

MoniTrace 1000 System
Builder and Supervisor

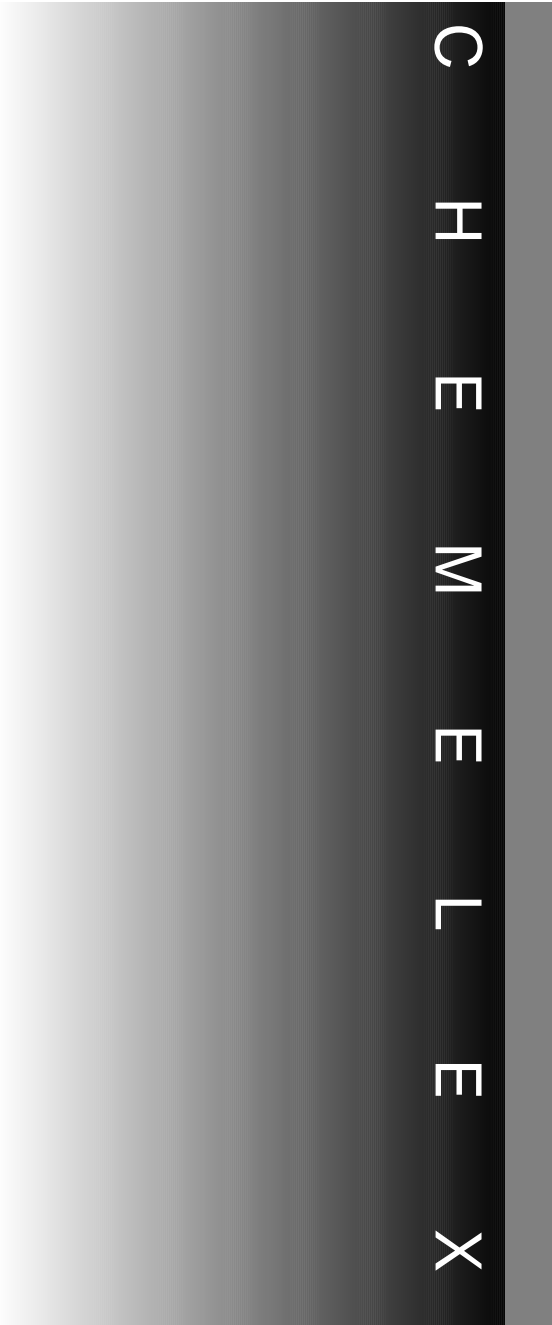


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1. MoniTrace System Builder and Supervisor Overview

MoniTrace 1000 System Builder

The MoniTrace 1000 System Builder is used to configure or define a network of MoniTrace 1000 controllers. The configuration defined by this application is used by the MoniTrace 1000 Supervisor in order to personalize each network installation. Individual MoniTrace 1000 controllers are given names, their network addresses are defined, groups are created, and a number of system-wide settings are established. This application is normally used when the network is installed, and each time MoniTrace 1000 controllers are added or removed from the network.

MoniTrace 1000 Supervisor

The MoniTrace 1000 Supervisor provides a PC based interface to MoniTrace 1000 controllers installed on a network. Each MoniTrace 1000 on the network can be accessed from one central location. Features of the MoniTrace 1000 Supervisor include access to operating and programming information, alarms, data logging and report generation. Password protection can be used to prevent unauthorized access to the programming features.

The MoniTrace 1000 Supervisor uses a graphical interface, based on Microsoft Windows, that makes operation easy and intuitive. All options available to the user of the MoniTrace 1000 Supervisor are available via push buttons. The buttons provide a brief description of the feature that they provide. This eliminates the need to learn and remember various keystrokes and commands.

Hardware

Each MoniTrace 1000 that will be on the network must be equipped with a communication card. This is available as a retrofit or as the controller was received from the factory. Additionally, the PC controlling the network must be equipped with a network card for communication with the MoniTrace 1000 units.

The network of MoniTrace 1000 controllers is presented to the user as a series of icons, with each controller having a unique name. Groups of MoniTrace 1000 are also represented as icons. A Group is a logical connection of a number of MoniTrace 1000s. Any number of MoniTrace 1000s may be placed in a Group.

Note - This manual has been written to include all elements of the MoniTrace 1000 Supervisor and the Data Log option. If you have not purchased the Data Log option you will not see a Data Log button on your display and will not be able to access the data log features.

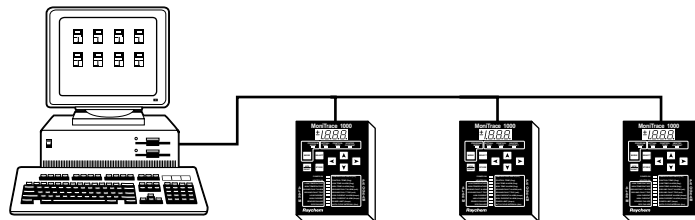


Figure 1.1. MoniTrace 1000 network.

2.0 Installation

Installation of the MoniTrace 1000 System Builder occurs when the MoniTrace 1000 Supervisor is installed.

To install the MoniTrace 1000 Supervisor it is necessary to run the setup program supplied on the MoniTrace 1000 Supervisor diskette. The setup program will create a directory where all of the executable files will reside. The default directory for the installation of the MoniTrace 1000 Supervisor is "C:\MT1000". As part of the setup process, the declaration of an alternative installation path is permitted. A subdirectory to this path will be created that will contain reports and data logs.

To install the MoniTrace 1000 Supervisor, perform these steps:

1. Run Windows 3.1.
2. Place the installation disk in the appropriate floppy drive. (A: is assumed here).
3. From the Program Manager window, select Run... from the File menu.

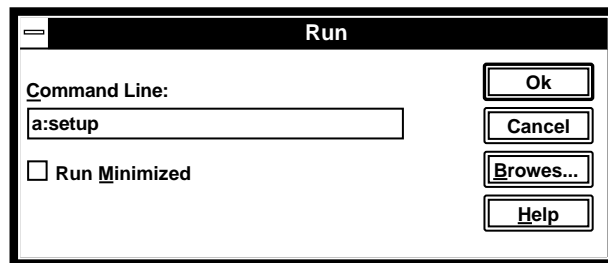


Figure 2.1. MoniTrace 1000 Program Manager Window.

4. Enter "a:setup" in the Command Line text box, then click OK.
5. When prompted, approve the displayed default drive and directory by clicking OK, or enter your desired changes.

The setup will be automatic from here. When the installation is complete, the MoniTrace 1000 Supervisor icon will appear in the MoniTrace Supervisor group window. Double-click on the MoniTrace Supervisor icon to start the program.

3.0 MoniTrace System Builder

3.1 Main Window

The main window of the MoniTrace 1000 System Builder application lists all of the MoniTrace 1000s that have been defined for the network, their subnet and node addresses, and their Group membership, if any. The subnet and node addresses are used to identify MoniTrace 1000s during network communications.

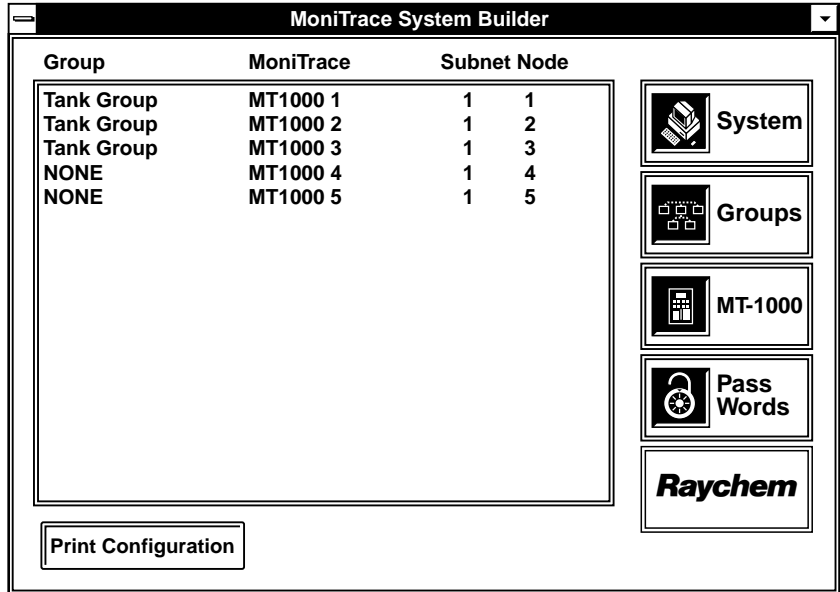


Figure 3.1. MoniTrace 1000 Main Window.

Each time a MoniTrace 1000 is added or removed from this list, the MoniTrace 1000 Supervisor will reflect that change. If the System Builder is used while the Supervisor is running, the Supervisor must be stopped and restarted to reflect any configuration changes.

3.2 System Configuration

The System Button is used to define system wide configuration options. Included in these are the site name, alarm response options, and the LonTalk™ network interface options.

Site Name:

Remote Alarm Acknowledgement
 Enabled Disabled

Remote Alarm Reset
 Enabled Disabled

Figure 3.2. MoniTrace 1000 System Setup window.

The Site Name can be used to identify the location where the MoniTrace 1000 Supervisor is installed. It will appear in several places throughout the MoniTrace 1000 Supervisor, most notably as the caption at the top of the System Overview window.

