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# Section I - Introduction

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## ***Product Description***

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The Smith Meter™ SyberMate is a software tool that simplifies set-up and maintenance of the Smith Meter™ SyberTrol™. It is designed to operate on a PC equipped with Windows 3.0 or above.

## ***Application***

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Applications include initial profiling of new SyberTrols, maintenance of SyberTrol parameters, viewing of SyberTrol run time data, setting up configurable reports and displays and aiding the development of supervisory systems.

The SyberMate consists of three basic modes of operation: Offline Mode, Read-Only Mode and an Online Mode.

### ***Offline Mode***

In the Offline Mode of Operation the SyberMate can be used to completely set up a data file or edit a file in the computers editor. This file can then be saved for future use or by changing to Live Mode it can be downloaded to the SyberTrol.

### ***Read Only Mode***

The Read Only Mode is used in the SyberMate for those times when it is being used only to read information from the SyberTrol. The Read Only Mode of operation can be entered by two separate methods. The first is if the operator does not enter the correct access code for the SyberTrol a message will pop up "You can only read this SyberTrol data". If the operator clicks 'OK' or presses 'ENTER' on the keyboard of the computer the SyberMate will automatically go into the Read Only Mode and no data will be allowed to change. The second method of entering the Read Only Mode is when changes are made to the parameters using the Save Changes (F2 Key). A device updated popup window will appear asking the question "Continue Live Editing? (Yes for Online

Mode, No for Read\_Only)", the operator can choose to either stay in Online Mode or go to the Read Only Mode. If the choice is to go to the Read Only Mode of operation, data will be read only and no changes will be allowed to parameters.

### ***Online Mode***

The Online Mode of operation requires that the SyberTrol and the SyberMate's communications port are set up with the same baud rate, parity, protocol and address of the SyberTrol. Also a definition or file has to be created for the SyberTrol that is being communicated with. The file is set up by selecting File and then selecting New SyberTrol.

Once the setups have been completed, communications can be established by selecting File and then selecting Login-Relogin which will pop up the dialog box that requests the desired security level access code. When the access code is entered and 'ENTER' is pressed the SyberMate will check the access code and if it is correct will go on-line with the SyberTrol.

When in the Online Mode the SyberMate can be used to configure the SyberTrol, inquire alarm, batch, run and prove data, read information from the SyberTrol or dump directories or entire files to the SyberTrol. Information is sent to the SyberTrol by either using the "Dump" icons or going to file and then to Save Changes, the SyberMate will save the changes in your file on the PC as well as update the SyberTrol with the changes.

## ***System Requirements***

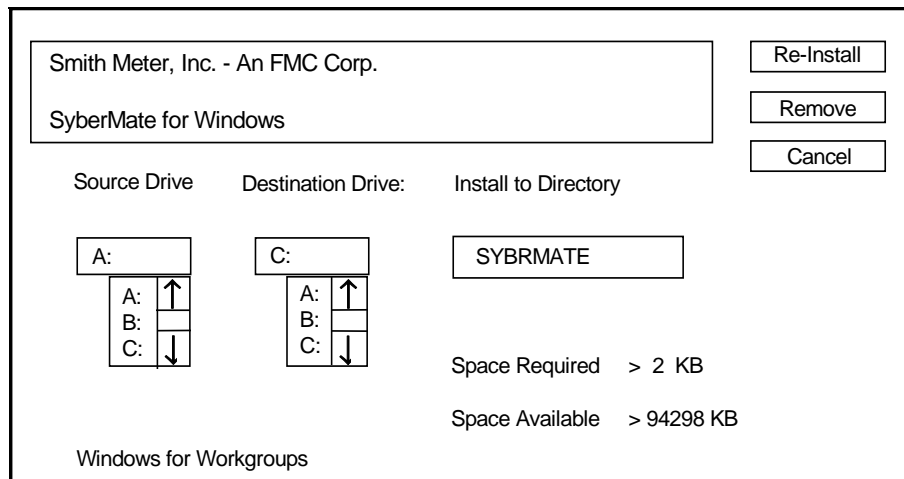
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The SyberMate will operate on an IBM-PC compatible (386 or better) computer operating in a Windows environment (3.0 or later) with at least 2M of memory and one 3-1/2" floppy disk drive. The hard drive should have at least 1M of free disk space.

## Section II - Installation

To install the SyberMate Computer Program:

1. Insert the SyberMate diskette into the 3-1/2" floppy drive.
2. From the Program Manager screen click on File or hold down the ALT key and Type "F" to select File.
3. Type "R" or click on Run to select Run.
4. On the command line type A:\setup and press 'ENTER' or click on OK. If not using the A drive replace with the letter of the drive with the SyberMate Install disk.
5. The next screen will have the SyberMate name and the Smith Meter logo in the upper left hand corner of the screen and the following box in the center.



The Source Drive is the drive that is being used to load the SyberMate. If installing from the diskette the source drive would be A: or B:. If the files were copied to a hard drive the selections will allow the choice of the hard drive designations.

The Destination Drive is the drive that the program is to reside on and run from.

Install to Directory: The directory on the computer that the program will be installed under. The default is SYBRMATE, if a different directory is required the default can be changed. Using either the mouse or 'TAB' key move the cursor to this location and re-name the directory.

Space Required: The number of free bytes required to load the program.

Space Available: The number of free bytes available on the drive that has been selected for loading the program.

6. The buttons on the right hand side of window are used to install the program, remove the program from the computer or cancel the installation of the program.
7. Using either the mouse or the 'TAB' key and pressing 'ENTER' with the INSTALL highlighted will start the process of loading the program onto the hard drive if the destination is one of the disk drives on the Computer. While going through the install process a screen will show the percentage of the files and program that has been loaded. When the loading process has been completed the Installation Completed screen will appear. Pressing 'OK' will acknowledge the End of the Installation.
8. The installation process is now complete and a new program group has been added to the Program Manager Window.
9. To check the files that should be installed to run the SyberMate program double click on the "SyberMate Info" icon on the SyberMate for SyberTrol window. The following information will appear on the screen:

# **SyberMate<sup>TM</sup>**

## **for SyberTrol<sup>TM</sup>**

*SyberMate* is a Windows-based software application for programming the SyberTrol flow computer from FMC Technologies Measurement Solutions, Inc. - a worldwide leader in measurement products for the custody transfer of petroleum and related products.

### **NEW IN REVISION 2:**

A translation tool has been added to handle translation of any literal string in the SyberTrol, for customization of specific strings or a complete language change.

An equation editor has been added that allows the user to define a customized subprogram that can be downloaded to the SyberTrol, with read access to all SyberTrol database variables and the ability to execute commands such as start/end batch, print report, write to user variables, etc.

Also, added support for the new Skid configuration area, the ability to read and write from the new user data and user timer data areas, and improved the Report Editor to be able to create batch reports.

### **NEW IN REVISION 1:**

Support for User Configurable Reports and User Configurable Displays.

Installed files should include:

SMWIN.EXE - the SyberTrol executable file.

SYBRMATE.DAT - data for the windows, help, and dialog boxes in the application.

SMIFONT.FON - font file used by Report/Display Editors and Translator.

SYSTEM.SDF  
METER.SDF  
PRODUCT.SDF  
DIO.SDF  
ANIO.SDF  
PIO.SDF  
COMM.SDF  
PROVER.SDF  
SECURITY.SDF  
ALARMTR.SDF  
ALARMSYS.SDF  
MBATCH.SDF  
MRUN.SDF  
DIORUN.SDF  
ANIORUN.SDF  
PIORUN.SDF  
PROVE.SDF  
QUICK.SDF  
TRIPS.SDF  
REPORT.SDF

## Section II - Installation

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DISPLAY.SDF  
SYSCTRL.SDF  
MTRCTRL.SDF  
DIOCTRL.SDF  
ANIOCTRL.SDF  
SKID.SDF  
USER.SDF

TIMER.SDF - SyberTrol data files; these files inform SyberMate where to look in the SyberTrol for specific information.

\*.SY - a SyberTrol configuration file. Several examples are shipped with the program. These include DEFAULT.SY, DEMO1.SY and DEMO2.SY.

SY.LST - list of SyberTrol device configurations stored on disk. Is updated when you add new or delete old SyberTrol definitions.

SM.CFG - SyberMate configuration file. Stores information such as current options and last used SyberTrol configuration.

SYBRMATE.WRI - this file.

**Contact your Smith Meter™ distributor if any files are missing or you have any other problems with the SyberMate installation.**

## Section III - Communications

### **Establishing Communications**

In order for communications to function the SyberTrol and the SyberMate setups must be compatible and the communications cable correctly wired. Several SyberTrol parameters must be set properly to enable communications, then the SyberMate setup must be configured to match the SyberTrol parameters.

### **Communication Cable Wiring**

Select an available communications port; Com1, Com2 or Com3. Only three wires are necessary for EIA-232 serial communications. They must be connected as follows:

Computer Port (9 Pin Connector)	SyberTrol (15 Pin Connector) Comm Port #1 (9 Pin Connector) Comm Port #2 and 3
1 - Shield	1 - No Connection
2 - Receive	2 - Transmit
3 - Transmit	3 - Receive
5 - Ground	7 - Ground

Computer Port (25 Pin Connector)	SyberTrol (15 Pin Connector) Comm Port #1 (9 Pin Connector) Comm Port #2 and 3
1 - Shield	1 - No Connection
2 - Transmit	2 - Transmit
3 - Receive	3 - Receive
5 - Ground	7 - Ground

### **Configuring SyberTrol Communications**

To configure the SyberTrol for communications, use the keypad to select the following menus/program parameters:

1. From the "Main Menu" select 8. Program Mode Menu and press 'ENTER'.
2. Enter the passcode for programming, default from the factory is "0".
3. From the "Program Mode Menu" select 6. Communications Menu and press 'ENTER'.
4. From the "Communications Menu" select the communications port that is being set up for the SyberMate. (Comm Port #1, 2 or 3) and press 'ENTER'.
5. From the "Communications Port Menu" select 1. Comm Protocol and press 'ENTER'.
6. From the Comm Protocol parameter select 6. Smith ASCII LRC, 7. Smith ASCII CR or 8. Smith Binary as the protocol for communicating with the SyberMate and press 'ENTER'.
7. From the "Communications Port Menu" select 2. Baud Rate and press 'ENTER'.
8. From the Baud Rate parameter select the required baud rate for the communications and press 'ENTER'.
9. From the "Communications Port Menu" select 3. Data Format and press 'ENTER'.
10. From the Data Format parameter select the required number of bits per character and the type of parity and press 'ENTER'.

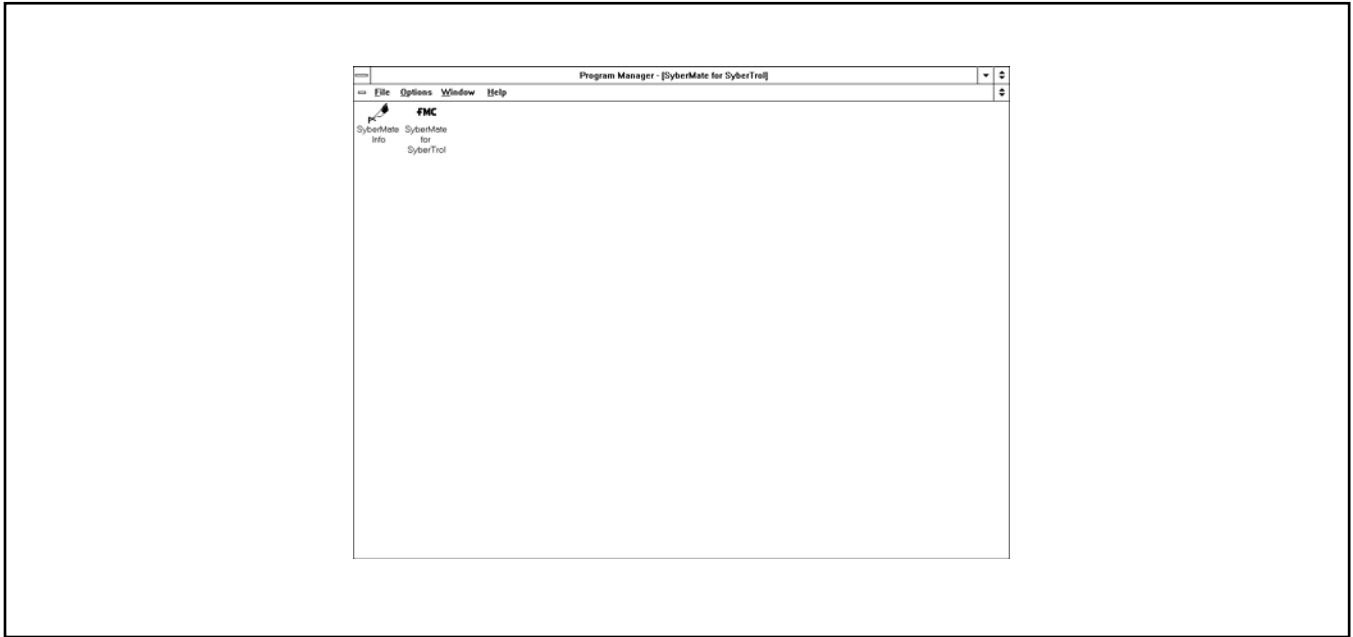
The communications port in the SyberTrol is now set up for communicating with the computer that is running the SyberMate program. Ensure that your SyberMate program is set up for the same protocol, baud rate and data format that the SyberTrol has been programmed to.

## Section III - Communications

### ***Configuring SyberMate Communications***

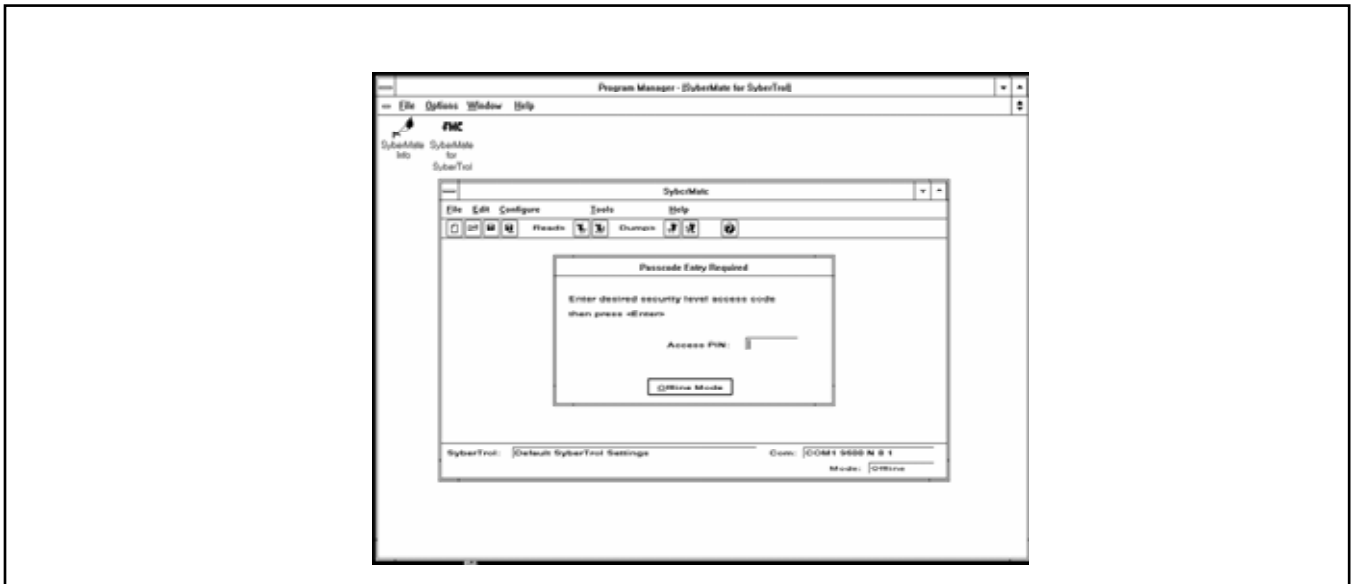
After the SyberTrol has been set up for communications and the cable has been connected to the serial port on the computer, the SyberMate can be configured for communications.

1. Locate the program group SyberMate for SyberTrol and double click on the FMC Icon.



**Figure 1**

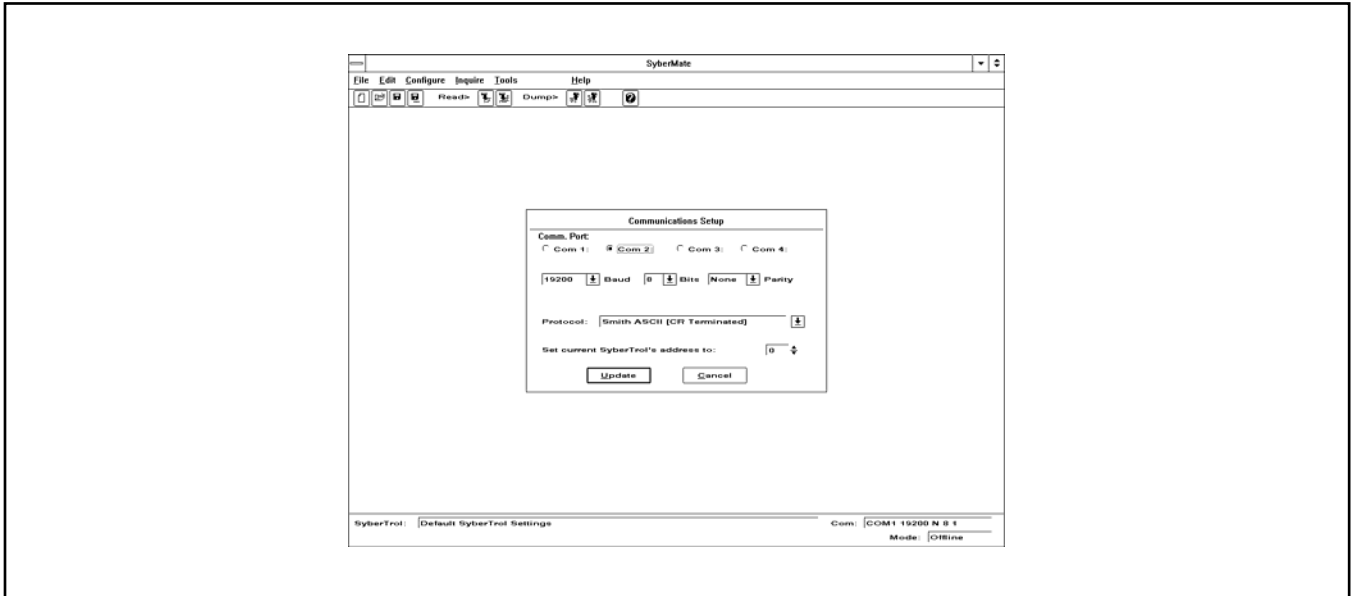
2. Using the mouse click on the "Offline Mode" button on the SyberMate Screen.



**Figure 2**

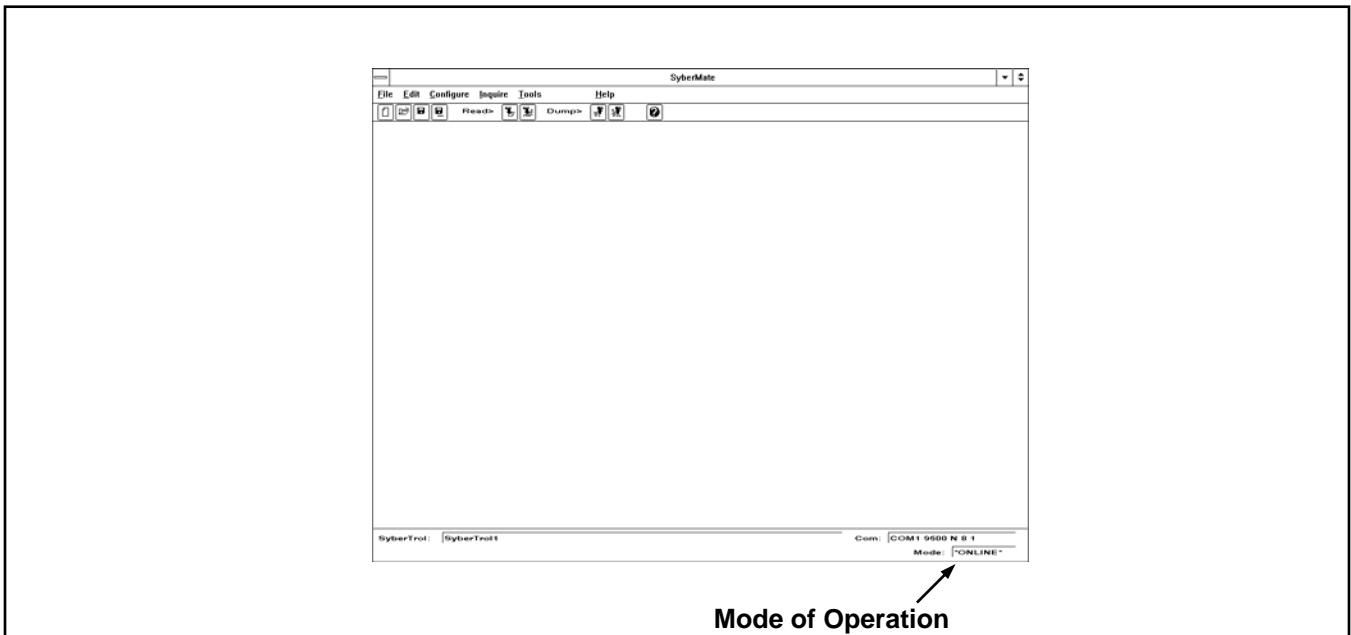
## Section III - Communications

3. Under “File” select Comm Setup. The Communication setup screen will be displayed. On this screen the Comm Port, the baud rate, the data bits, the parity, the protocol, and the SyberTrol's address are set up.



