Operation Manual

DETROIT DIESEL ® mtu

Monitoring Software

Monitor III Program

Models:

Digital 550 Generator Set Controller
Digital Generator Set Controller
Microprocessor-Plus 16-Light Controller with Communications
DXPower™ 1000   Transfer Switch Controllers
DXPower™ 1500   Transfer Switch Controllers
MATS Automatic Transfer Switch Controllers
MATS+ Automatic Transfer Switch Controllers
Digital Power Monitor

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	Guide to Using the Monitor III Program
1.	**Connect the hardware.** See TT-1405 for instructions.
	● Install KBUS/Modbus converter modules into Series 340 controllers and power monitors.
	● Connect as many as 247 devices in an RS-485 network.
2.	**Configure the devices.** See TT-1405 and the controller Operation/Installation Manual for instructions.
	● Assign a unique network address to each device.
	● Set the baud rate on each device. The baud rates must be the same on all connected devices and the PC.
3.	**Install the program.**
	● Use the PC's Add/Remove programs utility or click on the setup.exe file on the Monitor III CD-ROM.
	● Plug the hardware key into the PC's USB port.
4.	**Start the program.** From the Start menu, select Programs→DDC MTU→Monitor III.
5.	**Log in.**
	● Enter the username and password at the login screen. There are three levels of access:
	User Name: SUPERVISOR, Password: spw (highest access)
	User Name: USER, Password: upw (limited access)
	User Name: GUEST, Password: [blank] (monitoring only).
	● Change the username and password to prevent unauthorized access.
	Note: User names and passwords are case-sensitive.
6.	**Set up the site(s).**
	● From the menu toolbar at the top of the screen, select *File→Manage Sites*.
	● Click on *New* to set up one or more device sites:
	● Type a name for the site into the Site Name box.
	● Select the communications parameters in the Monitoring Mode window.
	● Click on *Add Device* and enter the network address and unique description for each device at the site.
	● Click on *OK* when the site setup is complete.
	● Click on *Done* when all sites have been set up.
7.	**Connect to a site.**
	● Select *Connection→Connect* to display the list of sites.
	● Click on one site to select it, and then click on *Connect*.
	Note: Only one site can be connected at a time.
8.	**Create data windows to display device system information and settings.**
	● Double click on one of the devices listed in the Site Overview window. The Add Window screen for the selected switch appears on the screen.
	● To create data windows when the Site Overview window is closed, select *Window→ New Window* from the menu toolbar at the top of the screen and then click on the desired device from the list on the left.
	● Drag and drop windows or use *Window→Cascade Windows* to arrange the windows on the screen, if desired.
9.	**Change settings on Digital 550 generator set controllers, DXPower™ 1000 transfer switch controllers, or DXPower 1500™ transfer switch controllers if necessary.**
	● Double-click on the selected display window or select *Window→Setup* from the Menu toolbar at the top of the screen. The setup window will appear.
	Note: Some display windows are for monitoring only and do not have a corresponding setup window.
10.	**Save screens and settings** for future use, if desired.
11.	**Disconnect.**
	● Choose *Connection→Disconnect* to disconnect the PC from the controller.
12.	**Exit the program.**
	● Choose *File→Exit* to exit and close the Monitor III Program.

Refer to the Table of Contents for more detailed information for each step.

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IMPORTANT SAFETY INSTRUCTIONS. Electromechanical equipment, including generator sets, transfer switches, switchgear, and accessories, can cause bodily harm and pose life-threatening danger when improperly installed, operated, or maintained. To prevent accidents be aware of potential dangers and act safely. Read and follow all safety precautions and instructions. SAVE THESE INSTRUCTIONS.

This manual has several types of safety precautions and instructions: Danger, Warning, Caution, and Notice.

⚠ DANGER

Danger indicates the presence of a hazard that *will cause severe personal injury, death*, or *substantial property damage*.

⚠ WARNING

Warning indicates the presence of a hazard that *can cause severe personal injury, death,* or *substantial property damage*.

⚠ CAUTION

Caution indicates the presence of a hazard that *will* or *can cause minor personal injury* or *property damage*.

NOTICE

Notice communicates installation, operation, or maintenance information that is safety related but not hazard related.

Safety decals affixed to the equipment in prominent places alert the operator or service technician to potential hazards and explain how to act safely. The decals are shown throughout this publication to improve operator recognition. Replace missing or damaged decals.

Accidental Starting

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (−) lead first when disconnecting the battery. Reconnect the negative (−) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (−) lead first. Reconnect the negative (−) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

Hazardous Voltage/ Electrical Shock

⚠ DANGER
Hazardous voltage. **Will cause severe injury or death.**
Disconnect all power sources before opening the enclosure.

Servicing the transfer switch. Hazardous voltage can cause severe injury or death. Deenergize all power sources before servicing. Open the main circuit breakers of all transfer switch power sources and disable all generator sets as follows: (1) Move all generator set master controller switches to the OFF position. (2) Disconnect power to all battery chargers. (3) Disconnect all battery cables, negative (−) leads first. Reconnect negative (−) leads last when reconnecting the battery cables after servicing. Follow these precautions to prevent the starting of generator sets by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer. Before servicing any components inside the enclosure: (1) Remove all jewelry. (2) Stand on a dry, approved electrically insulated mat. (3) Test circuits with a voltmeter to verify that they are deenergized.

Opening the power monitor enclosure. Hazardous voltage can cause severe injury or death. A transfer switch or generator set connected to the power monitor could automatically energize the power monitor or accessories. Disconnect all power sources before opening the enclosure. Move the generator set master switch on the controller to the OFF position and disconnect the battery negative (−) lead before proceeding.

Notes

This manual covers the installation and operation of the Monitor III Program for personal computers running the Windows® operating system. The Monitor III program allows remote monitoring and control of transfer switches and generator sets equipped with the following controllers:

- Digital 550 generator set controller

- Digital generator set controller

- Microprocessor-Plus, 16-Light generator set controller

- DXPower™ 1500 programmable transfer switch controller

- DXPower™ 1000 programmable transfer switch controller

- MATS automatic transfer switch controllers

- MATS+ automatic transfer switch controllers

- Digital Power Monitor

Information in this publication represents data available at the time of print. The manufacturer of DDC/MTU Power Generation products reserves the right to change this literature and the products represented without notice and without any obligation or liability whatsoever.

Read this manual and carefully follow all procedures and safety precautions to ensure proper equipment operation and to avoid bodily injury. Read and follow the Safety Precautions and Instructions section at the beginning of this manual. Keep this manual with the equipment for future reference.

List of Related Literature

Before using the software, the connect the controller to the PC or device network and configure it for communication. Connection diagrams, hardware requirements, and controller setup parameters are covered in a separate publication, TT-1405, which is included with the Monitor III software kit. Controller setup instructions are covered in the controller Operation Manual.

Obtain the controller Operation manual(s) and Instruction Sheet TT-1405 before beginning. The related document part numbers follow.

Operation Manual for Model:	Part Number
Digital 550 Generator Set Controller Operation Manual:	
Version 2.10 and higher	MP-6200
Versions prior to 2.10	MP-6083
Digital 550 Generator Set Controller Setup and Application	MP-6140
Digital Generator Set Controller	MP-5829
Microprocessor-Plus Generator Set Controller	MP-6161
Automatic Transfer Switches with DXPower™ 1500 Controls:	
Model SCS, SCP	MP-6446
Model SSS, SSP	MP-6447
Model SBS, SBP Bypass/Isolation	MP-6448
Model SGS, SGP Bypass/Isolation	MP-6449
Automatic Transfer Switches with DXPower™ 1000 Controls:	
Model SCT, SCP	MP-6126
Model SBT, SBP Bypass/Isolation	MP-6128
Model SDT, SDP	MP-6225
DXPower™ 1500	MP-6135
MATS+ Transfer Switch Controller	MP-5664
Digital Power Monitor	MP-5875
Connection and Converter Kits for Monitor III	TT–1405
Communication Module for the Microprocessor-Plus Generator Set Controller	TT–1377

Product Identification Information

Software Version Number

Record the software version number. The version number is shown on the CD-ROM, on the software Welcome screen, and under Help→About.

Software Version Number _____

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Service Assistance

For professional advice on generator power requirements and conscientious service, please contact your nearest DDC/MTU Power Generation distributor.

- Consult the Yellow Pages under the heading Generators—Electric

- Visit the DDC/MTU Power Generation website at ddcmtupowergeneration.com

- Look at the labels and stickers on your DDC/MTU Power Generation product or review the appropriate literature or documents included with the product

Section 1 Requirements and Software Installation

1.1 Introduction

The Monitor III program allows monitoring and control of generator set controllers, transfer switch controllers, and power monitors using a personal computer (PC) with the Windows® operating system and user interface.

Refer to the controller operation manual for descriptions of the data and messages communicated by the controller. See the List of Related Literature in the Introduction for the document part numbers.

Monitor III communicates using standard Modbus® protocol. The software allows communication through local direct connections, remote modem connections, or a TCP/IP network. See TT-1405 for more information.

1.2 Requirements

1.2.1 System Requirements

The minimum system requirements to run the Monitor III Program are:

- 133 MHz or higher Intel® Pentium®-compatible CPU

- 32 MB RAM

- CD-ROM drive and 75 MB hard drive space available for installation

- 800 x 600 or better color monitor (1024 x 768 recommended)

- Windows® 2000 or Windows XP® operating system with Internet Explorer version 4.0 or higher

- COM port numbered between 1 and 255, capable of baud rates of 9600 or 19200

- Network interface card (for applications using ethernet connections)

- Adobe® Reader® or Acrobat® to display the Help information

1.2.2 Hardware Requirements

The following system hardware items are required for device connection and communication. See TT–1405 for details.

Note: For the DXPower 1500 transfer switch controller, see the ATS Operation and Installation Manual for connection and communication setup instructions.

- Hardware key (also called a dongle; included with the software kit, see Section 1.2.3)

- RS-232 to RS-485 converter (included with software kit)

- Shielded #12-24 AWG twisted pair cable, Belden #9841 or equivalent, for the RS-485 connections (customer-provided)

- PC modem and device modem if remote modem connections are used (kits that include the device modem and the necessary cables, adapters, and converters are available from the factory)

- If Ethernet connections are used, one Modbus®/Ethernet converter for each site or device. A Modbus®/Ethernet converter is not required for the DXPower 1500 transfer switch controller.

    Note: Monitor III can communicate with only one Modbus®/Ethernet converter at a time. See TT–1405 for connection types.

- USB-to-serial converter *only if* your PC has a USB port rather than a serial port (customer-provided; the Belkin USB Serial Adapter is one example)

- The following controllers must be equipped with Modbus®/KBUS converter modules:

    - Digital generator set controller

    - MATS automatic transfer switch controllers

    - MATS+ automatic transfer switch controllers

    - Digital Power Monitor

- The Microprocessor-Plus 16-Light generator set controller must have the red main logic board (November 2003 or later), and be equipped with the communication board GM32644-KA1 or -KP1.

1.2.3 Hardware Keys

A hardware key (dongle) is required in order to run the program on your PC. One key is included with each software kit. See Figure 1-1.

Note: Only the hardware keys supplied with Monitor III or Surveyor software kits will allow the program to run. Keys purchased elsewhere for other applications will not work.

Insert the key into the PC's USB port before attempting to run the program. Figure 1-2 shows typical USB port locations. A red LED on the key indicates that the key is activated.

