
128 DCM DATA LOGGER & FLARS™ MANUAL

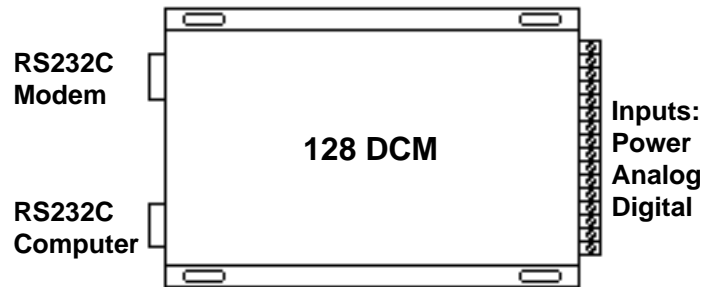
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DESCRIPTION

The Model 128 DCM data logger is designed for use with Eastech Badger's ultrasonic flowmeters. The logger accurately records and time tags up to five (5) measured variables at intervals from 1 minute to 255 minutes.

The Model 128 DCM has three analog and two digital input channels for recording various measurements such as flow, level and velocity. There are two RS232C serial ports to allow the downloading of the data to a laptop computer or through a modem to a central computer.

Programming and data collection is accomplished with the FLARS™ programming software. The FLARS software programs the logger for specific site and application information and identifies each logging channel. The parameters that can be programmed into the logger are:

- Site
- Site ID
- Channel scaling
- Baud rate
- Logging time intervals

The FLARS software stores the retrieved data in a file that can be converted into a report. The report lists the date and time of each measured variable from each of the 5 selectable channels. This report can be viewed on the computer screen or printed. The data file can also be formatted and imported into Lotus 1-2-3™ or Excel™ spreadsheet software programs for graphing to assist in analysis of the data.

The site parameters are stored in EEPROM which prevents loss in the event of power interruption. A ten year life, lithium battery backs up the internal clock and RAM to prevent loss of data in the event of power interruption.

The Model 128 DCM is housed in a NEMA 12 enclosure or can be mounted in the standard enclosures of the Eastech Badger Model 2100 and 2500 ultrasonic flowmeters.

The Model 128 DCM must be externally powered by a 12 to 24 VDC customer supplied power supply. However, if used with a Eastech Badger ultrasonic flowmeter, power is available through the serial communications port of the flowmeter.

For installation wiring and specifications, refer to the Pages 4-5.

LOGGER WIRING - INPUT TERMINALS

The input terminals labeled TX1, RX1, Gnd, TX2, RX2 and Gnd are the connections for the RS232C digital channels 1 and 2. These channels can only be used with flowmeters manufactured by Eastech Badger.

The AL input terminal is for connecting a contact closure for totalizing. The Gnd terminal between terminals A3 and BAT should be used with the AL terminal.

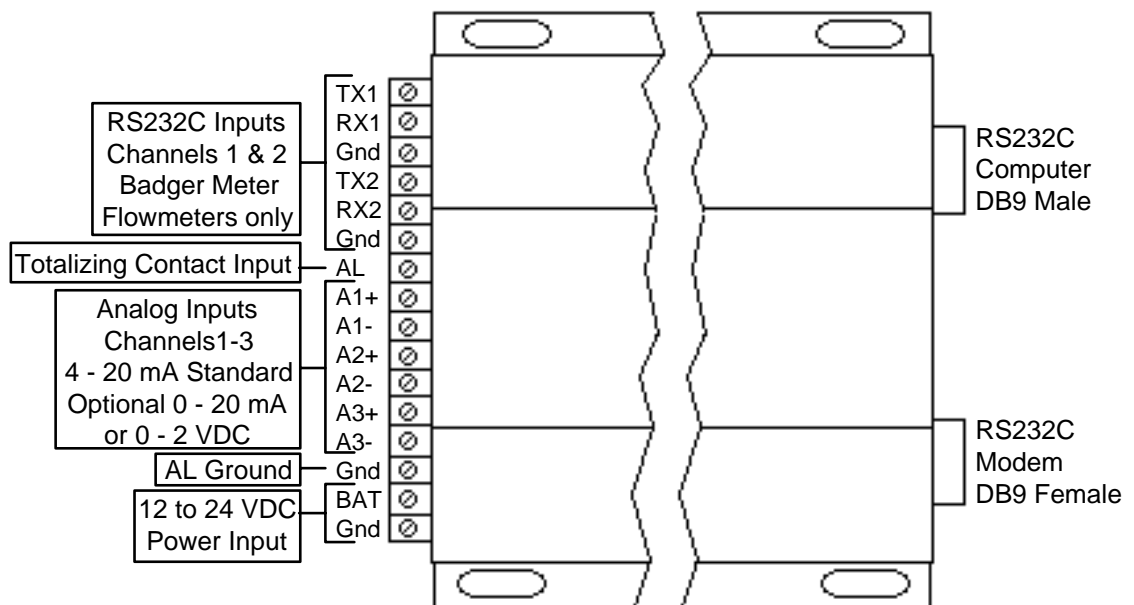
The input terminals labeled A1+, A1-, A2+, A2-, A3+ and A3- are the connections for the analog input channels 1, 2 and 3. These inputs are set up at the factory for 4-20 mA DC. They can also be set up for 0-20 mA DC or 0-2 VDC by the factory when the unit is ordered. The serial number label on the unit will indicate the mA or VDC configuration.

Important

•NOTE• It is important to note which meter output is connected to which data logger channel so that when programming the logger with the FLARS programming software, each channel can be correctly configured for proper data logging operation.

The Gnd terminal located between terminals A3 and BAT is to be used with the AL terminal for connection of a contact closure device.

The input terminals BAT and Gnd are for powering the unit. The input voltage must be 12 to 24 VDC.



I Model 128 DCM Data Logger

LOGGER WIRING-SERIAL INPUT AND OUTPUT CONNECTIONS

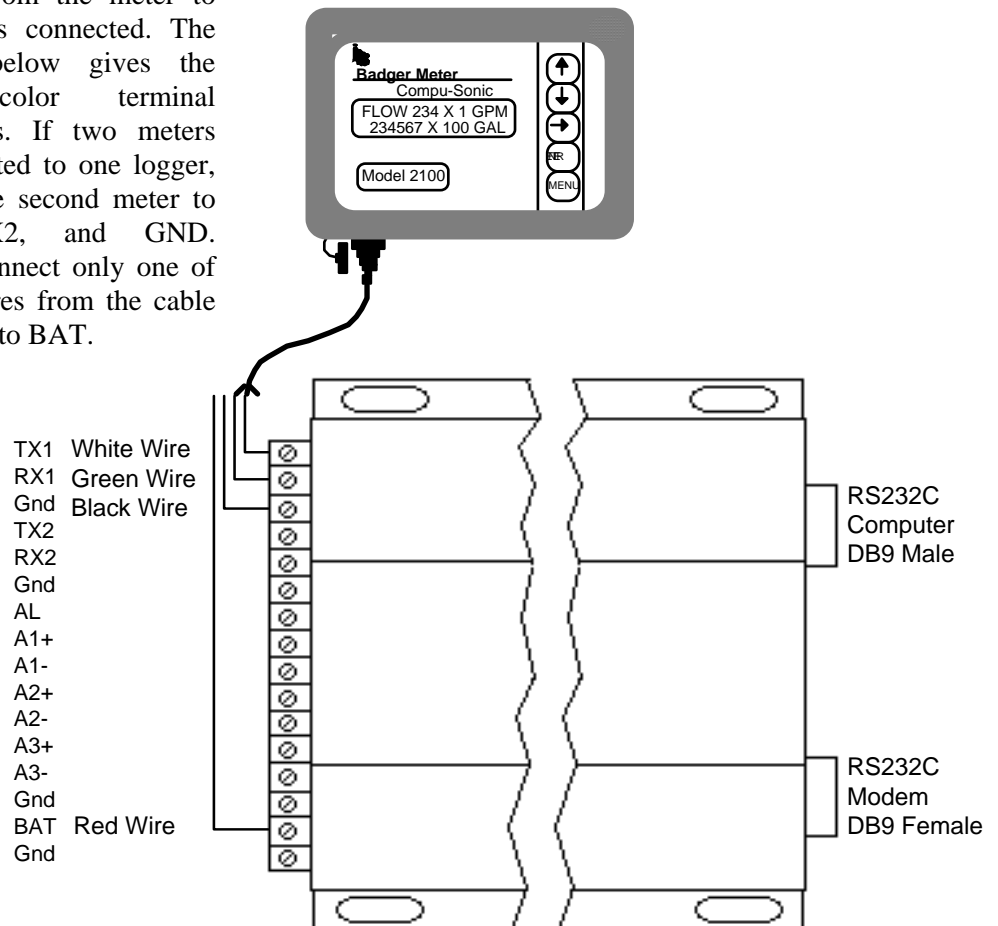
The two RS232C output connections are used for programming the Model 128 DCM and downloading the data.

One connector is for connecting the unit directly to a computer. This connector is a DB9 female connection. The cable connection between the 128 DCM and the computer requires a null modem cable. This cable, Part Number 543518-0004, is provided with the data logger.

The other connector is for connecting the unit to a modem. This connector is a DB9 male connection. The cable connection between the 128 DCM and a modem uses a commercially available modem cable and is not provided with the data logger.

Using the RS232C digital channels is only supported for use with Eastech Badger Flowmeters. Consult the factory for details.