**Figure 3**

To establish initial communication with the SyberTrol under “File”, select Login/ReLogin. The screen shown in Step 2 will appear. Entering the correct passcode and pressing “ENTER” should establish communications with the SyberTrol. Once established, Mode, located at the bottom right hand corner of the screen, will indicate Online or Read Only. Online will indicate that the SyberTrol is not in the program mode and the correct access code was entered. Read Only will indicate that either an incorrect access code was entered or that the SyberTrol is in the Program Mode.



**Figure 4**

## Section III - Communications

### To Run the Program

1. Using the mouse, locate the program group SyberMate for SyberTrol and double click on the FMC icon.

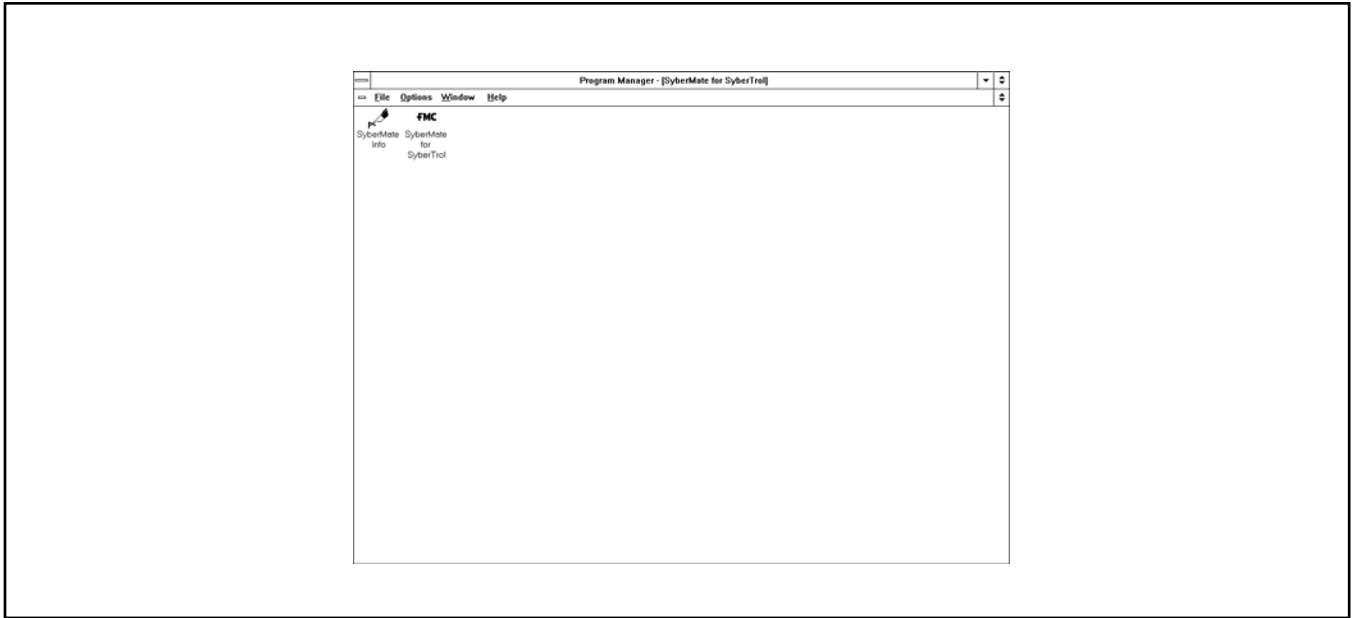


Figure 5

2. To access the SyberTrol data, the correct password or PIN number must be entered on this screen.

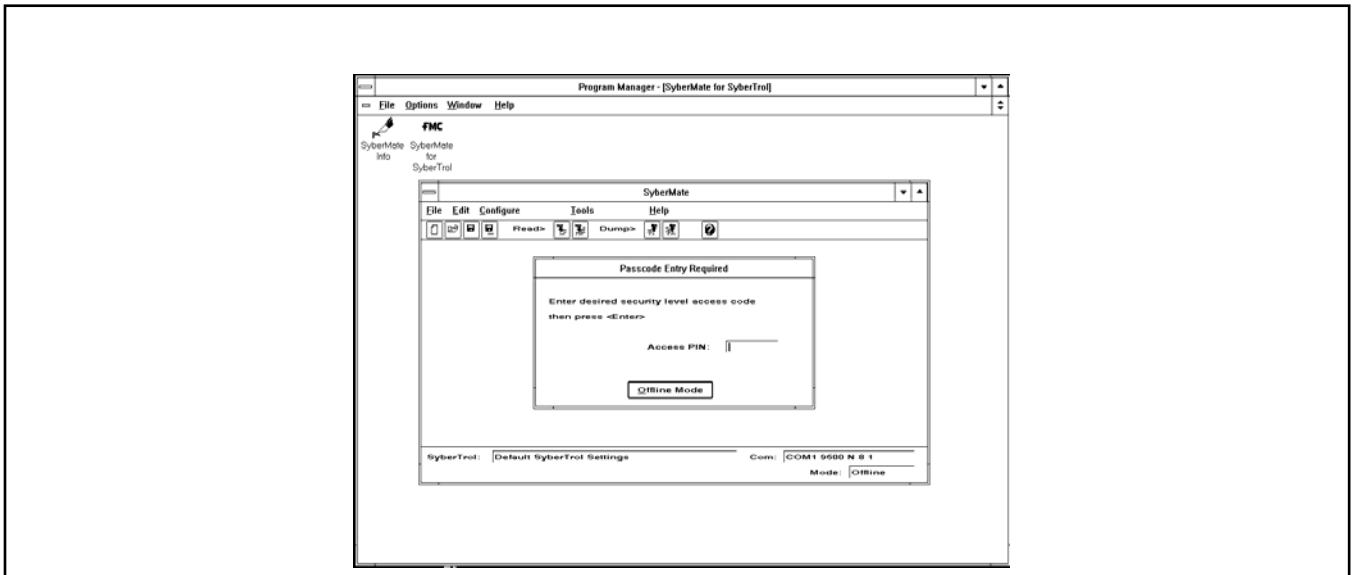
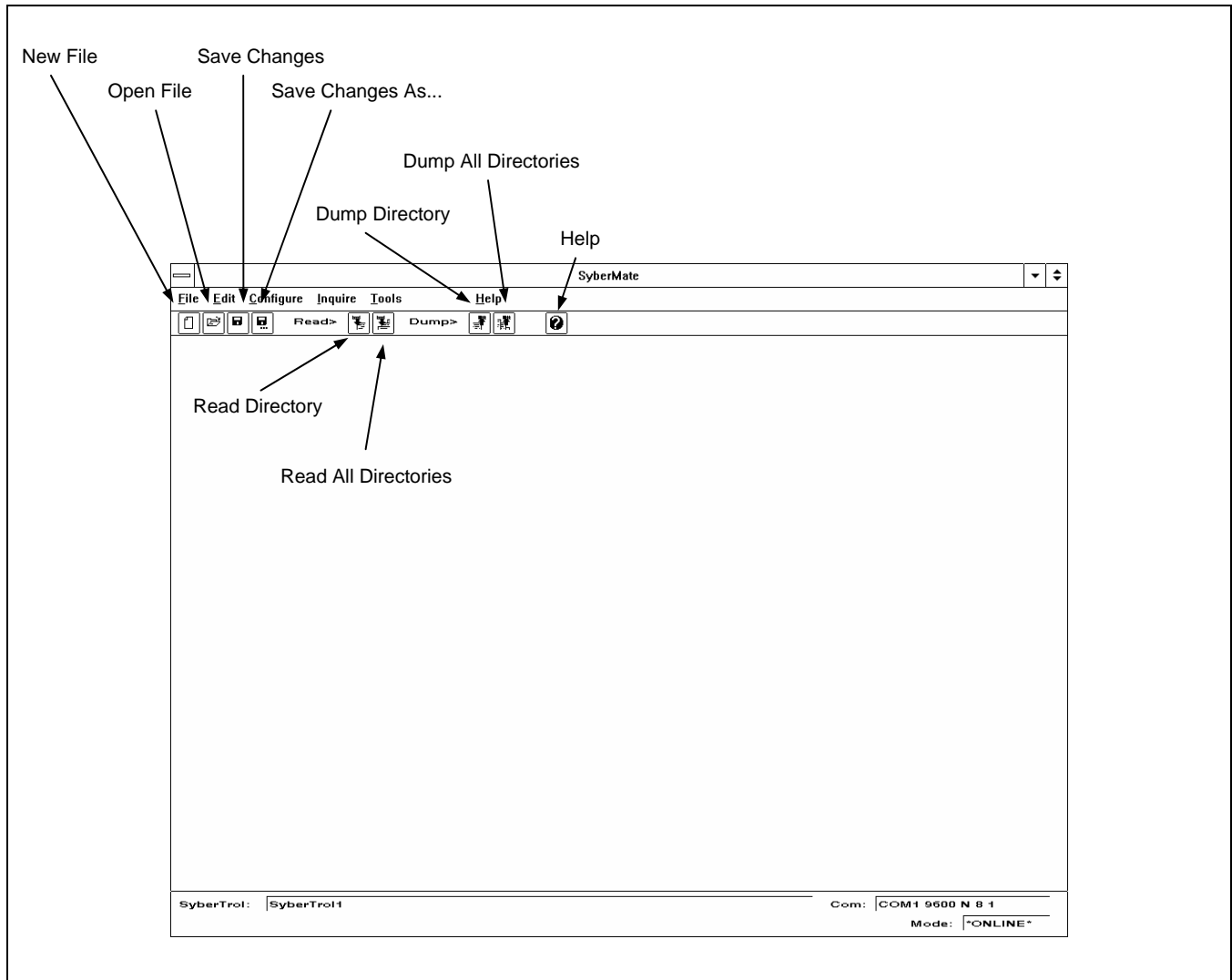


Figure 6

## Section IV - Operations

If the incorrect passcode is entered, the SyberMate will remain in the Offline Mode. If the correct passcode is entered, the SyberMate will go on-line with the SyberTrol (communications port, baud rate, data bits, etc. must be programmed the same at the computer and the SyberTrol). If the SyberTrol is in the program mode, the SyberMate will go into the Read Only Mode where data can be read but not changed.



**Figure 7**

The data/functions that can be accessed or accomplished from this screen are as follows:

### **File**

*New SyberTrol*, a new SyberTrol file will be created.

*Select SyberTrol*, a list of the SyberTrol files that are saved will be displayed and can be selected.

*Save Changes*, saves the changes in the current file and if on-line with the SyberTrol, sends an "update software" command causing all changes to take effect. This is equivalent to exiting the program mode.

*Save Changes As*, pops up a screen where a new file name and communications address can be entered along with the site name.

*Print*, prints either the current directory or all the parameters for the current SyberTrol file.

## Section IV - Operations

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*Comm Setup*, pops up a screen where the SyberMate can be configured for communications with the SyberTrol. The communications port, baud rate, data bits, parity, protocol, and address are configurable.

**Note:** *In order to communicate with the SyberTrol this screen must be setup identical to the setup in the SyberTrol for the selected communications port.*

*Login/ReLogin*, when in offline or Read Only mode, selecting Login/ReLogin pops up the login screen where the passcode can be entered. If the passcode is correct and the SyberTrol is in the run mode, the SyberMate will go online with the SyberTrol.

*Options*, sets up the operation of the SyberMate. When "Print" is selected, the data can be printed to a printer or a file. It can be presented either in the default format or a table format. The computer can be set to beep on errors or when the Read/Dump is completed.

*Exit*, exits the program.

### **Edit**

Not functional in this revision of the SyberMate.

### **Configure**

*System*, pops up a screen where the system parameters for general data, measurement units, and reports can be programmed and/or displayed.

*Skid*, when selected, allows the operator to view or program one of the skids in the system. The skid number is selected by moving the cursor to the required tab (1, 2, or 3) and clicking on it. From this screen the skid data can be programmed.

*Meter*, when selected, allows the operator to view or program one of the meters in the system. After the meter is selected, the meter parameters for general data, volumetric data, flow control data, flow control I/O, and miscellaneous I/O can be programmed and/or displayed.

*Product*, when selected, allows the operator to view or program one of the products in the system. After the product is selected, the product parameters for general data, pressure data, and meter factor data can be programmed and/or displayed.

*I/O Points*, allows for the selection of the digital I/O points, the analog I/O points, or the pulse I/O points for programming and displaying.

*Communications*, allows the selection of the communication port to be programmed and/or displayed.

*Prover*, when selected, allows the operator to view or program the prover or provers that can be set up in the system.

*User Data*, when selected, allows the operator to view or program the algebraic variable or the Boolean variable in the SyberTrol. The operator can select the registers by choosing the required number of the offset in the popup window. (Values are from 1 to 99.)

*Alarms - System*, when selected allows the operator to view or program how the system hardware or user/misc alarms will operate if they occur. They can be programmed to either print to a log, activate the alarm contact, shut down the batch, clear any acknowledged alarm, or to display an alarm message on the display of the SyberTrol. See alarm description in the Operators Manual MN09045.

*Alarms - Meter*, when selected allows the operator to view or program how the alarms associated with the meters will operate if they occur. They have the same options as described in the System alarms. The alarms in this menu are broken down into four sections meter I/O, a second screen for meter I/O, a user/misc. screen and a transducer screen. See alarm description in the Operators Manual MN09045.

*Alarms - Meter (Prover)*, when selected allows the operator to view or program the alarms associated with the prover. They have the same options as described in the System alarms. The alarms in this menu are broken down into four screens, the first three screens are the prover alarms and the fourth screen is for the inlet and outlet temperature and pressure alarms. See alarm description in the Operators Manual MN09045.

*Auto Configure*, not functional in this revision of the SyberMate.

*Read SyberTrol*, selects the data that is to be read from the SyberTrol. The choices are to read all the data from the SyberTrol, or just the current directory.

*Dump to SyberTrol*, selects the data from the current file that is to be dumped to the SyberTrol. The choices are to dump all the data, or to dump the data from the current directory.

## Section IV - Operations

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### **Inquire**

*Alarms*, when selected, will retrieve the system alarms or each of the meter's alarms from the SyberTrol.

*Batch Data*, will retrieve the batch information for the skids or each of the meters from the SyberTrol.

*Run Data*, retrieves the data from the SyberTrol for the meter or meters, digital I/O point, analog I/O point, and/or the pulse I/O point.

*Prove Data*, retrieves the general information about the prover, trip data, and quick trip data.

*Timers*, retrieves the current values of the timers from the SyberTrol.

### **Tools**

*Report Generator*, not functional in this revision of the SyberMate.

*Report Editor*, when selected, will provide the operator with the tools necessary to create a configurable report. (See "Creating Configurable Reports" for details.)

*Display Editor*, when selected, will provide the operator with the tools necessary to create a configurable display. (See "Creating Configurable Displays" for details.)

*Remote Display*, not functional in this revision of the SyberMate.

*Translator*, when selected, will provide the operator with the tools necessary to change the default messages that are resident in the SyberTrol. (See "Translator" for details.)

*Equation Editor*, when selected, will provide the operator with the tools necessary to create Boolean and algebraic expressions that can be used to set up operations in the SyberTrol that were not available in the default firmware. (See "Equation Editor" for details.)

### **Window**

Not functional in this revision of the SyberMate.

### **Help**

Provides help on various features of the SyberMate.

### **Selecting an Existing File**

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To select a file that has been previously created two options are available, one from the File name "Select SyberTrol" and one from the Icon shown on the third line of the screen (See Figure 7 for location). When the "Select SyberTrol" is selected a screen will appear listing the existing files and the desired file can be selected and opened, edited deleted or a file can be added. When the file is highlighted and the OK button is pressed is "Passcode Entry" screen will appear. The passcode can be entered to go online with the SyberTrol or the "Offline Mode" Button can be pressed to work on the file offline.

### **Creating a New File**

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To create a new data file two options are available, one from the File menu "New SyberTrol" and one from the Icon shown on the third line of the screen (See Figure 7 for location). When the "New SyberTrol" is selected a screen will appear where the operator can enter a new file name, a communication address, where to initialize the data from and the Site Name. Once this data is entered the screen will appear asking for the Passcode Entry, if the new file is to be created from a current SyberTrol the passcode can be entered and data uploaded to the new file or the operator can press the "offline" button and create the new file offline.

### **Saving Data**

---

To save a newly created or edited file two options are available, one from the File menu, "Save Changes" or "Save Changes as...", the other from selecting the Icons from the screen will perform the same functions (See Figure 7 for location). If "Save Changes" is selected the changes will be saved in the current file and if online with the SyberTrol will download the changes to the SyberTrol. If "Save Changes As..." is selected a popup screen will appear where a new file name can be entered and the changes will be downloaded to the SyberTrol if in the Online Mode of operation.

### **Read Data from SyberTrol**

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To read data from an existing SyberTrol two options are available, one from the Configure Menu "Read SyberTrol" and one from the Icons shown on the third line of the screen (See Figure 7 for location). From either of these options the operator can select to either read a directory or all the directories from the

## Section IV - Operations

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existing SyberTrol. When "Read a Directory" is selected a directory from the Configure Menu must be selected prior to pressing the Read Directory Button.

When the computer is reading the data from the SyberTrol a screen will appear where the directory being read is displayed as well on "ABORT" Button. The "ABORT" Button will halt the reading of the data from the SyberTrol. When the reading of the data is complete the program will return to the previous screen.

### ***Dump Data To the SyberTrol***

---

To dump data from the current file on the SyberMate two options are available, one from the Configure Menu "Dump to SyberTrol" and one from the Icons shown on the third line of the screen (See Figure 7 for location). From either of these options the operator can select either dump directory or dump all directories to SyberTrol. When dump a directory is selected a directory from the Configure Menu must be selected prior to pressing the dump directory button. When the SyberMate is dumping data to the SyberTrol a screen will appear where the directory being dumped is displayed as well as an "ABORT" button. The "ABORT" button will halt the data being downloaded to the SyberTrol. When the downloading of the data is complete the program will return to the previous screen.

### ***On-Line Help***

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To access the built in help function of SyberTrol, using the mouse, click on the word Help or using the keyboard type the letter H. This action will cause a menu to appear where Contents or About can be selected. Selecting Contents will produce a Help Index where a topic can be selected and by either pressing 'ENTER' on the keyboard or clicking on the 'Show Topic' button with the mouse the help information will be displayed. From this screen the operator can continue with the Help information for a different subject by choosing the 'Show Index' button or can close the help session by selecting the 'CLOSE' button.