The Remote Alarm Acknowledge and Remote Alarm Reset options can be enabled or disabled. These functions refer to the ability to acknowledge alarms or reset a MoniTrace 1000 from the MoniTrace 1000 Supervisor.

LonTalk Network Interface

Device Name: LON1

Subnet: 1 Node: 127

Domain ID: 0 :0 :0 :0 :0

Domain Length: 0

Figure 3.3. LonTalk Network Interface.

There are a number of fields that relate to the LonTalk Network Interface device. The Device Name field is the name of the network interface device driver. This device driver is loaded as part of the “config.sys” file when the PC boots. The default name for this device is “LON1”. Refer to the section Network Interface Options for a description of the available network interfaces and associated device drivers.

All LonTalk messages transmitted by the MoniTrace 1000 Supervisor contain addressing information. The addresses define both the sender and receiver of the message. There are three layers to the addressing; Domain ID, Subnet, and Node addresses. The System Setup dialog box is used to specify the addresses used by the PC network interface. The default values are Subnet = 1, Node = 127, and Domain Length = 0. By setting the Domain Length to 0, the net effect is that the domain addressing layer is not used. Do not change this setup. For further information regarding the LonTalk network and addressing, refer to appendix A.

In most instances it is not necessary to alter any of the default LonTalk Network Interface fields. All devices on a network must have a unique Subnet/Node address and it is therefore important that no MoniTrace 1000 be given a Subnet / Node address combination that matches that given to the network interface. In the example, Subnet 1, Node 127 is reserved for the network.

3.3 Group Configuration

Groups are a logical collection of a number of MoniTrace 1000 controllers. Groups can be used to ease programming of multiple units and to help organize a large network. The Group Configuration is a database of records, each record containing information about a single Group. New Groups may be added, or existing ones edited or deleted. After pressing the Group button the following dialog box will appear;

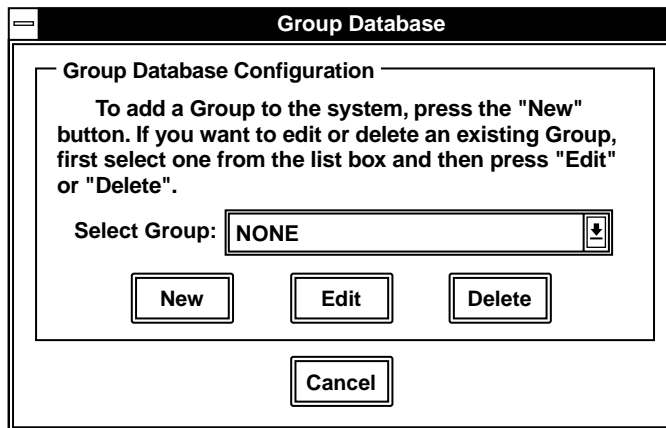


Figure 3.4. The Group Database Window

The Group Database dialog box provides a means of creating Groups, making changes to existing Groups, or removing a Group. If a Group is to be created, press the New button. If a Group is to be changed or removed, first select the Group from the drop down list box, and then press the Edit or Delete button.

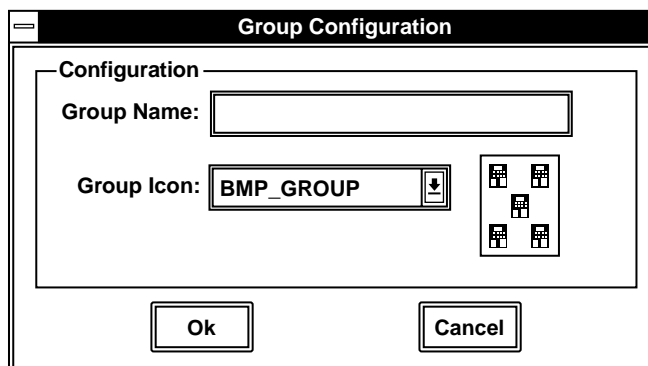


Figure 3.5. The Group Configuration dialog box

After making a Group Database selection, the Group Configuration dialog box will appear. The Group Configuration dialog box is used to define Group records in the Group database. Both a Group Name and Group Icon are assigned here. A list of icons is available through the Group Icon drop down list box. MoniTrace 1000s are assigned to Groups as part of the MoniTrace 1000 configuration.

3.4 MoniTrace 1000 Configuration

The MoniTrace 1000 Configuration is a database of records, each record containing information about a single MoniTrace 1000. New MoniTrace 1000s may be added, or existing ones edited or deleted.

Each MoniTrace 1000 on the network must be defined. Since each MoniTrace 1000 is a node, it must be assigned a network address. This is performed through a service menu at the controller (see the section titled Setting and Viewing MoniTrace 1000 Address). This same subnet/node address and the MoniTrace 1000 name must be entered here.

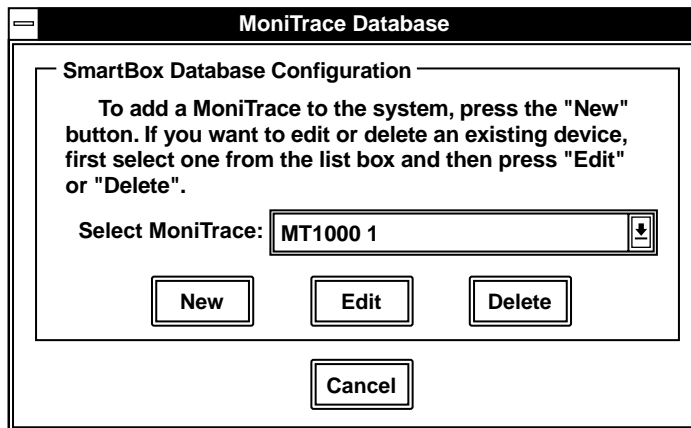


Figure 3.6. MoniTrace 1000 Database Dialog box.

The MoniTrace 1000 Database dialog box provides a means of adding a MoniTrace 1000, making changes to an existing MoniTrace 1000, or removing a MoniTrace 1000. If a MoniTrace 1000 is to be created, press the New button. If a MoniTrace 1000 is to be changed or removed, first select the MoniTrace 1000 from the drop down list box, and then press the Edit or Delete button.

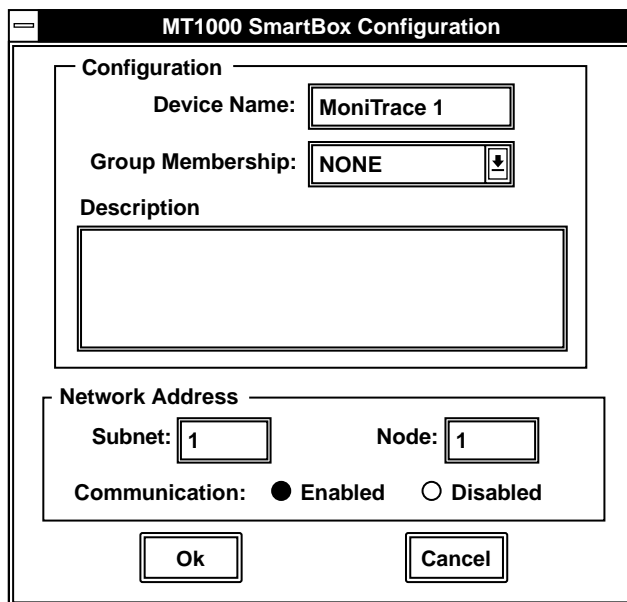


Figure 3.7. MoniTrace 1000 Configuration Dialog box.

After making a MoniTrace 1000 Database selection, the MoniTrace 1000 Configuration dialog box will appear. The MoniTrace 1000 Configuration dialog box is used to define MoniTrace 1000 records in the MoniTrace 1000 database. If a MoniTrace 1000 is defined, it will be displayed as an icon by the MoniTrace 1000 Supervisor. As part of this definition, a Device Name must be supplied. The Device Name must be 1 - 12 characters in length. This is the name that will appear under the MoniTrace 1000 icon when the MoniTrace 1000 Supervisor is run. Assignment of the MoniTrace 1000 to a Group is accomplished by the Group Membership drop down list box. This list box contains all of the Groups available. A Group must be defined in the Group database before a MoniTrace 1000 can be assigned to it. The Description field can be used to provide additional information about the MoniTrace 1000 and its associated circuit (i.e. location, heater type, etc.). Use of the Description field is optional. The Communication option allows network traffic to and from a MoniTrace 1000 to be turned on or off. If disabled, the MoniTrace 1000 Supervisor will not communicate with the specific MoniTrace 1000. This may be desirable in some instances when a MoniTrace 1000 will be down for an

extended period of time. A unique Network Address must be specified for each MoniTrace 1000. The Subnet address must be in the range of a 1 - 255. The Node address must be in the range of 1 - 127. These addresses must match those entered at the actual controller (see the section titled Setting and Viewing MoniTrace 1000 Address). No two MoniTrace 1000 should have identical Network Addresses, nor should they match the one assigned to the Network Interface. An error will result if there is an attempt to assign duplicate Device Names or Network Addresses.

3.5 Passwords

Password protection can be applied to a variety of features available in the MoniTrace 1000 Supervisor. If password protection is used, the user of the MoniTrace 1000 Supervisor will be prompted to supply the password before any changes become effective.