The digital channel connection is made with Eastech Badger's communication cable assembly Part Number 543518-0001. With the Cable the Model 128 DCM can be powered from the meter to which it is connected. The drawing below gives the wiring color terminal connections. If two meters are connected to one logger, connect the second meter to TX2, RX2, and GND. NOTE: Connect only one of the red wires from the cable assemblies to BAT.



Model 128 DCM Data Logger

SPECIFICATIONS

Analog Input:

- 3 Channels current or voltage
- Range 0 - 20 mA dc / 0 - 2.0 V (4-20 mA standard)
- Accuracy - 0.125% Full Scale

Digital Input (Eastech Badger Flowmeters):

- 2 Channels RS232C
- Resolution - 0.001% Full Scale

Contact Input:

- Pull down type input used to record a contact input

Outputs:

- 2 RS232C ports - DB9 for computer and modem communications

Two Logging Intervals (Main & Alternate):

- Selectable in intervals from 1 to 255 minutes

Temperature Range:

- 32 to 130 Degrees F

Memory Capacity:

- 128 K RAM
- 56 days at 5 minute logging intervals - all 5 channels

Programming and Downloading:

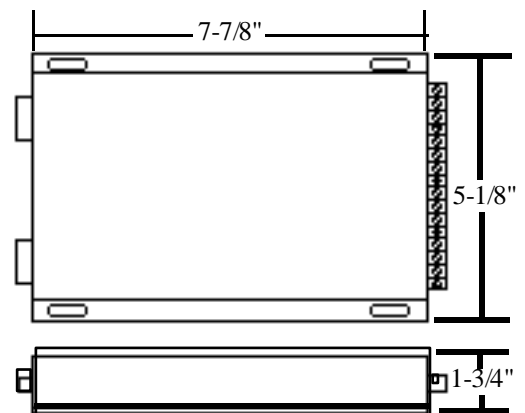
- FLARS™ software package - direct with Laptop computer or central computer via modem

Stored Information:

- Site description
- Site ID number
- Meter equipment type
- Logger serial number
- Time and date
- Logged measurements

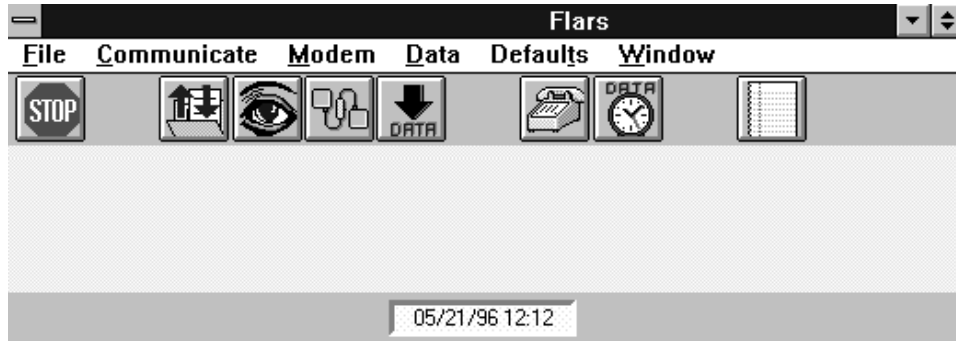
Power Requirements:

- 12 to 24 VDC @ 40 mA



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 Excel is a trademark of Microsoft Corporation
 Compu-Sonic & FLARS is a trademark of Eastech Badger
 Windows is a trademark of Microsoft Corporation

INTRODUCTION



The FLARS flow logging and retrieval system is a computer software program designed to program the Eastech Badger Model 128 DCM for data logging operations. The software also retrieves stored logger data for viewing or reporting.

The Model 128 DCM data logger, hereafter referred to as logger, monitors and stores information sent from other monitoring or measuring equipment such as a Eastech Badger Flowmeter. Using a flowmeter as an example, the logger would record information from the flowmeter and store this information in a memory storage area within the data logger known as Random Access Memory, or RAM. The stored information can be viewed as it occurs, or it can be retrieved from the logger RAM (memory) at a later time.

In order for the logger to collect and store this data, certain operational parameters must be programmed into the logger. This information tells the logger when and how to operate, what data to collect and store in its RAM memory, and other operational information. This operational data is stored in a file called a GEO file.

The GEO file is stored on a computer disk or hard drive and is accessed through FLARS. This GEO file can be transferred to the logger, where it is stored in a permanent memory area. When the logger's operational information (GEO) is transferred to the logger, the logger can begin collecting data from the equipment it is monitoring. This data can be called up from the logger via computer and viewed as it is being collected and stored by the logger. It can also be retrieved from the logger RAM memory at a later date.

Once the stored data has been retrieved from the logger, it can be viewed on a computer screen or printed out in report or graph from by a computer printer. It can also be converted into an ASCII file format and then transferred to other computer programs such as Lotus 1-2-3 or Excel.

SETTING UP FLARS

FLARS Requirements

To use FLARS requires:

An IBM-compatible personal computer with an 80386 or higher processor (486/33 or higher is recommended).

A hard disk with 8 megabytes of free space.

A mouse or other compatible pointing device.

A VGA display.

Four megabytes of random-access memory (eight megabytes or more is recommended).

Microsoft Windows™ 3.1 or Windows™.

Installing FLARS

1. Start Windows™
2. Insert Disk 1 in drive A.
3. Windows™ 3.1 or 3.11; from the File menu in the Program Manager, choose Run. Windows displays the Run dialog box..
- 3a. Windows™ 95; from the Start menu, choose Run. Windows displays the Run dialog box.
4. Type **a:setup**
5. Follow the setup instruction on the screen. **Note: if running Windows™ 95, select custom installation and leave all items selected.**

Using the Mouse

Moving the mouse moves a pointer on the screen. The shape of the pointer may vary depending on the type of computer you are using. Point to an item by moving the pointer on top of it. Note that it is often important to place the very tip of the pointer exactly where you want it to be. Click on an item with the left mouse button. The program does not use the right mouse button.

Starting FLARS

To start FLARS from Windows™ 3.1, double click on the FLARS for WINDOWS Group then double click on the FLARS icon.

Windows™ 95, click on Start, programs and FLARS™.

SETTING UP FLARS

Using Commands

Commands allow the user to tell the program what to do. All commands are available through the Main Menu screen (the screen shown when FLARS is first accessed). FLARS commands are displayed in two ways; through the menu bar, and the Toolbar. Both of these are displayed at the top of the screen.

Each command in the menu bar represents a pull down menu. When a menu bar command is selected, a pull down menu appears. Each pull down menu contains a number of commands that appear under the menu bar command. These commands perform functions associated with the menu bar commands.

Each icon on the Toolbar represents a specific command that may be selected by clicking on it, rather than through the pull down menu. When an icon is selected, it activates the appropriate command screen.

SELECTING COMMANDS

Selecting Commands with the Mouse

To select a command using the mouse:

1. Point to one of the commands on the menu bar and mouse click (click the left mouse button). The pull down menu appears under the selected menu bar command. This menu stays on the screen until you select a pull down menu command, pull down another menu, click on an icon, or click elsewhere on the main screen.
2. Mouse click on the pull down menu command you want to select. The command is activated and performs a function.

Selecting Commands Using The Keyboard

Any of the menu bar commands can be selected using the keyboard. To select a command using the keyboard:

1. Press the ALT key to activate the menu bar while you are in the Main Menu screen. The file command will be highlighted on the menu bar. Use the LEFT and RIGHT arrow keys to move back and forth between commands on the menu bar. When the command you want is highlighted, press either the DOWN arrow or the underlined letter of the command, this will activate the pull down menu. When the pull down menu appears, one letter in each command will be underlined.
2. Use the UP or DOWN arrow keys to select one of the pull down commands and press enter (RETURN). Or, press the underlined letter of the command on the keyboard. This will select the command. Press ENTER to activate the command.

When you activate a command from the pull down menu, one of three things will happen: The command will be performed without further action from you; a Dialog Box or Window will appear on the screen requiring further action or information; the information you are seeking will appear on the screen.

The row of icons across the top of the main Menu screen just below the menu bar is the Toolbar. To select a command from the Toolbar simply click on the icon once with the mouse. Rather than activate a pull down menu, the Toolbar will directly execute a command from one of the menu bar pull down menus. The Toolbar is quicker and more convenient than the pull down menus.

From left to right the Toolbar icons are: Stop, File, View, Digital Channels, Download Data, Phone Connect, Auto Download Data, and Data Manager.

SETTING UP FLARS

Selecting
Commands Using
the Toolbar

Stop • Exits FLARS Immediately.



File • Opens the GEO Setup Window.



View • Opens the View Logger Operation Window.



Digital Channel • Opens the Select Digital Channel Window.



Download Data • Opens the Download Window.



Phone Connect • Opens the Modem Direct Dial Window.

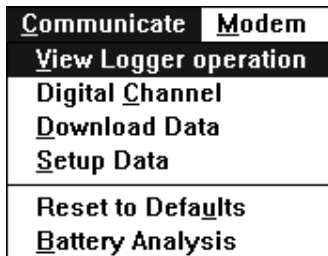


Auto Download Data • Opens the automatic Dial and Download Window.



Data Manager • Opens the Data Manager Window.

MENU BAR FUNCTIONS

Menu & Toolbar
Commands

File • This pull down menu allows the selection of the GEO file setup window or exit the program.

Setup... • Activates the GEO setup window. This window may also be activated by the Setup icon in the Toolbar.

Exit • Exits the FLARS program. The Stop icon in the Toolbar will also exit the program.

Communicate • This pull down menu allows various modes of communications with the Model 128 DCM data logger.

View Logger Operation • Activates the View window for real time viewing of the inputs to the channels in the logger. This window may also be activated by the View icon in the Toolbar.