See Section 2.13.2 if you see an "Invalid hardware key" message at program startup.

tt1349

Figure 1-1 Hardware Key (dongle)

Typical
Port Labels:

Serial Port:
| O | O |

USB Port:

1
2
3

1. Serial (RS-232) port   tt1349
2. Parallel (printer) port
3. USB ports
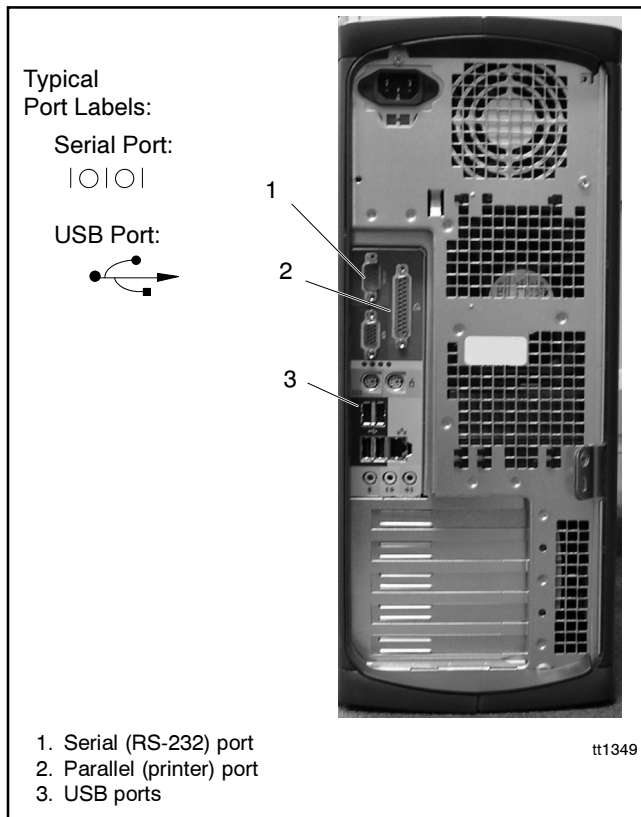
Figure 1-2 Typical Computer Ports

1.3 Hardware Connections

Refer to TT-1405, Converter Kits and Connections, provided with the software kit, for connection diagrams and instructions to connect the PC and monitored devices.

For the DXPower 1500 transfer switch controller, see the ATS Operation and Installation Manual for connection and communication setup instructions.

1.4 Software Installation and Removal

For simplicity, this manual and the software assumes that the PC has the CD-ROM drive installed as the D: drive and the hard drive installed as the C: drive. If your drive locations are different, type in the correct drive letter for your PC hard drive or CD-ROM drive when applicable during software installation or operation.

Note: When updating the Monitor III software to a new version, remove the old version of the software first. See Section 1.4.2, Software Removal. Then install the complete new version.

1.4.1 Installation

The Monitor III software CD-ROM contains various files that are used by the setup program to install the software on the PC. The setup program automatically installs a shortcut to run the program from the *Start* menu.

Follow the steps below to install Monitor III in Windows®.

Note: Administrative rights on the PC may be required to install the progam. Contact your system administrator if you encounter problems during installation.

Software Installation Procedure

1. Close all applications.

2. Insert the Monitor III Program CD-ROM into the PC's CD-ROM drive, the D: drive on most systems.

3. Open Windows® Explorer and double-click on the CD-ROM drive.

4. Double-click on the Setup.exe file.

5. The installation program will guide you through the installation process. Follow the instructions on the screen.

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6. The program will prompt you to approve or change the directory for file installation. The setup program installs the main software files into the C:\Program Files\DDC MTU\Monitor III directory unless an alternate location is selected.

7. A window appears when the program is ready to install the drivers for the hardware keys. Click on *OK* to proceed. The program will not operate without the hardware key and driver.

   Note: See Section 2.13.2 if you see an "Invalid hardware key" message.

8. Click the *OK* button after the setup is completed.

9. Remove the CD-ROM and store it in a safe location away from excessive heat, direct sunlight, and moisture.

Alternatively, use the PC's Add/Remove Programs utility. Click on the *Start* menu at the lower left corner of the screen and select *Settings→Control Panel.* Select *Add/Remove Programs* and follow the instructions on the screen to install the program files as instructed above.

When the program runs, it generates other files in the installation directory that the program uses to store system information.

Perform regular backups of the installation directory.

1.4.2   Software Removal

When updating the Monitor III software, remove the old version before installing the new one.

To remove the software from the PC, select *Settings→Control Panel→Add/Remove Programs* from the Start menu. Select the *Monitor III* group and click on *Add/Remove* to delete Monitor III Program files from the installation directory.

Note: Do not simply delete the software files.

Usernames and passwords are saved in a file in the program directory. If the program directory is not deleted when the software is updated, the usernames and passwords are not lost.

Notes

2.1 Introduction

This section provides general instructions for working with the Monitor III Program's tools and windows. Detailed descriptions of the individual data and setup windows are given in Sections 3 through 9.

Definitions

Data Window. A window that displays a set of device parameters or settings. For example, the source voltages, frequencies, number of phases, and phase rotation are displayed in the Source Info data window for an ATS.

Device. A single transfer switch controller, generator set controller, or power monitor.

Local mode. Communication through a direct connection between a device and a personal computer.

Remote (modem) mode. Communication through modem connections.

Remote (network) mode. Communication through an Ethernet network.

Screen. A collection of open data windows. After opening and arranging a set of data windows, you can save the screen to use the same arrangement of data windows at another time.

Setup Window. A window associated with an individual data window that allows the operator to change settings. Not all data windows have setup windows associated with them.

Site. A location including one or more devices connected to the PC either through a direct connection or through modems.

2.2 Starting the Program

Start the program by clicking on the *Start* button at the lower left corner of the personal computer (PC) screen and selecting *Programs →DDC MTU→Monitor III*.

Alternatively, you can create a shortcut to the program on your PC's desktop and then click on the shortcut to start the program. To create the shortcut, go to *C:\Program Files\DDC MTU\Monitor III* (or the directory where the Monitor III program is installed). Right-click on the *Monitor III* application file and select *Create Shortcut.* Then click on the newly created shortcut and drag it to your desktop.

2.3 Login

At startup, the program displays the login window shown in Figure 2-1. Three different security levels allow program access to supervisors, users, and guests. Passwords are required to log on to the supervisor and user levels. A password can also be set for the guest level.

2.3.1 Supervisor-Level Access

The Supervisor account allows the highest level of access. A supervisor can:

● Create, edit, and delete sites (see Section 2.5.1)

● Change time delays and other device settings

● Start and stop the generator set (and transfer the load for ATS devices)

● Monitor all devices in the system.

2.3.2 User-Level Access

The User account allows limited access. An authorized user can:

● Create, edit, and delete sites (see Section 2.5.1)

● Start and stop the generator set (and transfer the load for ATS devices)

● Monitor all devices in the system.

The setup windows, which allow users to change selected device settings, are disabled when the user logs on as a user or a guest.
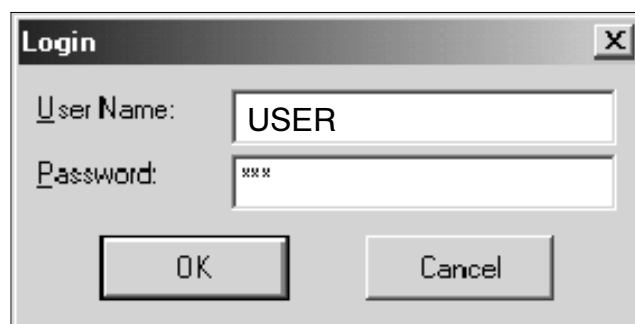
Figure 2-1 Login Screen

2.3.3 Guest-Level Access

The Guest account allows viewers to log on and monitor the system without changing any system settings or starting/stopping the generator set. Setup and manual operation windows are disabled when the user logs on as a guest. A password can be assigned to the Guest account, if desired. See Section 2.9 for instructions.

2.3.4 Passwords

The factory-default usernames and passwords are shown in Figure 2-2. Enter the user name and password and click on the *OK* button.

Note: Usernames and passwords are case-sensitive. Type the default username and password using upper or lower case exactly as shown in Figure 2-2.

Username	Password	Access
SUPERVISOR	spw	Highest
USER	upw	Limited
GUEST	(blank)	View Only
Note: Usernames and passwords are case-sensitive.		

Figure 2-2 Default Usernames and Passwords

Change the usernames and passwords to prevent unauthorized personnel from using the program to view system information, start or stop the generator set, or change system settings. See Section 2.9 for instructions.

Selected parameters for the DXPower™ 1500 transfer switch controller require entering an additional distributor-level password when changing the setting. These parameters are factory set and should not require changes unless the controller is replaced. Obtain the distributor-level password from the DDC/MTU Power Generation Power Systems Service Department. See Section 6 for more information.

2.4 Main Window

After login, the program displays the main window with the welco screen shown in Figure 2-3. Use the buttons at the upper right corner to resize, minimize, or maximize the main window.

Use the pull-down menus at the top of the main window to access the commands shown in the following sections.
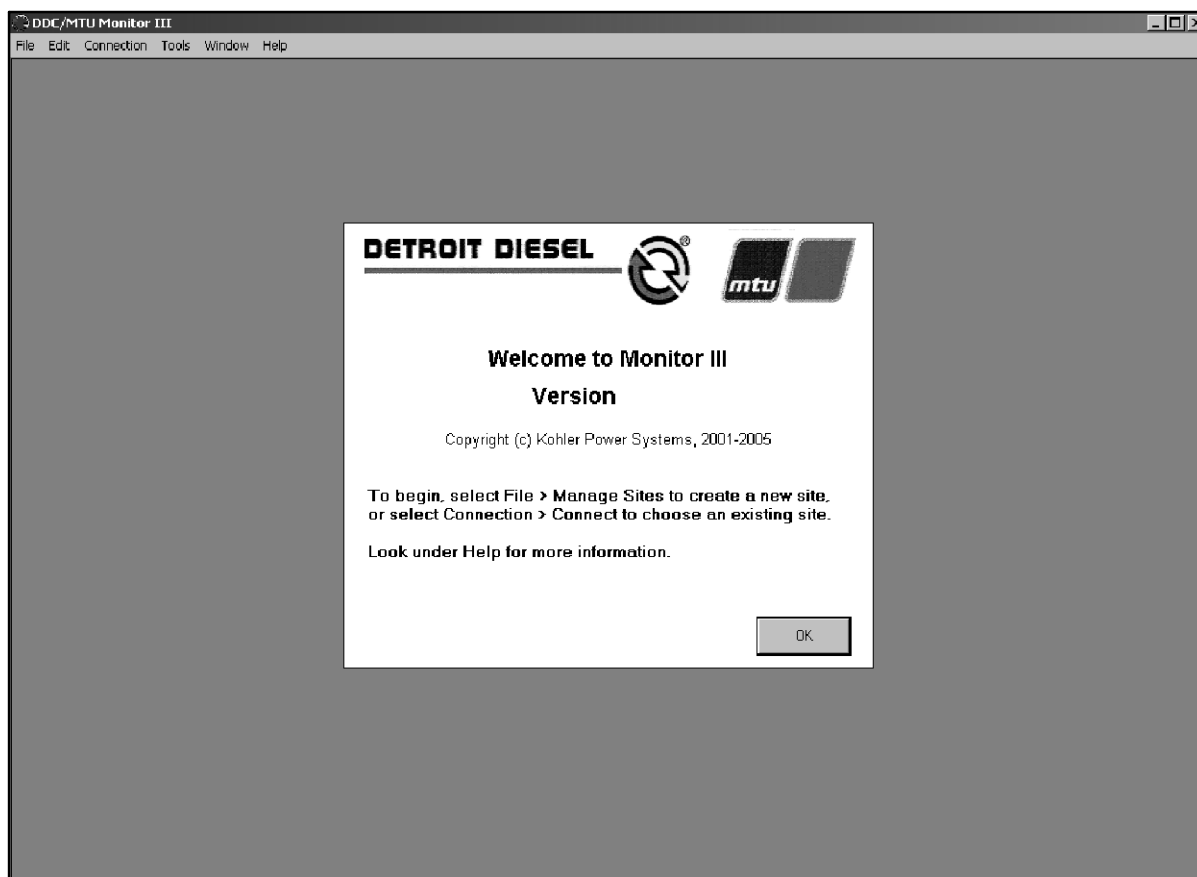
Figure 2-3 Main Window with Welcome Screen

2.5 File Menu

The file menu includes the following options:

- Manage Sites
- Open Screen
- Save Screen
- Save Screen As
- Restore Setup
- Save Setup
- Exit

The Screen commands are disabled if no windows are displayed. See Figure 2-4.
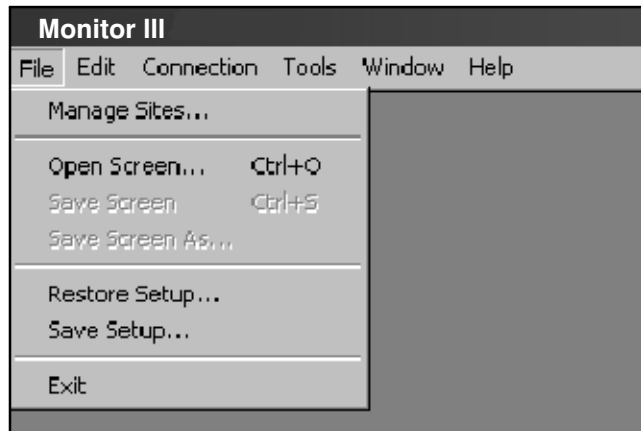
Figure 2-4 File Menu

2.5.1 Manage Sites

Use the *Manage Sites* command to define one or more sites before attempting to connect for the first time. A site is a location including one or more devices connected to the PC either through a direct RS-485 connection or through modems.