## Section IV - Operations

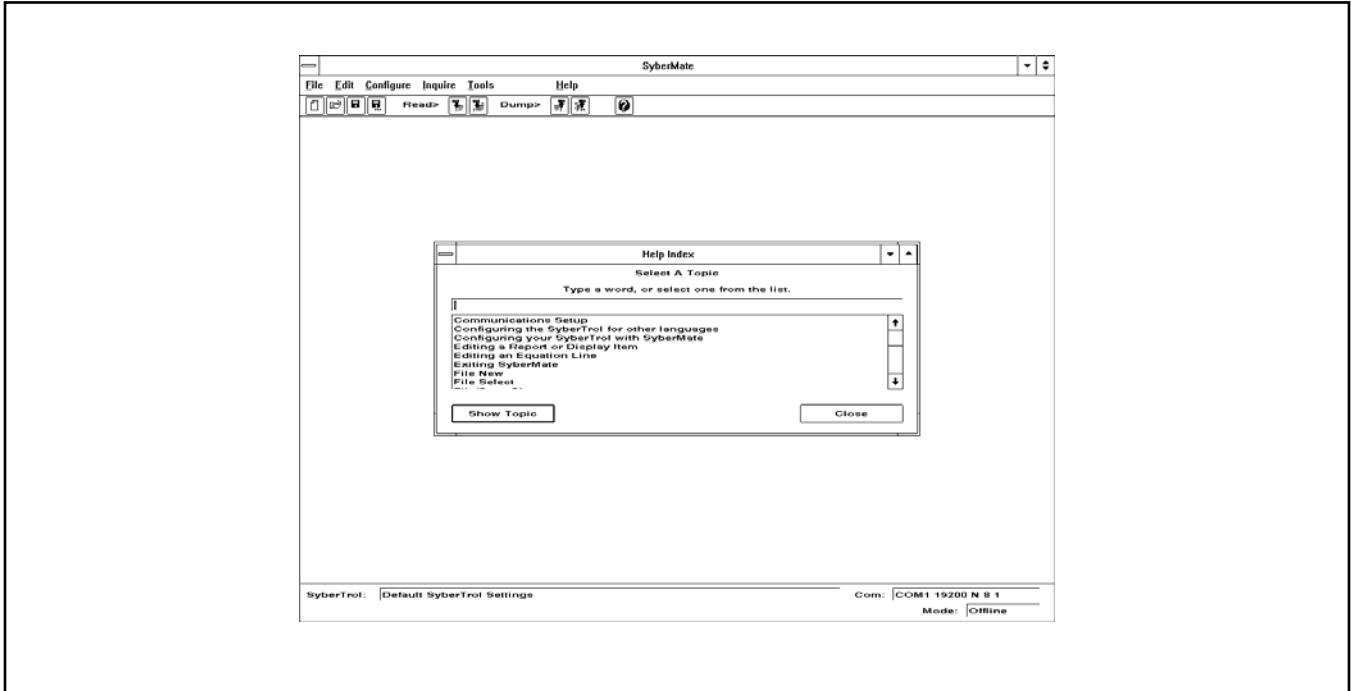


Figure 8

Selecting About from the Help menu will display the following screen:

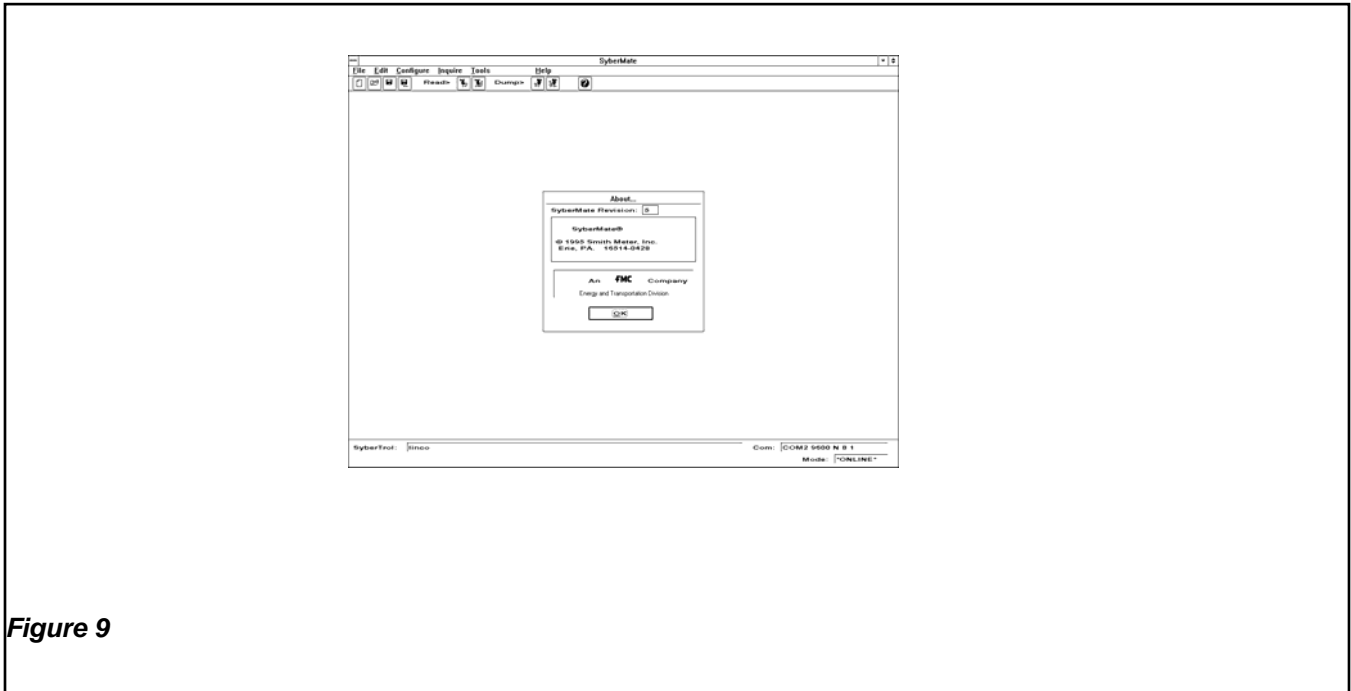


Figure 9

## Section IV - Operations

### Creating Displays

Create or open an existing display by selecting “Tools” from the main SyberMate screen as shown in Figure 10.

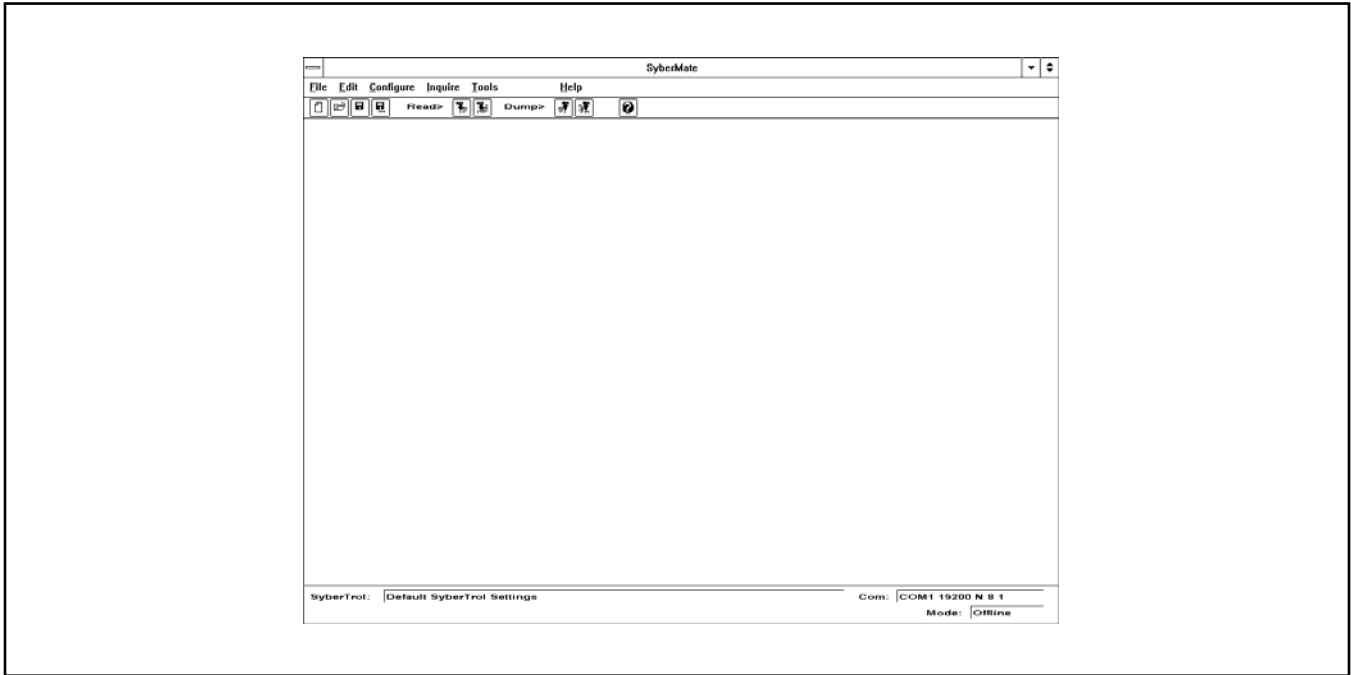


Figure 10

Select “Displays Editor” from the menu. The following window will appear.

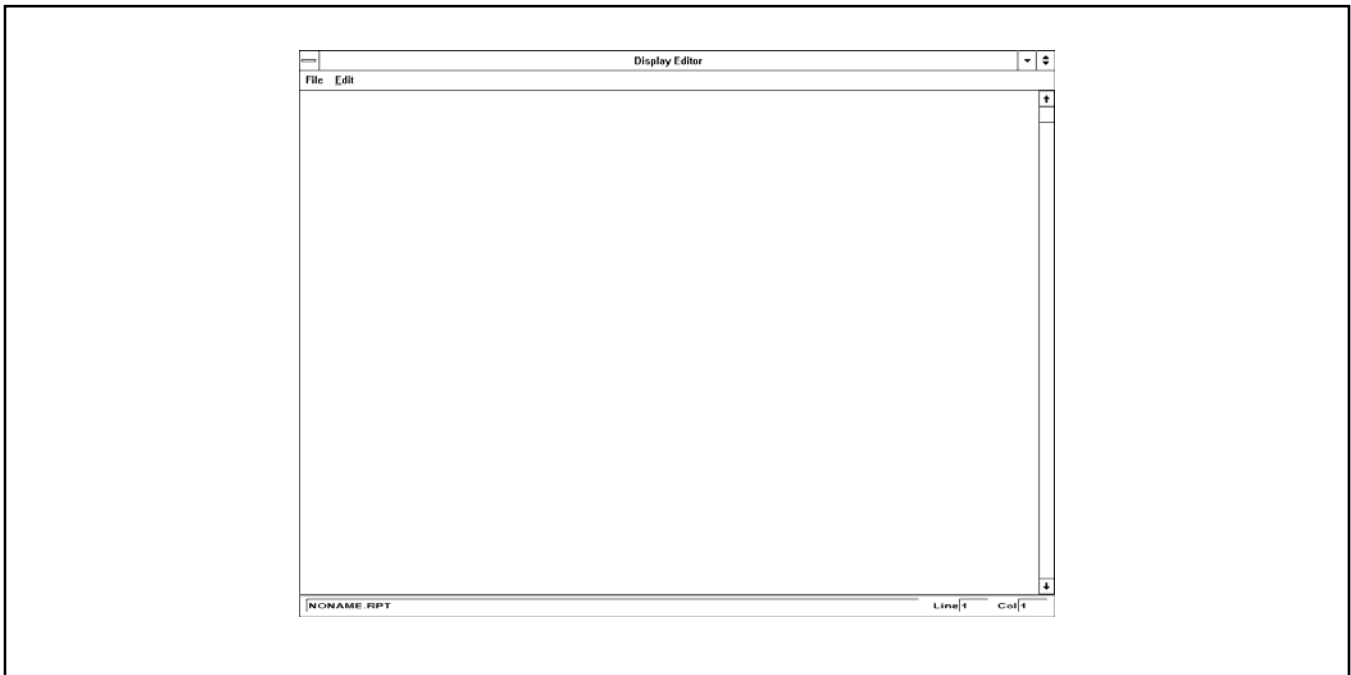


Figure 11

## Section IV - Operations

A number of functions can be performed from this display. Each of the main functions has a menu of items or subfunctions, as indicated below:

- File New** Selects the name, number of columns, number of lines per page, and number of pages from the popup window. See Figure 12 below.
- Open** This command lists stored displays available for selection.
- Save** This command saves changes to the current file.
- Save As** Use the popup window to enter a file name and select a location for the file on the computer.
- Report/Display Setup** Use the popup window to change the name, number of columns, number of lines per page, and number of pages in a report. The name is the only item that can be changed for a display.



Figure 12

## Section IV - Operations

### Retrieve from SyberTrol

This command is used to upload a configurable display from the SyberTrol to the SyberMate.

### Update SyberTrol

Use the popup window to select the location of the display on the SyberTrol. See Figure 13 below.

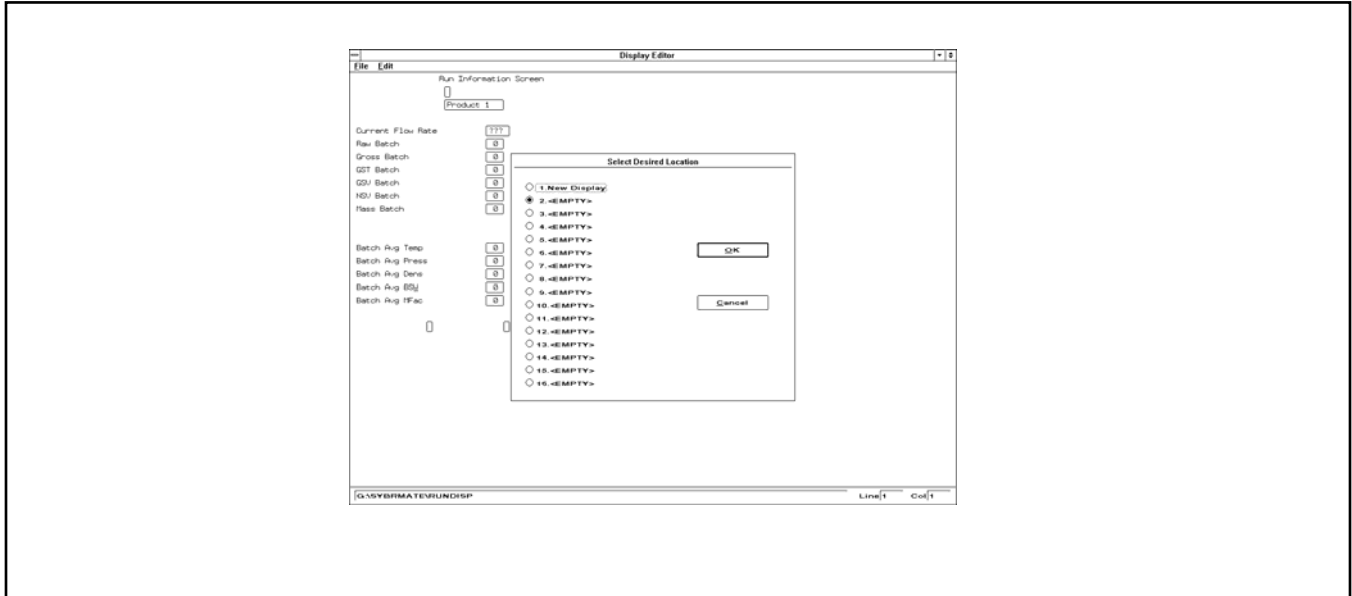


Figure 13

### Exit

This command closes the Display Editor.

### Edit - Insert New Item

Use the "Edit Display Item" screen to customize the following information. See Figure 14 below.

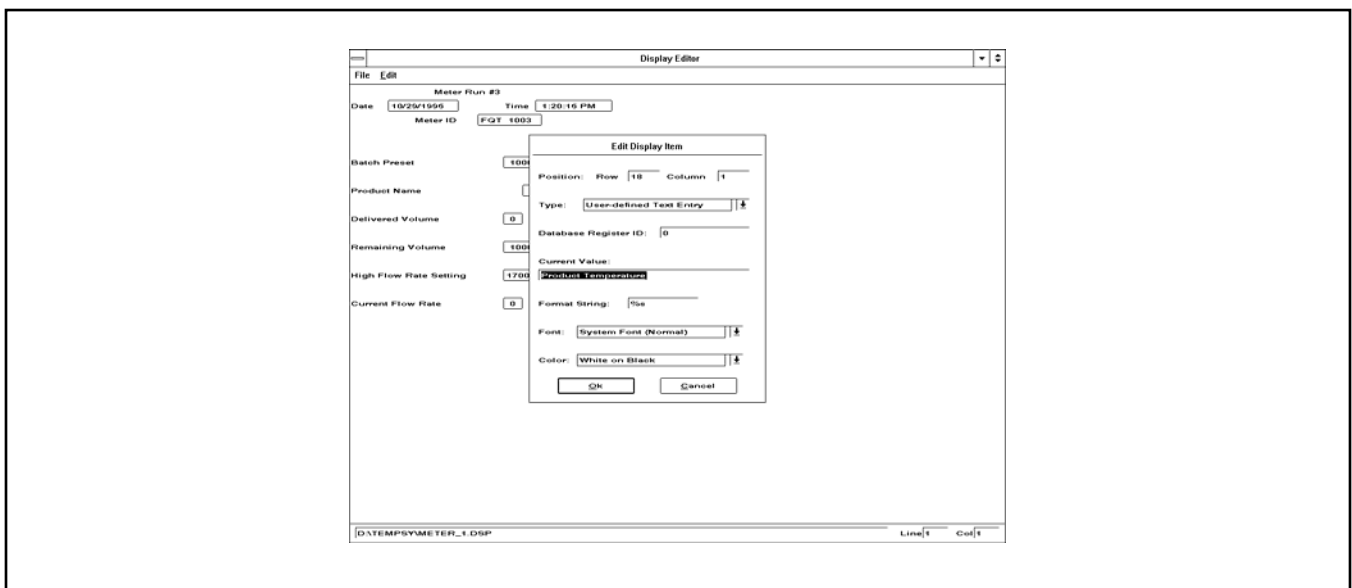


Figure 14

## Section IV - Operations

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<b>Row</b>	Indicates the row on which the data to be displayed is entered.
<b>Column</b>	Indicates the column in which the data to be displayed is entered.
<b>Type</b>	Selects the type of data to be entered on the screen. The choices are as follows:  <b>User-defined text entry</b> Displays text typed in the Current Value entry.  <b>Database Value</b> Displays the database value for a selected register.  <b>Database Description</b> Displays the database value description for a selected register.
<b>Database Register ID</b>	Displays the register number for an item dragged here from a Configure or Inquire Table or Workbook; or, if a register number is known, it can be entered here directly.
<b>Current Value</b>	Displays the current value of the register; or, if a user-defined text entry is selected as type, the text is entered here.
<b>Format String</b>	The format string designates the type of data to be displayed. The strings used in the SyberTrol are based on IEEE standards and are as follows:  <b>%uc</b> Data labeled as "Byte" on the SyberTrol (unsigned character)  <b>%f</b> Data labeled as "DP Float" or "Double Precision Floating Point." Specify the length of the numeric data in this field. (The SyberTrol stores all double precision floating point data as ten digits.) Using the number 0.2 between the "%" and the "f" right-justifies the data five places and truncates the data to two decimal places (i.e., %0.2f). This field can be used to line up the numerical data on the screen by entering an "8" between the "%" sign and the "f" (i.e., %8f). If the requirement is to both line up the data and truncate to two decimal places, the entry would be %8.2f.  <b>%d</b> Data labeled as an integer in the SyberTrol database.  <b>%s</b> Data labeled as a string in the SyberTrol, consisting of multiple characters.
<b>Font</b>	This command selects the font and point size of the text on the SyberTrol display. The selections are:  System Font (Normal) System Font (Italic) System Font (Bold) Arial 11 point (Normal) Arial 11 point (Italic) Arial 11 point (Bold) Arial 18 point (Bold) Arial 22 point (Bold)

**Note:** The font size will not change on the Display Editor. To view the actual size, download the display to the SyberTrol. Be careful not to overlap fields when using larger type sizes.