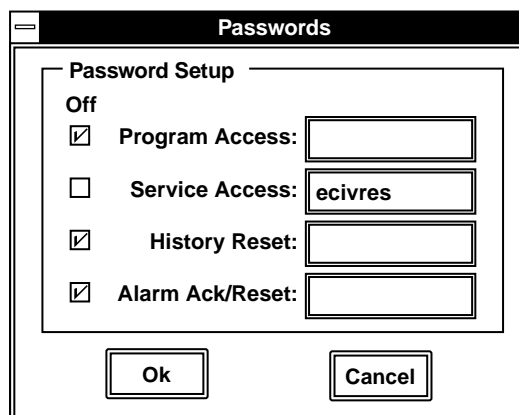


Figure 3.8. The passwords dialog box

Passwords are defined in the Password dialog box. Each feature listed in this dialog box can have a password associated with it. Alternatively, the password may be set to "Off", in which case the user of the MoniTrace 1000 Supervisor will not be prompted for a password. Note that is permissible to use the same password for each feature. Passwords must contain alphanumeric characters only (A - Z, 0 - 9). Either lower or upper case may be used. The comparison made at run-time between the user entry and the password is not case sensitive.

It should be noted that individual MoniTrace 1000s support passwords when programming the device at the local interface of the unit. The password entered on the interface of the MoniTrace 1000 is completely independent of the passwords used by the MoniTrace 1000 Supervisor.

3.6 Print Configuration

The Print Configuration button can be used to print a hard copy of the list of MoniTrace 1000 controllers that have been defined. The list will include the MoniTrace 1000 name, its group membership (if any), network address, and the communication enabled / disabled state.

3.7 About the MoniTrace 1000 System Builder

The Raychem button loads an informational dialog box, referred to as the "about box". The about box contains limited information about the MoniTrace 1000 System Builder application and Raychem Corporation.

3.8 File Descriptions

There are a number of files that are installed onto the hard disk of the PC when the MoniTrace 1000 Supervisor is installed. In addition to these files, several different database files are created by the MoniTrace 1000 System Builder application and by Data Logging. All of these files are listed in the following table. The Location field assumes installation into the default directory "c:\MT1000".

File	Location	Description
pcmt1000.exe	c:\MT1000	MoniTrace 1000 Supervisor application
pcmtcfg.exe	c:\MT1000	MoniTrace 1000 System Builder application
bwcc.dll	c:\MT1000	Borland custom control library
c4dll.dll	c:\MT1000	Database library
cpalette.dll	c:\MT1000	Custom control library
londrive.dll	c:\MT1000	Low level LonTalk communication library
lonlib.dll	c:\MT1000	LonTalk communication library
sbbitmap.dll	c:\MT1000	Smart Systems graphics library
sbfile.dll	c:\MT1000	Smart Systems file access library
led.fon	c:\MT1000	7 segment display font
group.dbf	c:\MT1000	Group database file
SmartBox.dbf	c:\MT1000	MoniTrace 1000 database file
system.dbf	c:\MT1000	System database file
password.dbf	c:\MT1000	Password database file
alarm.dbf	c:\MT1000	Alarm database file
alarm.cdx	c:\MT1000	Alarm index file
short.dbf	c:\MT1000	Short term data log file
short.cdx	c:\MT1000	Short term index file
mid.dbf	c:\MT1000	Mid term data log file
mid.cdx	c:\MT1000	Mid term index file
long.dbf	c:\MT1000	Long term data log file
long.cdx	c:\MT1000	Long term index file
*.rpt, *.txt	c:\MT1000\report	Report files are placed in this directory

3.9 Setting and Viewing the MoniTrace 1000 Address

Each MoniTrace 1000 controller that is placed on a network must have a unique address assigned to it. This is accomplished at each MoniTrace 1000 by a special network service menu.

Locate the Service Menu switch on the display card. Access to the network service menu requires that this switch be placed in the service setting, and a jumper be installed on the topmost pair of pins in the upper right hand corner of the power card.

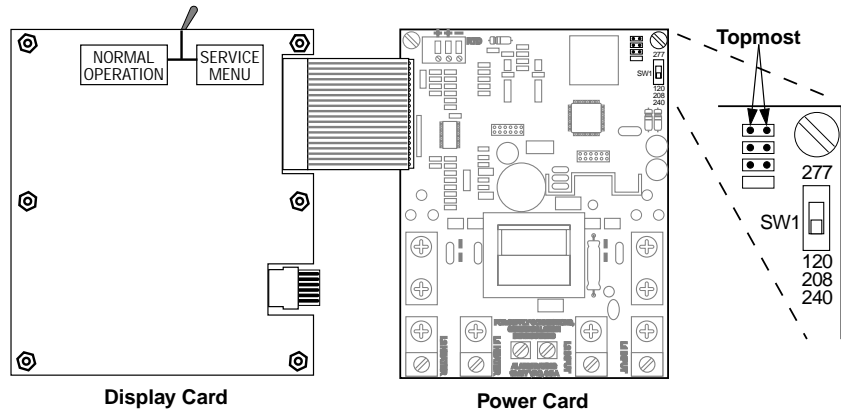


Figure 3.9. Display card service menu switch.

The following table lists the items available in the network service menu. Item numbers one through four are indicated by the LEDs; Program Mode, Actual Temp, Control Temp, and Heater Current.

Item No.	Description
1	Set the Subnet Address, Domain 0
2	Set the Node Address, Domain 0
3	Display Neuron ID, 12 hex digits (Do not change)
4	Reset Subnet, Node and Network Variable Selectors (Do not change)

The Subnet Address may contain any value in the range of 1 - 255. The Node Address may contain any value in the range of 1 - 127.

The Neuron ID is a unique number burned into each Neuron at the time of manufacture. It can be viewed in the network service menu. In order to view all 12 digits it is necessary to scroll the display by using the left and right arrow keys. The decimal point is used to indicate the position of the three digits displayed, relative to the 12 that form the Neuron ID. For example, if the decimal point is at the extreme left, the characters displayed are the three leftmost characters.

It is possible to Reset the network addresses to the default values through item four. This is not typically required and should never be performed if the MoniTrace 1000 is on a network with equipment other than MoniTrace 1000 (i.e. 4-20 mA device, RTD, etc.).

The Subnet / Node address assigned to a MoniTrace 1000 can be viewed while it is operating in the normal mode.

To View the Subnet address, press and hold the up arrow key for several seconds. The Subnet address will appear and remain displayed as long as the key is pressed.

To View the Node Address, press and hold the down arrow key for several seconds. The Node address will appear and remain displayed as long as the key is pressed.

4. MoniTrace 1000 System Supervisor

4.1 System Requirements

The MoniTrace 1000 Supervisor runs under Microsoft Windows™ 3.1. The minimum hardware required includes the following:

- 486 IBM-compatible computer
- Four megabytes of RAM
- VGA display
- Mouse
- Two megabytes of hard disk space. If data logging will be used the hard disk space required will increase dependent upon the number of MoniTrace 1000 in the network.
- LonTalk™ network interface. Consult Raychem Corporation at (800)545-6258 for information regarding the interface appropriate for your application.
- MT1000 Comm. Card in each MoniTrace 1000.

4.2 System Overview

When the MoniTrace 1000 Supervisor is started, the user is presented with a System Overview. This is identified by the "SYSTEM OVERVIEW" label that appears near the top of the window. The System Overview contains an icon for each MoniTrace 1000 or Group that has been defined. If a large number of icons are present a vertical scroll bar will appear on the right side of this window. The scroll bar can be used to scroll the display up and down in order to observe all icons.

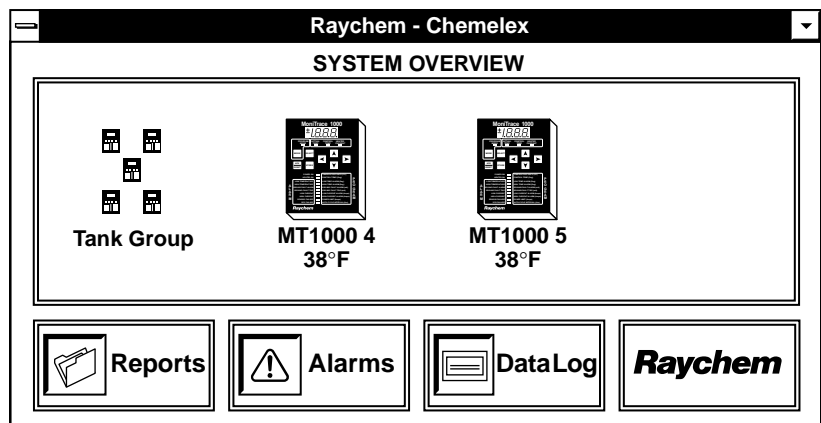


Figure 4.1. System overview display..

The icons display limited information about a MoniTrace 1000 or Group. Typically they will display the name of the MoniTrace 1000 or Group. When a MoniTrace 1000 is displayed the measured temperature is indicated. If an alarm has occurred, the temperature display will be replaced by "ALARM". If communication is not possible, as will occur when the unit is without power, "COMM ERROR" will be displayed. If communication to a MoniTrace 1000 has been disabled through the System Builder, "DISABLED" will be displayed.

In order to obtain more information about an individual MoniTrace 1000 or a Group, one must be selected. This is accomplished by placing the cursor on top of the icon and clicking the left mouse button. A Group View or an Individual View window will appear, containing the associated information.