Choose *File→Manage Sites* to open the Site Management window. The Site Management window allows a supervisor or user to create, edit, or delete a site. See Figure 2-5.

Note: User- or Supervisor-level access is required in order to access the *Manage Sites* command. Guests cannot create, edit, or delete sites.

New.   Use New to create sites and set up their communication parameters before connecting. Click on New to open a blank Site Setup form. See Figure 2-6.

All sites that have been set up are displayed on the left side of the Site Management screen. Up to 256 sites can be displayed. A scroll bar will appear on the side of the list box if there are more sites than can be displayed at one time. Click on a name in the list to select a site and then choose Delete, Edit, or Done.

Delete. Use Delete to remove the selected site from the list. The Delete button is disabled if no site is selected.
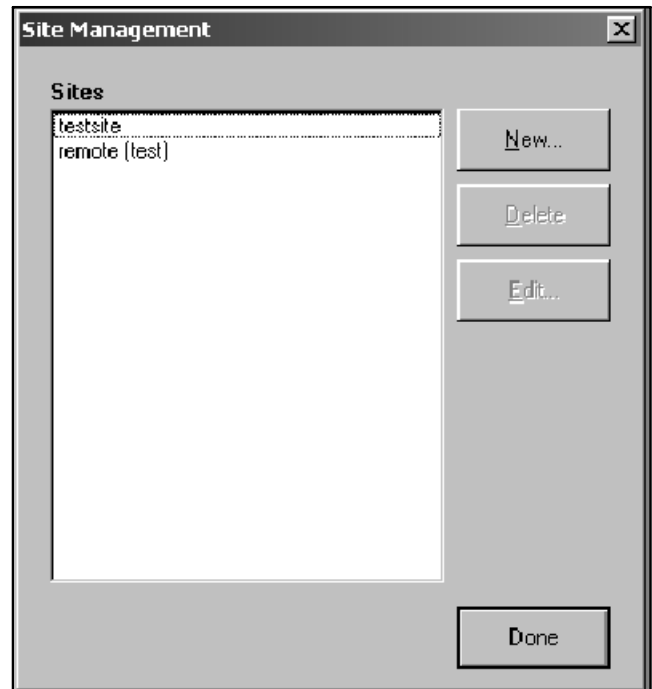
Figure 2-5 Site Management Screen
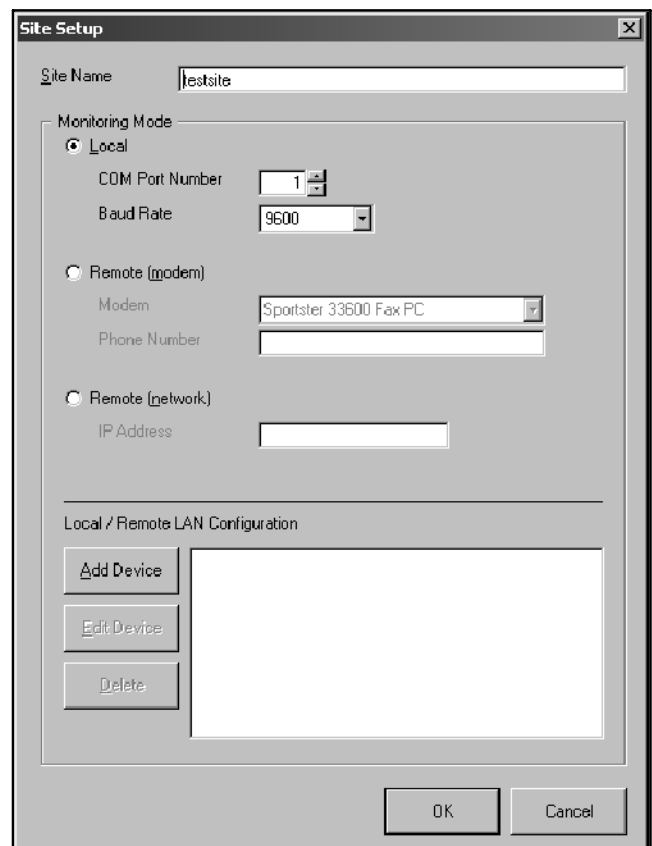
Figure 2-6 Site Setup Screen

Edit. Use Edit to change the site name or communication parameters, or to add, edit, or delete individual devices from the selected site. Clicking on the Edit button opens the Site Setup screen shown in Figure 2-6. Refer to Section 2.5.2 for instructions to edit the parameters in this screen.

Done. After creating and editing sites, select the Done button at the bottom of the screen to close the Site Management screen.

2.5.2 Creating or Editing a Site

Note: User- or Supervisor-level access is required in order to access the *Manage Sites* command. Guests cannot create, edit, or delete sites.

Selecting New or Edit from the Site Management window opens the screen shown in Figure 2-6. Complete all fields that are not disabled (grayed out) in the Site Setup screen. When finished, click on OK or press Enter to save any changes made to the sites. Click on Cancel to discard changes without saving.

Site Name (optional). Create a unique name to identify the site and type it into the Site Name box. Use a different name to identify each site.

Local Monitoring. Select Local if the site is connected directly to the PC using an RS-232 or RS-485 connection.

> **COM Port Number.** Select the COM port number used to connect the PC to the device.
>
> **Note:** Communications problems at startup are often caused by an incorrect COM port selection. If the PC does not communicate with the connected devices, try another COM port number. Numbers 1 through 4 are commonly used, but they can go as high as 256.
>
> **Baud Rate.** To set the baud rate for the PC, click on the drop-down arrow next to the Baud Rate box to display a list of available baud rates. Select the baud rate to match the baud rate on the connected devices.
>
> **Note:** The same baud rate must be used on the PC and all connected devices.

Remote (modem). Select Remote (modem) if modems are used to connect the PC to the site. (The PC may use an internal modem.)

> **Modem.** The program displays the modems found on the PC. Click on the down arrow next to the Modem box and select the PC modem.

Phone Number. Type the phone number for the site (device) modem into the Phone Number box, including the area code and any special characters needed. Use a comma to insert a slight pause if necessary.

Example: 9,1,9205551212 dials 9 for an outside line, pauses, dials 1 for a long distance number, pauses, then dials the area code and number, 9205551212.

Remote (network). Select Remote (network) for an Ethernet (TCP/IP) network connection.

> **IP Address.** Enter the IP address for the Modbus/Ethernet converter used with the connected devices. See Instruction sheet TT-1405 for instructions to assign the IP address to the converter. Required for Ethernet (TCP/IP) connections only.

Add Device. Click on Add Device to add a device to the site. All sites must have at least one device. The Device Screen will appear. See Figure 2-7.

> **Address.** Enter the device's network address (number 1–247). Each device in a site must have a different network address.
>
> **Note:** The address entered here must match the network address that was assigned to the device using the device keypad or DIP switches. The Monitor III program cannot be used to assign or change a device's network address. See TT-1405 and the controller Operation Manual. See the List of Related Literature.
>
> **Description (optional).** Type in a unique description for each device at the site. For controllers that have previously-assigned device designations or names, use that designation to avoid confusion. Refer to the controller operation manuals for instructions to assign the device designation.
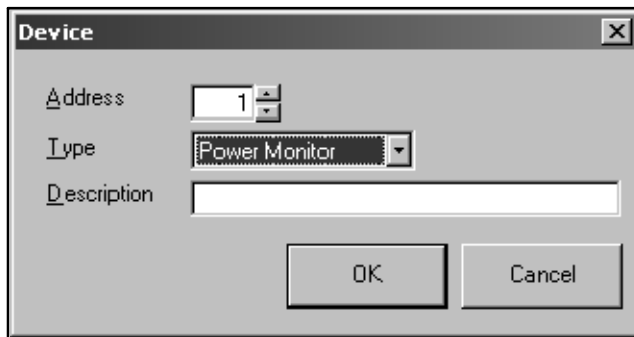

Figure 2-7 Device Screen

2.5.3 Copying Site Setup Information

Site setup information is stored in a file called site.dat and stored in the same directory as the Monitor III program files. To set up the same sites on more than one PC, copy the sites.dat file after completing the site setup. Be sure to paste the file in the same directory as the Monitor III program files.

Note: Do not edit the sites.dat file.

2.5.4 Save Screen and Open Screen

Screens can be saved to a file for reuse. Screens can include data windows for one or more devices at a single site. After creating the desired data windows and arranging them on the PC screen, use the following procedure to save the layout. Use the *Save Screen As* command to create a new file or *Save Screen* to update an existing Screen file.

Note: The *Save Screen* command does not save system settings (source parameters, time delay settings, etc.).

Procedure to Save a Screen to a File

1. Select *File→Save Screen As* from the menu bar as shown in Figure 2-4.

2. A dialogue box appears. See Figure 2-8. Type in a filename for the screen file. Choose a unique name that identifies the file for future reference. Screen files use the extension *.scn*. Do not type the filename extension; the program appends the extension to the filename automatically.

3. Click on the *Save* button.
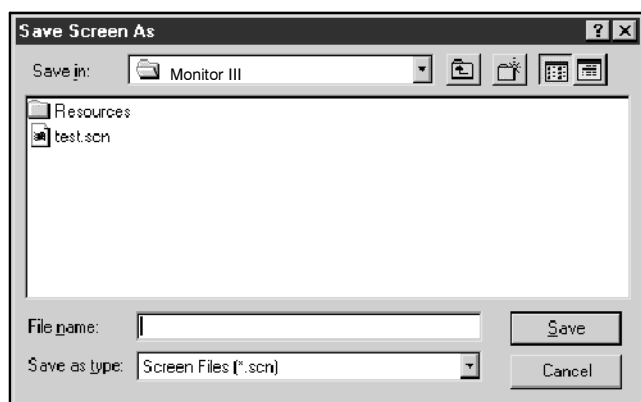
Figure 2-8 Save Screen

Procedure to Open a Saved Screen

The *Open Screen* command opens a file containing previously created data windows.

Note: You must connect to a site before opening a screen file.

Select *File→Open Screen* and then select the appropriate file from the list on the screen. Use the drop-down arrows to change directories if the file is located in a different directory than the one displayed in the *Look in:* box. With the file selected, click on the *Open* button. The saved screens appear in the program's main window when the file opens.

2.5.5 Save Setup and Restore Setup

The Save Setup and Restore Setup commands allow you to save device settings for time delays, input/output assignments, and any other settings that can be adjusted through Monitor III. This function only applies to the Digital 550 generator set controller and the DXPower™ 1000 transfer switch controller.

Settings can be made on one device, then saved and applied to other devices of the same type. These functions can be useful for controller replacement or to speed the setup of multiple controllers that use the same settings.

Procedure to Save Device Settings

1. Use the setup windows to set the desired time delays, inputs/outputs, and other settings on the device.

2. Select *File→Save Setup* from the menu bar as shown in Figure 2-4.

3. The Save Setup window appears. See Figure 2-9. Click on the device in the list and then click *OK*.

4. A dialogue box similar to the one shown in Figure 2-8 appears. Use the drop-down arrows to change directories if you need to save the file in a different location.

   Type in a filename for the data file. Choose a unique name that identifies the file for future reference. Do not type the filename extension; the program automatically appends the extension *.sdf*. Click on the *Save* button.
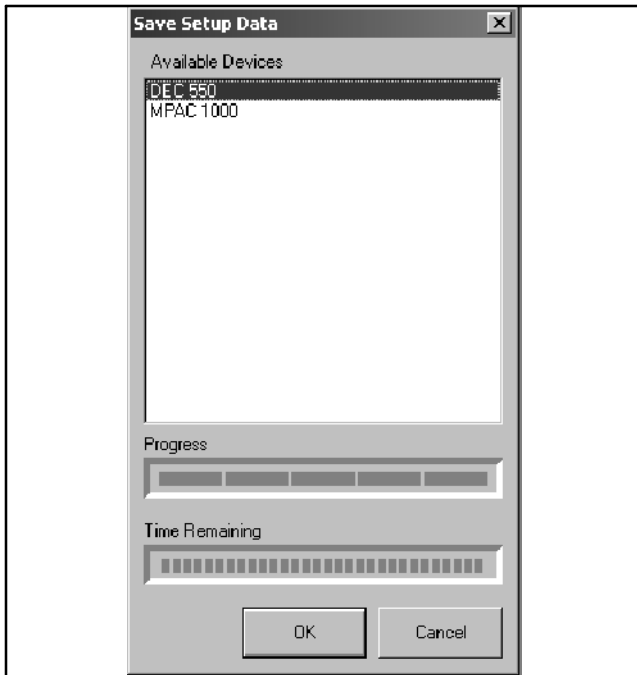
Figure 2-9 Save Setup

Procedure to Restore Device Settings

1. Select *File→Restore Setup* from the menu bar as shown in Figure 2-4.

2. The Restore Setup window (similar to the Save Setup window shown in Figure 2-9) appears. Click on the device in the list and then click *OK*.