## Section IV - Operations

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<b>Color</b>	<p>This command selects the color of the data displayed on the SyberTrol screen. The selections are:</p> <ul style="list-style-type: none"><li>White on Black</li><li>Light Gray on Black</li><li>Dark Gray on Black</li><li>White on Dark Gray</li><li>Light Gray on Dark Gray</li><li>Black on Dark Gray</li><li>White on Light Gray</li><li>Dark Gray on Light Gray</li><li>Black on Light Gray</li><li>Light Gray on White</li><li>Dark Gray on White</li><li>Black on White</li></ul> <p><i>Note: Combinations of light gray and dark gray may not be readable.</i></p>
<b>Cut</b>	<p>The item highlighted on the Display Editor will be cut from the display and stored in the clipboard.</p>
<b>Copy</b>	<p>The item highlighted on the Display Editor will be copied to the clipboard.</p>
<b>Paste</b>	<p>The information stored in the clipboard will be pasted to the upper left-hand corner of the Editor window.</p>
<b>Select All</b>	<p>This command is not functional in this revision of the SyberMate.</p>

## Section IV - Operations

### ***New Display File***

To create a new file,

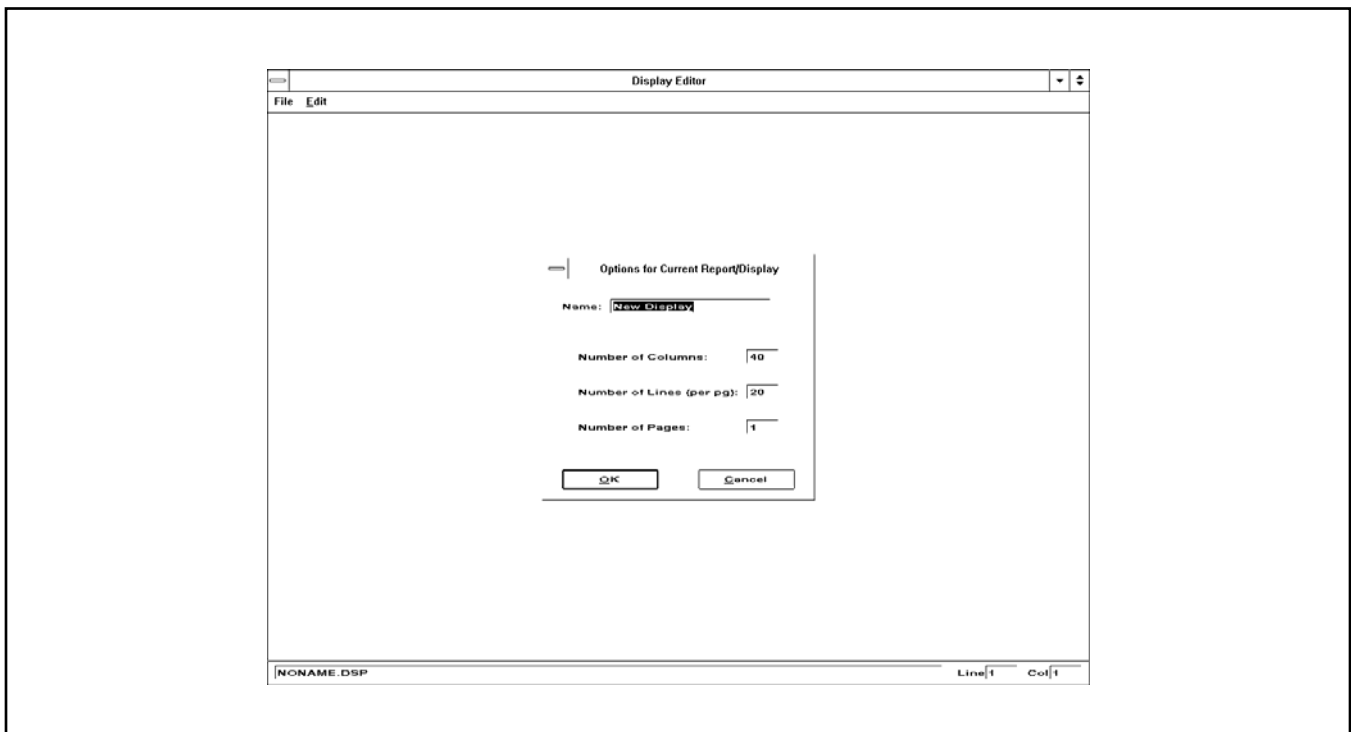
1. Select "File" from the Display Editor window.
2. Select "New" from the menu.
3. The popup menu shown in Figure 15 below will appear. Enter the name for the new display in the highlighted field. The entry can contain up to twenty characters.
4. A new display can now be created. There are two ways to enter the data on the display. The easiest method is to drag the Display Editor screen to one side of the computer screen, then click on either "Configure" or "Inquire" on the SyberMate screen. This allows system, meter, or product information to be displayed. To enter the information in the display, click on the item to obtain an arrow and page symbol, then drag the information to the display. The other method of creating a display is to use the Edit menu on the

Display Editor screen. Select Edit, then "Insert New Item," to obtain the Edit Display Item screen. If you know the database register number, you can use this screen to enter data on the display.

In most cases, both methods will be used to create displays. Use the grab method to get data from the database. Use the Insert New Item screen to add and locate user text.

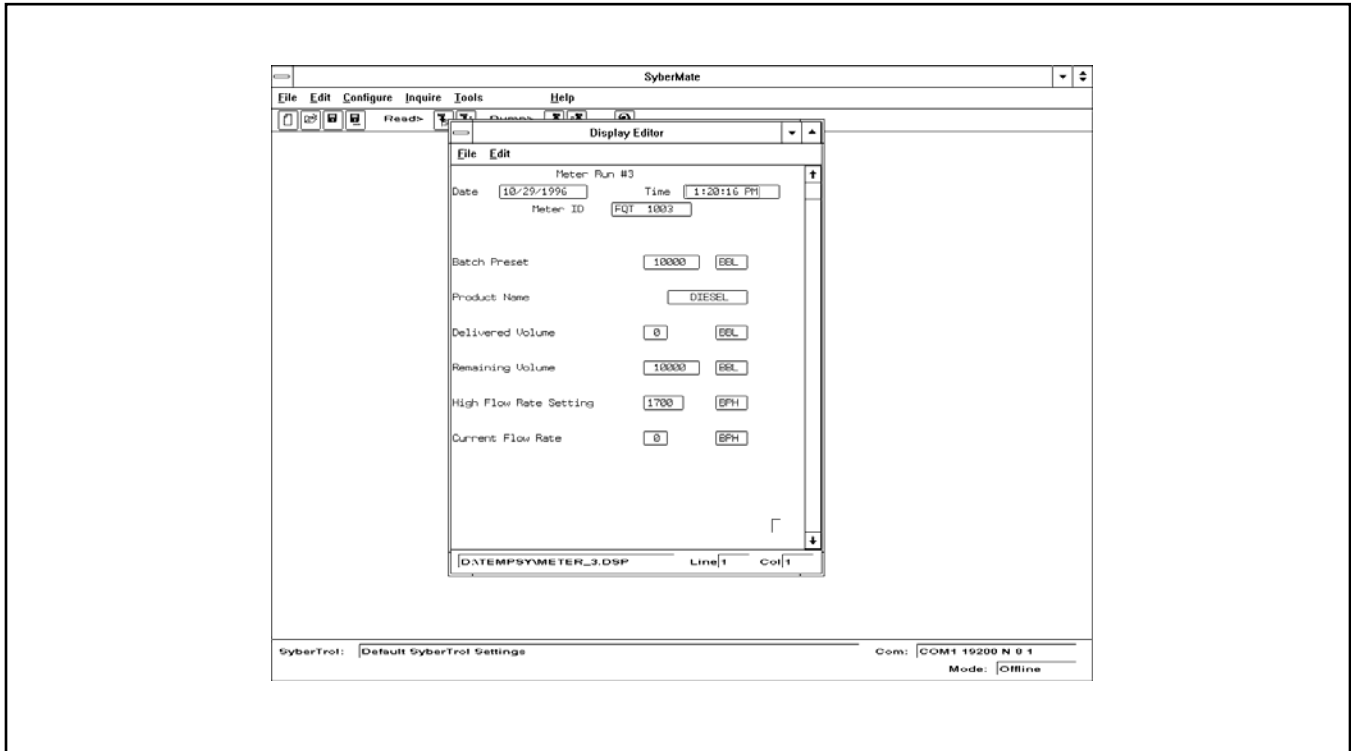
Once a display has been created and reviewed, use the Save As option from the File menu on the Display Editor screen to save the data. Choosing Save As will obtain a popup screen on which to enter the directory, subdirectory, and file name of the new display. When the information has been entered, click on the OK button to save the display.

Assuming that communications have been established between the computer and the SyberTrol, the display can be downloaded to the SyberTrol by selecting "Update SyberTrol" from the File menu.



**Figure 15**

## Section IV - Operations



**Figure 16**

To create the display in Figure 16 above, do the following.

1. From the SyberMate display, choose "Reports/Displays."
2. From the Reports/Displays menu, select "Edit Display."
3. From the Display Editor, select "File."
4. From the File menu, select New.
5. To name the new display, choose "Options" from the Current Report/Display menu. Type "Example" and press the OK button.
6. On the blank Display Editor screen, choose Edit.
7. From the Edit menu, select "Insert New Item."
8. To enter "Meter Run #3," the title of the display, do the following:
  - a) On the Edit Display Item screen, position the data in Row 1, Column 14. This centers the 12-character title on the 40-column display.
  - b) On the same screen, choose "User Defined Text Entry" for "Type."
  - c) Move the cursor to "Current Value," delete value, and type in "Meter Run #3."
  - d) Press the OK button. The title "Meter Run #3" is now centered on the first line of the new display.
9. Move the Display Editor screen to the right-hand side of the computer screen to allow work to be done on both screens simultaneously.

## Section IV - Operations

---

10. To add the date and time to the display, do the following:
  - a) Choose "Configure" on the SyberMate screen.
  - b) From the Configure menu, select "System."
  - c) The system directory screen will be displayed. Choose "General" to display a screen with the date and time in the right-hand corner. Using the mouse, select the time data box. Hold the left mouse button down and move the time to line 2 on the right-hand side of the Display Editor screen. Repeat this step to move the date to line 2, column 7 of the Display Editor.
  - d) Set up the literals "Date" and "Time" on the Display Editor in either of two ways:
    - i) In the Display Editor, click on the date, highlighting it, then move the cursor and click on Edit. Move the cursor to Copy and click to copy the date to the clipboard.
    - ii) Click on Edit and select Paste to insert the date in line 1, column 1 of the Display Editor. Use the left mouse button to click on the date and move it to row 2, column 1.
    - iii) Double-click on the date that was just moved. From the Edit Display Item screen, change the type to "Database Description" and press the OK button.
    - iv) Repeat these three steps to enter the time, except move it to row 2, column 25. When you are finished, the word "time" will be located in front of the actual time.
  - e) Another way of entering the literals for date and time is to do the following:
    - i) Click on Edit, then click on "Insert New Item" from the menu.
    - ii) From the Edit Display Item screen, change the row indicator to 2, leave the type at "User Defined Text Entry," and type the word "Date" in the Current Value box. Delete the word "value" and press the OK button. The word "Date" will appear on the Display Editor in row 2, column 1.
    - iii) Repeat these two steps to enter the time, except change the row indicator to 2 and the column indicator to 25.
  - f) Line 6 is the "Batch Preset Value" for meter #3. "Batch Data" is found under "Inquire" on the SyberMate screen. Click on "Inquire," then move down to "Batch Data." Clicking "Batch Data" will produce a menu on which to select system or a meter. Choose "Meter 3."
  - g) From the Batch Data-Meter 3 screen, select the value in register 5110003. Hold down the left mouse button to grab the value, then drag it to the Display Editor and drop it in place. The "Batch Preset" value is a floating point number stored as ten digits in the database. All or part of this number can be shown on the display.
  - h) Double-click on "Batch Preset Value" on the Display Editor screen to obtain the Edit Display Item screen. On this screen, you can change the position and font, and format the string.

## Section IV - Operations

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- i) The starting position of the data is row 6, column 25. If these numbers are not those shown on the screen, change them to read "Row 6, Column 25."
  - ii) In order to line up all the numerical data on the screen, the largest number of digits will be eight (five whole places and two decimal places). Enter "8.0f" in the format string box to indicate that the number will be right-justified to column 33 (column 25 + 8); 0 decimal places will be displayed; and the number is a floating point number.
  - iii) To change the font, select a new one from the font selection box. A change in type size will not appear on the Display Editor. The SyberTrol display will need to be viewed to determine whether a font size change affects the location of other data. Too large a type size may result in overlapping data. When the changes have been made on the Edit Display Item screen, click on the OK button to return to the Display Editor.
- i) Enter the literal "Batch Preset" on the Display Editor by following the same procedure that was used to enter the date and time. The literal can be entered as a New Data Item, or copy the Preset Value location on the display and change it to the database description on the Edit Display Item screen.

Set up the remainder of the items on the display by locating the item in the database and moving it to the Display Editor, as described above. The table on the following page indicates the item, where found in the database, the type of entry, the register number, how to set up the format string, the row, and the starting column for the data.

## Section IV - Operations

Item	Type	Register	Format String	Row	Column	Where Found
Meter Run #3	User Defined Text	---	%s	1	14	---
Date	Database Description	700	%s	2	1	Configure/System/General
10/29/96	Database Value	700	%s	2	7	Configure/System/General
Time	Database Description	800	%s	2	25	Configure/System/General
1:20:16 PM	Database Value	800	%s	2	30	Configure/System/General
Meter ID	User Defined Text	---	%s	2	30	---
FQT 1003	Database Value	10003	%s	3	21	Configure/Meter/Meter #3/ DP Float
Batch Preset	Database Description	5110003	%s	6	1	Inquire/Batch Data/ Meter #3/DP Float
10000	Database Value	5110003	%8.0f	6	25	Inquire/Batch Data/ Meter #3/DP Float
BBL	Database Value	100	%s	6	34	Configure/System/General
Product Name	Database Description	20003	%s	8	1	Configure/Product/ Product 3/General
DIESEL	Database Value	20003	%s	8	28	Configure/Product/ Product 3/General
Delivered Volume	Database Description	5120103	%s	10	1	Inquire/Run Data/Meter/3/ DP Float
0	Database Value	5120103	%8.2f	10	25	Inquire/Run Data/Meter/3/ DP Float
BBL	Database Value	100	%s	10	34	Configure/System/General
Remaining Volume	Database Description	5120203	%s	12	1	Inquire/Run Data/Meter/3/ DP Float
10000	Database Value	5120203	%8.2f	12	25	Inquire/Run Data/Meter/3/ DP Float
BBL	Database Value	100	%s	12	34	Configure/System/General
High Flow Rate Setting	User-defined Text Entry	---	%s	14	1	---
1700	Database Value	5010903	%8.0f	14	25	Configure/Meter/Meter #3/ Flow Control
BPH	Database Value	0	%s	14	34	Configure/System/General
Current Flow Rate	Database Description	5120303	%s	16	1	Inquire/Run Data/Meter/3/ DP Float
0	Database Value	5120303	%8.0f	16	25	Inquire/Run Data/Meter/3/ DP Float
BPH	Database Value	0	%s	16	34	Configure/System/General

## Section IV - Operations

### Creating Configurable Reports

Create or open an existing report by selecting “Tools” from the main SyberMate screen as shown in Figure 17.

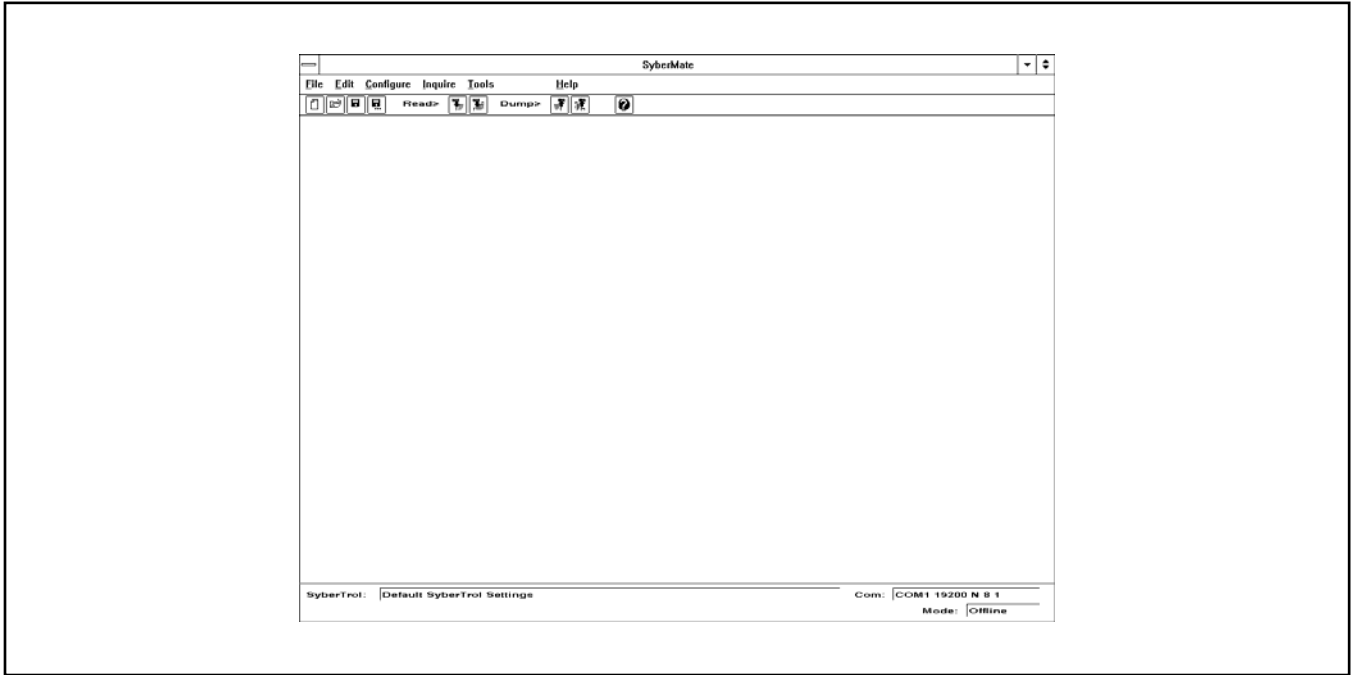


Figure 17

Select “Report Editor” from the menu. The following display will appear.

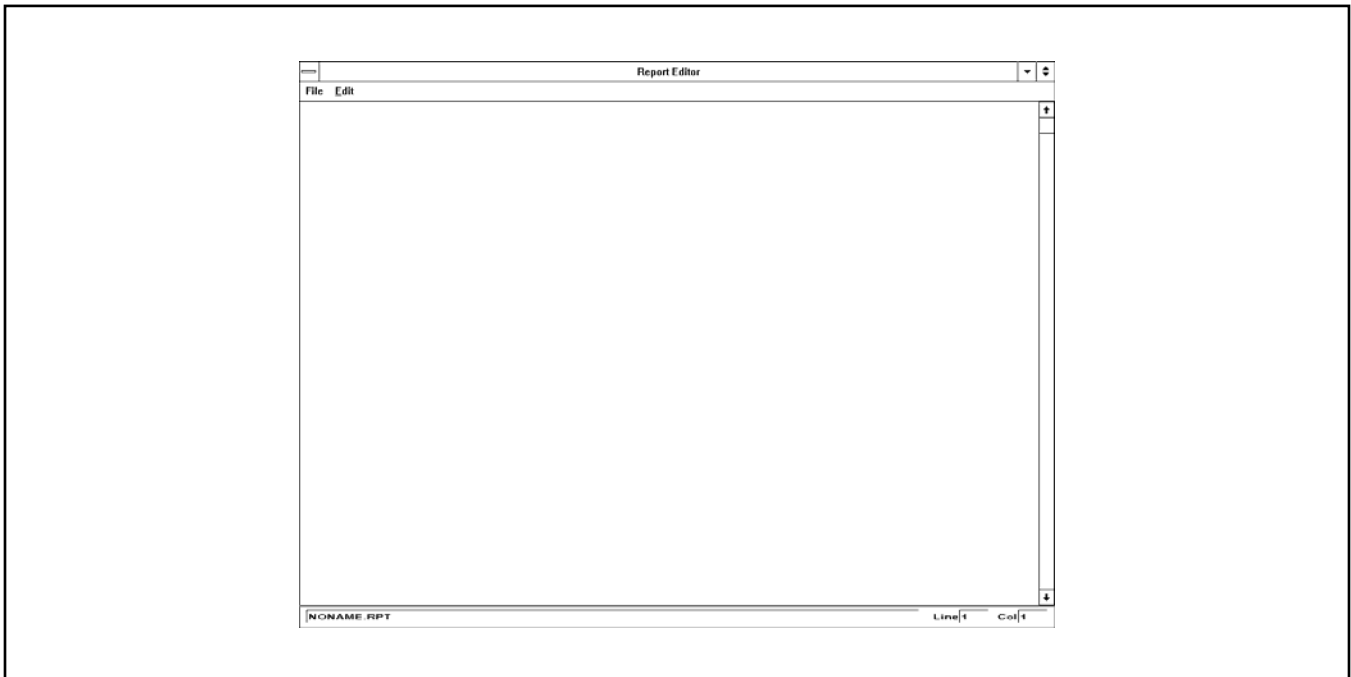
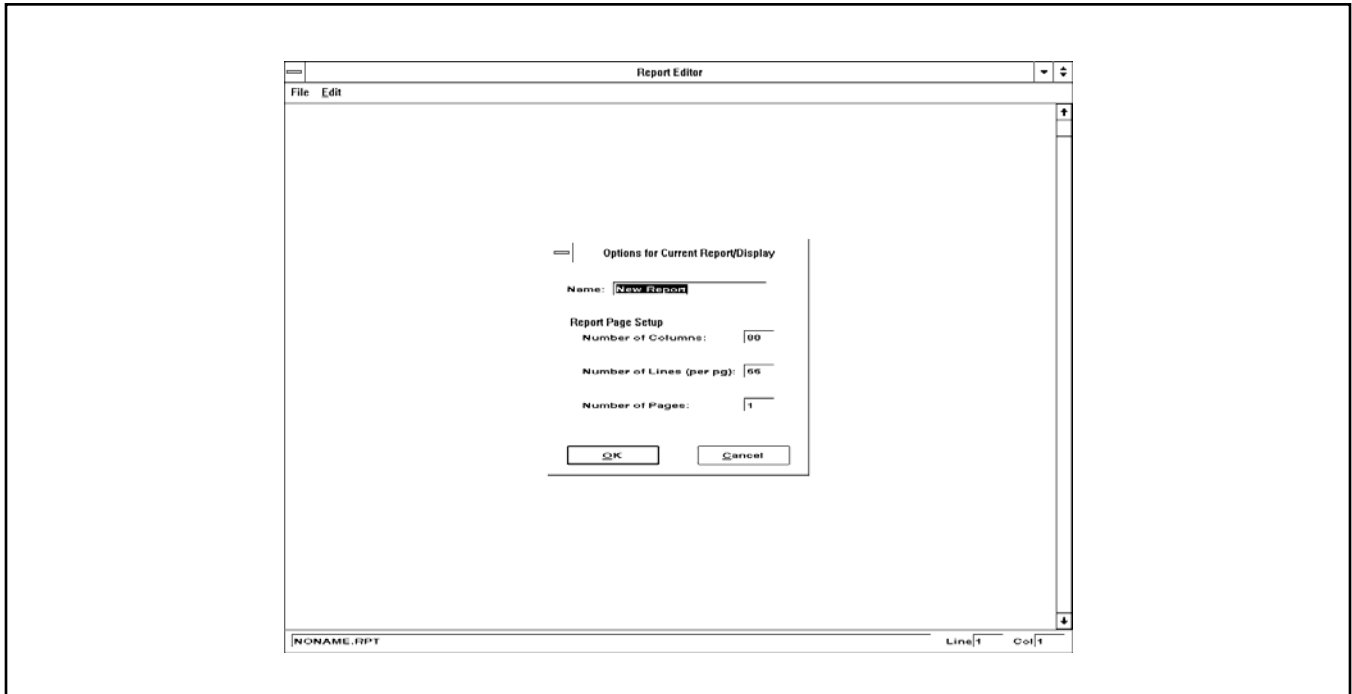


Figure 18

## Section IV - Operations

A number of functions can be performed from this display. Each of the main functions has a menu of items or subfunctions, as indicated below:

- File New** Select the name, number of columns, number of lines per page, and number of pages from the popup window. See Figure 19 below.
- Open** This command lists stored reports available for selection.
- Save** This command saves changes to the current file.
- Save As** Use the popup window to enter a file name and select a location for the file on the computer.
- Report/Display Setup** Use the popup window (see Figure 19 below) to change the name, number of columns, number of lines per page, and number of pages in the report.