Digital Channel • Activates the direct communication window allowing direct communication to a Eastech Badger flowmeter connected to Digital Channels 1 or 2 of the logger. Only active with Model 2100 and 2500 flowmeters at this time. This window may also be accessed by clicking on the Channel icon in the Toolbar.

Download Data • Downloads the logged data from the logger. This window may also be accessed by clicking on the Download icon in the Toolbar.

Setup Data • Activates the logger GEO/Setup screen. Also accessible by clicking on the File icon in the Toolbar.

Reset to Defaults • Resets the logger Host Port and baud rates to the factory default settings.

Battery Analysis • Displays the status and voltage powering the logger.

MENU BAR FUNCTIONS



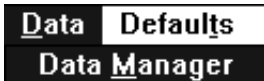
Modem • This pull down menu allows the selection of communication through a modem by direct dial or auto dialing.



Dial • Activates the modem direct dial window. This window allows the entry of one or more phone numbers into a site phone list. The selection and dialing of a logger site can also be accomplished. This window may also be accessed by clicking on the Phone icon in the Toolbar.



Autodownload • Activates the Autodownload window. The Autodownload window allows entry of multiple logger site phone numbers plus automatic calling and data downloading. This window may also be accessed by clicking on the Autodownload icon in the Toolbar.



Data • This pull down menu controls the formats in which data files may be viewed or converted.



Data Manager • Activates the Data Manager window, which allows logger data files to be converted into graph or report form. This screen also controls the printer settings. This window may also be accessed by clicking on the Data Manager icon in the Toolbar.



Defaults • This pull down menu allows setup of the default settings for the communications and download procedure. **This default should be setup before trying to communicate with the logger.**

Setup Modem • Activates the Modem setup window which allows the selection of a modem.

Setup Port • Activates the local port setup window to select the port for direct connection.

File Name Options • Allows the selection of how a retrieved data file is named and stored.

MENU BAR FUNCTIONS



Window • This pull down menu allows selections which affect the appearance and layout of the FLARS main menu screen.

Toolbar • Turns the Toolbar on and off. When the program first starts the Toolbar will be on. When off, the Toolbar is not visible.

Display Firmware Revision • Displays what version of firmware is being used by the logger.

About FLARS • Activates the FLARS title screen and shows the version.

Cascade • Arranges the various windows to lay one atop the other. This is the standard format.

Tile • Arranges the windows side by side.

Arrange Icons • Allows icons to be rearranged, see your Windows™ manual for more information.

COMMUNICATIONS SETUP

Overview

In order to program and retrieve data information from the logger, communication must first be established between the logger and the computer. There are two methods by which this can be done: Direct communication and Modem communication.

Direct communication between the logger and computer is accomplished with the interconnect cable provided with the Model 128 DCM Data Logger and FLARS software package. This cable connects directly between the logger and computer.

The Modem method of communication is from the computer, through a modem, via phone line to a modem at the logger and into the logger.

In order to communicate with the logger using either method, certain operational parameters must be setup using the FLARS software program.

Important

You must perform either the Direct or Modem communication setup procedure before communicating with the logger for the first time.

Once you have performed a setup procedure, it will not be necessary to perform it again unless you erase the operational information from the logger, change equipment (logger, modem, or computer), or change the method of communication.

Both procedures require you to set the Baud rate to be used in communicating with the logger. You also will need to select the communications port (Comm Port) to be used.

Important

NOTE: The logger comes from the factory with the Host Port (Direct Comm.) baud rate set at 9600 and the Modem Port (Modem Comm.) set at 1200. You must select the same baud rates for your computer. If you send a new GEO file to the logger with a different baud rate, you will loose communication with the logger. You will need to change your computer's baud rate to the baud rate just sent to the logger to reestablish communication with the logger.

The Direct method of communicating with the logger is usually utilized "in the field" using the direct interface cable supplied with the logger. Communication is established by connecting one end of the cable to a Laptop Computer serial port and the other end to the RS232C Host port (connector) on the logger.

The Modem method of communication is done from a remote computer through a modem, via phone line, through another modem to the logger. Cables for this method are not supplied with the logger.

In order to communicate, you must select the proper com port for your computer and set the baud rate to the same as the data logger.

COMMUNICATIONS SETUP

The communications ports available on the logger are the Host port for direct communications and the Modem port for modem communications. Most computer ports include Com1 and Com2. Which port is used for the logger will depend on which port is available to the computer. For additional computer com port information, refer to the computer manufacturer's manual.

Direct Connect Procedure

For direct communication, you must select the computer communications port and baud rate by accessing the **Defaults Setup Port** screen.

After starting FLARS, open the Defaults pull down menu by pressing the ALT key and then the D key, or by mouse clicking on the Defaults menu bar command. The Defaults pull down menu will appear. Select Setup Port with the mouse or the DOWN arrow key and then the ENTER key. The Local Port window will appear.

The Comm ports and baud rate selections will be listed, and beside each will be a small circle which will be either empty, or show a single black dot. The black dot indicates that the option has been selected. By clicking on a different circle with the mouse, you may move the indicator and select a different setting. Choose a Comm port to designate the computer port you intend to use to communicate between the logger and your computer. Choose the 9600 baud rate to make initial connection to the logger. The logger has been programmed at the factory to communicate at 9600.

Mouse click on **OK** when you have made you selections. The screen will return to the Main Menu.

COMMUNICATIONS SETUP

Modem Communication Procedure

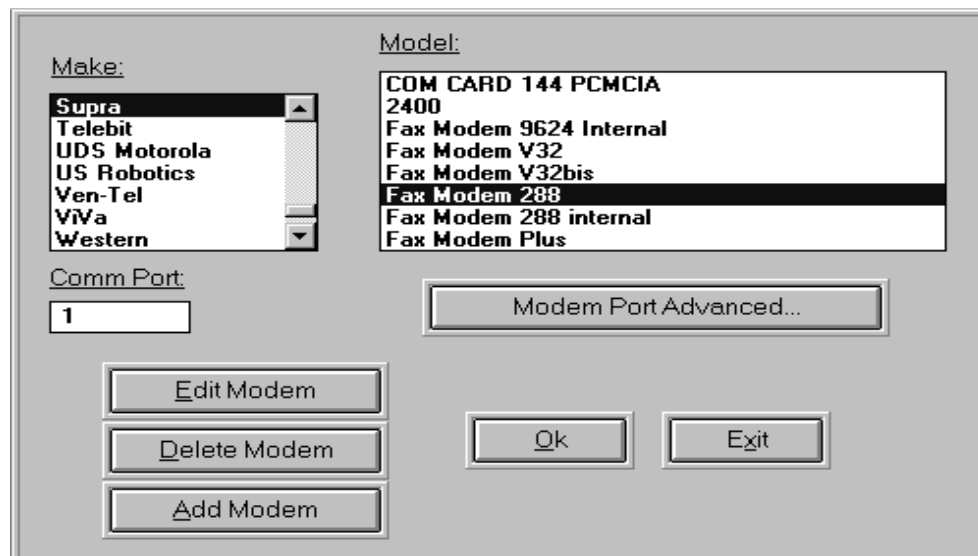
The Modem method of communicating with the logger requires a modem at the computer and logger, with a phone line connection between the two.

In order to communicate with the logger, you must setup the baud rates for both modems to match the baud rate programmed into the logger. You must also select a com port for the modem at the computer.

In order to select the modem com port and baud rate you must activate the **Setup Modem** window.

Defaults	Window
Setup Modem	
Setup Port	
Filename Options	

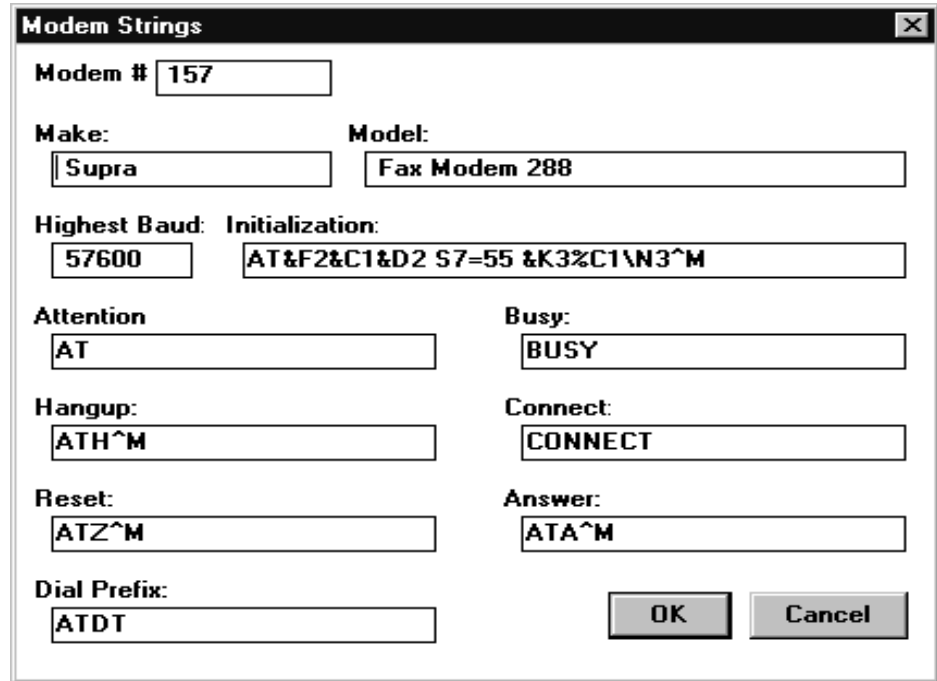
After starting FLARS, open the **Defaults** pull down menu by pressing the ALT key and then the D key, or click on the Defaults Menu bar command. The Defaults pull down menu will open. Push **S** or click on Setup Modem. The Modem Setup window will appear.