3. A dialogue box listing the files appears. Use the drop-down arrows to change directories if the file is located in a different directory than the one displayed. Setup data files use the extension *.sdf*. Select the setup data file that contains the desired settings and click on the *Open* button.

2.5.6   Exit

Use the *File→Exit* command to exit the Monitor III Program after disconnecting from the site (see Section 2.6, Connection Menu).

The message shown in Figure 2-10 appears at exit if any data windows have been added or removed. The *Save Screen* command allows the displayed set of data windows to be saved and then reopened later, eliminating the need to open and position the windows individually at each use of the program. Select *Yes* to save, *No* to exit without saving, or *Cancel* to cancel the exit command and return to the program. See Section 2.5.4 for more information.
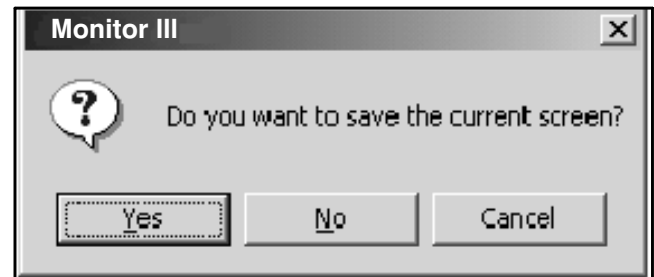
Figure 2-10 Save Screen

2.6 Connection Menu

The *Connect* command attempts to open the communication port and establish communications with a site. See Figure 2-11.

Note: Each device must be configured for Modbus communication. Refer to the controller Operation Manual for instructions.

Select *Connection→Connect* to open the Connect window shown in Figure 2-12. Click on one site in the list to select it, then click on the Connect button at the bottom of the window to connect to that site. The Site Overview window automatically appears after connection. See Section 2.7 for instructions for using the Site Overview window.

The *Disconnect* command closes the communication port.

Note: Monitor III communicates with one site at a time. Disconnect before attempting to connect to another site.
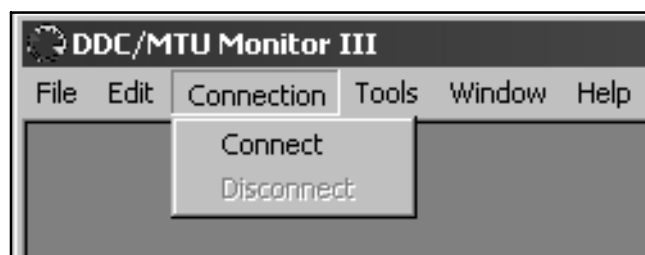
Figure 2-11 Connection Menu
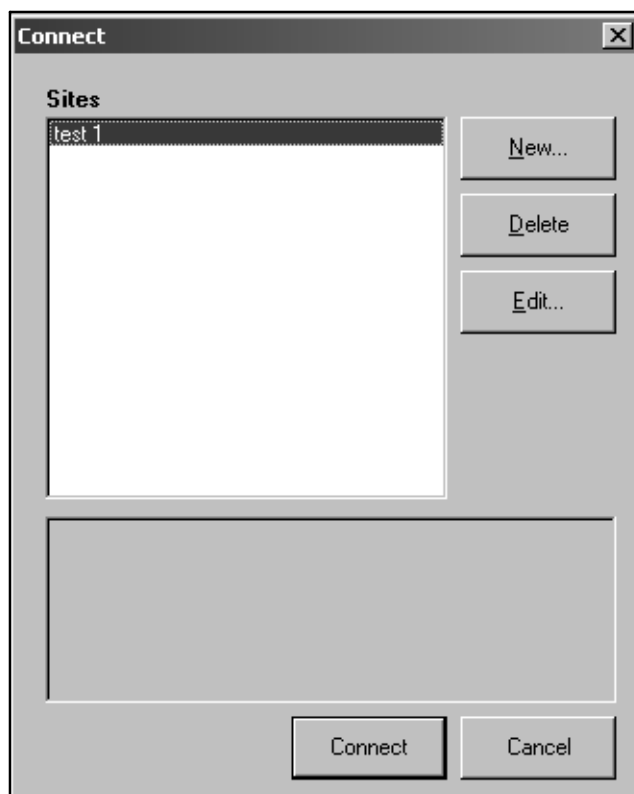
Figure 2-12 Connect Window

2.7 Site Overview Window

Connecting to a site opens the Site Overview window shown in Figure 2-13. For transfer switch controllers, the Site Overview window displays the ATS position (Normal, Off, or Emergency), the available sources, and system status for each device at the connected site. For generator sets and power monitors, the system status is displayed in the lower part of the window as shown.

2.7.1 ATS Controllers

Site Name. The site name appears at the top of the window. The site name was assigned using the Site Setup Screen under the Site Management window. See Section 2.5.1.

Addr (address). The Addr (address) column shows the network address for each ATS at the site. The network address must be assigned at the device and entered into Monitor III during device setup. See Section 2.5.2.

Description. The Description column displays the ATS description that was assigned during the device setup. See Section 2.5.2, Creating or Editing a Site. Assign a unique description to each ATS for identification.

Position. The Position column shows the contactor position, Normal, Emergency, or Off (programmed-transition models only). The color of the box also indicates position:

● Green when the contactor is in the Normal position

● Yellow when the contactor is in Off

● Red when the contactor is in Emergency
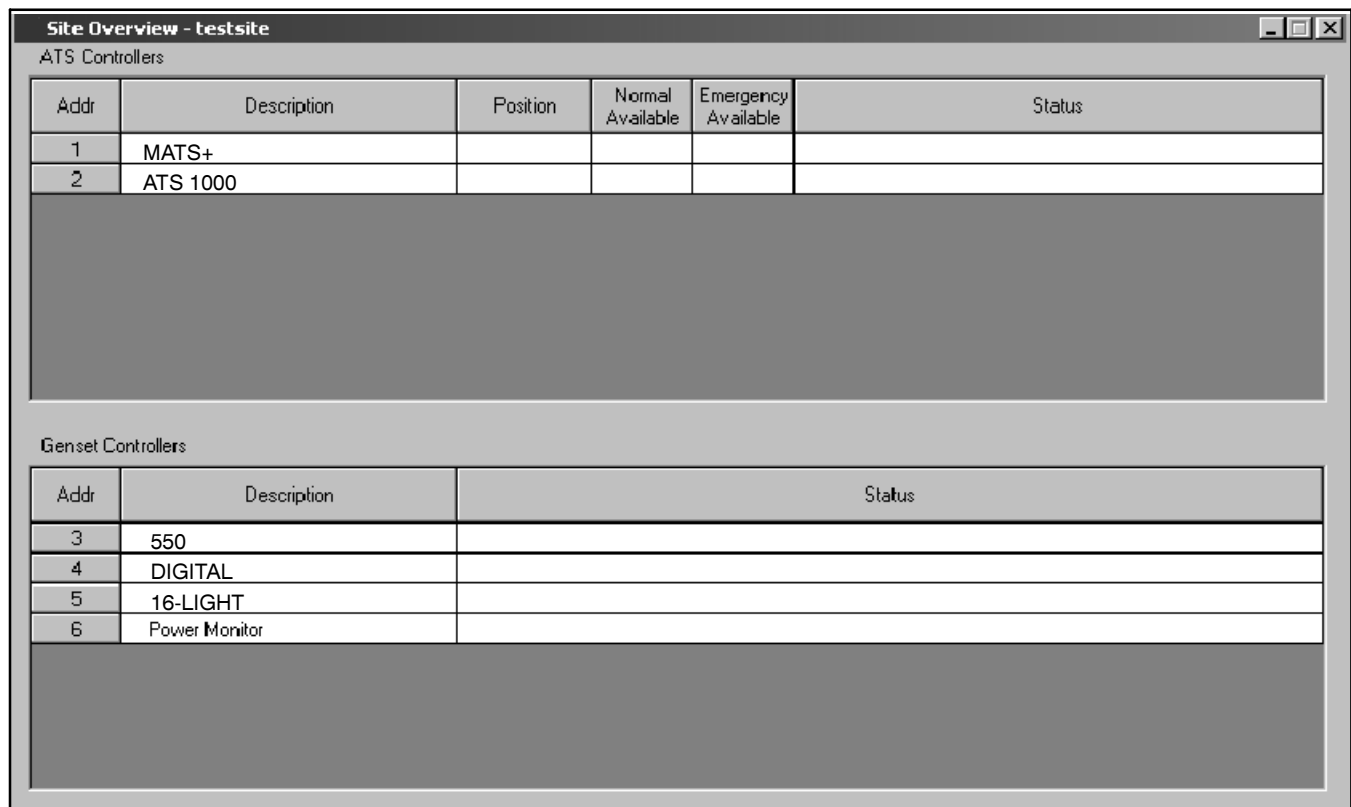
Normal Available, Emergency Available. An X in the Normal Available and/or Emergency Available columns shows that the indicated source is available.

Status. The Status column displays messages indicating the condition of the device. Some possible system status messages are:

● System Ready
● Test Running
● Fault
● Lost Communications
● Failure to Acquire Standby

If one of the devices indicates a fault condition, the status box for that switch displays a fault message and the display flashes red.

Figure 2-13 Site Overview Window

2.7.2 Generator Set Controllers and Power Monitors

Description. The Description column displays the description assigned when the site was created. See Figure 2-7. Assign a unique description to each controller or power monitor for identification.

Status. The Status column displays messages indicating the condition of the device. Some examples of system status messages are:

● System Ready (all except 550-series controllers)
● Generator Running (all controllers)
● Fault codes (some controllers)
● Lost Communications (check connections)

If one of the devices indicates a fault condition, the status box for that device displays a fault message and flashes red.

2.7.3 Opening Data Windows from the Site Overview Window

Data windows can be opened from the Site Overview window. See Figure 2-13. Double-click on the device in the Site Overview table to open the Add Window screen for that device. See Figure 6-1. Or, use the Add Window screen to open any available data window for the selected device.

See Section 2.10 for more information about adding and using data windows.

When the Site Overview window is closed, the *Window→New Window* command can be used to open data windows. See Section 2.10.

2.8 Edit Menu

The *Edit* menu allows the user to cut, copy, and paste selected text. See Figure 2-14. With some systems, the *Edit* commands can be accessed by clicking the right mouse button while the setup window is active.

The *Cut* and *Copy* commands are enabled only when text that can be cut or copied is selected. The *Paste* command is only enabled when there is text on the clipboard that is available to paste.
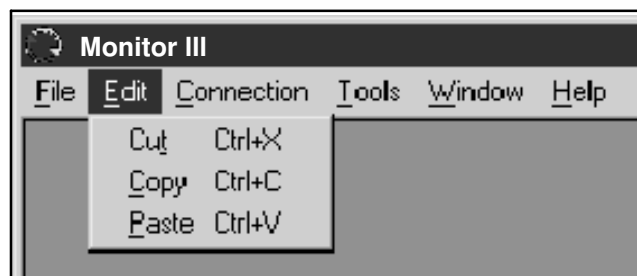
Figure 2-14 Edit Menu

2.9 Tools Menu

Use the *Tools* menu to change the software user name and password and to set the PC's communication settings. See Figure 2-15.
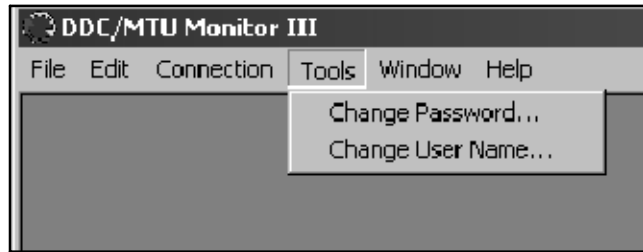
Figure 2-15 Tools Menu

2.9.1   Change Password

Use this window to change the password. See Figure 2-16. The default passwords are shown in Figure 2-2.