**Figure 19**

## Section IV - Operations

### Retrieve from SyberTrol

This command is used to retrieve a configurable report from the SyberTrol.

### Update SyberTrol

Use the popup window to select the location of the display on the SyberTrol. See Figure 20 below.

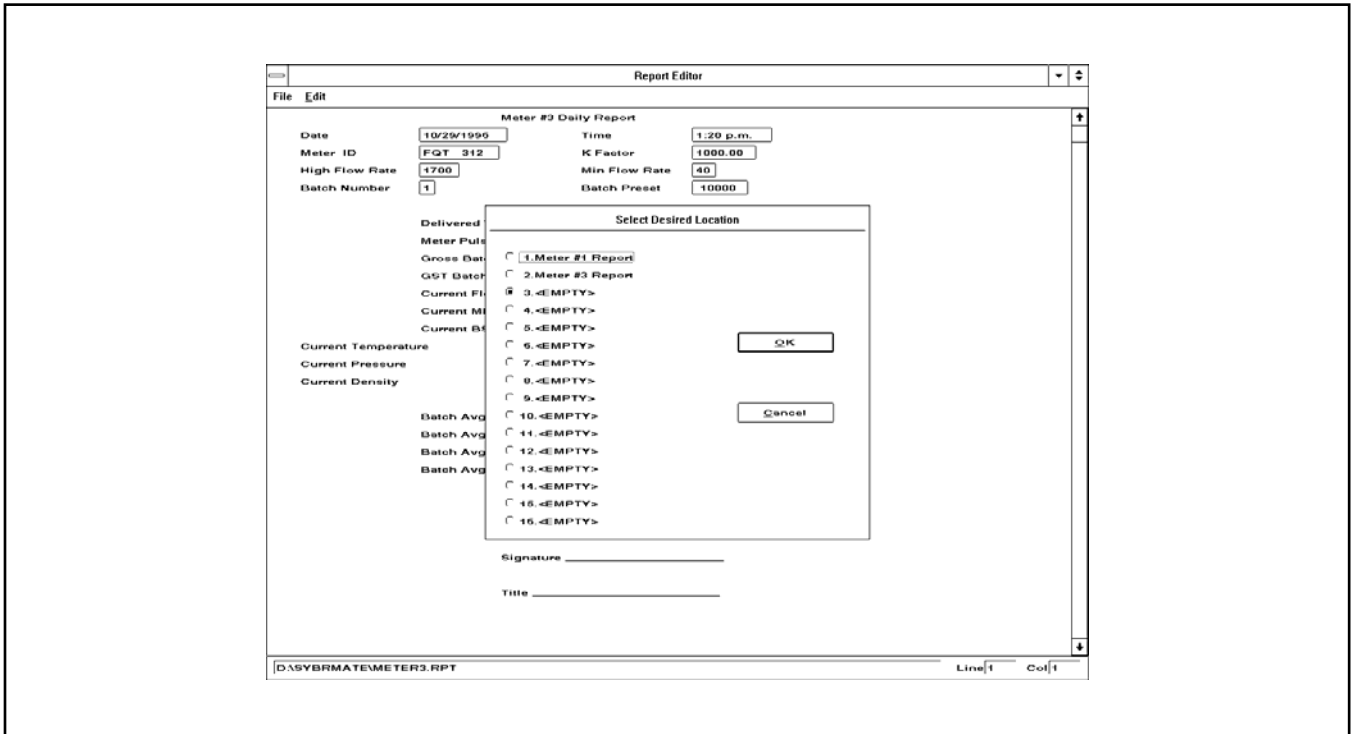


Figure 20

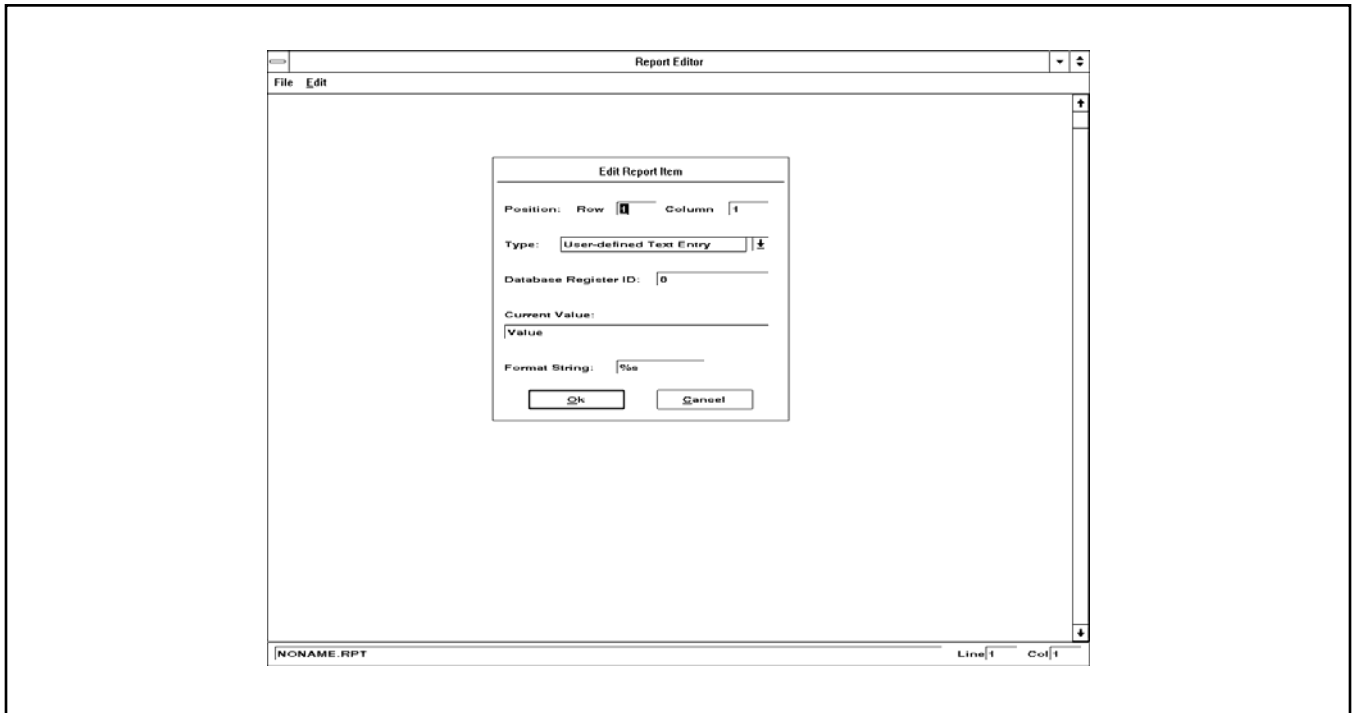
## Section IV - Operations

### **Exit**

This command closes the Report Editor.

### **Edit - Insert New Item**

Use the “Edit Display Item” screen to customize the following information. See Figure 21 below.



**Figure 21**

### **Row**

Indicates the row on which the data to be reported is entered.

### **Column**

Indicates the column in which the data to be reported is entered.

### **Type**

Selects the type of data to be entered on the screen. The choices are as follows:

**User-defined text entry** Displays text typed in the Current Value entry.

**Database Value** Displays the database value for a selected register.

**Database Description** Displays the database value description for a selected register.

### **Database Register ID**

Displays the register number for an item dragged here from a Configure or Inquire Table or Workbook; or, if a register number is known, it can be entered here directly.

### **Current Value**

Displays the current value of the register; or, if a user-defined text entry is selected as type, the text is entered here.

## Section IV - Operations

---

<b>Format String</b>	The format string designates the type of data to be displayed. The strings used in the SyberTrol are based on IEEE standards and are as follows:
<b>%uc</b>	Data labeled as "Byte" on the SyberTrol (unsigned character).
<b>%f</b>	Data labeled as "DP Float" or "Double Precision Floating Point." Specify the length of the numeric data in this field. (The SyberTrol stores all double precision floating point data as ten digits.) Using the number 0.2 between the "%" and the "f" right-justifies the data five places and truncates the data to two decimal places (i.e., %0.2f). This field can be used to line up the numerical data on the screen by entering an "8" between the "%" sign and the "f" (i.e., %8f). If the requirement is to both line up the data and truncate to two decimal places, the entry would be %8.2f.
<b>%d</b>	Data labeled as an integer in the SyberTrol database.
<b>%s</b>	Data labeled as a string in the SyberTrol, consisting of multiple characters.
<b>Cut</b>	The item highlighted on the Report Editor will be cut from the report and stored in the clipboard.
<b>Copy</b>	The item highlighted on the Report Editor will be copied to the clipboard.
<b>Paste</b>	The information stored in the clipboard will be pasted to the first row and first column of the report.
<b>Select All</b>	This command is not functional in this revision of the SyberMate.

## Section IV - Operations

### **New Report File**

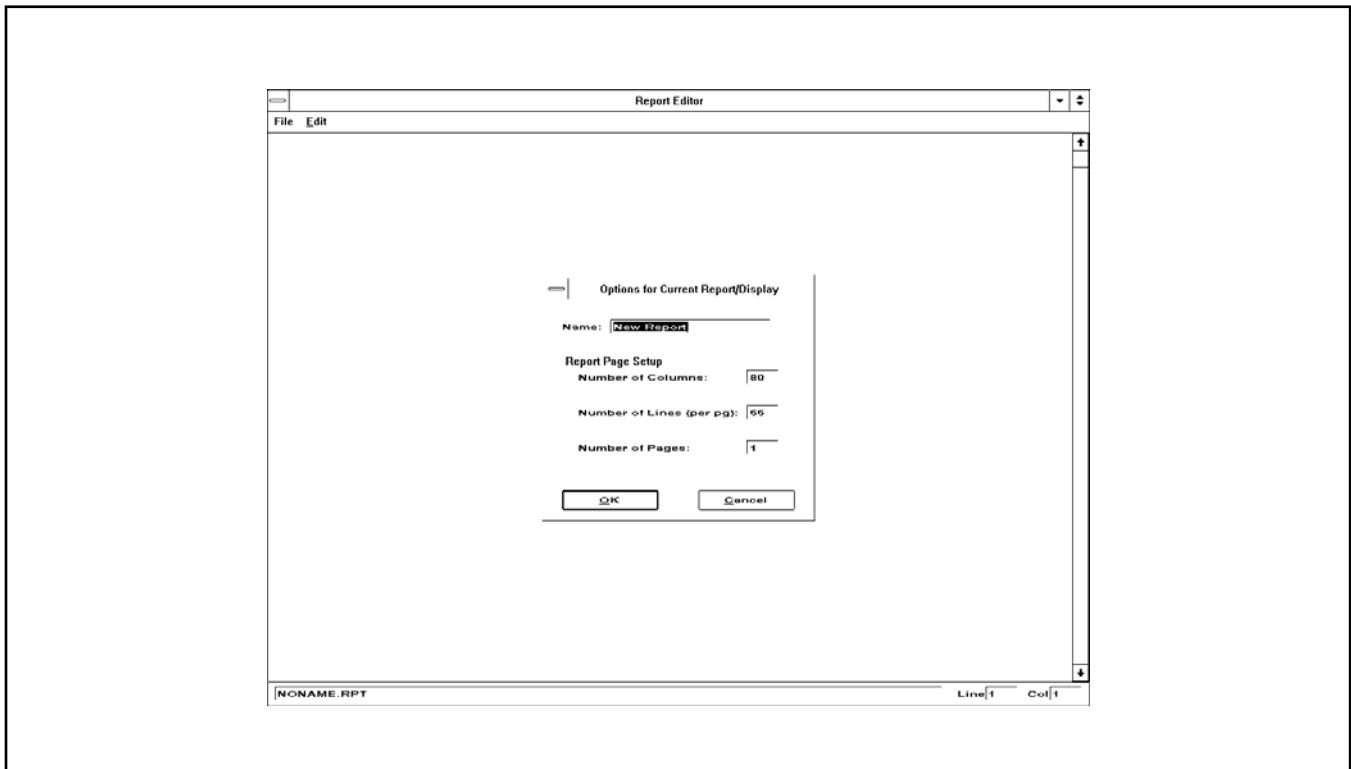
To create a new file,

1. Select "File" from the Report Editor window.
2. Select "New" from the menu.
3. The popup menu shown in Figure 22 below will appear. Enter the name for the new report in the highlighted field. The entry can contain up to twenty characters. After the name of the report has been entered, the number of columns, number of lines, and the number of pages can be set up. The default values are 80 columns, 66 lines per page, and 1 page. When these values are set, press "Enter" or click on OK. The program will return to the Report Editor screen.

A new report can now be created. There are two ways to enter the data on the report. The easiest method is to drag the Report Editor screen to one side of the computer screen, then click on either "Configure" or "Inquire" on the SyberMate screen. This allows system, meter, or product information to

be displayed. To enter the information in the report, click on the item to obtain an arrow and page symbol, then drag the information to the report. The other method of creating a report is to use the Edit menu on the Report Editor screen. Select Edit, then "Insert New Item," to obtain the Edit Report Item screen. If you know the database register number, you can use this screen to enter data on the report. In most cases, both methods will be used to create reports. Use the grab method to get data from the database. Use the Insert New Item screen to add and locate user text.

Once a report has been created and reviewed, use the Save As option from the File menu on the Report Editor screen to save the data. Choosing Save As will obtain a popup screen on which to enter the directory, subdirectory, and file name of the new report. When the information has been entered, click on the OK button to save the report. Assuming that communications have been established between the computer and the SyberTrol, the report can be downloaded to the SyberTrol by selecting "Update SyberTrol" from the File menu.



**Figure 22**

## Section IV - Operations

The screenshot shows a window titled "Report Editor" with a menu bar containing "File" and "Edit". The main area is a form titled "Meter #3 Daily Report". The form contains several fields with values: Date (10/25/1996), Time (1:20 p.m.), Meter ID (FGT 312), K Factor (1000.00), High Flow Rate (1700), Min Flow Rate (40), Batch Number (1), and Batch Preset (10000). Below these are several rows of fields for "Delivered Volume", "Meter Pulses", "Gross Batch", "CST Batch", "Current Flow Rate", "Current MFac", "Current BSW", "Current Temperature", "Current Pressure", "Current Density", "Current CTL", and "Current CPL", each with a value of 0. At the bottom, there are fields for "Batch Avg MFac", "Batch Avg Temp", "Batch Avg Press", and "Batch Avg Dens", each with a value of 0. A "Signature" line and a "Title" line are also present. The status bar at the bottom shows "D:\SYBERMATE\METER3.RPT" and "Line 1 Col 1".

**Figure 23**

To create the report in Figure 23 above, do the following.

1. From the SyberMate display, choose "Reports/Displays."
2. From the Reports/Displays menu, select "Edit Report."
3. From the Report Editor, select "File."
4. From the File menu, select New.
5. To name the new report, choose "Options" from the Current Report/Display menu. Type "Example" and press the OK button.
6. On the blank Report Editor screen, choose Edit.
7. From the Edit menu, select "Insert New Item."
8. To enter "Meter #3 Daily Report," the title of the display, do the following:
  - a) On the Edit Report Item screen, position the data in Row 1, Column 30. This centers the title on the 80-column report.
  - b) On the same screen, choose "User Defined Text Entry" for "Type."
  - c) Move the cursor to "Current Value," delete value, and type in "Meter #3 Daily Report."
  - d) Press the OK button. The title "Meter #3 Daily Report" is now centered on the first line of the new display.
9. Move the Report Editor screen to the right-hand side of the computer screen to allow work to be done on both screens simultaneously.
10. To add the date and time to the display, do the following:
  - a) Choose "Configure" on the SyberMate screen.
  - b) From the Configure menu, select "System."
  - c) The system directory screen will be displayed. Choose "General" to display a screen with the date and time in the right-hand corner. Using the mouse, select the time data box. Hold the left mouse button down and move the time to line 2, column 54 of the Report Editor screen. Repeat this step to move the date to line 2, column 20 of the Report Editor.
  - d) Set up the literals "Date" and "Time" on the Report Editor in either of two ways:
    - i) In the Report Editor, click on the date, highlighting it, then move the cursor and click on Edit. Move the cursor to Copy and click to copy the date to the clipboard.

## Section IV - Operations

---

- ii) Click on Edit and select Paste to insert the date in line 1, column 1 of the Report Editor. Use the left mouse button to click on the date and move it to row 2, column 5.
- iii) Double-click on the date that was just moved. From the Edit Report Item screen, change the type to "Database Description" and press the OK button. The word "date" will replace the actual date in row 2, column 5.
- iv) Repeat these three steps to enter the time, except move it to row 2, column 40. When you are finished, the word "time" will be located in front of the actual time.
- e) Another way of entering the literals for date and time is to do the following:
  - i) Click on Edit, then click on "Insert New Item" from the menu.
  - ii) From the Edit Report Item screen, change the row indicator to 2 and the column indicator to 5, leave the type at "User Defined Text Entry," and type the word "Date" in the Current Value box. Delete the word "value" and press the OK button. The word "Date" will appear on the Display Editor in row 2, column 5.
  - iii) Repeat these two steps to enter the time, except change the row indicator to 2 and the column indicator to 40.
- f) Line 5, column 40 is the "Batch Preset Value" for meter #3. "Batch Data" is found under "Inquire" on the SyberMate screen. Click on "Inquire," then move down to "Batch Data." Clicking "Batch Data" will produce a menu on which to select system or a meter. Choose "Meter 3."
- g) From the Batch Data-Meter 3 screen, select the value in register 5110003. Hold down the left mouse button to grab the value, then drag it to the Report Editor and drop it in place. The "Batch Preset" value is a floating point number stored as ten digits in the database. All or part of this number can be shown on the display.
- h) Double-click on "Batch Preset Value" on the Report Editor screen to obtain the Edit Report Item screen. On this screen, you can change the position and font, and format the string.
  - i) The starting position of the data is row 5, column 54. If these numbers are not those shown on the screen, change them to read "Row 5, Column 54."
  - ii) In order to line up all the numerical data on the screen, the largest number of digits will be eight (five whole places and two decimal places). Enter "8.0f" in the format string box to indicate that the number will be right-justified to column 62 (column 54 + 8); 0 decimal places will be displayed; and the number is a floating point number.
- i) Enter the literal "Batch Preset" on the Report Editor by following the same procedure that was used to enter the date and time. The literal can be entered as a New Data Item, or copy the Preset Value location on the display and change it to the database description on the Edit Report Item screen.