The box under Make has a listing of most of the commercially available modems. Scroll through the listing and select the make of your modem. In the box under Model will be a listing of models from the Make you selected. Select the Model that matches your modem. If your modem is not listed, you may add it to the list by clicking on the **Add Modem** button. The Modem Strings window will appear. Refer to the manual for your modem and change the appropriate boxes.

For best operation it is recommended that the following be added to the Modem initialization string in the Modem Strings window (**Edit Modem**): F8&K0%CO. This should be done for the modem connected to the DCM128 data logger and the one at the computer.

COMMUNICATIONS SETUP



Modem Strings

Modem #

Make: Model:

Highest Baud: Initialization:

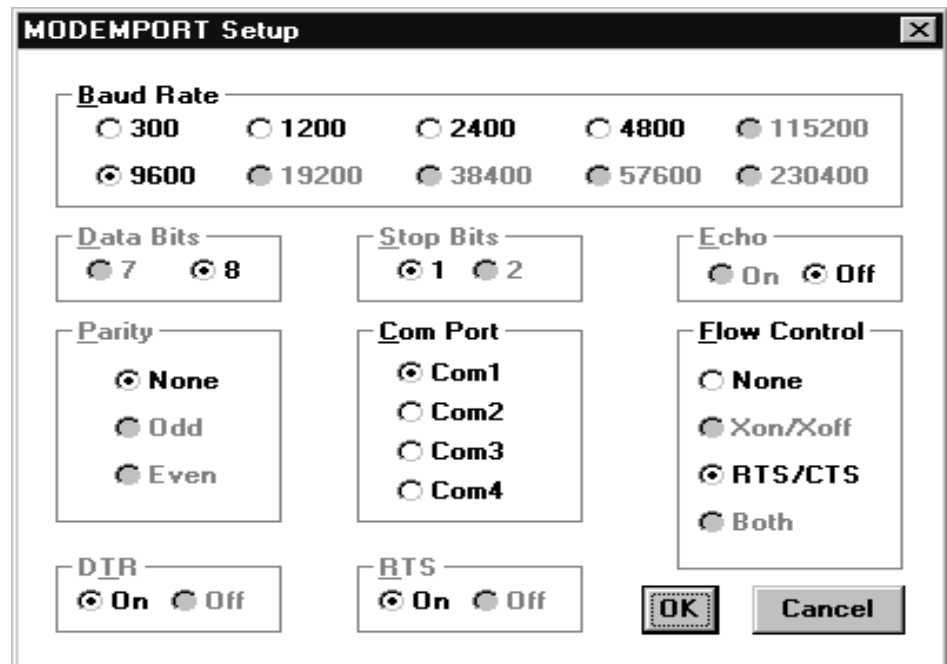
Attention: Busy:

Hangup: Connect:

Reset: Answer:

Dial Prefix:

The box below Comm Port indicates the number of the comm port for the modem. To change the Comm Port click on the **Modem Port Advanced**. The MODEMPORT Setup window will appear.



MODEMPORT Setup

Baud Rate

300 1200 2400 4800 115200

9600 19200 38400 57600 230400

Data Bits 7 8

Stop Bits 1 2

Echo On Off

Parity None Odd Even

Com Port Com1 Com2 Com3 Com4

Flow Control None Xon/Xoff RTS/CTS Both

DIR On Off

RTS On Off

COMMUNICATIONS SETUP

In the Com Port box click in the circle next to the appropriate Comm. Also select the appropriate baud rate. You must select 9600 initially to communicate to the 128DCM data logger.

After you have made the appropriate changes click on the OK button.



The **Dial** command in the **Modem** pull down menu is used for initiating communication with the Model 128DCM loggers installed in the field. To open the Modem pull down menu, press the ALT key and then the M key, or mouse click on the Modem command. Use the DOWN arrow key to highlight the Dial command and press the ENTER key, or mouse click on the Dial command. You may also activate the command by clicking on the Modem icon in the Toolbar. The phone Window will open.

#	Name	Number to dial
1	Tulsa	555-1234
2		
3		
4		
5		
6		
7		
8		
9		
10		

Number to dial: 555-1234

Comments:

Last connected: 02/06/97 14:13

Call progress:

Start Time: hh:mm:ss

Elapsed: hh:mm:ss

To enter a new number, mouse click on the line you wish to use, or click on New, then type in a name. You may use a code, or a place name. Press the ENTER key. Then mouse click on the Number to Dial box and type in a number to go with the name and press the ENTER key. For example, 5557654. If an outside line must be established, preface the number with the number for the outside line followed by a comma. For example, 9,5554532. To Delete a number, click on the site name, click on the Delete button. If a number needs to be changed, click on the site name and alter the number by clicking on Edit button. You may also add comments about a particular site by clicking on the Edit on-screen key. You may also add comments about a particular site by clicking in the comments box. Type in your comments and press the ENTER key. Click on Save to save your changes.

COMMUNICATIONS SETUP

To Dial a number, mouse click on the name you wish to dial. Then click on the Dial button. The Last Connected box will give the date and time of the last occasion that number was used. The Call Progress box will record and display the time the call was initiated, and the time elapsed since that call. Under the call progress box is the Comm Port and Baud Rate settings for the modem. And below that is the Communication Status box.

When a phone/modem connection has been made, the Phone window will reduce to a small phone icon in the lower left portion of the screen. Downloading data, viewing the logger or transferring a GEO setup file can be done at this time.

To terminate communication double click on the name below the phone icon. The Phone window will be restored. To hang up the phone/modem, mouse click on the Hangup button.

PROGRAMMING THE LOGGER

This section describes in detail how to use FLARS to program the logger. The menu commands and programming details are not presented in the order in which they appear on the main menu, but in the order you are likely to use them when using FLARS for the first time. If you purchased the data logger with a flowmeter from Eastech Badger, the logger will be factory programmed for the proper flow parameters.

To start the FLARS program from Windows™, click on the FLARS for Windows™ group. Then double click on the FLARS icon in the window.

When you first start FLARS you will be presented with the Main Menu screen. The menu bar across the top of the screen contains commands and pull down menus with additional commands to create GEO files, program and retrieve data from the logger, generate reports and convert data into ASCII files. All of these features are available directly from the Main Menu and can be accessed using either mouse or keyboard.

The program also provides a Toolbar that appears as a row of icons just below the menu bar. The Toolbar provides a more direct way to activate certain screens and commands without going through the pull down menus. The Toolbar may be turned off if you do not want it, but you may find it simplifies the use of FLARS once you are familiar with the program.

In order to program the logger, a Setup procedure must be performed. The Setup procedure will create a GEO file that contains all of the programming information for the logger's operation.



To enter the Setup screen, open the **File** pull down menu by pressing the ALT key and then either the DOWN key or the S key. You may also activate the Setup screen by mouse clicking on the File command and then the Setup command. As a third option, you may reach the screen by mouse clicking on the Setup File icon in the Toolbar.

When you have selected the Setup command, you will be presented with the Channels Used screen. This screen allows you to set the channels to be logged. There are five (5) channels that can be used, two (2) digital (RS232) channels and three (3) analog (4-20 mA input) channels. The digital channels can only be utilized with meters manufactured by Eastech Badger. The analog channels are set to accept 4-20 mA signals. Other output options are available, but must be setup at the factory prior to delivery.

I

n the Channels Used window you will see the five channels listed and beside each one a white rectangle. By clicking on the rectangle beside a channel you will place an X in it and select that channel for logging.

PROGRAMMING THE LOGGER

Channel	Fullscale	Channel Identification
<input checked="" type="checkbox"/> Digital #1	1000 GPM	Model 2100
<input type="checkbox"/> Digital #2		
<input checked="" type="checkbox"/> Analog #1	50 PSI	Pressure Gauge
<input type="checkbox"/> Analog #2		
<input type="checkbox"/> Analog #3		

Totalizer Each count of the totalizer input equals -> 1000 GAL

Communication Status: Offline

Buttons: Open, Send, Time Set, Save, Get, Exit

In order to enter characters in any box on the screen, simply mouse click on the box and a cursor will appear, use the cursor and keyboard to enter or delete characters.

The Fullscale Value box sets the logging channel to match the fullscale output and engineering units of the device connected to that channel. Both the fullscale value and the units are typed in this box. A maximum of 13 characters can be used in this box including spaces. The fullscale value must be entered first and then the measurement units. A space is not required between the two. For example: 1000 GPM which represents 20 mA input. A decimal point followed by one or two zeros may be used for better logging resolution.

The Channel Identification box identifies the device connected to the channel. A maximum of 32 characters, including spaces, can be typed in this box.

The totalizer is used when a dry contact input is connected to the AL input of the logger. The logger will count the number of contact inputs and then store this value at the programmed time interval. The counts in the counter are reset to zero after the value is stored in memory. This could be used to store a totalizer output from a flow meter.

To the right of the Channels Used tab title you will see a file tab that reads Setup. Mouse click on it to open the Setup window. This window contains information on the logger and how it is set.

PROGRAMMING THE LOGGER

GEO Description – This allows the customer to enter a description of the application, location, etc. Click in the box to activate the cursor and type in a description.

Equipment Type – Here is where the type of equipment the logger is monitoring is identified. Click in the box and then type in the name of the piece of equipment the logger is connected to.