Log in at the level to be changed (supervisor, user, or guest). The window displays the name of the user logged on to the program. Type in the old password, the new password, and the new password a second time for confirmation. To ensure confidentiality, the passwords do not appear on the screen. Click on the *OK* button to enter the new password. Click on the *Cancel* button to discard the changes and keep the old password.

Note: Passwords and user names are case-sensitive. Use upper and lower case letters as you want them to be typed at login. Check the *Caps Lock* key when typing passwords.
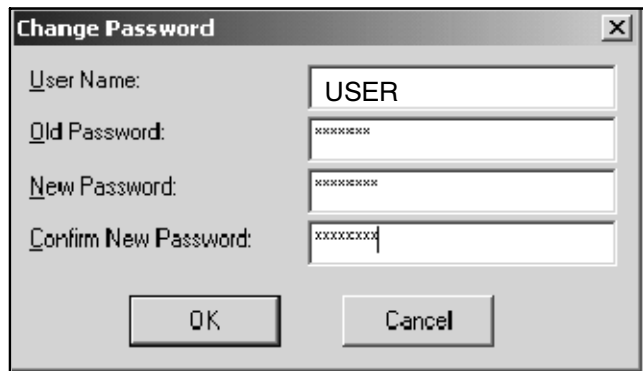
Figure 2-16 Change Password

2.9.2   Change User Name

Use this window to change the user name of the person who is logged in. See Figure 2-17. The default usernames are shown in Figure 2-2.

Log in at the level to be changed (supervisor, user, or guest). The window displays the current user name near the top. Type in the new user name and type it again in the second box to confirm it. The new names appear on the screen as they are typed. Click on *OK* to accept the new user names, or *Cancel* to discard the change and keep the old user name.

The program verifies that the new names match before accepting the change.

Note: Passwords and user names are case-sensitive. Use upper and lower case letters as you want them to be typed at login.
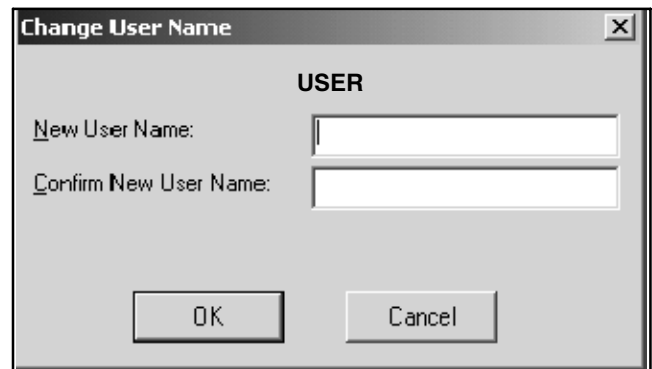
Figure 2-17 Change User Name

2.10 Window Menu

Use the *Window* menu to open new data windows, select an open window, enter the setup screen for an existing window, arrange windows on the screen, and delete windows. See Figure 2-18.

This section gives general instructions for creating and working with data windows. Refer to Sections 3 through 9 for detailed descriptions of the available windows for each device.

Note: You must be connected to a site in order to add a window.

2.10.1 New Window

The New Window command creates data windows on the screen. Connect to a site before trying to create data windows. See Section 2.6.

Select *Window→New Window...* from the main window pull-down menus. The program displays the Add Window screen shown in Figure 2-19.

The list on the left side of the Add Window screen contains all devices at the connected site. Click on one

device in the list to select that device. Then select one or more data windows from the list on the right side of the screen. You can select multiple items from the list by holding down the control (*Ctrl*) key and clicking on each item. Or, select blocks of items by clicking on the first item, then holding down the *Shift* key while clicking on the last item in the block. The selected data windows will be highlighted. Click on *OK* to open the highlighted data windows for the selected device.
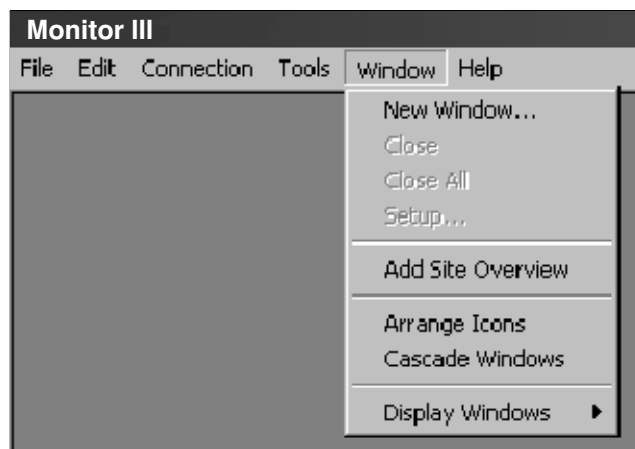
Figure 2-18 Window Menu
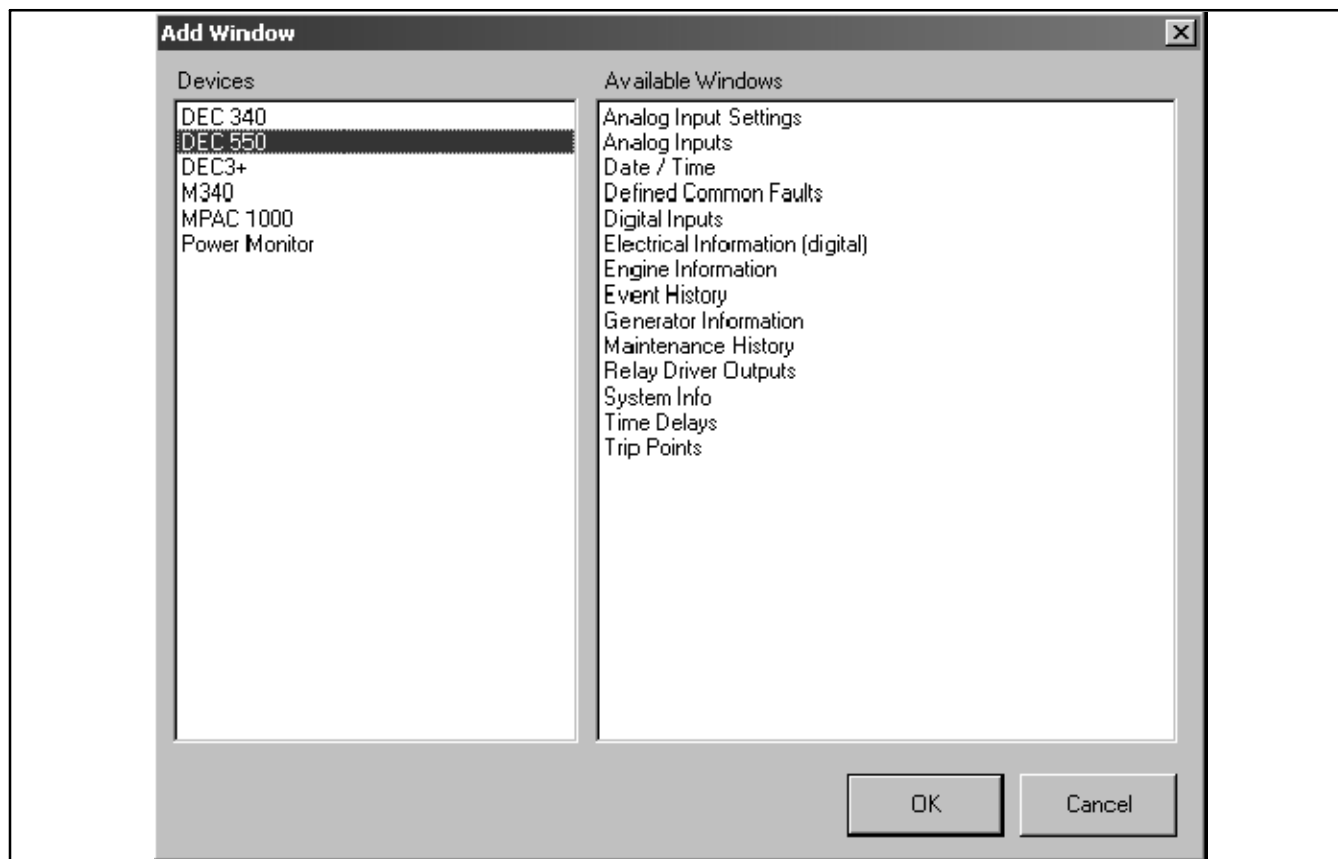
Figure 2-19 Typical Add Window Screen

To create data windows for a different device at the connected site, click on the device designation in the list on the left side of the screen. The available data windows for that device will be listed on the right side of the screen.

Data windows that have already been added to the user screen do not appear on the list. If all data windows have been added to the user screen, the list is empty.

Click on *Cancel* or the **X** button at the upper right corner of the screen to return to the main window.

See the individual device sections of this manual for more information about available data windows for that device.

2.10.2 Working with Data Windows

Data Window Title Bar

The colored title bar at the top of the window contains the following information for the device:

● Network address

● Description (entered in the Add Device screen; see Section 2.5.2)

● Data window name, in brackets (factory-set)

Long device descriptions may cause the title bar information to be cut off in some smaller data windows. Place the cursor over the title bar to display the entire line.

Data Window Size

If part of a data window is not visible on the screen, try the following solutions (see Figure 2-20):

● Click on the maximize button to expand the main window to full size.

● Move the data window by clicking in the title bar and dragging the window to a better location.

● Use the scroll bars on the main window to view the other part of the screen.

● Change the screen area of your PC monitor to 1024 X 768 pixels or more:

   ● Select Start→Settings→Control Panel.

   ● Click on Display, choose the Settings tab, and find the Screen Area setting. Slide the bar in the More direction to increase the number of pixels.

   ● Click on Apply and then OK. Click on Yes to keep the new settings if you are happy with the result.

Note: Changing the monitor screen area will affect the look of other applications on the PC.

1. Maximize button
2. Scroll bars
3. Title bar (click and drag to move window)
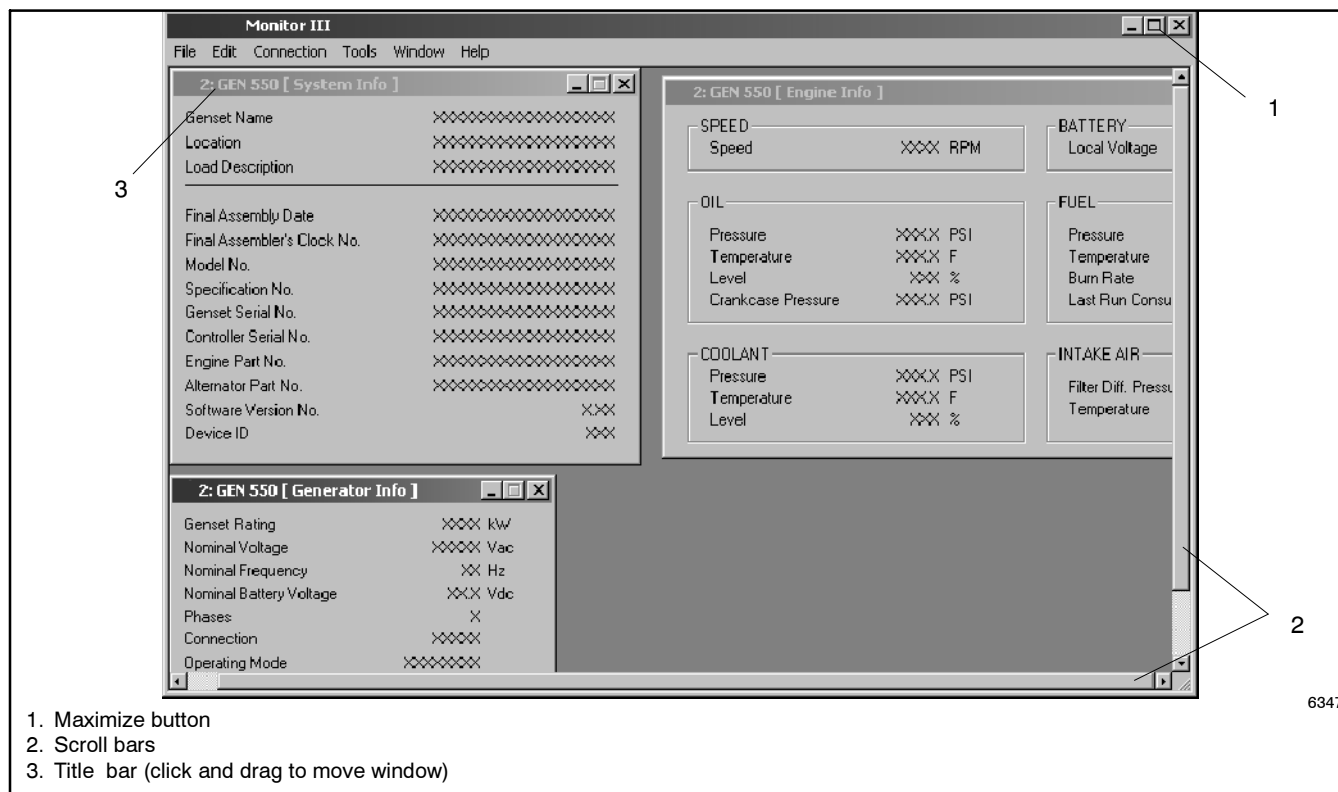
Figure 2-20 Working with Data Windows

2.10.3 Setup Windows

Setup windows allow you to change selected settings for the Digital 550 generator set controller and the DXPower™ 1000 ATS controller.