Set up the remainder of the items on the display by locating the item in the database and moving it to the Report Editor, as described above. The table on the following page indicates the item, where found in the database, the type of entry, the register number, how to set up the format string, the row, and the starting column for the data.

When the above instructions are followed and the data is entered for the configurable display, the data will appear on the SyberTrol display as shown in Figure 24 below. Note that through the format string, all the numeric data is right-justified to the eighth position.

## Section IV - Operations

```
1234567890123456789012345678901234567890123456789012345678901234567890
1
2           Date           11/26/96           Time           9:21:05 AM
3           Meter ID       FQT   312           K Factor       1000.00
4           High Flow Rate 1700           Min Flow Rate  40
5           Batch Number   1           Batch Preset   10000
6
7           Delivered Volume           5000.25
8           Meter Pulses           5000250.00
9           Gross Batch           4999
0           GST Batch           4981
1           Current Flow Rate           1500
2           Current Mfac           0.9999
3           Current BS$W           0.00
4           Current Temperature           62.10
5           Current CTL           0.9989
6           Current Density           47.00
7
8           Batch Avg Mfac           0.9998
9           Batch Avg Temp           66.70
0           Batch Avg Dens           46.70
1
2
3
4
5
6           Signature _____
7
8           Title _____
9
0
```

**Figure 24**

## Section IV - Operations

Item	Type	Register	Format String	Row	Column	Where Found
Meter #3 Daily Report	User-defined Text Entry	---	%s	1	30	---
Date	Database Description	700	%s	2	5	Configure/System/General
11/26/96	Database Value	700	%s	2	20	Configure/System/General
Time	Database Description	800	%s	2	40	Configure/System/General
9:21:05 AM	Database Value	800	%s	2	54	Configure/System/General
Meter ID	User-defined Text Entry	---	%s	3	5	---
FQT <sub>AAA</sub> 312	Database Value	10001	%s	3	20	Configure/Meter/Meter 3/ General
K Factor	Database Description	5010001	%s	3	40	Configure/Meter/Meter 3/ General
1000.00	Database Value	5010001	%8.2f	3	54	Configure/Meter/Meter 3/ General
High Flow Rate	Database Description	5010901	%s	4	5	Configure/Meter/Meter 3/ Flow Control
1700	Database Value	5010901	%8.0f	4	20	Configure/Meter/Meter 3/ Flow Control
Min Flow Rate	Database Description	5011101	%s	4	40	Configure/Meter/Meter 3/ Flow Control
40	Database Value	5011101	%8.0f	4	54	Configure/Meter/Meter 3/ Flow Control
Batch Number	Database Description	2120003	%s	5	5	Inquire/Run Data/Meter/INT
1	Database Value	2120003	%d	5	20	Inquire/Run Data/Meter/INT
Batch Preset	Database Description	5110003	%s	5	40	Inquire/Run Data/Meter/ DP Float
10000	Database Value	5110003	%8.0f	5	54	Inquire/Run Data/Meter/ DP Float
Delivered Volume	Database Description	5120103	%s	7	20	Inquire/Run Data/Meter/ DP Float
5000.25	Database Value	5120103	%8.2f	7	50	Inquire/Run Data/Meter/ DP Float
Meter Pulses	Database Description	5120803	%s	8	20	Inquire/Run Data/Meter/ DP Float
5000250.00	Database Value	5120803	%8.2f	8	50	Inquire/Run Data/Meter/ DP Float
Gross Batch	Database Description	5121003	%s	9	20	Inquire/Run Data/Meter/ DP Float
4999	Database Value	5121003	%8.0f	9	50	Inquire/Run Data/Meter/ DP Float
GST Batch	Database Description	5121103	%s	10	20	Inquire/Run Data/Meter/ DP Float

## Section IV - Operations

Item	Type	Register	Format String	Row	Column	Where Found
4981	Database Value	5121103	%0.8f	10	50	Inquire/Run Data/Meter/ DP Float
Current Flow Rate	Database Description	5120303	%s	11	20	Inquire/Run Data/Meter/ DP Float
1500	Database Value	5120303	%8.0f	11	50	Inquire/Run Data/Meter/ DP Float
Current Mfac	Database Description	5120403	%s	12	20	Inquire/Run Data/Meter/ DP Float
0.9999	Database Value	5120403	%8.4	12	50	Inquire/Run Data/Meter/ DP Float
Current BS&W	Database Description	5120503	%s	13	20	Inquire/Run Data/Meter/ DP Float
0.00	Database Value	5120503	%8.2f	13	50	Inquire/Run Data/Meter/ DP Float
Current Temperature	Database Description	5121903	%s	14	5	Inquire/Run Data/Meter/ DP Float
62.1	Database Value	5121903	%8.2f	14	30	Inquire/Run Data/Meter/ DP Float
Current Density	Database Description	5122103	%s	16	5	Inquire/Run Data/Meter/ DP Float
47.0	Database Value	5122103	%8.2f	16	30	Inquire/Run Data/Meter/ DP Float
Current CTL	Database Description	5122203	%s	14	45	Inquire/Run Data/Meter/ DP Float
0.9989	Database Description	5122203	%8.4f	14	60	Inquire/Run Data/Meter/ DP Float
Batch AVG Mfac	Database Description	5120603	%s	18	20	Inquire/Run Data/Meter/ DP Float
0.9998	Database Value	5120603	%8.4f	18	50	Inquire/Run Data/Meter/ DP Float
Batch AVG Temp	Database Description	5121503	%s	18	20	Inquire/Run Data/Meter/ DP Float
66.70	Database Description	5121503	%8.2f	19	50	Inquire/Run Data/Meter/ DP Float
Batch AVG Den	Database Description	5121703	%s	21	20	Inquire/Run Data/Meter/ DP Float
46.7 API	Database Value	5121703	%8.4f	21	50	Inquire/Run Data/Meter/ DP Float
Signature _____	User-defined Text Entry	---	%s	26	30	Inquire/Run Data/Meter/ DP Float
Title _____	User-defined Text Entry	---	%s	28	30	Inquire/Run Data/Meter/ DP Float

## Section IV - Operations

### Translator

The translator provided by the SyberTrol can be used to modify or translate any message that resides in the SyberTrol. Currently the messages can be changed or translated into any language that uses the Latin character set that is resident in the SyberTrol. Also available in this version of the SyberMate is the Cyrillic (PC-866) character set. For other character sets, contact the factory for availability.

To access the translator, select Tools from the main SyberMate screen. Then, using the mouse or pressing “T” on the keyboard, select “Translator.” The following screen will be displayed.

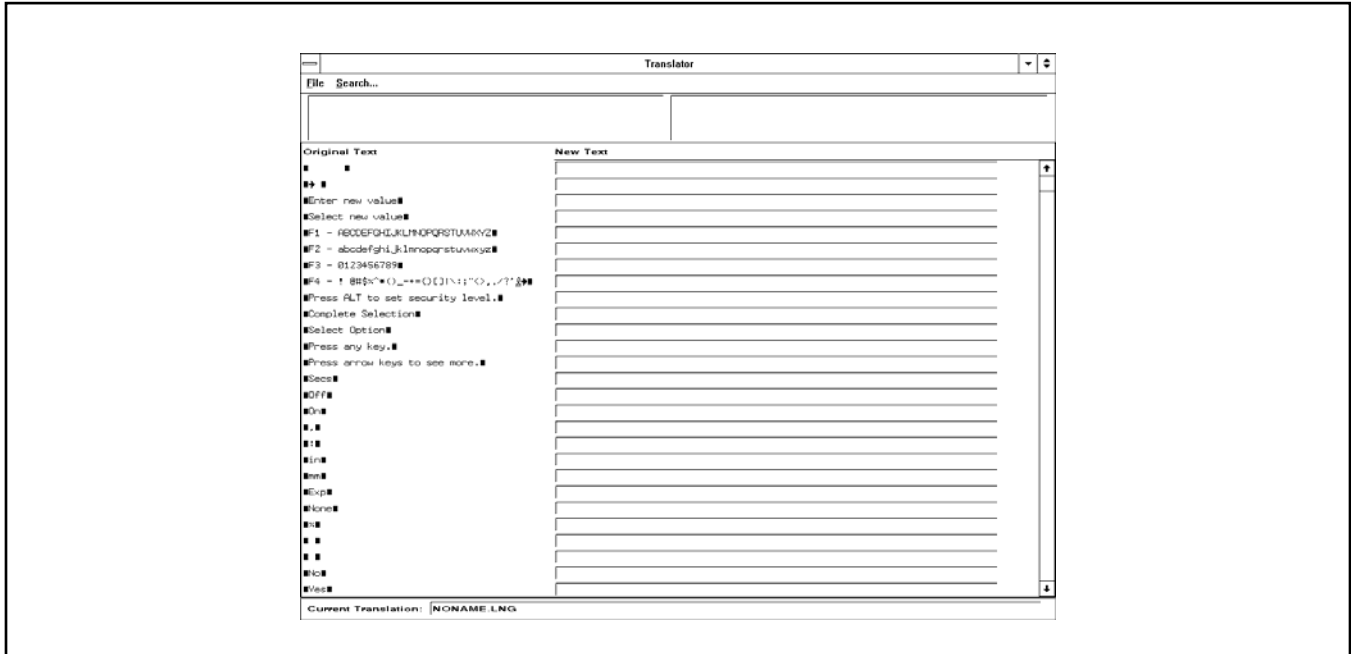


Figure 25

From this screen, all the literals that are resident in the SyberTrol are accessible and can be changed. There are two items on the first line of the screen, File and Search, that provide the functions that can be used with the translator function of the SyberTrol.

When “File” is selected, a drop down menu is displayed that has the following actions:

- New** Provides a new file to be worked on, if a previous file was being modified. The SyberMate will provide an opportunity for the old file to be saved before the new file is created.
- Open** When Open is selected, a screen pops up that allows the operator to select an existing file to be loaded into the translator.
- Save** When Save is selected when working with an existing file, that file will be modified. When Save is selected when working with a new file, a popup menu will appear to enable the operator to select a new file name and indicate the drive where the file is to be stored.

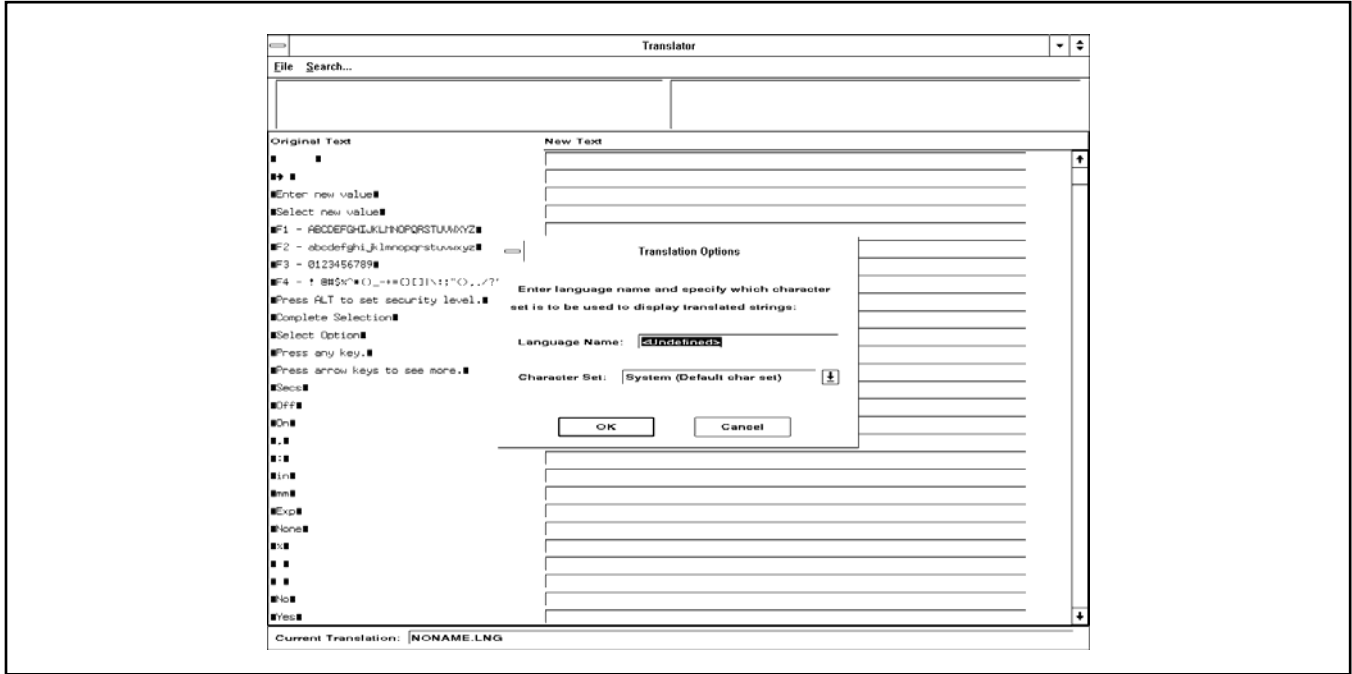
## Section IV - Operations

### **Save As**

Pops up a screen where a new file name can be assigned and the file location can be assigned.

### **Name and Font**

Pops up a screen where the character set can be selected for translated messages.



**Figure 26**

### **Retrieve from SyberTrol**

Retrieves the current set of literals from the SyberTrol to the translation clipboard in the SyberMate.

### **Uppdate SyberTrol**

Downloads the translated messages from the translation clipboard to the SyberTrol.

### **Exit**

Exits the translator screen back to the main SyberMate screen.

## Section IV - Operations

### Search

Pops up a screen where a word or a string of text can be entered and located in the literals file. *The search mechanism is case sensitive; therefore, the word or phrase must be entered exactly as it appears in the literals file.*

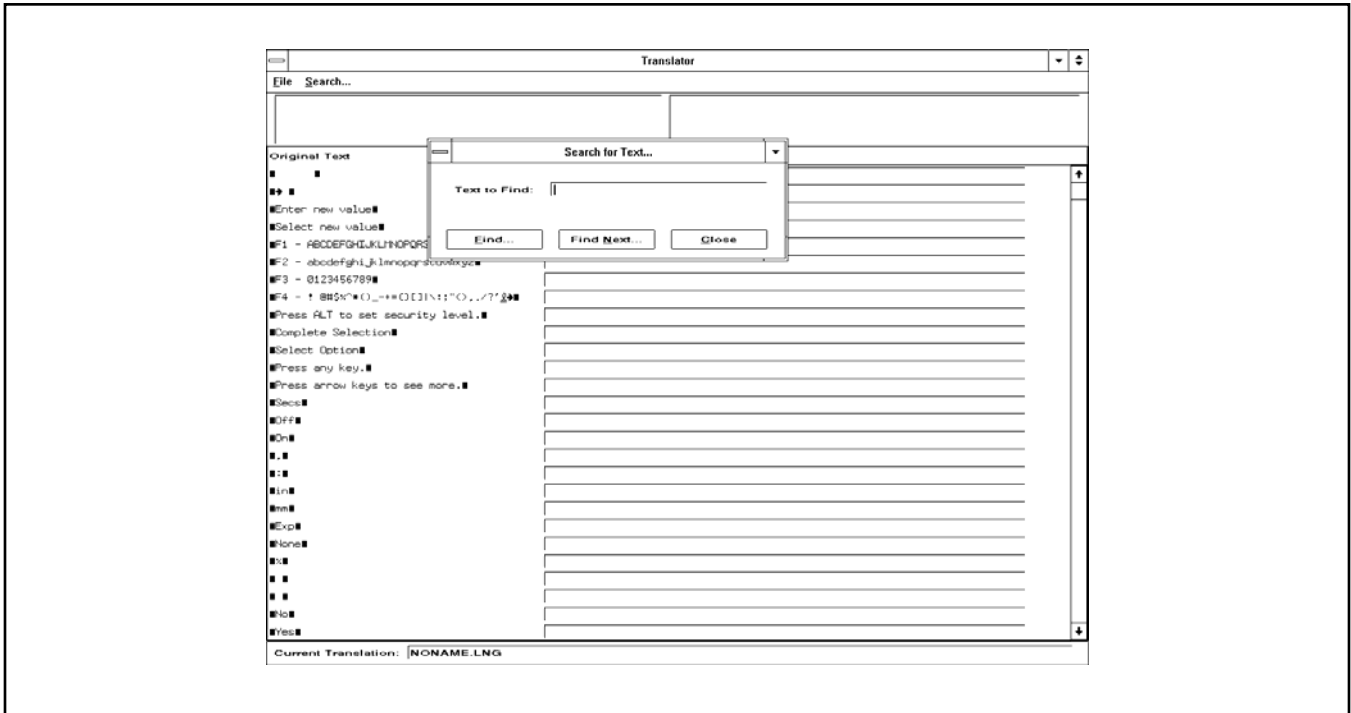


Figure 27

### Find

Used to find the initial occurrence of the word or string.

### Find Next

Used to find the subsequent occurrences of a word or string.

### Close

Closes the "Search" function and returns to the translator screen.

## Section IV - Operations

### Using the Translation Editor

For translations where the Latin character set is used, the SyberTrol literals can be changed by simply moving the cursor to the message that is to be translated and typing in the translation or new message.

For translations where a new character set is required for the translation, the following procedure is used:

1. From the E file menu, choose “Name and Font.” The following screen will be displayed:

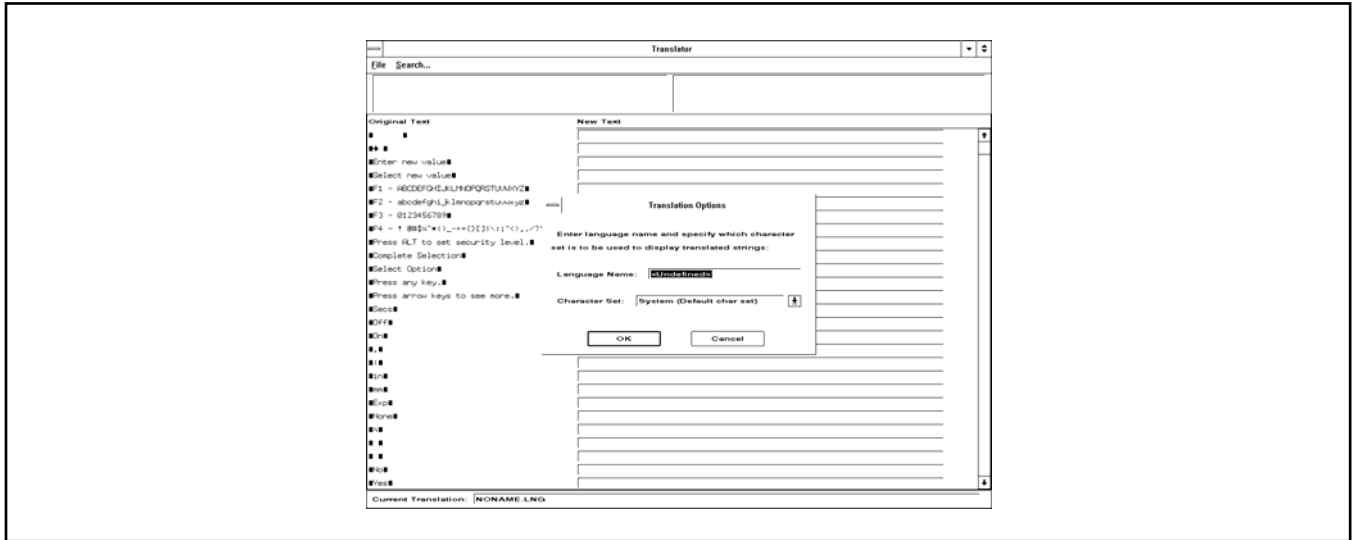


Figure 28

2. Select the arrow on the right side of the “Character Set” window. The current character sets that are resident in the SyberMate will be displayed. The current version of SyberMate contains the default Latin character set and the Cyrillic (PC-866) character set.
3. Select the Cyrillic (PC-866) character set. Click on “OK.” Note that the font must be selected in the SyberMate program.