Serial # - This allows the user to assign a two digit serial number to the logger. This serial number is used as part of the name of a downloaded data file when the auto file name is used. The auto name feature is discussed in more detail in the DEFAULTS Filename Options section of this manual. Click in the box and type in the serial number. Press ENTER when done or click on another text box. **No spaces or symbols may be entered in the serial number.**

Site ID – This allows the site identification number to be entered, up to a maximum of 8 alpha/numeric characters, **no spaces may be used.** This Site ID name is used when the auto filename option is activated. When the auto filename option is activated the Site ID name is used to create a directory to store the downloaded files. Click in the box and type in the Site ID.

Recording Interval – This box governs the rate at which the logger records and stores information. There are two logging rates, Main and Alternate. The main is the normal recording interval of the logger. The alternate rate only applies when enabled.

PROGRAMMING THE LOGGER

Main – This is the number of minutes between recording intervals by the logger. It can be set from 1 minute to a maximum of 255 minutes, selectable in one minute intervals. Click in the box and type the desired value.

Alternate – This is the alternate recording interval. It can be set from 1 minute to a maximum of 255 minutes. When enabled, the logger switches to the alternate interval when the selected switching channel value is greater than the percent of full scale entered into the % box. Click in the box and type the desired value.

% - This box is where the desired percent of full scale is entered to activate the alternate recording interval. Example: It is desired that the recording interval switch to the alternate when the flow recorded on analog channel 1 reaches 500 GPM. Analog channel 1 was set up for a maximum flow of 1000 GPM, 50 would be entered into the % box (500 is 50% of 1000). Click in the box and type the desired value.

Switching Channel – This selects the channel the switchover will use. Click on the scrollbar arrow to reveal the menu of all available channels. Select one by clicking on it. It will appear in the window at the top, indicating that it has been selected. To activate the switchover mode, click in the circle to the left of the Enable command. A black dot will appear, indicating that the command is selected. The switchover option may also be disabled by clicking on the circle to the left of the Disable command.

Example: You have set the Main Recording Interval at 15 minutes and the Alternate Sampling Rate at 2. You have analog channel #1 monitoring a flow rate and have selected it as the switchover channel. You have also selected 50% as the Switchover %. The logger will read and store data from all active channels at the Main Recording Interval of once per 15 minutes. If the analog channel #1 flow rate exceeds 50% of its full scale value, the logger will switch to the Alternate Logging Rate of once every 2 minutes and store all data from all channels at that rate. Once the logger reads a value from analog channel #1 which is less than 50% of full scale, it will return to the Main Recording Interval. The factory default settings are 5 minutes for the Main and 2 minutes for the alternate.

Baud Rate Settings – These set the baud rate for the logger for both direct and modem communication. Be sure that the baud rates are set to match the modem or computer you are using to connect with the logger. In order to select a baud rate, mouse click on the circle beside it. A black dot will appear, indicating that the rate has been selected. You may change the baud rate of either the Host or Modem in the logger, but after the GEO file is sent to the logger you will not be able to communicate to the logger. You must change the baud rate in your computer or modem to re-establish communication.

PROGRAMMING THE LOGGER

At the bottom of the window are the **File** command buttons. These on-screen buttons govern the use and control of the GEO files which direct the logger. Remember to connect the computer to the logger, or dial up the logger through the modem, when trying to send or get any GEO file or to set the time in the logger.

Open – Allows the retrieval of a GEO file that has been saved previously. It will be stored on the hard drive, or on disk, and can be opened to view its logger operational information and make changes as desired. To open a file, mouse click on the Open button or press and hold the ALT key then press the O key.

After activating the Open command, the Directory Window opens. Listed in the Directory will be the current drive and directory. Listed in the File Name box will be all the files in the current directory. When you first enter the Directory Window, the File Name box is active. To move to the other boxes, press the TAB key, or click on the box you wish to select. If the GEO file you want is in the current directory, use the arrow keys to highlight it, or click on it with the mouse. Then either click on OK, or press TAB until OK is highlighted and press ENTER.

If the GEO file you want is in a subdirectory of the current directory, click on the Directory Window and use the mouse or arrow keys to select the subdirectory you want. As you highlight each subdirectory the File Name box will display the files present in that subdirectory.

Depending on the number of subdirectories or GEO files, not all of them may appear in the appropriate window. By mouse clicking on the arrows of the Scroll Bar you may move down through all the fields and subdirectories until you reach the one you want.

If the GEO file is in a directory in a different drive, click on the DOWN arrow beside the drive box and all available drives will be listed. By clicking on each you will display their directories in the Directory window and then by highlighting the directories you will see the stored files in the File Name box. Once you have highlighted the file you want, either click on OK or press TAB until OK is highlighted and then press ENTER.

Save – Once the GEO file has been created, it should be saved before it is sent to the logger. By clicking on Save you will accomplish this. Click on the Save key on the screen with the mouse or press and hold the ALT key, then the S key. When the Save command is activated the Save box will appear. Type a name for the file and then either press ENTER or click on OK.

PROGRAMMING THE LOGGER

Send – In order to program the logger, you must Send the GEO file to the logger. This is accomplished through the Send command. To send a new or opened GEO file, mouse click on the Send key on the screen, or press and hold the ALT key, then the E key. **NOTE:** Before attempting to Send a file be certain you have properly set the communication parameters for your computer hardware. If using a modem, be certain it is connected.

When the Send command is activated, the GEO Transfer Warning will appear as a reminder that sending the file will erase the data presently stored in the logger's RAM. Mouse click on the Begin command if you wish to proceed. The Communication Status icon will indicate connection and that the transfer is taking place. If communicating with a modem, you must call up the logger first but remember to hang it up after completion.

Get – If you wish to retrieve the file from the logger prior to sending it a new one, or if you wish to review the logger programming and make alterations, you will need to retrieve the GEO file from the logger. The Get command accomplishes this. To activate it, mouse click on the Get on-screen key, or press and hold the ALT key then the G key. Again, be certain you have correctly setup the communication parameters. If you are using a modem it must be activated before proceeding.

Time Set – The Time Set command sets the clock on the data logger. Before selecting Time Set, be sure the communications parameters have been set. If you are using a modem, be sure it is activated. To activate Time Set, mouse click on the Time Set on-screen key, or press and hold the ALT key then the T key. The present time and date in the logger will be displayed. To change the time and date, press any key and the cursor will appear in the time side of the Time/Date box. Type in the new time using the HH:MM:SS (hours, minutes, seconds) format. Press the TAB key to move the cursor to the date box. Type the new date using the DD/MM/YY (day, month, year) format. Press ENTER, or click on OK to set the logger clock. The screen will return to the Main Menu.

Exit – The Exit command exits the Channels Used/Setup Window. Activate it by mouse clicking on the Exit on-screen key, or press the X key and then ENTER.

VIEW LOGGER OPERATION

Communicate	Modem
View Logger operation	
Digital Channel	
Download Data	
Setup Data	
Reset to Defaults	
Battery Analysis	



The View Logger Operation command in the Communication pull down menu provides continuous live viewing of the data logger operation and active channel data as it is being monitored by the logger. Before selecting the command, be sure you have setup the communications parameters for your computer hardware. If communicating through a modem, be sure it is activated.

To open the Communications menu, press the ALT key and then the C key, or mouse click on the Communications command. To select View, press the V key or move the highlighted area over View with the arrow keys and press ENTER, or mouse click on the View Logger Operation command. You may also activate the command by mouse clicking on the View icon on the Toolbar. The Logger Operation Window will appear.

At the lower left corner you will see the Communication Status icon. When the window first opens, the icon will indicate it is trying to communicate with the logger. If there is not a connection, or the baud rates are set incorrectly, a message box will appear indicating the problem. If connection is made, the message Getting GEO and then Online will appear beside the icon.

The Logger Operation window will display the Time/Date, Site I.D., Serial #, Last Wakeup time and Next Wakeup Time. The window will also include the amount of data stored in RAM (size of logged data), the Voltage Power Level to the logger, the status of RAM, EEPROM, Clock and the Activated Logging Channels data.

In View mode the logger is constantly being polled. The Time Line will be updated after each poll and the Time will change about every 2 seconds. The Last Wakeup Time for logger data collection and the Next Wakeup Time will be indicated as well as the amount of data currently stored in RAM.

The logger voltage indicator will be darkened to indicate the voltage level. The Pass area indicates the voltage is 12 VDC or higher.

The fail area indicates the voltage is less than 9 VDC and the logger cannot collect and store data. If battery powered, the battery should be changed or recharged immediately. Otherwise, check the power source.

The RAM, EEPROM, and Clock Status Indicator will highlight either pass or Fail. Contact the factory if a fail indication occurs.

The lower section of the Logger Operation window shows the current reading of each activated logging channel. In the view mode, the channels are continuously updated and displayed. Click on the EXIT button to return to the main screen.