First select the data window for the function that you want to work with. Then choose *Window→Setup* or double-click on the active data window to open the setup window for that function. Figure 2-21 shows a typical data window with its corresponding setup window.

Note: The data window for a function must be open and selected before the setup window can be opened. The Setup command is grayed-out if the selected data window does not have a setup window associated with it.

When the user presses the OK button or Enter, all of the settings will be sent to the controller. If the user presses Cancel or X, the screen will be dismissed without warning and no changes will be made.

The setup windows use several methods to enter system information and settings. This section gives general instructions about how to use the different methods to enter information.

Radio Buttons. A radio button appears as an open circle. Position the cursor inside the open circle and left-click to select the desired option. The selected radio button has a dark dot in the center. Radio buttons allow the selection of only one of the options in a set. Selecting one radio button in a set of options deselects, or turns off, all of the other options.

Check Boxes. Check boxes are open rectangular boxes. A selected check box contains a check mark. Position the cursor inside the box and click to select or deselect the option. Check boxes allow the selection of any or all of the options in the set. Selecting one option with a check box will not deselect the other options in a set.

Data Entry Boxes. Data entry boxes allow you to type in text or numerical data from the keyboard. Position the cursor inside the box, left-click, and type in the new information. If the box already contains information, double-click to highlight the text before typing the new information. Some items show the acceptable range of settings after the data entry box. Verify that the data you enter falls within the range shown. If the setting does not fall within the acceptable range, the system will not accept the change.

Drop-Down Arrows. A drop-down arrow appears as a down arrow in a box at the end of a line. Position the cursor on the down arrow and click to display a selection list. Click on an item in the list to select it. The selected item appears in the box next to the arrow.

Up and Down Arrows. Up and down arrows appear in boxes after a data entry box containing a numerical setting. Click on the up arrow to increase the number or the down arrow to decrease the number. You can also double-click inside the data box and type in the setting directly, provided it falls within the acceptable range.

Password Boxes. Selected parameters for the DXPower™ 1500 transfer switch controller require entering an additional distributor-level password when changing the setting. These parameters are factory set and should not require changes unless the controller is replaced. Type the password into the box provided before clicking on OK to change the setting. See Section 6 for more information.

OK and Cancel Buttons. The *OK* and *Cancel* buttons appear at the bottom of each window. Make changes to the selections or data entry boxes, and then click on *OK* to accept the changes and enter them into the system. If the *OK* box is highlighted on the screen, pressing the *Enter* key will also enter the changes. Click on *Cancel* to discard the changes without sending them to the device.

Note: The software does not send changes to the device until the *OK* button is clicked.

Confirmation Boxes. Clicking on *OK* to enter some changes prompts a confirmation box to appear on the screen before the system sends the changes to the device. Double check your selections and their effect on the system before clicking on *OK* to confirm the changes.
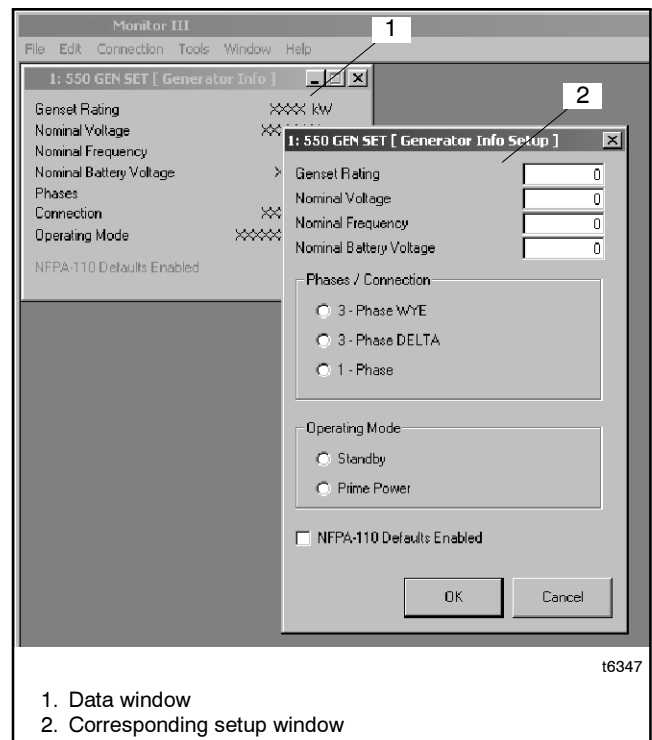

t6347

1. Data window
2. Corresponding setup window

Figure 2-21 Data and Setup Windows (typical)

2.10.4 Add Site Overview

If the Site Overview window has been closed, select *Window→Add Site Overview* to open it again. See Figure 2-13.

2.10.5 Arrange Icons

Minimizing windows by clicking on the ▬ symbol in the upper right corner of the window reduces the window to an icon. Select *Window→Arrange Icons* to arrange the icons neatly at the bottom of the main window.

2.10.6 Cascade Windows

Choose *Window→Cascade Windows* to arrange the windows on the screen. The *Cascade Windows* command is enabled only when two or more data windows are on the screen.

2.10.7 Display Windows

Choose *Windows→Display Windows* to see a list of all windows that have been created on the screen. Select a window from the list to bring it to the top and activate it.

2.11 Help Menu

Choose *Help→About...* for information about the software. See Figure 2-22.
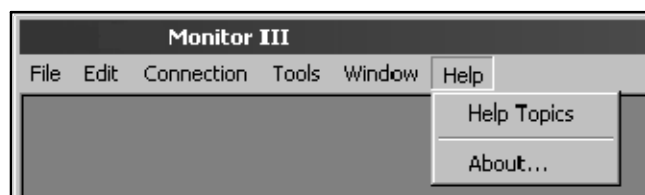
Figure 2-22 Help Menu

The *Help Topics* option contains the contents of this instruction manual in a .pdf file format. Adobe®

Acrobat® or Adobe® Reader® is required to display the Help file.

The *About...* box displays the software name, version number, build date, and copyright information. Record the software version number on the inside front cover of this manual for future reference.

Click on the *System Info* button to launch the Microsoft® system information application if it is available on your PC.

Click on the *OK* button to close the window.

2.12 System Tray

An icon in the box at the lower right corner of the screen indicates whether the PC is connected to the site. See Figure 2-23.

● A green icon indicates that the PC is communicating with the site.

● A red icon indicates that the devices are not connected.

If there are connection problems, check the selected COM port and the hardware connections (see TT-1405).

1. Connection icon: green=connected, red=disconnected
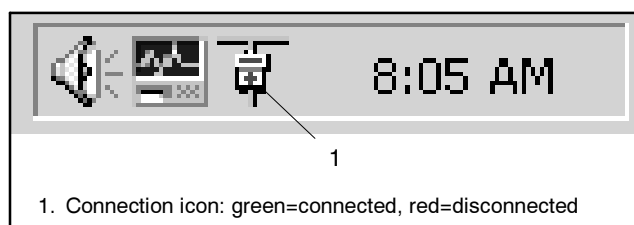
Figure 2-23 System Tray

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2.13 Error Messages

Message windows indicate errors or prompt the user to save the screen before exiting.

2.13.1 Incorrect User Name or Password

The following messages may appear:

● *The user name or password is incorrect. User names and passwords are case sensitive.* See Figure 2-24. This message can appear when the username or password is being changed or if the user tries to enter an old user name/password combination.

● *The new passwords typed do not match.* See Figure 2-25.

● *The usernames typed do not match.* See Figure 2-26.

If any of these messages appear, check the spelling and capitalization of the password or username carefully, and then retype it in both boxes.

> **Note:** Passwords and usernames are case sensitive. Check the *Caps Lock* key before typing.

Figure 2-24 Login

Figure 2-25 Change Password

Figure 2-26 Change User Name

2.13.2 Invalid Hardware Key Message

On some systems, Monitor III may display an error message when the USB hardware key is applied. See Figure 2-27. The error is the result of a compatibility issue between the USB hardware key and the Microsoft Windows operating system on your personal computer. The error has been known to occur with various Microsoft® Windows® Win32 and Win64 applications.

If the error appears, you must download a new device driver to support the hardware key. Go to http://www.aladdin.com/support/hasp/hasp4/enduser.asp and select the device driver appropriate to your PC operating system. A link to the site is also provided on Tech Tools on the Kohlernet. Go to www.kohlernet.com and use your SecurID Card to log in. Click on Tech Tools, then Software, then Monitor III and then the link. Select the file for the HDD32 device. Follow the instructions in the readme.txt file associated to the download.

Figure 2-27 Invalid Hardware Key Message

2.13.3 Missing Hardware Key

The message shown in Figure 2-28 appears at program startup if the harware key is not inserted into the PC's USB port.

A red LED on the key indicates that the key is activated. If the message appears when the key seems to be properly inserted, contact your system administrator.

Figure 2-28 Missing Hardware Key

2.13.4 Failed to Start Messages

The following error messages are related to the hardware key device driver:

● Failed to Start the Aladdin Device Driver

● Failed to Start a Service in the Service Control Manager Database

If one of these messages appears, follow these steps to reinstall the HASP device driver:

Procedure to Reinstall Hasp Device Driver

1. On your PC, go to:
   C:/Program Files/DDC/MTU/ MonitorIII.

2. Click on hdd32.exe and follow the instructions on the screen to reinstall the device driver.

2.13.5 Communication Errors

A Lost Communication error message can indicate a physical loss of connection or a problem with communication settings. Check connections, controller settings, and the site settings in Monitor III. See TT-1405 and Section 2.5.2 of this manual.

Monitor III may appear to stop communicating if the user attempts to change a parameter that cannot be changed. For example, attempting to change 550 controller settings when the controller is set to the Local programming mode will cause Monitor III to seem to stop communicating as it repeatedly attempts to change the setting.

3.1   Introduction

The Monitor III Program allows viewing and adjustment of selected settings for generator sets equipped with the 550 controller.   The software provides the following functions.

- Manual operation (password-protected):
  - Start and stop the engine
  - Timed run
  - Reset maintenance records
  - Reset faults
- View and adjust (password-protected):
  - Analog input settings
  - Common alarms
  - Date and time
  - Digital input settings
  - Generator information, including nominal ratings, connection type, and operating mode
  - Relay driver output assignments, status, and settings
  - System information, including generator set name, location, and description
- View only:
  - Analog input status
  - Electrical information, including voltage, frequency, current, and power
  - Engine status information
  - Event history
  - Maintenance information
  - Factory-set system information, including specification numbers and serial numbers

The view only items listed above can be changed using the controller keypad.   See the controller Operation manual.

Some information displayed on the 550 controller is not displayed in Monitor III. For example, some information for DDEC or MDEC-equipped engines shown in the 550's Menu 2 is not displayed in Monitor III. See the 550 Controller's Operation Manual.

The Monitor III Program cannot be used to view or adjust the controller's communication settings, i.e. the network address or the network interface baud rate. Use the controller keypad to view and adjust communication settings.

3.2   Controller Connection and Setup

Refer to TT-1405, provided with the Monitor III software kit, for controller connection and setup instructions. Connect the controller to the PC or network and configure the controller for communications. Refer to the controller Operation Manual for instructions to use the controller's keypad to set the communications parameters.