There are buttons at the bottom of the System Overview window that access features for report creation, viewing the alarm status, data logging, and an informational "about box". The data log feature is available as an optional package. This button will not appear if the data log option has not been installed.

4.3 Report Generation

The Reports button will load the Report Selection dialog box. This dialog box allows for the selection of Program Reports, Process Data Reports, or Data Log Reports. If the Data Log option is not present, only Program Reports are available.

4.4 Program Reports

The Program Report dialog box is used to generate a report containing the program settings (control temp, alarm settings, etc.) of a number of MoniTrace 1000 controllers. This report can be saved as an ascii text file and/or printed.

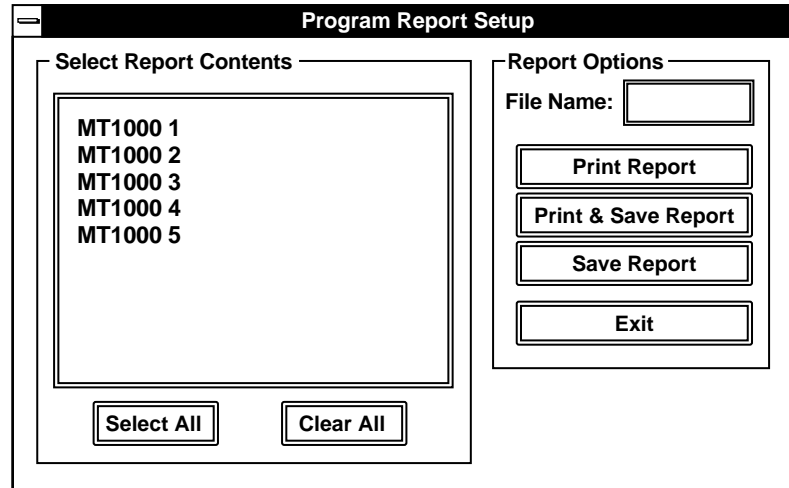


Figure 4.2. Program report dialog box.

The report may contain one, several, or all of the MoniTrace 1000s in the system. They are individually selected by clicking on them in the list box, or the entire list may be selected by pressing the Select All button.

The File Name field must be entered if the report will be saved. The File Name must be 1 to 8 characters in length and consist solely of alphanumeric characters (A-Z, 0-9). When the report is saved, this file name, plus an extension, ".rpt", will be created in the "c:\mt1000\report" directory (assuming installation in the default directory).

The four buttons in the lower right hand corner of the dialog box are used after the report contents have been established. Print Report will generate a printed copy of the report. Print and Save Report is used to both print the report and create a file on disk. Save Report creates a file but does not print it. Exit closes the Program Report dialog box.

4.5 Process Data Reports

The Process Data Report dialog box is used to generate a report containing the instantaneous process data readings (RTD temp, heater current, ground fault, and expansion temp) of a number of MoniTrace 1000 controllers. This report can be saved as an ascii text file and/or printed. Process Data Reports require the Data Log option to be present.

Figure 4.3. The process data report dialog box.

The process data fields to be included in the report are determined by clicking on the check box next to each item. The default settings are to include each item.

The report may contain one, several, or all of the MoniTrace 1000s in the system. They are individually selected by clicking on them in the list box, or the entire list may be selected by pressing the Select All button.

The File Name field must be entered if the report will be saved. The File Name must be 1 to 8 characters in length and consist solely of alphanumeric characters (A-Z, 0-9). When the report is saved, this file name, plus an extension, ".rpt", will be created in the "c:\mt1000\report" directory (assuming installation in the default directory).

The four buttons in the lower right hand corner of the dialog box are used after the report contents have been established. Print Report will generate a printed copy of the report. Print and Save Report is used to both print the report and create a file on disk. Save Report creates a file but does not print it. Exit closes the Process Data Report dialog box.

4.6 Data Log Reports

The Data Log Report dialog box is used to generate a report containing information from a data log file. This report can be saved as an ascii text file in report format, comma delimited format and/or printed. Data Log Reports require the Data Log option to be present.

There must be one or more active data logs in order to create a data log report. If no data logs are active there will be no information available to place in a report. Prior to accessing the Data Log Report dialog box, you will be prompted to select one of the currently active data logs.

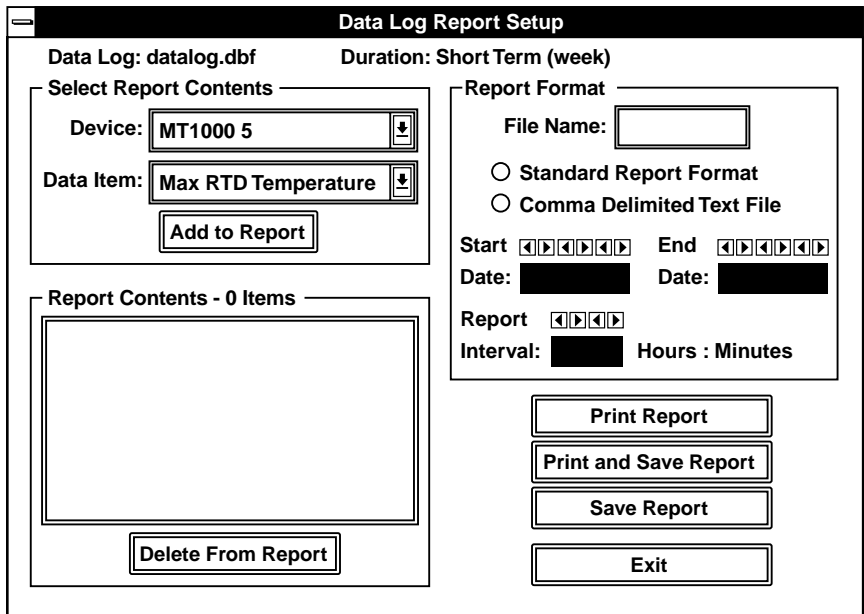


Figure 4.4. The data log report dialog box.

At the top of the dialog box is an indication of the data log that has been selected, as well as its type (short, mid, or long term). Refer to the Data Log section for more information on these three types of data logs.

The left side of the dialog box is used to select the information that will be placed in the report. The first step is to select a Device (MoniTrace 1000) and a Data Item. Drop-down list boxes are used for these selections. After the Device and Data Item are selected, pressing the Add to Report button places the item in the report. This item will appear in the list box titled Report Contents. An item may be removed from a report by selecting it from the Report Contents list box and pressing the Delete From Report button. A report may contain up to ten data items. Each item is a single measurement from a single MoniTrace 1000 controller.

The right side of the dialog box is used to name the report, specify the format, set the time period and rate for data extraction, and to generate and/or print the report. The rate is the report interval, or time period, between data entries.

The File Name field must be entered if the report will be saved. The File Name must be 1 to 8 characters in length and consist solely of alphanumeric characters (A-Z, 0-9). When the report is saved, this file name, plus an extension, will be created in the "c:\mt1000\report" directory (assuming installation in the default directory).

The report format will be either Standard Report Format or Comma Delimited Text File. If the standard format is used the extension to the file name will be ".rpt". If the text format is selected the extension will be ".txt". Comma Delimited Text Files are commonly used to export information to other software applications. Most database, spreadsheet, and statistical software packages support this file type. See appendix B for examples of these file formats.

The time frame, from which information will be gathered for the report, is determined by the Start Date and End Date. The ending date may be equal to, but cannot precede the starting date.

The Report Interval specifies how often data will be recorded in the report. Each line of information within the report will have a time and date stamp.

The four buttons in the lower right hand corner of the dialog box are used after the report contents and time frame have been established. Print Report will generate a printed copy of the report. Print and Save Report is used to both print the report and create a file on disk. Save Report creates a file but does not print it. Exit closes the Data Log Report dialog box.

4.7 Alarm Display

The Alarms button will load the Alarm Status dialog box. This dialog box is used to view both active and historical alarms. If the Auto Pop-Up feature is enabled the alarm status dialog box will automatically appear each time a new alarm is found in any MoniTrace 1000 on the network.

Status	Value	Alarm Point	Alarm	Group / Device
ACTIVE	89	85	High Temperature Alarm	Tank Group MT1000 5

Alarm List: Active, Historical, Print

Remote Ack / Reset: Acknowledge, Reset, Acknowledge All

Alarm Prompt: Auto Pop-Up, Exit

Figure 4.5. The Alarm Status dialog box.

⚠ WARNING: Fire hazard. A ground-fault alarm may mean the heating cable has been damaged or improperly installed; the alarm must not be ignored. Sustained electrical arcing or fire can result. To minimize the risk of fire if the alarm is triggered, shut off the power and repair the system immediately. For maximum sensitivity, set the alarm to 30 mA or less.

The Alarm Status dialog box is a list of alarms, either active or historical. In both cases the alarm list identifies the type of alarm and the device associated with the alarm.

The Alarm List, either Active or Historical, is selected by pressing one of the buttons in the lower right-hand corner of the Alarm Status dialog box. The type of list displayed will be indicated near the top of the dialog box.

The Active Alarms list will contain the Status, Value, and Alarm Point.

The Status of an alarm is either active or acknowledged. If an alarm is active, the alarm output at the MoniTrace 1000 will be energized, and the local display will indicate an alarm. If an alarm is acknowledged, the alarm output at the MoniTrace 1000 will be de-energized. For more information on the response to alarms by the MoniTrace 1000, consult the MoniTrace 1000 User's Manual, Chapters 4 and 5.