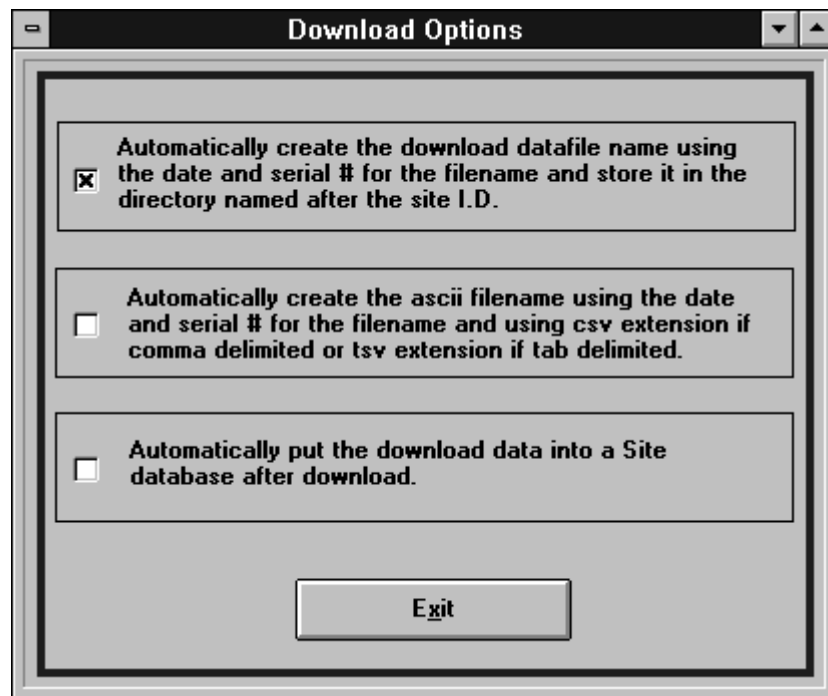
DOWNLOADING STORED DATA

Setup Procedure

The downloading of the stored data in the logger can be performed on demand by direct connect, through a modem, or auto downloading through a modem. There are several options available when downloading data. The Filename Options under the Defaults menu allows selection of these options.

Defaults **Window**
Communications
Filename Options

To activate the Filename Options open the Defaults pull down menu by pressing and holding the ALT key and then press the T key, or mouse click on the Default menu. Select the Filename Options by pressing the O key, or use the arrow keys to highlight Filename Options and press ENTER, or mouse click on the Filename Options command. The Download Options window will appear.



The first option is the auto filename. Clicking on the box to the left will activate this option by putting an X in the box. When this option is used, the download data file will be automatically named and stored under a directory with the same name as the Site ID. The data file will be named with the Month/Day/Year and the Serial Number of the unit. For example: The serial number assigned the logger is 01, the Site ID is FT203, and the date the data is downloaded is 5/12/96. When the data is downloaded from the logger, a sub-directory under the FLARS directory will be created (if one does not exist) with the name FT203 and the data will be stored in this directory with the file name 05129601.dat. It is recommended that this option be used to help keep the data files stored in an orderly fashion. If the user is downloading data more than once a day, then this should not be used because the previous downloaded data file of that day will be overwritten.

DOWNLOADING STORED DATA

Setup Procedure

The second option is the auto conversion. Clicking on the box to the left will activate this option by putting an X in the box. When this option is used, the downloaded data file will be automatically converted to an ASCII format and named in the same fashion as described in the first option. The ASCII file will have the DIF (data exchange format), or TSV (tab delimited) for an extension, depending on the selection in the Download window, which is discussed in more detail later in this section.

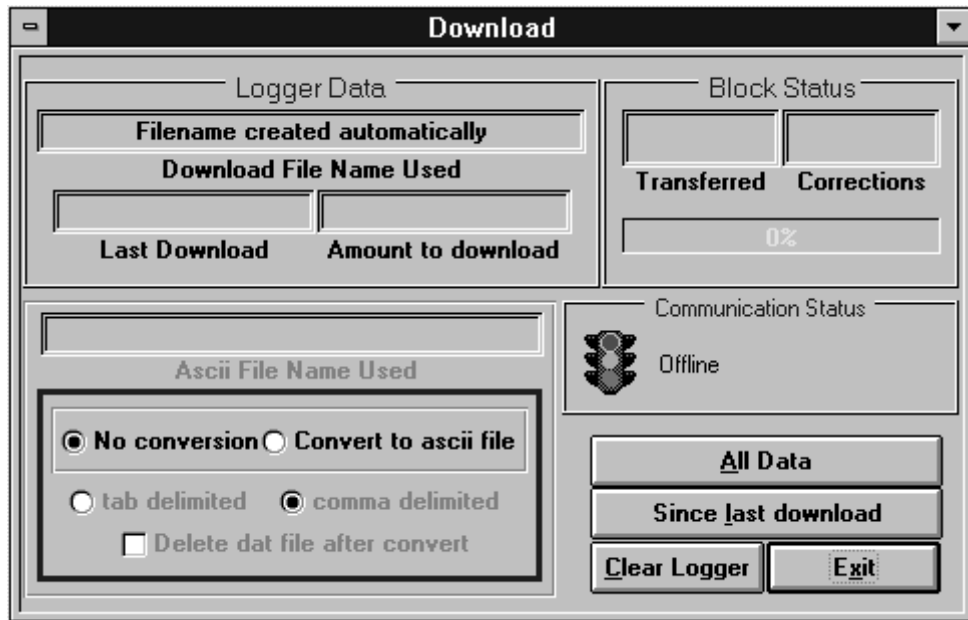
The third option puts the data file automatically into a site data base. Clicking on the box to the left will activate this option by putting an X in the box. The data base is used in the report generation which will be discussed in the Data Manager section of this manual.

Demand Download Procedure

The Download command in the Communications pull down menu downloads data from the logger. Before selecting download, be sure that the communications parameters have been setup for your computer hardware. If communicating through a modem, be sure it is connected before proceeding (refer to Section II, Page 17).

To open the Communications pull down menu, press the ALT and then the C key, or mouse click on the Communications menu. To select Download Data, press the D key, or use the arrow keys to highlight Download Data and press ENTER, or mouse click on the Download Data command. You may also activate the command by mouse clicking on the Download Data icon on the Toolbar. The Download Window will appear.

Communicate	Modem
View Logger operation	
Digital Channel	
Download Data	
Setup Data	
Reset to Defaults	
Battery Analysis	



DOWNLOADING STORED DATA

Demand Download Procedure

If the user is using the auto filename, this will be stated in the Download File Name Used box. If not, click on the Filename box to activate the cursor and type in a filename. **You must use the extension .dat after the filename.** The name can be alpha and/or numeric characters up to a maximum of 8. For example, BLTK1234.dat. If you use an existing filename, it will be overwritten with the data being downloaded.

If the user desires to convert the downloaded data into ASCII format, click in the circle to the left of Convert to ASCII file. If the auto filename option is being used, this will be stated in the ASCII File Name Used box. If not, click on the Filename box to activate the cursor and type in a filename. The name can be alpha and/or numeric characters up to a maximum of 8. It is recommended the user put an extension to the filename of .TSV or .DIF, depending on whether tab delimited or data exchange format is selected.

In the lower section of the Download window are the buttons used to begin the download process. The button **'All Data'** will download all of the data stored in the logger. The button **'Since last download'** will download the data stored since the last download was performed. When one of the buttons is clicked on and communication is established with the logger, the filename is shown along with the date and time of the last download and the size of the stored data. The Communications Status box will indicate the logger is connected, downloading data and when the download is finished. It will also indicate if there is a communication problem.

The Block Status box displays the progress of the download. The Transfer box identifies the number of bytes transferred. The Corrections box indicates when there are communication errors in the transfer. This will indicate the quality of the transmission line. If more than 12 errors occur, the download will be aborted. The Indicator Bar below the Block Status box darkens as data is downloaded to show the percentage of data that has been downloaded.

The button **'Clear logger'** will clear (erase) the logged data in the logger. Click on this button and a warning box will appear reminding the user to download the data before proceeding.

After completing the download of the data, click on the **EXIT** button to return to the main screen. If communicating through a modem, be sure to hang up the modem.

Auto Download Procedure



The Autodownload command in the Modem pull down menu allows you to automatically download data at one or more sites at a set interval.

To open the Modem pull down menu, press the ALT key and then the M key, or mouse click on the Modem command. To select Autodownload, press the A key or use the arrow keys to highlight the Autodownload command and press ENTER, or mouse click on Autodownload. You may also activate the command by mouse clicking on the Autodownload icon on the Toolbar. The Autodownload Information window will appear.

DOWNLOADING STORED DATA

Information			Schedule	Asciifile options
#	Site Name	Active	Number to dial	Download successful?
1	Tulsa	FALSE	5551234	Disabled
2				Last connected
3			Comments	01/17/1997 07:51
4				Status
5			Autodownload Options	Skipped
6			<input checked="" type="checkbox"/> Use partial download?	Autodownload Enabled?
7			<input type="checkbox"/> Clear ram after download?	<input type="radio"/> Yes <input checked="" type="radio"/> No
8			<input checked="" type="checkbox"/> Create ascii file after download	Ok Exit
9				
10				

Call progress
hh:mm:ss hh:mm:ss
Start Time Elapsed

Auto Download Procedure

The Information tab of the window will be visible. This section is for entry of the sites and phone numbers.

To enter a new site, mouse click on the line you wish to use, or click on New, then type in a name. You may use a code, or a place name. Press the ENTER key, then mouse click on the Number to Dial box and type in a number to go with the name and press the ENTER key. For example, 5557654. If an outside line must be established, preface the phone number with the number for the outside line, followed by a comma. For example, 9,5554532. To Delete a number, mouse click on the site name and then on the Delete button. If a number needs to be changed, you may alter it by clicking on the number. You may also add comments about a particular site by clicking in the comments box, type in your comments and press the ENTER key. You may change a name in the site name by clicking in the site name box you want to change. Then press the ENTER key. Click on Save to save the changes.

To put the site in the auto call-up list double click in the box under ACTIVE to change it from FALSE to TRUE. To remove it, change it back to FALSE by double clicking on box. To save the site and phone number information click on 'Save'.

Select the desired options under the Autodownload Option section. Clicking on the box next to the option places an X in the box and activates that option. The 'Use partial download?' will download the data stored since the last download. The

DOWNLOADING STORED DATA

Auto Download Procedure

‘Clear ram after download?’ will erase the logger stored data. The ‘Create ascii file after download’ will create an ASCII file based on the options selected for the ASCII file.

