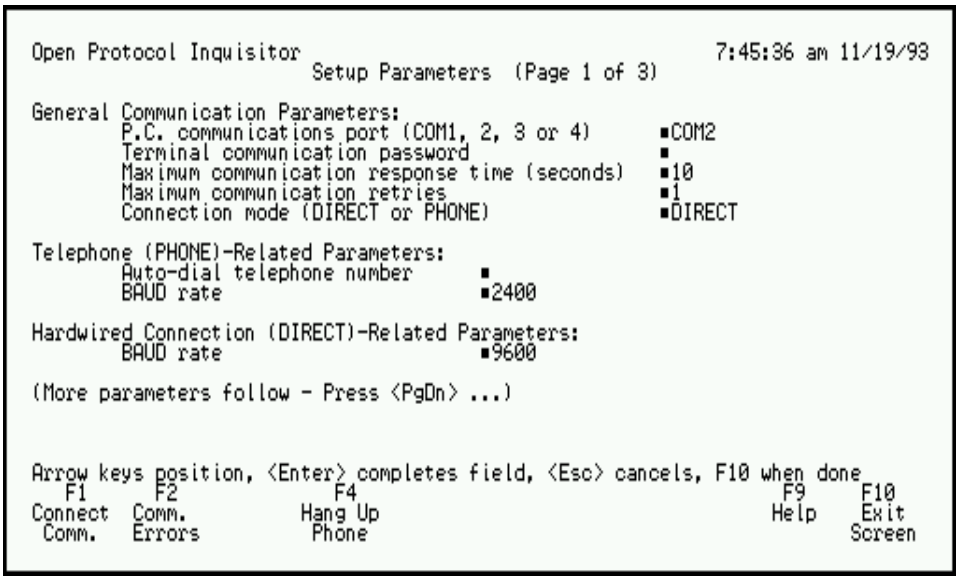


Figure 4.7

Page 1 of the *Setup Parameters* screen series contains three areas of information that may be changed to establish the communication parameters desired.

General Communication Parameters

P.C. communications port (COM1, 2, 3, or 4)
Set the P.C. communications port parameter to match the communication port used on the computer you have connected to the controller or the port used by the modem.

Terminal communications password
This option is not used from the Setup Parameters function. Terminal communication passwords must be altered from the *Edit User Authorization and Logon Information* screen. Special access authorization is required.

Maximum communication response time (seconds)
The maximum communication response time is the time that will elapse waiting for a response from the controller between each communication attempt made by your computer.

Maximum communication retries
The maximum communication retries parameter specifies the number of times each communication request will be attempted by your computer without a response from the controller before a communication error is logged.

Connection mode (DIRECT or PHONE)
The connection mode parameter is used to specify the mode of communication to the controller, either via modem (PHONE) or by direct connection (DIRECT).

Telephone (PHONE)-Related Parameters

Auto-dial telephone number
The auto-dial telephone number is used by your computer modem to initiate a connection with a modem attached to a remotely located controller. Commas (,) may be used to cause the pauses necessary for telephone switches to react.

BAUD rate
The baud rate parameter is used to set a baud rate (data transmission speed) for connection to a remotely located controller.

Hardwired Connection (DIRECT)-Related Parameters

BAUD rate
The baud rate parameter is used to set a baud rate (data transmission speed) for direct connection to the controller. (This parameter is usually set to 9600.)

Parameters for alarm, event, and trend logging can be found on pages 2 and 3 of the *Setup Parameters* screen series, and can be viewed using the "Page Up" and "Page Down" keys. Typically, Open Protocol Monitor software is not used to

administer these functions. The program will prompt on the command line of each page in the *Setup Parameters* screen series as follows:

Arrow keys position, <Enter> completes field,
<Esc> cancels, F10 when done

To set the relevant setup parameters

1. Use the cursor keys to select the parameter **< ← ↑ → ↓ >**

2. Use the plus and minus keys to change the parameter **< + - >**

3. Use the enter key to accept a change **<Enter>**
   or
   Use the escape key to leave a parameter unchanged **<Esc>**

There are five functions available on the option line of each page in the *Setup Parameters* screen series. If changes have been made to any parameters, all functions (except F9, Help) will first bring up the *Communications Initiation* screen (see Figure 4.4) and attempt to initiate communication with a controller using the new information. Refer to the "Connecting to a Controller" section in Chapter 3, "Using the Support Menu," for more on communications initiation. If communications are properly established, the *Communications Initiation* screen will be replaced immediately with the *Support Menu* screen.