The Value field holds the actual reading by the MoniTrace 1000. The measured temperature, current, or ground fault will be displayed in the Value field, depending on the type of alarm that occurred.

The Alarm Point is the programmed setting for the alarm that occurred. This is the point that was exceeded, resulting in the alarm.

The Alarm field identifies the alarm that occurred. For descriptions of the various alarms, refer to the Individual View - Program section of this manual.

The Group / Device field is used to display the Group name and MoniTrace 1000 name of the device that has alarmed. If the MoniTrace 1000 does not belong to a Group, the Group name will be blank.

Alarms displayed on the Active Alarm List may be acknowledged and/or reset remotely. In order to perform this action it is necessary to select an alarm from the list by clicking on it. The Acknowledge button will acknowledge the alarm on the selected device. The Reset button will reset all alarms on the selected device. The Acknowledge All button will acknowledge all alarms displayed within the active alarm list. Access to these functions may be password protected.

The Historical Alarms list replaces the value and the alarm point with the Date and Time of the alarm. The status field will be blank. The Historical Alarms list will contain the 500 most recent alarms.

The Print button will print a list of the alarms currently selected, active or historical. The Auto Pop-Up check box is used to enable (checked) or disable (unchecked) the automatic alarm prompt. When the Auto Pop-Up feature is enabled the Alarm Status dialog box will automatically be loaded each time a new alarm occurs. This feature is enabled each time the MoniTrace 1000 Supervisor is first started. The Alarm Status dialog box may be closed by pressing the Exit button. This button does not affect the acknowledged / reset status of any MoniTrace 1000 on the network.

4.8 Data Logging

The Data Log button will load the Data Log Selection dialog box. This dialog box provides a means to Create Data Logs, Delete Data Logs, and Graph Data Logs. If the Data Log option is not installed, this button will not be present.

4.9 Create Data Log

Before any information will be recorded, it is necessary to create a data log file for that information. After a data log is created, it will be continually updated until it is deleted. Up to 10 data logs may be active at any given time.

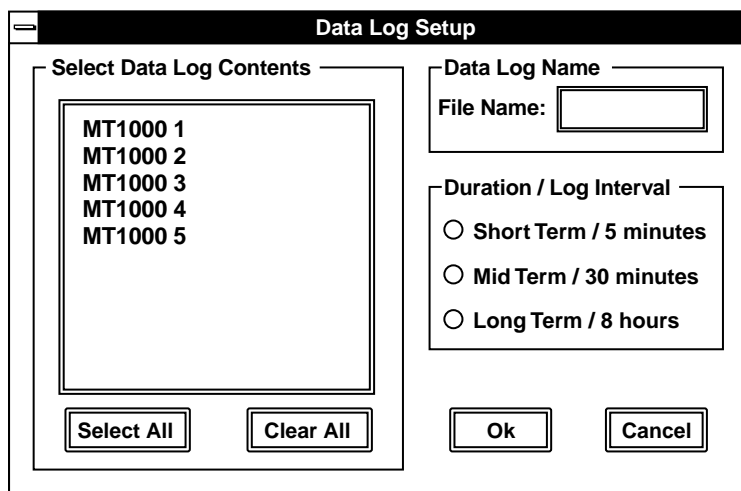


Figure 4.6. The Data Log Setup dialog box.

The data log may contain one, several, or all of the MoniTrace 1000 in the system. They are individually selected by clicking on them in the list box, or the entire list may be selected by pressing the Select All button.

The File Name field must be entered if the report will be saved. The File Name must be 1 to 8 characters in length and consist solely of alphanumeric characters (A-Z, 0-9). The data log file name will have the extension “.dbf” automatically added when the file is created.

The duration of the data log determines how often information is recorded, and the period of time over which it is maintained. Short Term logs contain data recorded on 5 minute intervals for the past 7 days. Mid Term logs contain data recorded on 30 minute intervals for the past 60 days. Long Term logs contain data recorded on 8 hour intervals for the past 2 years. As these intervals are exceeded, the old information is deleted. This is a self limiting feature that greatly reduces the likelihood of problems due to lack of hard disk space.

After a data log file is created, the log will be routinely updated. This can only occur as long as the MoniTrace 1000 Supervisor is running. The application can be minimized (press the down arrow in the upper right hand corner) and continue to log data.

4.10 Delete Data Log

Data logs should be deleted when there is no further need to acquire information. When a data log is deleted the actual data log file is removed from the hard disk. If there is important information in a data log it should be placed in a report where it can be copied to a floppy disk, or printed, before it is deleted.

After pressing the Delete Data Log button, a list of active data logs will appear. To delete a data log, select one of these files and press the delete key.

4.11 Graph Data Log

The Graph Data Log button will load the Data Log - Graphical View window, after a data log is selected. This window is used to view data logs graphically. Up to four data items may be placed on the graph at a single time.

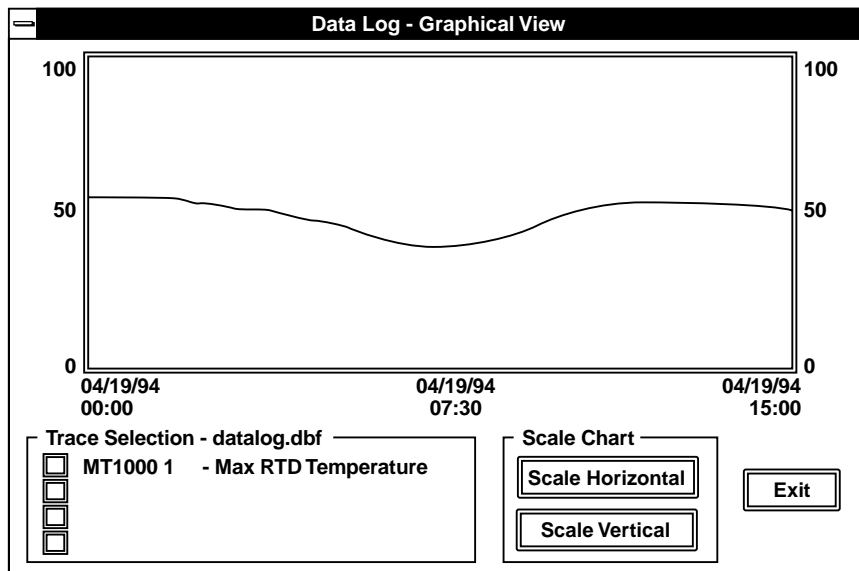


Figure 4.7. The Graph Data Log dialog box.

In the lower left hand corner of the Data Log - Graphical View window are four buttons that are used for Trace Selection. Each button corresponds to a single trace, or data item that may be graphed. The color of the button corresponds to the color of the trace that is displayed. When a Trace Selection button is pressed, the device and data item to be associated with the trace may be selected. The currently selected data log file is listed above these buttons.

The horizontal axis of the graph represents time. The beginning and ending points of the time axis can be adjusted by pressing the Scale Horizontal button.

The vertical axis of the graph represents the magnitude of the selected data items. The upper and lower limits of this axis can be adjusted by pressing the Scale Vertical button.

The Data Log - Graphical View window may be closed by pressing the Exit button.

4.12 About MoniTrace 1000 Supervisor

The **Raychem** button loads an informational dialog box, referred to as the "about box". The about box contains limited information about the MoniTrace 1000 Supervisor and Raychem.

The Raychem logo is displayed in a bold, italicized font within a double-bordered rectangular box.

Figure 4.8. The **Raychem** Button.

4.13 Group View

The Group View contains an icon for each MoniTrace 1000 assigned to the selected group. A Group View is accessed by clicking on a Group Icon from within the System Overview. The selected Group is indicated by the label at the top of the Window. If the Group contains a large number of MoniTrace 1000s a vertical scroll bar will appear on the right side of this window to allow access to all icons.

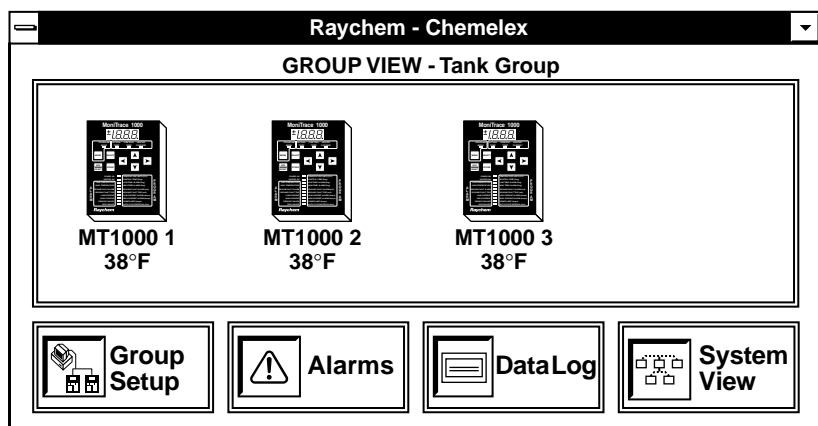


Figure 4.9. The *Group View* dialog box.

The Group View replaces the Reports and MoniTrace 1000 buttons at the bottom of the window, with two new buttons, Group Setup and System View.