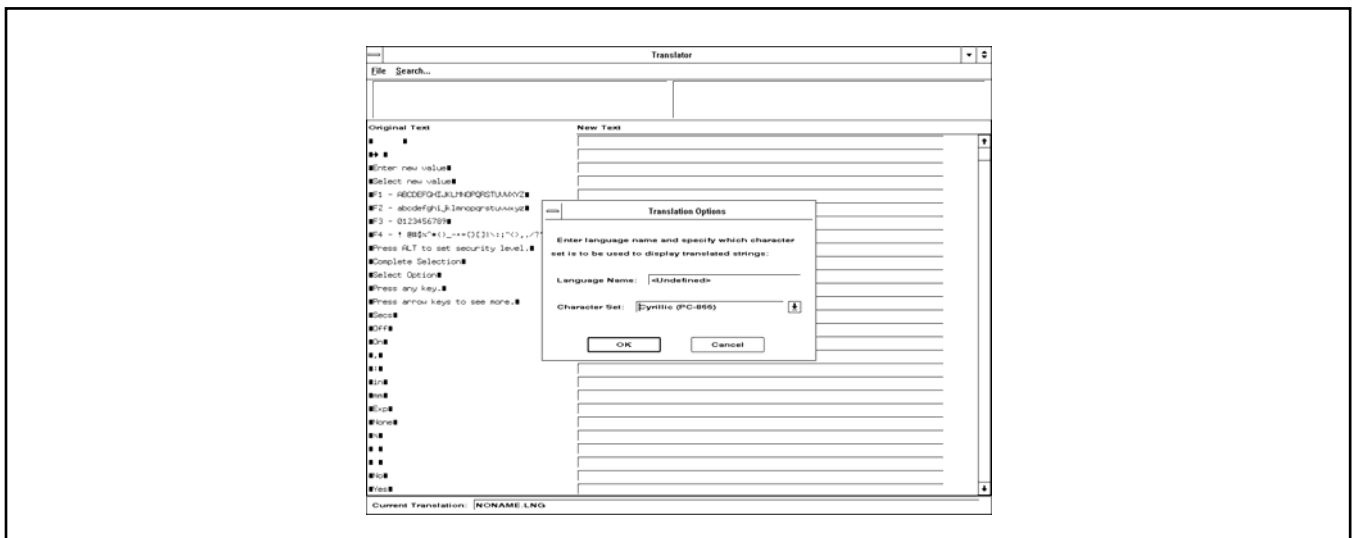


Figure 29

## Section IV - Operations

- Now that the SyberMate program has been set up for the Cyrillic (PC-866) character set, the Windows character mapping program must be activated on the computer.

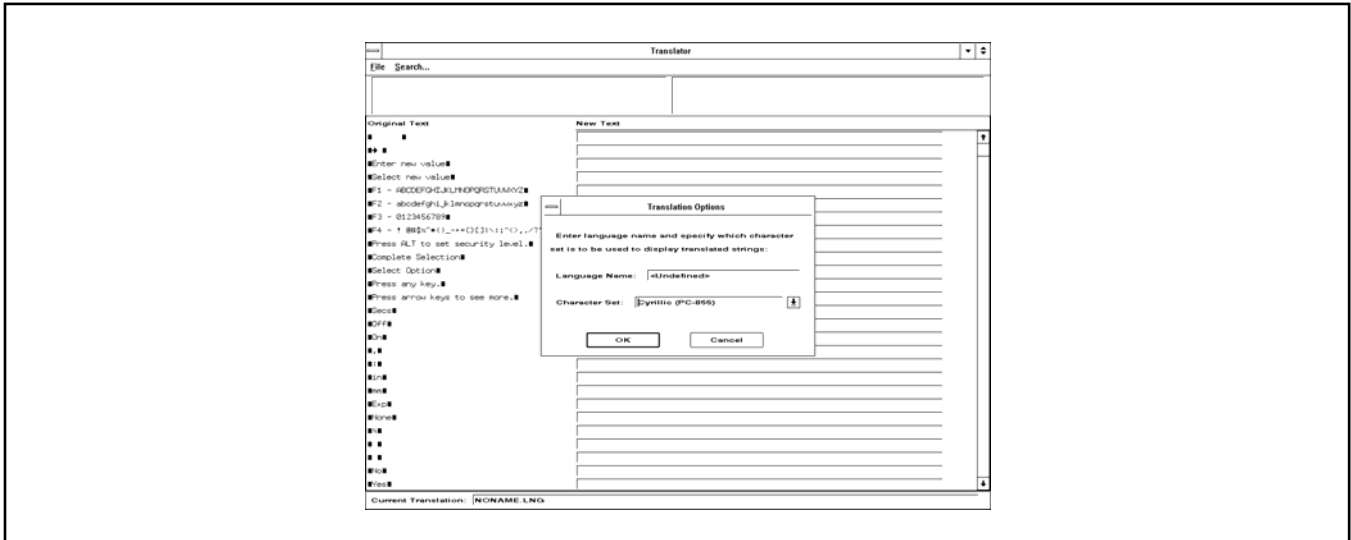


Figure 30

- Double-click on the character map symbol.

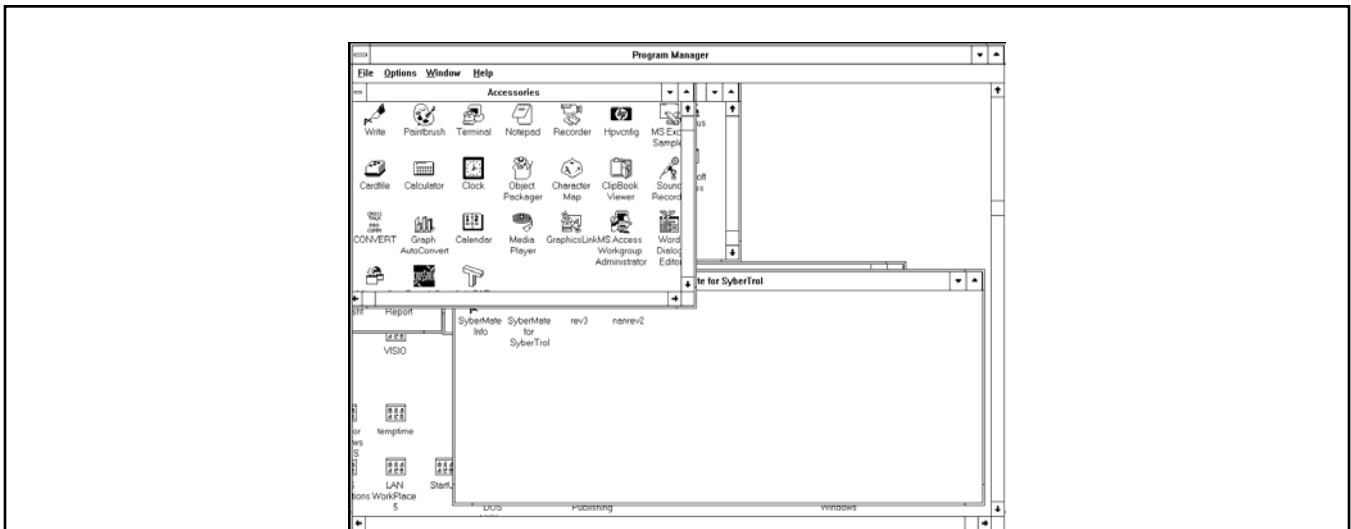


Figure 31

## Section IV - Operations

6. Position screens so that both the SyberMate translator display and the character map display are on the screen.

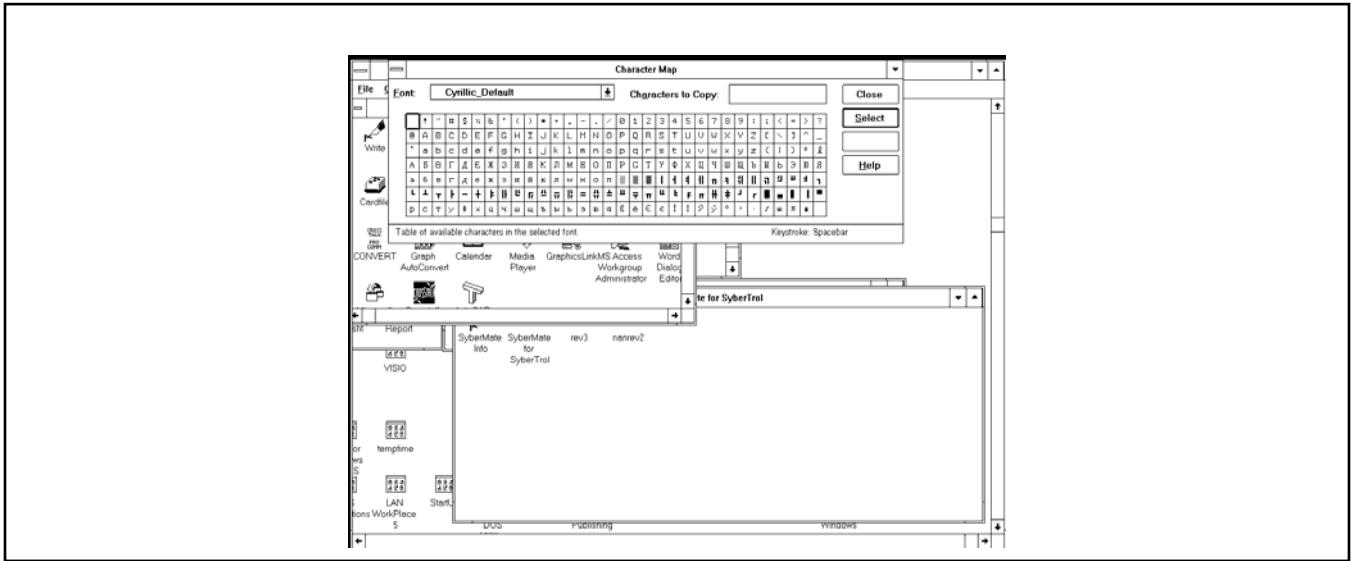


Figure 32

7. On the character map screen, double-click on the characters to make up the literal that is being translated. As each character is double-clicked, it will appear in the "Characters to Copy" window.

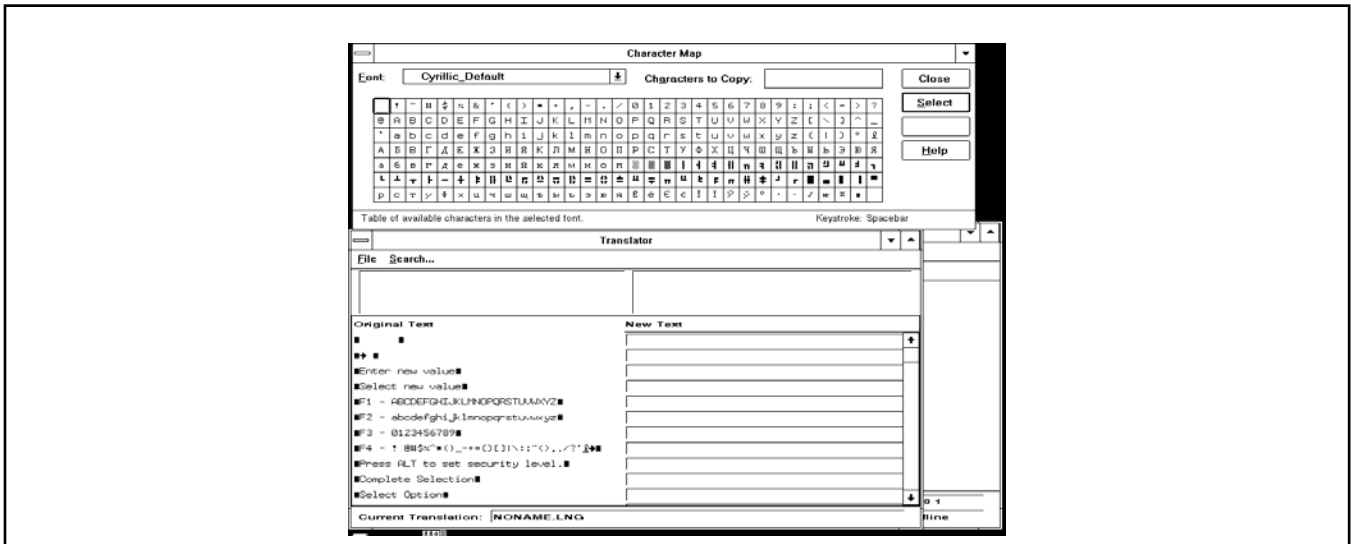


Figure 33

## Section IV - Operations

When the translation has been completed, it can be copied to the SyberMate by selecting the “Copy” button on the character map or by highlighting the message and pressing “CTRL” and “C” simultaneously on the keyboard.

8. Move the cursor to the field for the message or literal that is being translated and press “CTRL” and “V” simultaneously on the keyboard. The literal is now transferred to the SyberMate.

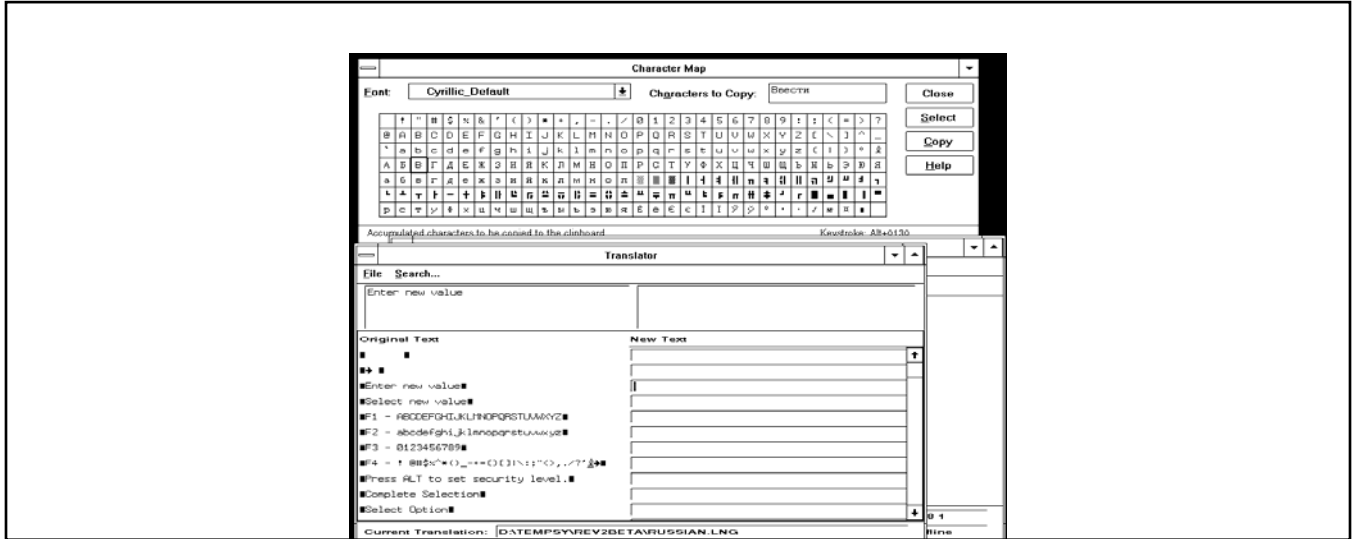


Figure 34

9. Continue until the entire list of literals have been translated. **Caution:** Translations should be restricted in length to no more than the number of characters that is in the default message to be sure the literals will be displayed correctly on the SyberTrol when downloaded.
10. Once the translation has been completed, it should be saved in an xxxx.lng file in the SyberMate, then downloaded to the SyberTrol through the “Update SyberTrol” menu selection.

## Section IV - Operations

### Equation Editor

The equation editor is used to display the equations that have been set up in the SyberMate or that are being set up in the SyberMate.

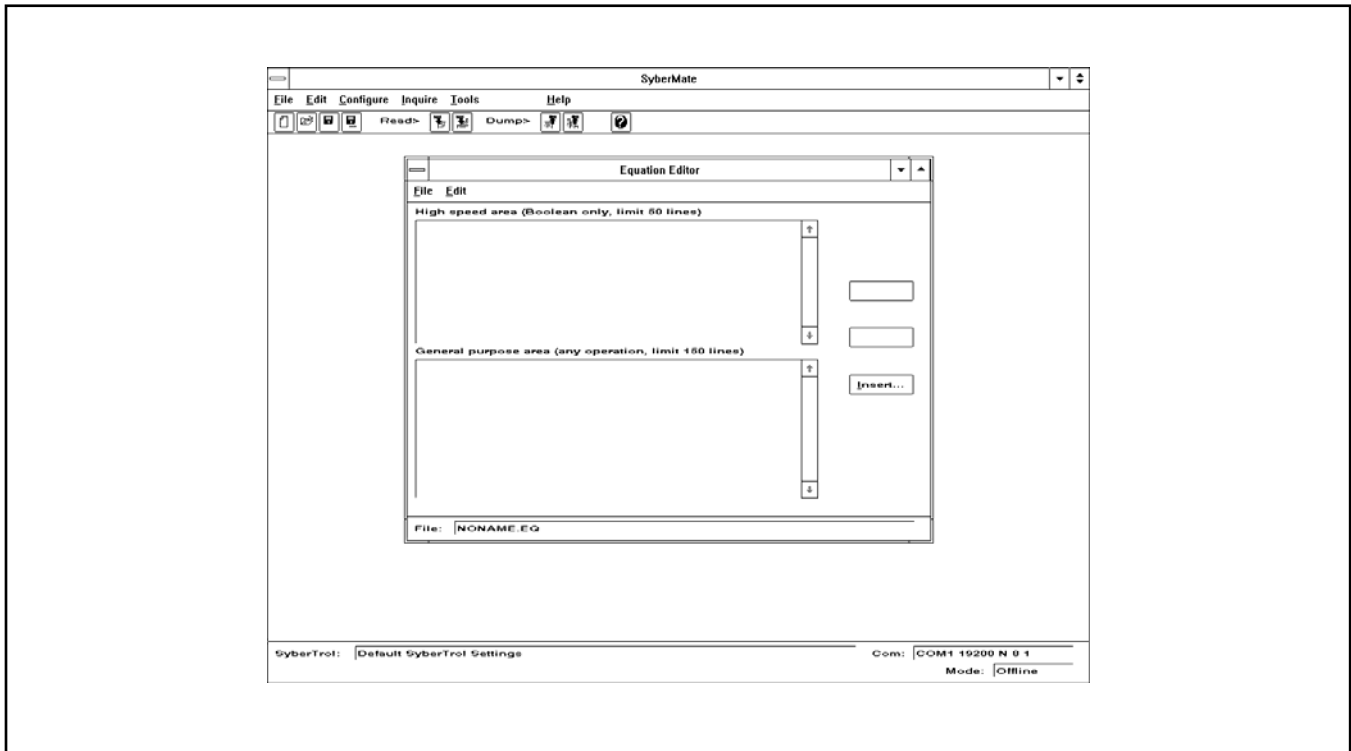


Figure 35

From this screen, there are two menus available, "File" and "Edit." There are also three buttons that are used for inserting new equations onto the screen, deleting equations from the screen, and modifying equations or statements on the screen. The following actions are available from this screen.

<b>File</b>	Displays the following menu items:
<b><u>N</u>ew Equation Set</b>	Used to set up a file of new equations.
<b><u>O</u>pen Equation Set</b>	Used to open an existing file of equations that has been saved on the system.
<b><u>S</u>ave Equation Set</b>	Used to save the equations that are being edited in an existing file.
<b>Save Equation Set <u>A</u>s...</b>	Used to save the equations that are being edited in a new file.
<b>Read Set from SyberTrol</b>	Used to read the equation set that is currently being used by the SyberTrol.
<b>Download to SyberTrol...</b>	Downloads to the SyberTrol the equations that are being displayed.

## Section IV - Operations

### Print Equation Set

Prints the equation set to the printer that is wired to the computer.

### Exit Equation Editor

Exits the equation editor screen and returns to the main SyberMate screen.

### Edit

#### Cut

Cuts the highlighted equation from the screen and places it on the clipboard for placement by the Paste command.

#### Copy

Copies the highlighted equation on the screen to the clipboard for placement by the Paste command.

#### Paste

Pastes the information on the clipboard to the "Equation Editor" screen.

#### Insert

Performs the same function as the Insert button on the right side of the screen. Selecting Insert will display the following screen:

#### Delete

Deletes the selected item.