F1 Connect Comm.
The Connect Communications function will bring up the *Communications Initiation* screen (see Figure 4.4) and attempt to initiate communication with a controller using the information specified by the setup parameters. Refer to "Connecting to a Controller" in Chapter 3, "Using the Support Menu," for more on communications initiation.

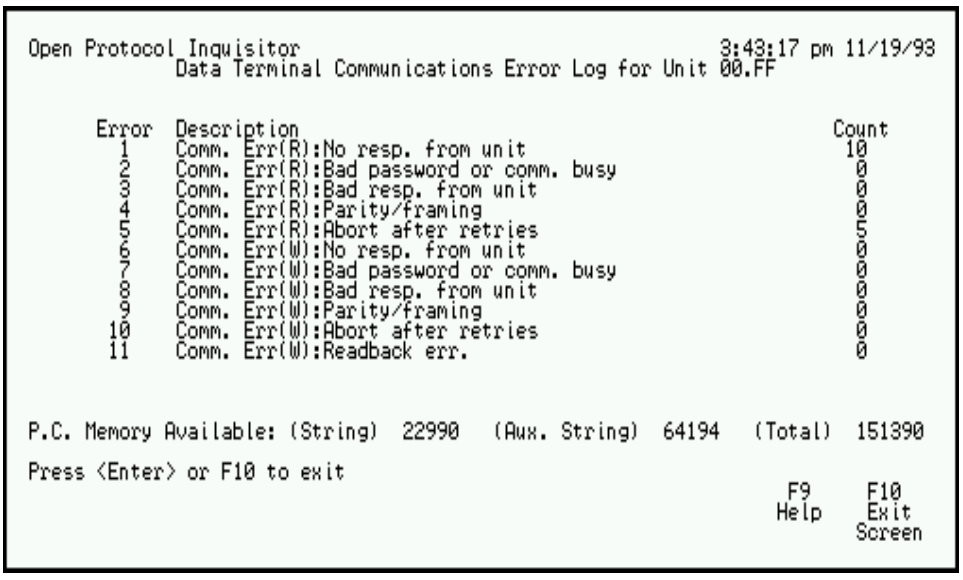


Figure 4.8

F3 Comm. Errors

Communication errors are automatically logged, and the communication errors function will bring up the *Data Terminal Communications Error Log* screen for the controller you are connected to. See Figure 4.8. If a connection is not recognized, the screen will display the default controller address 00.FF.

There are eleven identified types of communication error. The number of times each type of communication error has occurred will be displayed. The program will prompt on the command line of the *Data Terminal Communications Error Log* screen as follows:

Press <Enter> or F10 to exit

To exit from the *Data Terminal Communications Error Log* screen

- Press the enter key **<Enter>**

Use <Enter> to return to page 1 of the *Select Parameters* screen series, or as always, use one of the two functions available on the option line of the *Data Terminal Communications Error Log* screen:

F9 Help

Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen

Exit Screen function as previously described. Refer to the "Logging Off" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F4 Hang Up Phone

The hang up phone function will terminate a modem (telephone) connection.

F9 Help

Help function as previously described. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

F10 Exit Screen

Exit Screen function as previously described. Refer to the "Logging Off" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

Using the DOS Command

Selecting F7 from the *Support Menu: Advanced Features* screen calls the DOS Command function and will display the *Exit to DOS for Command Execution* screen. The DOS Command function provides temporary exit from the Open Protocol Monitor program to the command line of the operating system. You can use the DOS Command to avoid exiting the Open Protocol Monitor program for routine computer system administration. The program will prompt on the

command line of the *Exit to DOS for Command Execution* screen with the following:

Use the DOS command "EXIT" to return to Monitor... Press <Enter>

To reach the operating system command line prompt (usually C:\>)

1. Press the enter key **<Enter>**

   Once the operating system command line is active, the DOS command "exit" is used to return to the Open Protocol Monitor program.

2. To return to the Monitor program type **exit** **<Enter>**

Getting Help

Selecting F9 from the *Support Menu: Advanced Features* screen calls the Help function. The Help function provides on-line assistance for any screen in the Monitor program. A choice between two types of information is necessary each time you initially press the F9 key. Pressing <Enter> displays additional information on the screen currently being displayed while pressing any function key (F1-F10) displays information on that function key's function within the screen currently being displayed. Refer to the "Getting Help" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

Exiting the Support Menu

Selecting F10 from the *Support Menu: Advanced Features* screen calls the Exit Screen function. In this case, the Exit Screen function is used to exit the Support Menu and return to the Main Menu. Pressing the F10 key again will exit the Monitor program itself. However, you must confirm exit from the Monitor program to the actual exit. Refer to the "Logging Off" section in Chapter 2, "Running the Open Protocol Monitor Program," for details on how to use this function.

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