4.14 Group Programming

Each MoniTrace 1000 controller has 10 user programmable fields. These fields can be programmed from the MoniTrace 1000 Supervisor. The Group Setup button causes all MoniTrace 1000s within the group to be programmed with the same settings. It is possible through Group Programming to program all of the fields, or a subset of those fields. This feature is intended to make it easier to setup a group of controllers, such as setting the control temperature, without affecting fields that may be unique to an individual circuit, such as the high current alarm. For information on programming a single MoniTrace 1000, consult the Individual View - Program section of this manual.

PROGRAM	OFF	Parameter	Value	Unit
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Control Temp:	40	Deg
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Low Temp Alarm:	35	Deg
<input checked="" type="checkbox"/>	<input type="checkbox"/>	High Temp Alarm:	95	Deg
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ground Fault Alarm:	20	mAmp
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ground Fault Trip:	30	mAmp
<input type="checkbox"/>	<input type="checkbox"/>	Low Current Alarm:		Amps
<input type="checkbox"/>	<input checked="" type="checkbox"/>	High Current Alarm:		Amps
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Power Limit:		Amps
<input type="checkbox"/>	<input type="checkbox"/>	Auto-Cycle Interval:		Hours

Figure 4.10. The Group Setup dialog box.

Each field has an acceptable value range, which may include "Off". Consult the Individual View - Program section of this manual for further information on the programmable fields.

The Group Program dialog box is used to program all MoniTrace 1000 belonging to the group. Since it may not be desirable to program each field identically in all members of the group, the Program check box is used to select which fields are to be programmed. Clicking on a Program check box will cause it to toggle between checked/unchecked. If the Program check box is checked, the associated field will be updated for all group members. In the example above, the control temperature, high and low temperature alarms, ground fault alarm, and ground fault trip will be programmed for each member in the group. The individual member's high and low current alarms, power limit setting, and auto-cycle interval will remain unchanged.

If a field is to be set to the "Off" position the Off check box should be checked. When a field is set to off it is not possible to change the value in the associated edit box.

The information is transmitted to the individual MoniTrace 1000 by pressing the Ok button. If an error is detected a message box will appear that describes the error. The error must be corrected before the programmable field information can be transmitted to the MoniTrace 1000. Pressing the Cancel button will result in no changes being made to any of the group members.

4.15 Exiting Group View

The Group View is exited by pressing the System View button. After pressing this button the System Overview is restored.

4.16 Individual View

The Individual View provides information and the ability to program a specific MoniTrace 1000. Access to the Individual View is obtained by clicking on any one of the MoniTrace 1000 icons, either in the System Overview or the Group View windows. The Individual View will be loaded with information from the selected MoniTrace 1000.

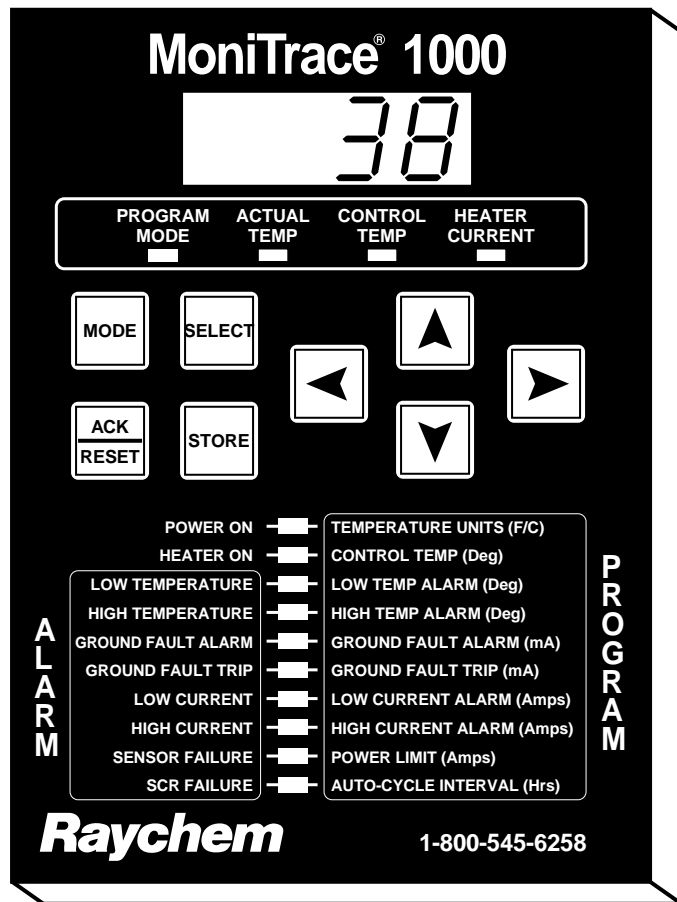


Figure 4.11. The Individual View dialog box.

The left side of the Individual View window is occupied by a representation of the user interface found on the MoniTrace 1000. There are several push buttons on this image. The Select button can be used to change the display field of the MoniTrace 1000. This field can display the actual temperature, the set temperature, or the heater current. The field displayed is indicated by the LEDs that appear below these items. If the Select button is repeatedly pressed until all LEDs are lit, the display will continuously cycle through these three fields.

The Mode button causes the programming dialog box to be loaded. Refer to the Program section for more information regarding this option.

The remaining buttons Ack/Reset, Store, and the Arrow buttons, may be pressed but do not provide any functionality.

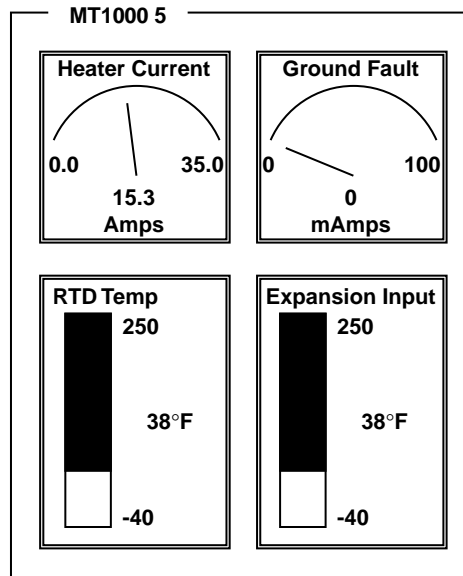


Figure 4.12. The Gauges dialog box.

The right side of the Individual View window displays information from the selected MoniTrace 1000. Gauges are used to display the heater and ground fault currents. Bar graphs are used to display the measured temperatures. An Expansion Temperature Input Card is an optional card that can be installed in a MoniTrace 1000 to provide dual temperature sensing capability. If the optional input card is not installed, the second bar graph is not displayed. Currently, the Expansion Temperature Input is not available.

At the top of the Individual View the MoniTrace 1000 name is displayed. If communication is lost to the unit, both the name and the message "COMMUNICATION ERROR" will be displayed. Typical causes of communication errors include loss of power and broken network cables.

4.17 Program

The Program button is used to load the Program dialog box. This dialog box allows all programmable fields to be specified. Pressing the Mode button will also load the Program dialog box.

PROGRAM

Program - MT1000 5

Temperature Units

Fahrenheit Celsius

OFF

Control Temp: Deg

Low Temp Alarm: Deg

High Temp Alarm: Deg

Ground Fault Alarm: mA

Ground Fault Trip: mA

Low Current Alarm: Amps

High Current Alarm: Amps

Power Limit: Amps

Auto-Cycle Interval: Hours

Figure 4.13. The Program dialog box.

There are 10 fields in the MoniTrace 1000 that are user programmable. Associated with each field is a programmable range, which may include “Off”.

If a field is to be set to the off position the Off check box should be checked. When a field is set to “Off” it is not possible to change the value in the associated edit box.

The following table provides a brief description of each programmable field and the allowable range of entry.

Program Field	Range	Description
Temperature Units	° F or ° C	Temp scale, affects both the alarm settings & temp measurements.
Control Temp	-40 to 999 ° F, Off	Control setpoint, when set to Off, heater is always On.
Low Temp Alarm	-40 to 999 ° F, Off	Temps below this level result in a low temp alarm.
High Temp Alarm	-40 to 999 ° F, Off	Temps above this level result in a high temp alarm.
Ground Fault Alarm	20 to 100 mA	Ground fault currents above this level result in a ground fault alarm.
Ground Fault Trip	20 to 100 mA, Off	Ground fault currents above this level result in a ground fault trip (load off).
Low Current Alarm	0.0 to 30.0 A, Off	Currents below this level result in a low current alarm.
High Current Alarm	1.0 to 30.0 A, Off	Currents above this level result in a high current alarm.
Power Limit	1.0 to 30.0 A, Off	Average current limiting value. The output is reduced if current exceeded.
Auto-Cycle Interval	0.5 to 24.0 hrs, Off	Time interval for self test diagnostics.

In addition to this table, the MoniTrace 1000 User's Manual (Chapters 4 and 5) should be used as a reference for a further description of these fields and the actions taken by the MoniTrace 1000 when alarms occur.

After the fields contain the desired settings, the information transmitted to the MoniTrace 1000 by pressing the Ok button. If an error is detected a message box will appear that describes the error. The error must be corrected before the program settings can be transmitted to the MoniTrace 1000. Pressing the Cancel button will result in no changes being made to any of the fields.

4.18 Service

Access to the Service fields is made available through the Service button in the Program dialog box. The Service fields are additional parameters that can be programmed in the MoniTrace 1000. These parameters are programmed during the initial installation of the MoniTrace 1000 and are not typically changed. For this reason it is recommended that password protection be placed on Service access (refer to the MoniTrace 1000 System Builder manual).