Use the controller's keypad to set the communication protocol in Menu 13 to Modbus Online. Use the keypad to set the programming mode in Menu 14 to Remote in order to use Monitor III to change controller settings. If the programming mode is set to Local, Monitor III can display the controller settings but not change them.

Set the other communication parameters as required for the connection type as described in TT-1405.

3.3 Data Windows

Select Window→New Window to open the Add Window screen. Select the generator set/controller from the list on the left. The available data windows for the selected controller appear on the right. Figure 3-1 illustrates the list of available data windows for the 550 controller.

The Manual Operations window allows remote starting and stopping of the generator set, resetting faults, and resetting maintenance records. User or supervisor access is required to perform Manual Operations.

Setup windows are available for some windows. The setup windows allow changes to selected controller settings including system parameters, time delays, trip points, alarms, inputs, and outputs. Supervisor-level access is required to access the setup windows.
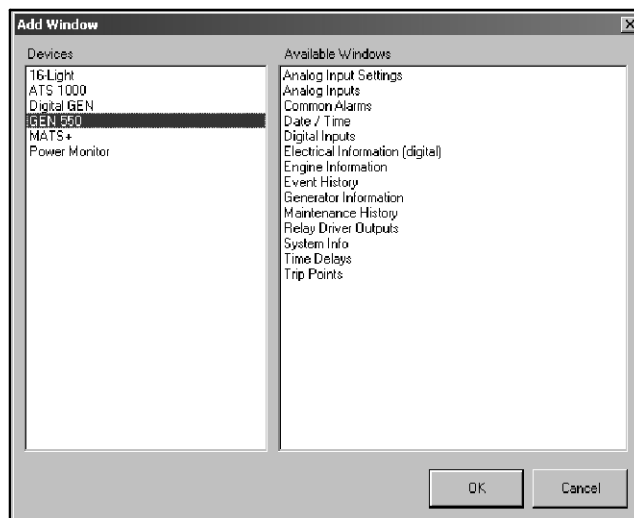

Figure 3-1 Add Window

3.4 Data Window Summary Table

The following table summarizes the available data windows and indicates which setup windows are available. More details about selected data windows are given after the table.
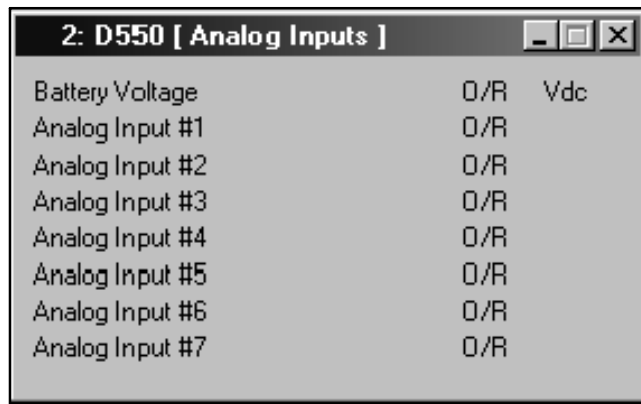
Data Window	Display	Setup	Item	Notes
Analog Inputs	X		Battery Voltage	VDC
			Aux. Analog Inputs #1–#7	
Analog Input Settings	X	X *	Aux. Analog Inputs #1–#7	High Shutdown Limit †
				High Warning Limit †
				Low Warning Limit †
				Low Shutdown Limit †
				Inhibit time, 0–60 sec.
				Warning time, 0–60 sec.
				Shutdown Time, 0–60 sec.
				Shutdown Enabled/disabled (checkbox)
				Warning Enabled/disabled (checkbox)
Common Alarms	X	X	Assigned common alarms	Add and remove items from the common alarm. See the controller Operation Manual for available alarms
Date/Time	X	X	Date	
			Time	
			Synchronize with Computer Button (setup only)	
Digital Inputs	X	X	Function Assigned	
			Inhibit Time	minutes:seconds (mm:ss)
			Delay time	minutes:seconds (mm:ss)
			User-assigned description	Type custom description in setup window
			Enable/disable (setup only)	Checkbox (setup only)
Electrical Info	X		Frequency	Hz
			% of Rated kW	% (percent)
			Voltage L1–L2	Line-to-line voltage
			Voltage L2–L3	
	X		Voltage L3–L1	Line-to-line voltage
			Voltage L1–L0	Line-to-neutral voltage
			Voltage L2–L0	

* Double click on one analog input in the data window to open the setup window for that input only.

† For analog input settings, enter the scaled values appropriate to each sensor.

Data Window	Display	Setup	Item	Notes
Electrical Info, continued	X		Voltage L3–L0	Line-to-neutral voltage
			Current L1	Amps
			Current L2	
			Current L3	
			Power Factor	Total, L1, L2, and L3; leading or lagging
			kVA	Total, L1, L2, and L3
			kW	Total, L1, L2, and L3
			kVAR	Total, L1, L2, and L3
Engine Info (units defined at controller)	X		Speed	RPM
			Oil	Pressure
				Temperature
				Level
				Crankcase pressure
			Coolant	Pressure
				Temperature
				Level
			Battery	ECM Voltage, VDC
			Fuel	Pressure
				Temperature
				Burn Rate
				Last Run Consumption
			Intake Air	Filter Diff. Pressure
				Temperature
Event History	X		Date, time, and event	Up to 100 events with up to two parameters per event can be displayed
			Save History button	Saves to an ASCII text .log file. Operator enters the filename and path.
Generator Info	X	X	Genset Rating	kW
			Nominal Voltage	System voltage
			Nominal Frequency	System frequency, Hz
			Nominal Battery Voltage	VDC
			Phases	1 or 3
			Connection	Wye or Delta (3-phase)
			Operating Mode	Standby or prime power
			NFPA 110 Defaults	Enabled/Disabled (checkbox)
Maintenance	X		Run time	Total and since last maintenance
			Loaded run time	
			Unloaded run time	
			kW hours	
			Number of starts	
			Last maintenance date	See Manual Operations to reset
			Operating days	
			Last Run	Date
				Time
				Run time
				Loaded or unloaded

Data Window	Display	Setup	Item	Notes
Maintenance, continued		X	Timed Run	Engine run time, 0:01–72:00 hours:minutes
				Set run time
				Start engine button
				Stop engine button
			Reset maintenance records button	
			Reset faults button	
RDO Summary	X	X	Relay Driver Output assignments, ON/OFF	Click on the each line to set up single RDOs. See the controller documentation for available functions.
		X	Software-controlled RDOs	Turn each SCRDO on or off (checkbox)
		X	Setpoints	Select high shutdown, high warning, low warning, or low shutdown for selected functions
System Info	X	X	Genset Name	User-defined, setup window
		X	Location	
		X	Description	
			Final Assembly Date	Factory-set, not adjustable
			Final Assembler's clock number	
			Model Number	
			Specification Number	
			Genset serial number	
			Controller serial number	
			Engine part number	
			Alternator part number	
			Software version number	
Time Delays	X	X	Engine Start	0:00–5:00 minutes:seconds
			Engine Cooldown	0:00–10:00 minutes:seconds
			Overvoltage	2–10 seconds
			Undervoltage	5–30 seconds
			Starting Aid	0–10 seconds
			Load Shed	2–10 seconds
			Crank On	00:01–01:00 minutes:seconds
			Crank Pause	00:01–01:00 minutes:seconds
			Max. Crank Cycles	1–6
Trip Points	X	X	Load Shed Output	% of rating and kW
			Overvoltage	% of nominal and Volts
			Undervoltage	% of nominal and Volts
			Overfrequency	% of nominal and Hz
			Underfrequency	% of nominal and Hz
			Overspeed	Hz and RPM
			High Battery Voltage	VDC
			Low Battery Voltage	VDC

3.5 Analog Inputs

The Analog Inputs data window shows the status of each analog input.

Figure 3-2 Analog Input Values (display)

3.6 Analog Input Settings

The Analog Input Settings window displays the warning and shutdown limits and time delays for each analog input and allows adjustments to the settings. See Figure 3-4.
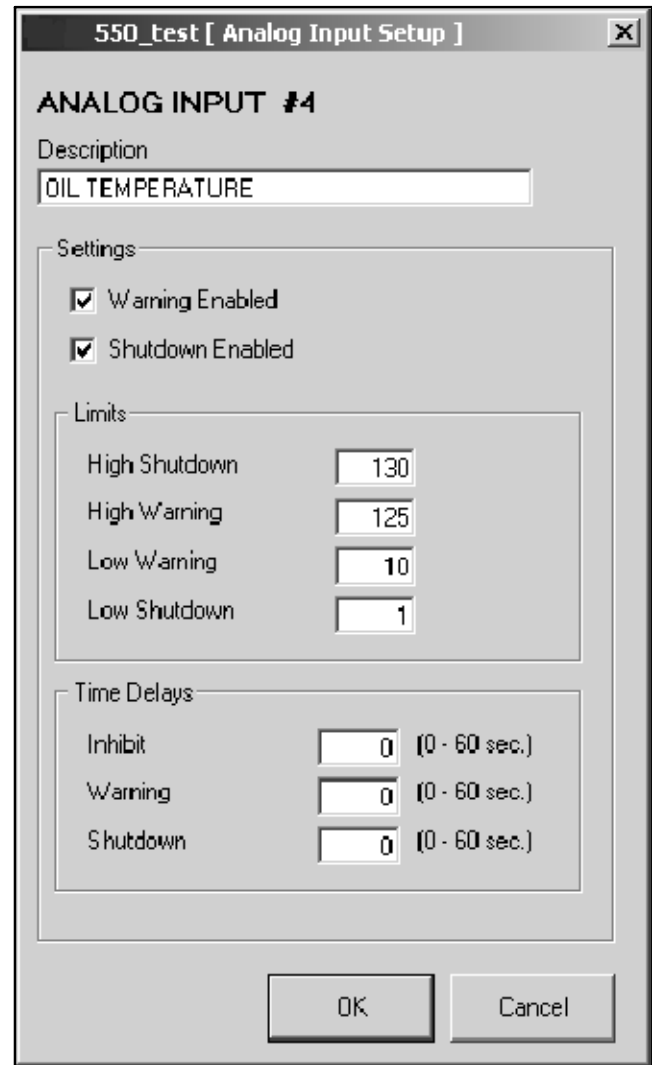
Open the Analog Input Settings data window and then use the instructions in the following procedure to change settings. The setup window for only one input can be open at a time.

Changing Settings

Position the cursor on the input to be changed and double click to open the setup window for that input. See Figure 3-3.

1. Type a descriptive name for the input into the Description box.

2. Select warning or shutdown by clicking on the appropriate box.

3. Enter the limits and time delays in the boxes provided. For the limit settings, enter the appropriate scaled value for each input sensor. See MP-6140, Controller Application and Setup Manual, for instructions to calibrate analog inputs.

4. Click OK to send changes to the device or Cancel to discard the changes.

Figure 3-3 Analog Input Setup Window for a Single Analog Input (example settings shown)

Input No.	Description	High Shutdown Limit	High Warning Limit	Low Warning Limit	Low Shutdown Limit	Inhibit Time (sec)	Warning Time (sec)	Shutdown Time (sec)	Shutdown Enabled	Warning Enabled
1	Aux. Analog Input #1	99	90	89	0	30	5	5	X	
2	Analog Auxiliary In	100	90	10	5	30	5	5		X
3	Analog Auxiliary In	100	90	10	1	30	5	5		X
4	Analog Auxiliary In	100	90	15	1	30	5	55	X	X
5	Analog Auxiliary In	100	90	10	1	30	5	5		X
6	Analog Auxiliary In	100	90	10	1	30	5	5		X
7	Aux. Analog Input #7	100	35	33	4	60	0	60	X	

Figure 3-4 Analog Input Settings Display Window

3.7 Common Alarms

3.7.1 Common Alarm Display

Use this window to view the events that are assigned to the controller's common fault.

If more events are assigned to the common fault than can be displayed in the text box, the scroll bars are enabled.

3.7.2 Common Alarm Setup

Double click anywhere on the common alarms data window to open the setup window.

Use this window to assign events to the controller's common alarm.

All events assigned to the common fault are displayed in the Assigned Events box on the right. Any events not assigned to the common fault are displayed in the Available Events box on the left. Note that these boxes are mutually exclusive so an event will not appear in both.

Click the Add button to move the selected events in the left box into the assigned box. Press the OK button to send the events to the controller. If no events in the left box are selected, the Add button is disabled.