Once a download has begun, the status of the call is displayed, including the time the call began, and the time elapsed since the call began. The Comm Port and Baud Rate are also shown.

The right side of the window lists the status of the download. The Success or Failure of the download, the time and date of the last download, and the status of the download in progress are all displayed.

To enable or disable the Autodownload, mouse click on the white circle beside your choice, a black circle will appear, indicating it has been selected. You must set the call schedule to your desired time schedule.

To set a Schedule, mouse click on the Schedule tab at the top of the Autodownload Information window. The Schedule window will appear.

Day and Time to Download	
<input checked="" type="checkbox"/> Sunday	1:00 AM
<input checked="" type="checkbox"/> Monday	1:00 AM
<input checked="" type="checkbox"/> Tuesday	1:00 AM
<input checked="" type="checkbox"/> Wednesday	1:00 AM
<input checked="" type="checkbox"/> Thursday	1:00 AM
<input checked="" type="checkbox"/> Friday	1:00 AM
<input checked="" type="checkbox"/> Saturday	1:00 AM

Check if Time Valid

To select a day, mouse click on the box beside that day and a black X will appear, indicating it has been selected. To select a time, mouse click on the bar to the right of the day abbreviation and a cursor will appear. Type in the time you wish, using the twenty-four hour format or standard 12 hour format with a.m. or p.m. Example: using 24 hour format, 6 p.m. would be 18:00. Using 12 hour format, 6 p.m. would be 6:00 p.m. When the schedule is complete click on “check if time valid” to determine if time entry format is correct.

DOWNLOADING STORED DATA

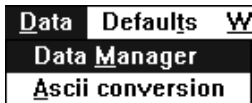
The screenshot shows a software window with three tabs: 'Information', 'Schedule', and 'Asciifile options'. The 'Asciifile options' tab is active. It contains two sections: 'File type' and 'Data Averaging'. In the 'File type' section, 'Tab Delimited' is selected with a radio button. In the 'Data Averaging' section, 'No average' is selected with a radio button. Other options include 'DIF (Data Exchange Format)', '15 minute average', 'Hourly average', and 'Daily average'.

Auto Download Procedure If you have selected to convert the data after download to an ASCII file, click on the Ascii options tab. Select the type of file by clicking on the circle next to your selection. Select the Data Averaging desired by clicking on the circle next to your selection.

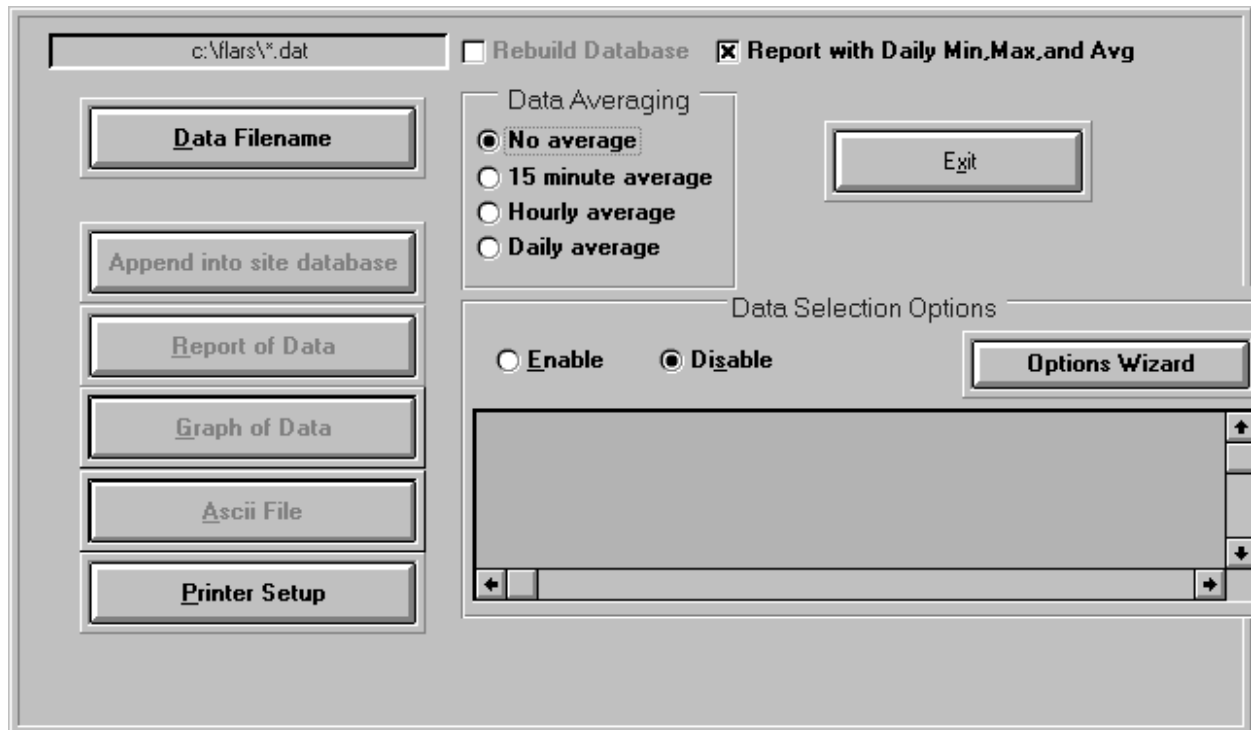
Click on the Information tab at the top of the window to return to the Autodownload information screen. Click on the OK to save the information and return to the Main Menu screen.

DATA MANAGER

The Data Manager allows many manipulations of the data collected by the logger. From the Data Manager window reports, printouts and even graphs can be made from the downloaded data. The data files are converted into a data base which is used when creating the different reports. You can create separate data bases for each data file, or append the downloaded data files from a specific site into a site data base, which is recommended.



To activate the Data Manager window, press the ALT key and then the D key, use the arrow keys to highlight the Data Manager command and press ENTER. You can also mouse click on the Data Manager command, or access the window by clicking on the Data Manager icon in the Toolbar.



To select a file, mouse click on the Data Filename on-screen key, or press the D key and the File Directory Window will open. Select the file you wish, changing directories if needed. Once you have selected the desired file, that filename will appear in the Filename box above the Data Filename button. If you go directly to creating a Report or Graph, a data base will be created with the filename of the data file, but with the '.mdb' extension.

DATA MANAGER

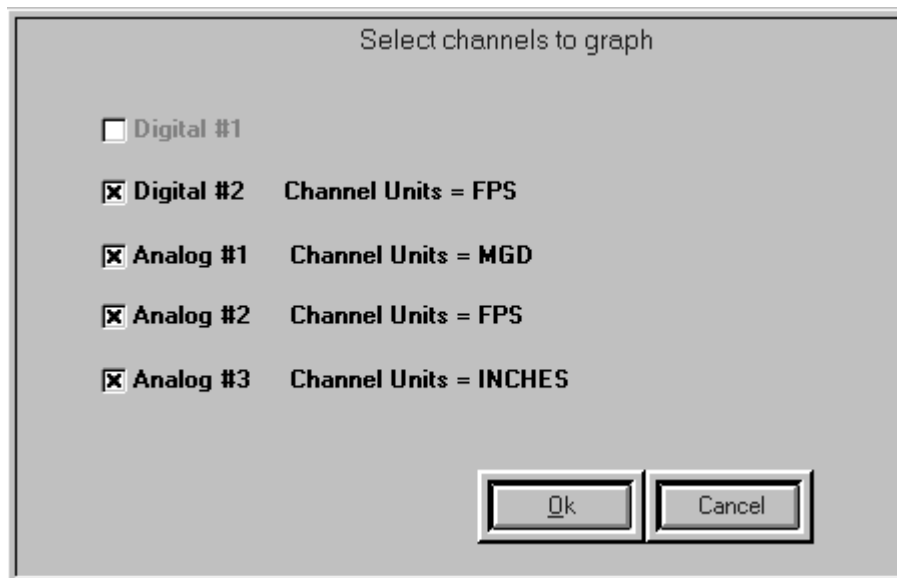
To put the data into a database for that site, mouse click on the '**Append into site database**' button. A site data base will be created if one does not exist. SITE.MDB will now be in the Filename box.

Before creating a Report or Graph, select the desired **Data Averaging**. Before printing the **Print Setup** should be performed.

The Data Selection Options allows the user to select data based on a time frame or channel values or a combination. Mouse click on **Options Wizards** button and follow the prompts to choose the way in which the data will be selected. When you have made your selections in all the prompt boxes, the screen will return the Data Manager window. Your selections will appear in the blue text box.