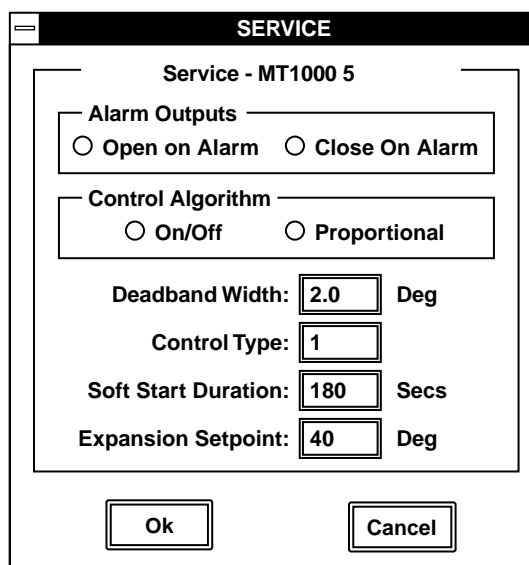


Figure 4.14. The Service Access dialog box.

The following table describes each service field and the allowable range of entries.

Service Field	Range	Description
Alarm Outputs	Open or Close	Causes the alarm contact at the MoniTrace 1000 to Open or Close on alarm.
Control Algorithm	On/Off or Proportional	Selects the control algorithm used by the MoniTrace 1000.
Deadband Width	0.5 to 10.0 deg	Specifies the temperature deadband around the control temp.
Control Type	1 to 15	Control action based on input temps and failures (see MoniTrace 1000 Manual, Chapter 6).
Soft Start Duration	0 to 999 seconds	Time duration when heater output is limited, (control decision from off to on).
Expansion Setpoint	-40 to 999 ° F	Temperature setpoint for MoniTrace 1000 equipped with optional Expansion Temperature Input Cards (not Available at this time).

In addition to this table, the MoniTrace 1000 User's Manual, Chapter 6, should be used as a reference for a further description of these fields.

The Control Type field is limited to the values of 1 and 2 if no expansion card is installed in the MoniTrace 1000. Type 1 causes the heater to turn On if the RTD sensor fails. Type 2 causes the heater to turn Off if the RTD sensor fails. The 15 potential Control Types are described in the MoniTrace 1000 User's Manual.

After the Service fields contain the desired settings, the information is transmitted to the MoniTrace 1000 by pressing the Ok button. If an error is detected a message box will appear that describes the error. The error must be corrected before the service settings can be transmitted to the MoniTrace 1000. Pressing the Cancel button will result in no changes being made to any of these fields.

4.19 History

Pressing the History button will load the Historical Data dialog box. This dialog box displays the historical information maintained by the MoniTrace 1000.

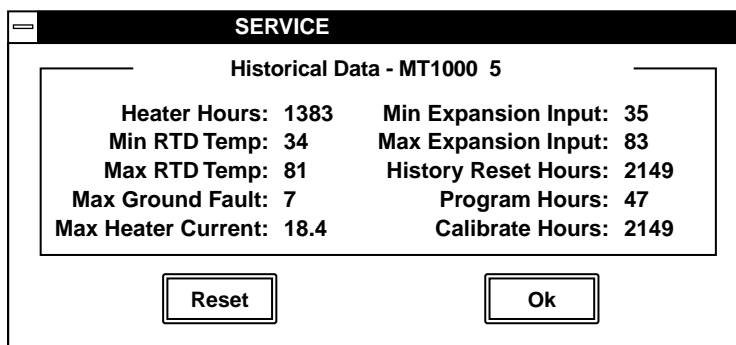


Figure 4.15. The Historical Data dialog box.

The Heater Hours are the number of hours that the heater has been operating since the history was last reset. The RTD Temperatures, Max Ground Fault current, Max Heater Current, and the Expansion Input values are the most extreme measurements recorded by the MoniTrace 1000. The History Reset Hours are the number of hours since the historical data was last reset. The Program Hours are the number of hours since any programming change was made. Lastly, the Calibrate Hours are the number of hours since the MoniTrace 1000 was calibrated. Time spent without power to the MoniTrace 1000 will not be included in these last three values.

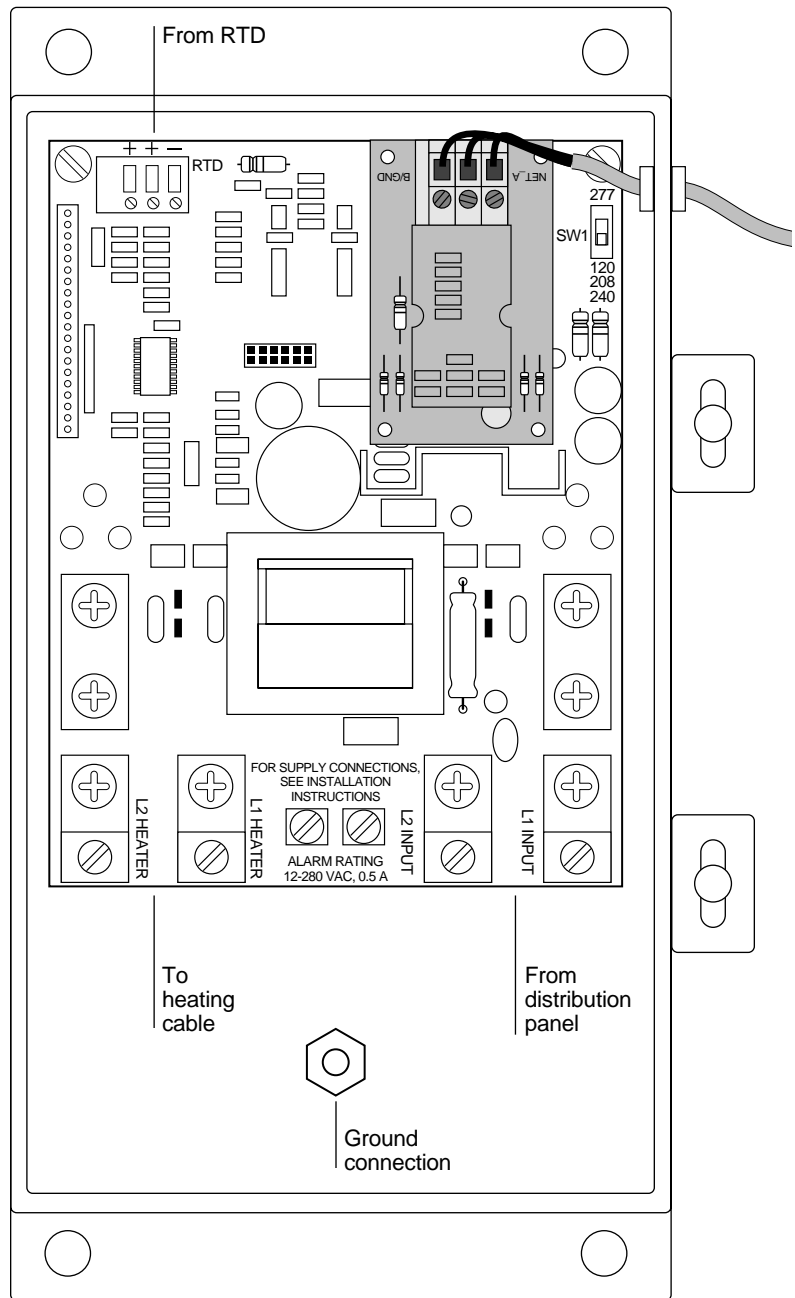
The Reset button is used to reset all historical values, with the exception of the calibrate hours. From the moment this button is pressed, new max and min values will be recorded and the timed fields will be set to zero hours.

The Ok button is used to close the Historical Data dialog box.

4.20 Exiting Individual View

The Exit button closes the Individual View window. The display will contain either the System Overview or Group View window that was present before the MoniTrace 1000 icon was selected.

Appendix A – Wiring Guidelines



Appendix B – Standard Report Format

MoniTrace 1000 Supervisor Report

Column	Description					
1	Tank Line 1 - Max. RTD Temperature					
2	Tank Line 2 - Max. RTD Temperature					
3	Tank Line 3 - Max. RTD Temperature					
4	Tank Line 4 - Max. RTD Temperature					
5	Tank Line 1 - Max. Heater Current					
Date	Time	1	2	3	4	5
09/21/93	11:00	43	42	45	51	0.0
09/21/93	11:30	43	43	44	51	0.0
09/21/93	12:00	44	43	45	50	0.0
09/21/93	12:30	42	43	45	49	8.2
09/21/93	13:00	41	42	43	49	8.3
09/21/93	13:30	43	43	44	52	0.0
09/21/93	14:00	43	43	45	51	0.0
09/21/93	14:30	45	46	47	50	0.0
09/21/93	15:00	43	42	44	49	8.1
09/21/93	15:30	43	41	44	49	8.1
09/21/93	16:00	43	41	43	49	8.1
09/21/93	16:30	41	42	44	50	0.0
09/21/93	17:00	42	43	45	51	0.0
09/21/93	17:30	43	42	43	50	0.0

Comma Delimited Text File :