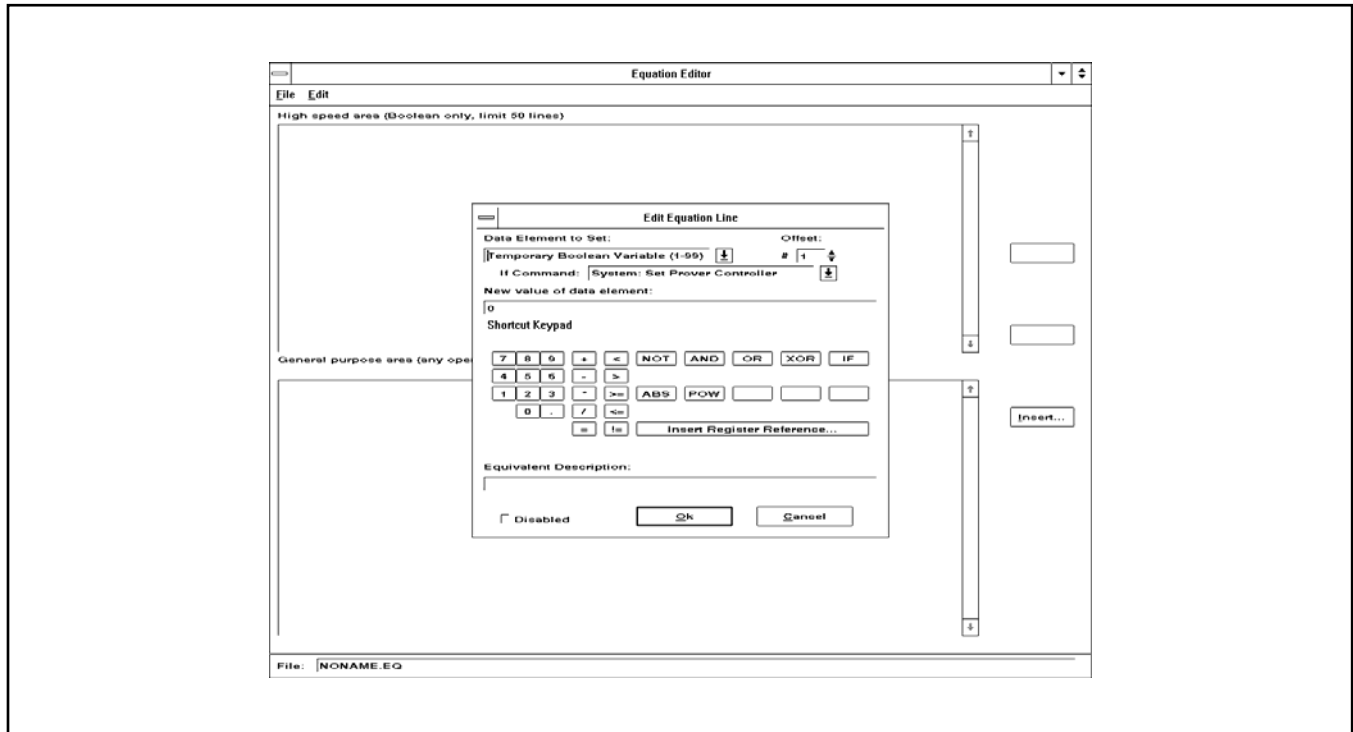


Figure 36

## Section IV - Operations

This screen is used to define the equation(s) that will be displayed on the “Equation Editor” screen.

### Delete

Performs the same function as the Delete button on the right side of the screen. Selecting “Delete” will remove the highlighted line from the screen.

### Modify

This button is used to display the “Edit Equation Line” screen for the equation that is highlights on the “Equation Editor” screen. (See Figure 37 above.)

### Delete

Performs the same function as described above on the “Edit” menu.

### Insert

Performs the same function as described above on the “Edit” menu.

## Equation Editor

The “Equation Editor” screen is divided into two sections. One is the “High Speed” area, where only Boolean expressions are addressed. This area has a maximum of 50 lines available for Boolean expressions. These expressions are evaluated once every 100 milliseconds. The other area is the “General Purpose” area, where a maximum of 150 lines of expressions can be developed. This is where algebraic expressions are developed. They are evaluated once every 500 milliseconds.

## Edit Equation Line

The “Edit Equation Line” screen is the screen where the Boolean equations and algebraic expressions are developed.

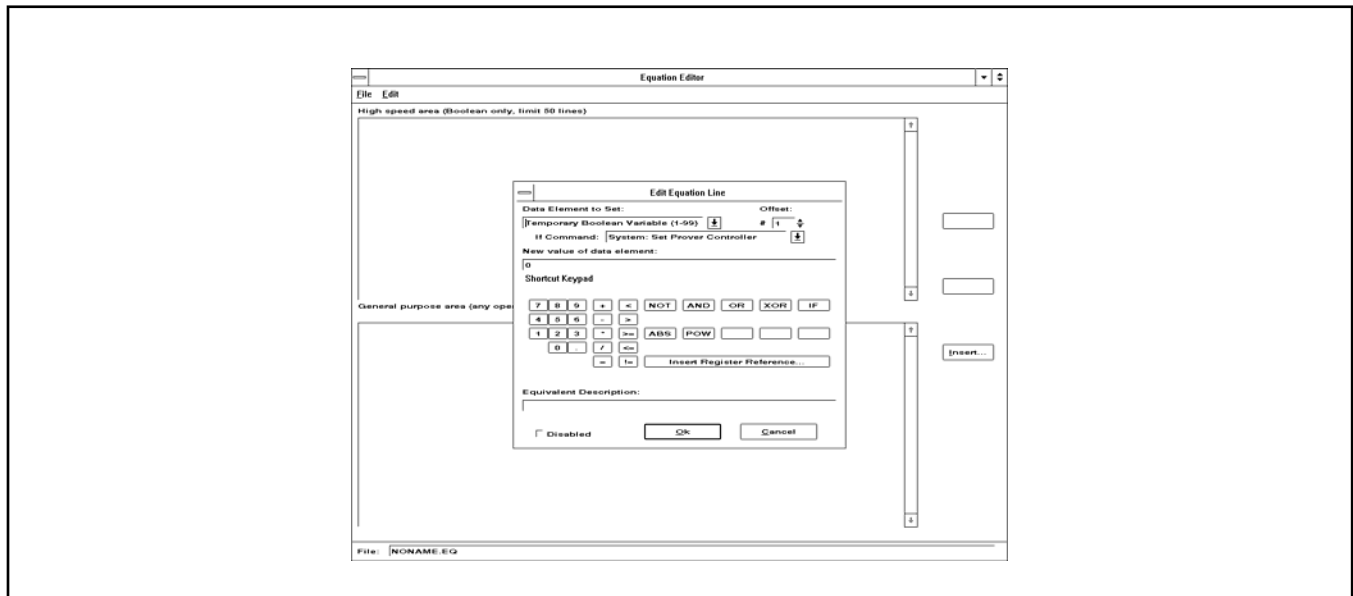


Figure 37

## Section IV - Operations

---

<b>Data Element Set</b>	<p>This window allows the user to select the element that will be set. In the case of the "Send" command, this window allows the user to designate which system or meter will be addressed.</p> <ul style="list-style-type: none"><li>*Temporary Boolean variable (1-99)</li><li>*User Boolean register (1-99)</li><li>Temporary float variable (1-99)</li><li>User float register (1-99)</li><li>*Digital I/O state (1-32)</li><li>Analog I/O state (1-12)</li><li>*Timer (1-16)</li><li>*"Send" command (0 Sys, 1-9 Mtr)</li></ul> <p>Any of the above elements can be set using the algebraic equations. Those marked with an "*" can be set through the Boolean equations</p>
<b>Offset</b>	<p>The offset window is used to select the specific number of the variable, register, I/O number, timer, or "Send" command to be used.</p>
<b>If Command</b>	<p>The "If command" window data is used only if the "Send" command is present in the "Data Element Set" window. The "If" command selections are:</p> <ul style="list-style-type: none"><li>System: Set Prover Controller<ul style="list-style-type: none"><li>Prover ID Select</li><li>Print System Report</li><li>Print System User Report</li><li>Set System Alarm</li><li>Ack System Alarm</li><li>Clear System Alarm</li></ul></li><li>Meter: Batch Control<ul style="list-style-type: none"><li>Sampler Control</li><li>Print Meter Report</li><li>Update Meter Factors</li><li>Prover Control</li><li>Print User Meter Report</li><li>Set Meter Alarm</li><li>Ack Meter Alarm</li><li>Clear Meter Alarm</li></ul></li></ul>

### ***"If" Command***

---

These commands are used to activate a command in the SyberTrol (i.e., in the "Starting a New Batch Based on Product Density Change" example, the meter 1 Batch command is used to end the existing batch and start a new batch. To use these commands,

1. Choose "Send Command (0 Sys, 1-9 Mtr)" from "Data Element Set."
2. Choose the command that is to be issued in the "If Command" window.
3. Add the remainder of the expression in the "New Value of Data Element" window (i.e., 0 IF USERBOOL5).
4. Choose "OK" to load the expression into the editor.

## Section IV - Operations

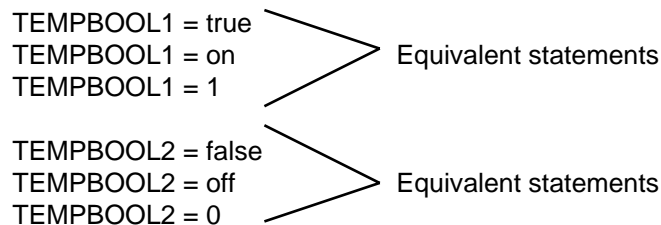
---

<b>New Value Data Element</b>	This is the area on the screen where data can be entered for developing the Boolean and algebraic equations. See the examples for the types of data that can be entered.
<b>Shortcut Keypad</b>	Can be used for entering data in the “New Value of Data Element” window. The keypad can be used for entering numerical data plus logical expressions. It also provides a button that will aid in finding the register number for elements in the database.
<b>Equivalent Description</b>	This is a Read Only window that displays a description of the expression being developed. If there is a problem with the expression, error messages will also be displayed in this window.
<b>Disabled</b>	If this box is checked, the expression will be disabled and not used. It can be enabled later via the SyberTrol
<b>OK</b>	If the expression developed meets the user’s approval, the “OK” button is pressed and the expression is moved to the “Equation Editor” screen.
<b>Cancel</b>	If the expression that has been developed is not satisfactory, it can be canceled. When the “Cancel” button is pressed, the program will return to the “Equation Editor” screen.

### ***Programmable and Boolean Statements***

---

A Boolean statement is a statement that has two states: “true” or “false.” There are different ways to express each of these values:



The logical operators that are used in conjunction with Boolean statements are “NOT”, “AND”, “OR”, and “XOR.”

<b>NOT</b>	A Boolean logic operator indicating negation. A variable designated with a “NOT” in front of it will be the opposite of its “AND” or “OR” function. It is a switching function for one variable.
<b>AND</b>	A Boolean logic operator similar to multiplication. If two variables are involved, both must be true for the output to be true.
<b>OR</b>	A Boolean logic operator similar to addition except that two truths add up to one truth. Using two variables, only one needs to be true for the output to be true.
<b>XOR</b>	A Boolean logic operator in which the output is true if either of two variables is true but not if both are true.

## Section IV - Operations

---

### ***Boolean Logical Operation Tables***

---

A	B	AND	OR	XOR	NOT A AND B
0	0	0	0	0	1
0	1	0	1	1	1
1	0	0	1	1	1
1	1	1	1	0	0

Examples of the use of the above defined logical operators are as follows: The true or false at the right-hand side of the expression is the evaluation of that expression.

Definition: TEMPBOOL1 = True  
TEMPBOOL2 = True  
TEMPBOOL3 = False

#### ***NOT***

TEMPBOOL4 = NOT TEMPBOOL3 (True)

#### ***AND***

TEMPBOOL5 = TEMPBOOL1 AND TEMPBOOL2 (True)  
TEMPBOOL6 = TEMPBOOL1 AND TEMPBOOL3 (False)

#### ***OR***

TEMPBOOL7 = TEMPBOOL1 OR TEMPBOOL3 (True)

#### ***XOR***

TEMPBOOL8 = TEMPBOOL1 XOR TEMPBOOL3 (True)  
TEMPBOOL9 = TEMPBOOL1 XOR TEMPBOOL2 (False)

### ***Specific Boolean Expressions***

---

When constructing a set of equations that take action based on a level value such as a temperature, a status value, the state of a digital I/O point, or any other value that may change between the evaluation of one equation and the next; read the value into a temporary or user-defined variable (Boolean or float, as applicable); and use the variable, not the actual value, in multiple equations.

Boolean equations can be more clearly expressed as a result of an evaluated expression than by assigning a value conditionally. For example, let us assume that we want to turn on a digital output when the product temperature of a specific meter is between 70 and 90, inclusive, and turn the same digital output off again when the temperature is no longer within that range. Because of the left-to-right evaluation of Boolean and algebraic expressions, it is recommended that the expressions be broken down into simple expressions so that the results are as expected.

## Section IV - Operations

---

For this example, we will show three separate methods of writing the expressions that will accomplish the results that are expected.

### **Example**

```
TEMPBOOL1 = @5121901 > = 70
TEMPBOOL2 = @5121901 < = 90
TEMPBOOL3 = TEMPBOOL1 AND TEMPBOOL2
DIO1 = ON IF TEMPBOOL3
DIO1 = OFF IF NOT TEMPBOOL3
```

where @5121901 = the meter #1 current temperature register and  
DIO1 = Digital Output #1.

This set of equations will have the expected results, i.e., the digital output will be “ON” when the temperature is in range and “OFF” when the temperature is out of range. The same results can be achieved with the following set of expressions:

```
TEMPBOOL1 = @5121901 > = 70
TEMPBOOL2 = @5121901 < = 90
DIO1 = TEMPBOOL1 AND TEMPBOOL2
```

where Digital Output #1 will be on if TEMPBOOL1 AND TEMPBOOL2 = True and off if they = False.

With the above two examples, if the temperature changed from the evaluation of expression one to expression two, the expected result would not be correct. In order to overcome this possibility, another step can be added to the expression.

```
TEMPFLOAT1 = @5121901
TEMPBOOL1 = TEMPFLOAT1 > = 70
TEMPBOOL2 = TEMPFLOAT1 < = 90
DIO1 = TEMPBOOL1 AND TEMPBOOL2
```

### **Example - Setting a Time**

The starting of a timer is not as straightforward as it might seem. For this example, we want to start timer #9 which is a timer that increments in minutes if we use the Boolean equation

$$\text{TIMER9} = \text{ON}$$

to turn the timer on. It will never increment above 1 because each time the expression is evaluated, it will get re-set to “ON” and restart. We can add a conditional “IF” statement to get around this problem. The new expression would be

$$\text{TIMER9} = \text{ON IF } \text{TIMER9} = 0.$$

## Section IV - Operations

---

The following example is used to determine the time that batches are being run on meter #1 in minutes, during a certain period of time (8 hours, 24 hours, etc.). This is determined by monitoring register 6120401 for an indication of when a batch is in progress for meter #1.

```
TEMPBOOL1 = @6120401
USERFLOAT1 = 1 IF USERFLOAT1 = 0
TIMER9 = USERFLOAT1 IF TEMPBOOL1 AND NOT TEMPBOOL2
TIMER9 = OFF IF TEMPBOOL2 AND NOT TEMPBOOL1
TEMPBOOL2 = TEMPBOOL1
USERFLOAT1 = TIMER9 IF TIMER9 > 0
```

Explanation of the above Boolean expression:

1. TEMPBOOL = @6120401 - This expression will be either true or false depending on the status of the register. If the register indicates a batch in progress, it will be "true." If no batch is in progress, it will be "false."
2. USERFLOAT1 = 1, IF USERFLOAT1 = 0 - This expression initializes the userfloat register to "true" if it was "false."
3. TIMER9 = USERFLOAT1 IF TEMPBOOL1 AND NOT TEMPBOOL2 - This expression turns the timer off if the TEMPBOOL2 register is "true" and the TEMPBOOL1 register is "false."
4. TIMER9 = OFF IF TEMPBOOL2 AND NOT TEMPBOOL1 - This expression turns the timer off if TEMPBOOL2 register is "true" and the TEMPBOOL1 register is "false."
5. TEMPBOOL2 = TEMPBOOL1 - This expression sets the TEMPBOOL2 register equal to the TEMPBOOL1 register.
6. USERFLOAT1 - TIMER9 IF TIMER9 > 0 - This expression sets the USERFLOAT1 register to the timer value if the timer value is greater than 0. This value will then be used as the starting value for the timer the next time a batch is started.

### ***Algebraic Expressions***

---

The SyberTrol converts all algebraic values to double precision floating point values prior to performing calculations.

Calculations may be defined using positive or negative whole numbers, fractional numbers, or a combination. Algebraic expressions are evaluated from left to right and all operators (+, -, /, \*) have the same precedence. Multiplication does not take place before addition, etc. The following expression has a result of 54.

$$\text{TEMPFLOAT1} = 4 + 5 * 6 \text{ (Result 54, } 4 + 5 = 9 * 6 = 54)$$

Algebraic processing will allow out of range values, such as division by zero, or evaluations of expressions whose results are greater than the range of a double precision floating point variable. It is the responsibility of the user to ensure that valid expressions are used.

## Section IV - Operations

---

### **Example - Flow Rate Conversion**

This is a simple example for converting the flow rate that is currently being run through meter #1 from barrels/hour to gallons/minute. The Meter #1 current flow rate register is 5120301.

$$\text{USERFLOAT1} = @ 5120301 * 42/60$$

where USERFLOAT1 is the register where the results of the current flow rate (register 5120301) times 42 divided by 60 is stored. This value can then be accessed through communications, or used on the user configurable reports and displays.

### **Example - Temperature Conversion**

This example will convert the temperature that is being read by the SyberTrol for meter #1 from Fahrenheit to Celsius. The current temperature register is 5121901.

$$\text{USERFLOAT2} = @ 5121901 - 32/1.8$$

where USERFLOAT2 is the register where the results of the current temperature in degrees Fahrenheit (register 5121901) minus 32 degrees divided by 1.8 are stored. This is the equivalent temperature in degrees Celsius, and can be accessed through communications or used on the user configurable reports and displays.

### **Example - Starting a New Batch Based on Product Density Change**

This example will start a new batch of product 3 on meter #1 if the product density changes and stays in the new range for at least five seconds. The new range in this example is between 40 and 50 API. This example assumes that the batches have been preset in the SyberTrol and the first batch is running.

1. USERBOOL1 = TRUE IF @ 5122101 > 40
2. USERBOOL2 = TRUE IF @ 5122101 < 50
3. USERBOOL3 = TRUE IF USERBOOL1 AND USERBOOL2
4. TIMER5 = OFF IF NOT USERBOOL3
5. TIMER5 = ON IF USERBOOL3 AND NOT USERBOOL4
6. USERBOOL4 = TRUE IF TIMER5 > 0
7. USERBOOL5 = TRUE IF TIMER5 > 5
8. METER1 BATCH: 0 IF USERBOOL5 AND USERBOOL3
9. TIMER5 = OFF IF USERBOOL5 AND USERBOOL3

where

Expressions 1 and 2 are tests for the product density.

Expression 3 is true if the density is within the range being tested for.

Expression 4 turns timer #5, a one-second timer, off if the product is not within the density range being tested for.

Expression 5 turns the timer on if the density is in the range and the timer is currently off.

Expression 6 is true if the timer is currently on.

## Section IV - Operations

---

Expression 7 is true if the timer is on over five seconds.

Expression 8 ends the current batch and starts the next batch if the timer has been on for more than five seconds and the density is in the range.

Expression 9 turns the timer off if it has been on for more than five seconds and the density is in the range.

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## Section VI - Related Publications

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The following literature can be obtained from FMC Technologies Measurement Solutions, Inc. Literature Fulfillment at [johno@gohrs.com](mailto:johno@gohrs.com) or online at [www.fmctechnologies.com/measurementsolutions](http://www.fmctechnologies.com/measurementsolutions). When requesting literature from Literature Fulfillment, please reference the appropriate bulletin number and title.

### **SyberTrol**

Specifications.....	Bulletin SS09036
Installation.....	Bulletin MN09043
Operations .....	Bulletin MN09045
Programming .....	Bulletin MN09041
Communications.....	Bulletin MN09044
Modbus Communications.....	Bulletin MN09048

### **SyberMate**

Specifications.....	Bulletin SS09037
Installation/Operations.....	Bulletin MN09047

Revisions included in MN09047 Issue/Rev. 03 (11/97):

- Added Alarms-System, Alarms - Meter, Alarms - Meter (Prover)
- Added Skid description.

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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#### **Headquarters:**

1803 Gears Road, Houston, TX 77067 USA, Phone: 281/260-2190, Fax: 281/260-2191

#### **Gas Measurement Products:**

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**Kongsberg, Norway** Phone (47) 32/286-700  
**San Juan, Puerto Rico** Phone 787/274-3760  
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