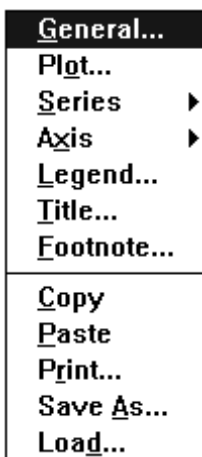
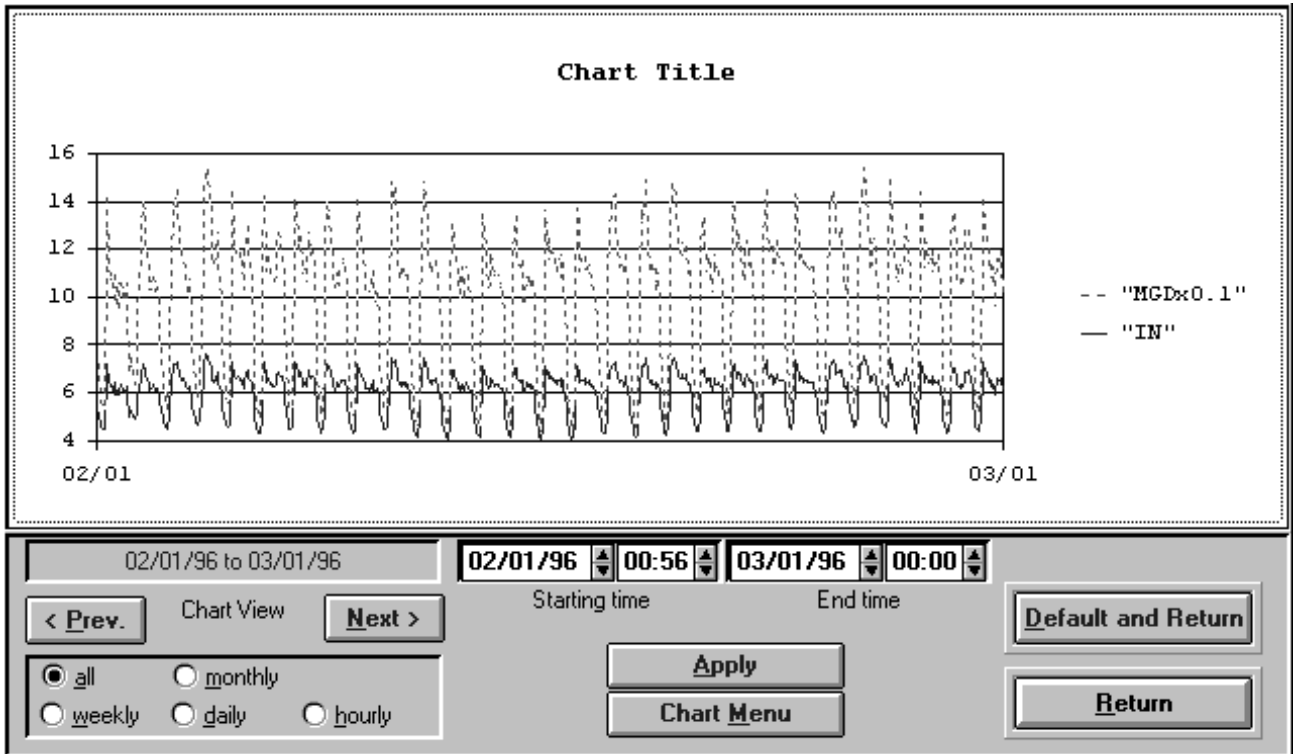
Once you have selected a series of Data Selection Options, you may choose whether or not to utilize them on a particular file by Enabling or Disabling the Options. To select Enable or Disable, mouse click on the white circle beside the command and a black dot will appear, indicating it has been selected.

Creating a Graph The **Graph** button allows you to create a graph from the selected data file or site data base. Select it by mouse clicking on the Graph button. There may be a delay if the data is loaded into a database. A text box will appear, displaying the percentage of the file which has been entered into the database. When it is finished the Channel Selection window will open.



DATA MANAGER

Creating a Graph The channels being used will be displayed along with what they are monitoring. Here you may select to view only certain channels in the graph. A selected channel will have a black X in the white box beside it. Mouse click in the channel boxes to enable or disable the channels. When the channels are properly selected, mouse click on OK to view the graph.



The Graph screen displays the data in graph form along with the date and time the data collection began and ended. There are also several options available for altering the graph. In the lower left corner of the chart window are a set of commands for selecting the interval the data is graphed by. When the graph first appears, all intervals are displayed. To choose to view only one, mouse click on the white circle beside it and a black dot will appear, indicating it has been selected. You may choose to view the data at monthly, weekly, daily, or hourly intervals. To view a specific time interval, use the scrollbars in the date/time boxes to select the specific interval. Example, 02/07/96 00:00 to 02/08/96 23:45. Click on the number you want to change and an arrow will appear under that number. Use the UP and DOWN arrow buttons to change to the desired value. When the time and date are set properly, click on Apply to set the graph to the time you wish to view.

The details of the graph may also be altered by using the Chart Menu command. Mouse click on the Chart Menu on-screen key and a pull down menu will appear listing the

DATA MANAGER

Creating a Graph options, mouse click on your selection and the graph will change accordingly. Double clicking on any of the graphed items in the legend, or parts of the graph, will activate pop-up windows that will allow the user to make changes in the presentation of the graph. If the user wants to have these changes as the defaults for other graphs, click on the 'Default and return' button when exiting the graph. Otherwise, click on the Return button to exit the graph.

Creating a Tabular Report The **Report** button allows the user to make tabular reports from the selected data. You may generate the reports with, or without, daily minimum, maximum and average values for each channel. To activate this function, click in the box next to the **Report with Daily Min, Max, and Avg** in the upper right portion of the Data Manager window. To make a tabular text report, mouse click on the Report button. The report will appear on screen with a row of command icons below it.

Date	Digital #1	Digital #2	Analog #1	Analog #2	Analog #3	Totalizer
09/18/95	not used	not used	MGD	FPS	IN	not used
09:00			1.19	0.02	6.67	
10:00			1.23	0.03	6.71	
11:00			1.22	0.03	6.73	
12:00			1.27	0.04	6.88	
13:00			1.26	0.03	6.73	
14:00			1.19	0.02	6.65	
15:00			1.16	0.04	6.50	
16:00			1.11	0.03	6.39	
17:00			1.21	0.02	6.73	
18:00			1.28	0.03	6.85	
19:00			1.24	0.02	6.82	
20:00			1.25	0.04	6.79	
21:00			1.18	0.03	6.56	
22:00			1.19	0.03	6.61	
23:00			1.18	0.03	6.55	
Min			1.03	0.00	6.09	Total
Max			1.43	0.07	7.18	
Avg			1.21	0.03	6.68	

1 of 30
Cancel
Close
8365 of 8365
Total: 8365
100%

The **Arrow** icons move you around the report format. The outer arrows will take you all the way to the beginning or the end of the report. The inner arrows will move you a page at a time. Between the arrow icons will be shown the page you are on as well as the number of pages in the report. The scroll bar on the right will scroll the page up or down as well as the page up or page down keys.

DATA MANAGER

Creating a Tabular Report

Cancel returns you to the Data Manger screen.

Zoom allows you to look more closely at the report.

The **Printer** command allows control of printer operation, once setup has been accomplished.

The **Change Format** icon allows the data report to be converted to another software format, such as Excel or Lotus 1-2-3.

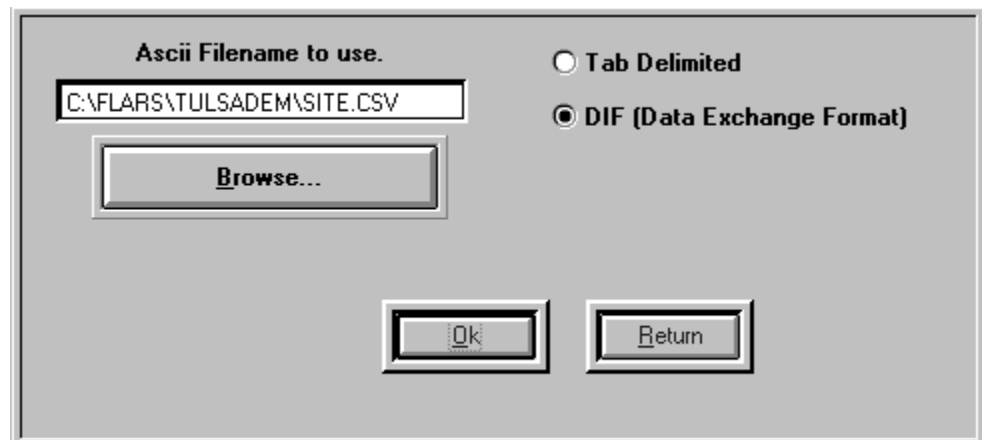
The **Mail** icon is not operational with this version of software.

At the far right of the bar the data point total for the file will be displayed, along with the amount currently in the tabular report.

Create a Report In ASCII Format

The **ASCII File** button allows the user to convert a data file to an ASCII format file that can be imported into other programs such as Lotus 1-2-3 or Excel.

After the user has selected the data file or site data base and the desired report options, mouse click on the **ASCII File** button. The ASCII Conversion window will appear.



There are two delimit formats to choose from: tab delimited or DIF (data exchange format). The data file you selected will be the name of the file with the extension TSV (tab) or DIF (data exchange format). You may change the converted filename by clicking in the name box and erasing the existing name and typing in a new name (8 characters max). When you are ready to perform the conversion, click on the OK button. After conversion, click on the **'Return'** button to return to the Data Manager window.

WARRANTY

Eastech Badger warrants meters and parts manufactured by it and supplied hereunder to be free from defects in materials and workmanship for a period of 18 months from date of shipment or 12 months from date of installation, whichever period shall be shorter. If within such period any meters or parts shall be proven to Seller's satisfaction to be defective, such meters or parts shall be repaired or replaced at Seller's option. Seller's obligation hereunder shall be limited to such repair and replacement and shall be conditioned upon Seller's receiving written notice of any alleged defect within 10 days after its discovery and, at Seller's option, return of such meters or parts f.o.b. to Seller's factory. THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES WHATSOEVER INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES (EXCEPT OF TITLE) OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Eastech Badger shall not be liable for any defects attributable to acts or omissions of others after shipment, nor any consequential, incidental or contingent damage whatsoever.

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