09/21/93, 11:00, 43, 42, 45, 51, 0.0

09/21/93, 12:00, 44, 43, 45, 50, 0.0

09/21/93, 13:00, 41, 42, 43, 49, 8.3

09/21/93, 14:00, 43, 43, 45, 51, 0.0

09/21/93, 15:00, 43, 42, 44, 49, 8.1

09/21/93, 16:00, 43, 41, 43, 49, 8.1

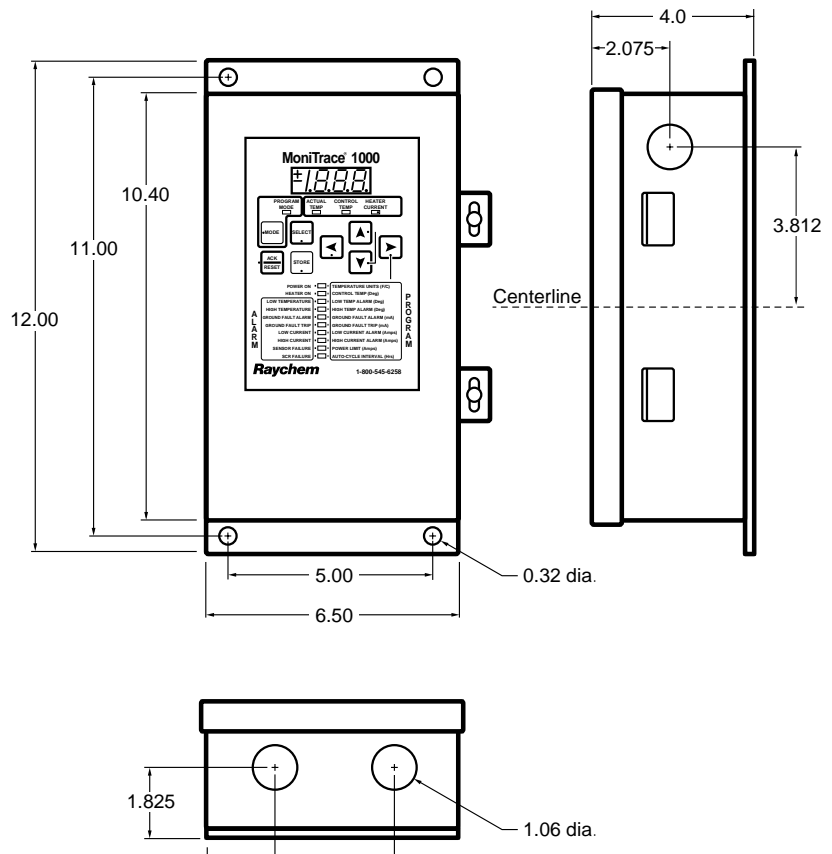
09/21/93, 17:00, 42, 43, 45, 51, 0.0

Appendix C – Specifications

MoniTrace 1000

The MoniTrace 1000 is equipped with a digital display, fourteen Program/Status/Alarm LEDs, and eight operator keys. The microprocessor reacts to key presses to change and monitor parameters, set modes, acknowledge alarms, select values, and reset the unit. The keypad has tactile feedback to indicate when a key has been pressed.

The RTD input is calibrated for a standard DIN 43760 with a temperature coefficient of .00385 ohm/ohm/°C. Lead resistance is automatically compensated for internally (up to 20 ohms).



MoniTrace 1000 Enclosure Layout (dimensions in inches)

Supply voltage

110 to 277 Vac $\pm 10\%$, 50/60 Hz; internal power less than five watts

Environmental temperature

-40°F to 125°F (-40°C to 52°C) maximum operating temperature range;
0%–95% relative humidity at 40°C, noncondensing

Microprocessor

Nonvolatile memory; no data loss on power outage

Load current

30 A max.

Control

Double-pole solid-state switching

Temperature sensor input

100-ohm platinum RTD, 3-wire, 20-ohm max. lead wire compensation,
 $\alpha = .00385$ ohm/ohm/°C

Outputs

Unit alarm output configurable as “open on alarm” or “close on alarm.”

AC alarm triac: isolated solid-state triac, SPST, 0.5 A max. at 12 to 277 Vac

Indicators

LED: Program Mode, Actual Temperature, Control Temperature, Heater Current, Power On, Heater On, Alarm Conditions/Programming Parameters

Digital Display: Actual Temperature, Control Temperature, Heater Current, Programming Parameter Values, Alarm Values

Set points**Temperature**

Units	°F or °C
Control range	-40°F to 999°F (-40°C to 537°C) or OFF
Low-temp. alarm	-40°F to 999°F (-40°C to 537°C) or OFF
High-temp. alarm	-40°F to 999°F (-40°C to 537°C) or OFF

Ground fault

Alarm range	20 to 100 mA
Trip range	20 to 100 mA or OFF

Current

Low-alarm range	0.0 to 30.0 amps or OFF
High-alarm range	1.0 to 30.0 amps or OFF
Power limit	1.0 to 30.0 amps or OFF

Auto Cycle Time

0.5 to 24.0 hours or OFF

Alarm conditions

Low Temperature	Low Current	Memory Failure
High Temperature	High Current	Ground-Fault Trip
Ground Fault	Sensor Failure	SCR Failure

Heating cable system diagnostic test

System cycles heating cable regularly (settable period from 0.5–24.0 hours) and confirms proper system operation.

Stored parameters (measured)

Minimum process temperature, maximum process temperature, maximum ground-fault current, maximum heating cable current

Enclosure

NEMA 4X (12.0” x 6.5” x 4.5”), black painted stainless steel

Additional features

Soft Start, On/Off or Proportional Control, power limiting, password protection

Approvals and Certifications**Hazardous Locations**

NEMA 4X
Class I, Div. 2, Groups B, C, D
Class II, Div. 1 and Div. 2, Groups E, F, G
Class III

**Hazardous Locations**

7M61

TYPE 4X
Temperature Indicating Equipment
For Use In Hazardous Locations
Class I, Div. 2, Groups A, B, C, D
Class II, Div. 2, Groups F, G
Class III

MoniTrace 1000 Supervisor Software

The MoniTrace 1000 Supervisor heat-tracing program is a PC based software program that enables users to interface with field installed MoniTrace 1000 units.

MoniTrace 1000 Supervisor runs on Windows based personal computers. The Supervisor uses a graphical interface that displays the front keypad panel of the MoniTrace1000. This makes the operation of the software easy and intuitive. The supervisor can be used to program individual units or groups of units, monitor, check and record alarm status, data log, and generate reports. Password protection can be used to prevent unauthorized access to the programming features.

Individual MoniTrace 1000 units are connected to the PC with a twisted pair in a daisy chain structure. The MoniTrace 1000 units must have a transceiver communication card (Moni-1000-Comm-Card) installed to communicate as a node on the network. The network communication protocol is based on Lontalk™, a third party protocol that follows the ISO OSI reference model and supports fast, reliable communications.

System Requirements

- 486 (or beyond) IBM computer installed with Windows 3.1 (or beyond) or Windows 95
 - 4 megabytes of RAM
 - VGA or higher resolution display
 - Mouse
 - 2 megabytes of hard disk space. If data logging is used, the required hard disk space will increase depending upon the number of active logs.
-

Features

- Graphical user interface that is intuitive and easy to use.
- Access to all operating parameters and historical information from each MoniTrace 1000.
- Ability to program individual and groups of MoniTrace 1000 controllers.
- Alarm annunciation and historical alarm records are maintained.
- Report generation and printing.
- Password protection.
- Data logging.
- Network option can be added at any time, with no limit to the number of MoniTrace 1000s on the network.
- Network communications is based on Lontalk™, a third party protocol that follows the ISO OSI reference model and supports fast, reliable communications.

MoniTrace 1000 Communication Card

The Moni-1000-Comm-Card is a twisted pair Lonworks® transceiver that is designed to be placed inside the MoniTrace 1000 unit and used to communicate with a central computer. The transceiver snaps into a 12 pin connection that is located on the MoniTrace 1000 circuit card. Each MoniTrace 1000 unit on the network must have this transceiver card installed.

The transceivers meet the Lonmark interoperability guidelines and are designed to comply with FCC and VDE requirements.

The transceiver uses a transformer to isolate itself from the twisted pair network bus. This design provides excellent common mode rejection and permits the system to operate in electrically noisy environments. It also reduces the susceptibility of the system to ground loops caused by the use of multiple node power supplies that float relative to ground. This architecture makes the transceivers ideal for communicating over long distances in industrial environments.

Function Twisted pair transceiver for use with the MoniTrace 1000 system.	Network Bus Length 4600 ft (1400 m)
Data Comm. Type Transformer isolated, differential Manchester coding	Maximum Stub Length 9.8 ft (3 m)
Bit Rate 78 kbps	Network Bus Polarity Polarity insensitive
Electrostatic Discharge No errors to 15,000 V, no hard failures to 20,000 V tested per MIL-STD 883	Supply Voltage +5 Vdc, ±5%
EM Designed to comply with FCC part 15 level B and UDE 0871 level B	Supply Current 10 mA
Max. Nodes per Channel 44	Operating Temperature −40°F to 125°F (−40°C to 52°C)
Network Bus Wiring 22 AWG shielded twisted pair	Operating Humidity 25% to 90% RH (Non-condensing)

Approvals (when used with the MoniTrace 1000 system)



NEMA 4X
Class I, Div. 2, Groups B, C, D
Class II, Div. 1 and Div. 2, Groups E, F, G
Class III

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