Clicking the Remove button will move any selected events in the right box into the available box. If no events

in the right box are selected, the Remove button is disabled.

Clicking the Select All or Clear All buttons will select all remaining or clear all selected events respectively from the box above the button pair. If there are no events in a list box, its associated Select All and Clear All buttons are disabled.

If no events are selected in a text box, its associated Clear All button is disabled.

If more events are in a text box than can be displayed, the scroll bar for that box is enabled.
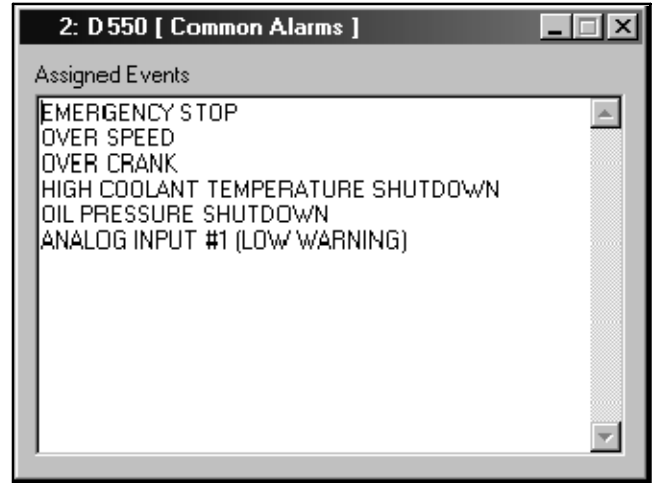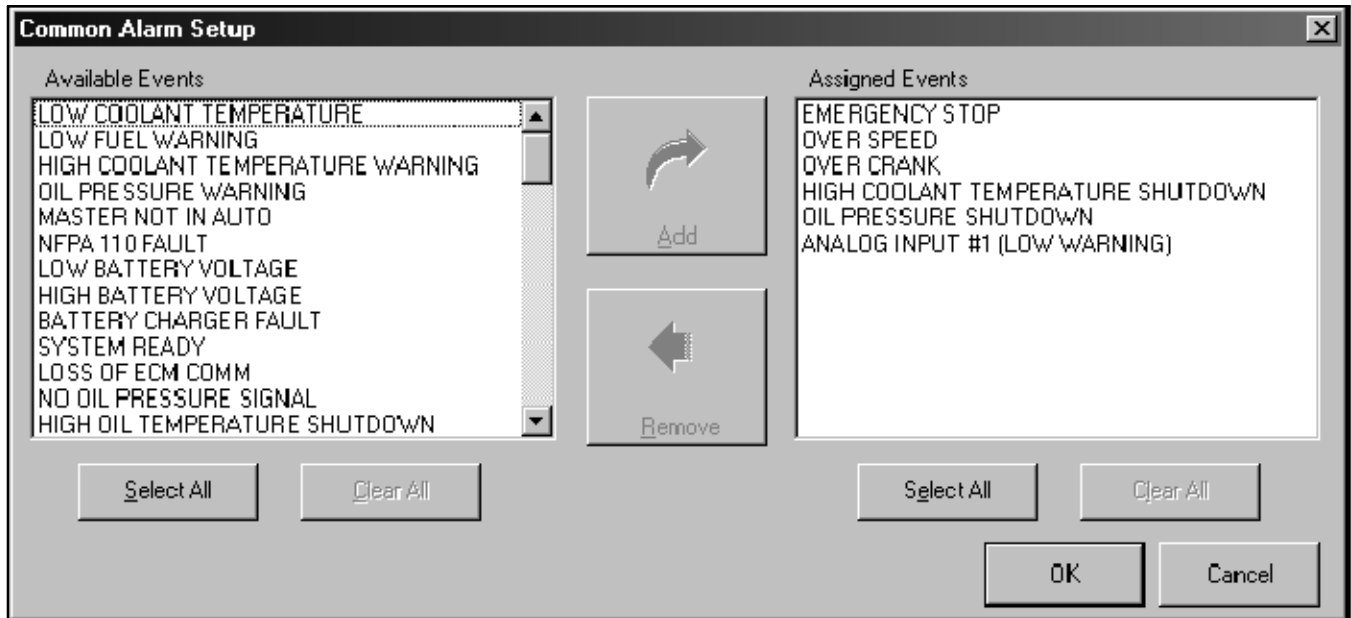

Figure 3-5   Common Alarm Display Window

Figure 3-6   Common Alarm Setup Window

3.8 Date and Time

3.8.1   Date and Time

Use this window to view the controller's time and date settings.

3.8.2   Date and Time Setup

Double click anywhere on the date and time data window to open the setup window.

Use this window to set the controller's time and date.

The setup window displays the controller's time at the moment the window was loaded. The time is not updated as in the Date/Time data window.

The date and time can be entered directly by selecting the pick boxes and typing the value.

Press the down arrow on the date box to select a date from 01/01/2000 to 12/31/2156.

Clicking the Synchronize with Computer button sets the date & time fields to match the computer's system clock.
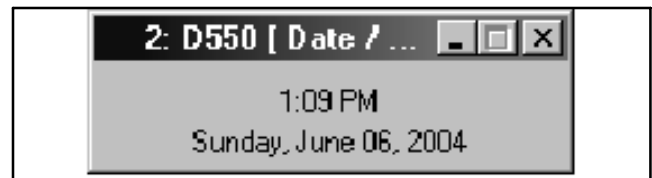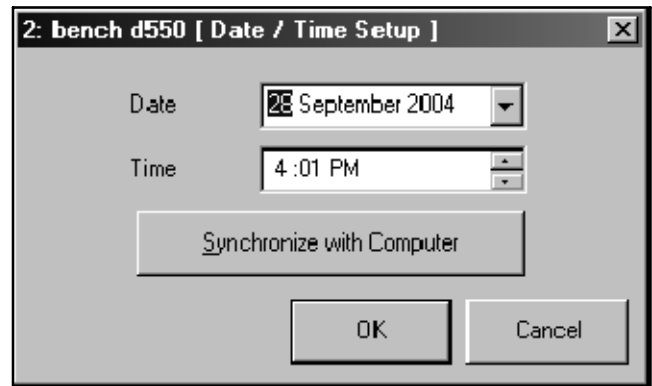

Figure 3-7   Date/Time Data Window

Figure 3-8   Date/Time Setup Window

3.9   Digital Inputs

3.9.1   Digital Input Display

The Digital Input data window displays the functions, time delays, and descriptions for all assigned digital inputs. See Figure 3-10.

If an input is disabled, the text is gray.

3.9.2   Digital Input Setup

Use this window to set up a single digital input on a controller.

Double click on any input in the data window to open the setup window for that input only. Using the scroll bar to view available functions, select the desired function from the list. Click on the Enable box to enable or disable the input. A check mark in the box indicates that the input is enabled. Enter the inhibit time and delay time in minutes:seconds. Type in a description, which will appear in the User Assigned Description Area of the data window, if desired.

Click OK to send the changes to the controller or Cancel to discard changes and close the setup window.

Figure 3-9   Digital Input Setup Window for a Single Digital Input

Figure 3-10 Digital Input Display Window

3.10 Electrical Info

This window displays information about electrical power being delivered by the controller's generator set. There is no setup window for this information.

Figure 3-11 Electrical Info Display

3.11 Engine Info

This window displays engine information available to the DEC550 controller. There is no setup window.

The window will display the same measurement system (English/Metric) as the controller.

ECM Voltage will change to Local Voltage if the controller is configured for a non--ECM engine.

Figure 3-12 Engine Info Display Window

3.12 Event History

Use this window to view and save the controller's event log. The events displayed in this window are the System Events displayed in Menu 10 on the 550 controller display. See the controller's Operation Manual for more information about system events.

The window will display all the events in the controller's event log, the time and date of the events, and up to two parameters associated with the event.

If there is at least one event in the log, the Save History… button is enabled. To save the history to a file, press the Save History… button and then select or enter a name and path for the directory to save the log. The file is an ASCII text file with a default file extension of log.

Up to 100 events may be displayed. If more events are in the log than can fit in the event list box, scroll bars will appear on the right side.
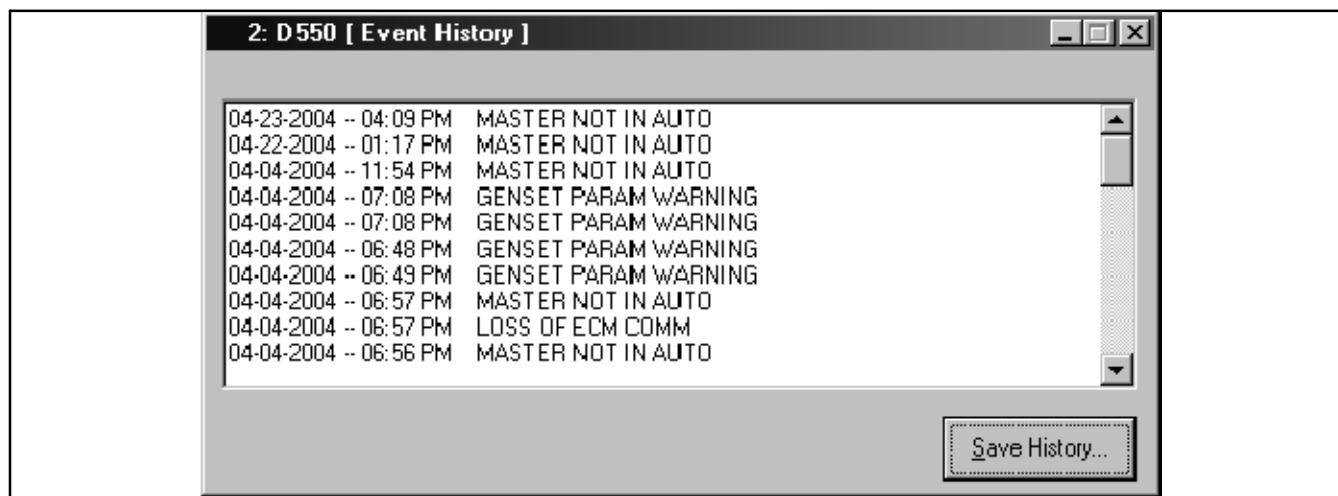
Figure 3-13 Event History Display Window

3.13 Generator Info

3.13.1 Generator Info Display

This window will display electrical information about the generator set's alternator.
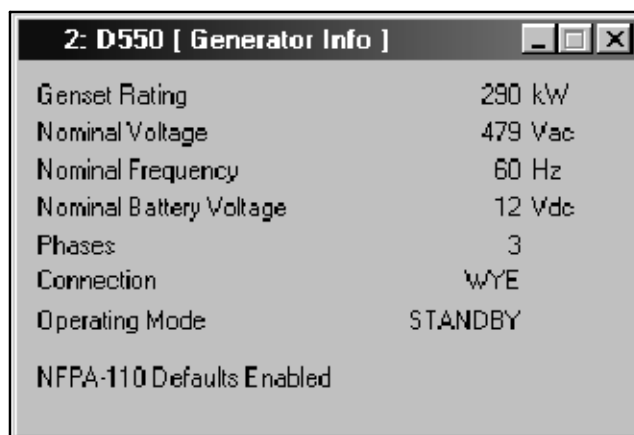
Double click anywhere on the window to open the setup window.

3.13.2 Generator Info Setup

Double click on the Generator Info data window to open the setup window. Use this window to change the voltage and frequency data for the generator set. Enter the corresponding data if the generator set requires voltage reconnection and/or frequency adjustment.

Note: It is *imperative* that the user enter the correct data because these settings trigger all related shutdowns.

Note: The user defines the data shown. It is NOT data measured by the controller and associated sensing devices. The user defines these values for purposes of calibrating the control.

Figure 3-14 Generator Info Display Window

Figure 3-15 Generator Info Setup Window

3.14 Maintenance History

3.14.1 Maintenance History Display

This window displays maintenance and some historical information about the generator set.

Double clicking anywhere on the window will open the Manual Operations window.

3.14.2 Remote Maintenance Setup (Manual Operation)

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

Double click anywhere on the Maintenance data window to open the Remote Maintenance Operations window. This window allows supervisors and users to remotely start and stop the generator set.

Note: Supervisor-level access is required to reset faults and maintenance records.

The command to perform the requested operation is sent *immediately* when a button on this window is pressed. Pressing the Close button does not send commands to the generator set.

For remote starting and stopping, the generator set master switch must be in the AUTO position. To start the generator set from the computer, type the desired engine run tim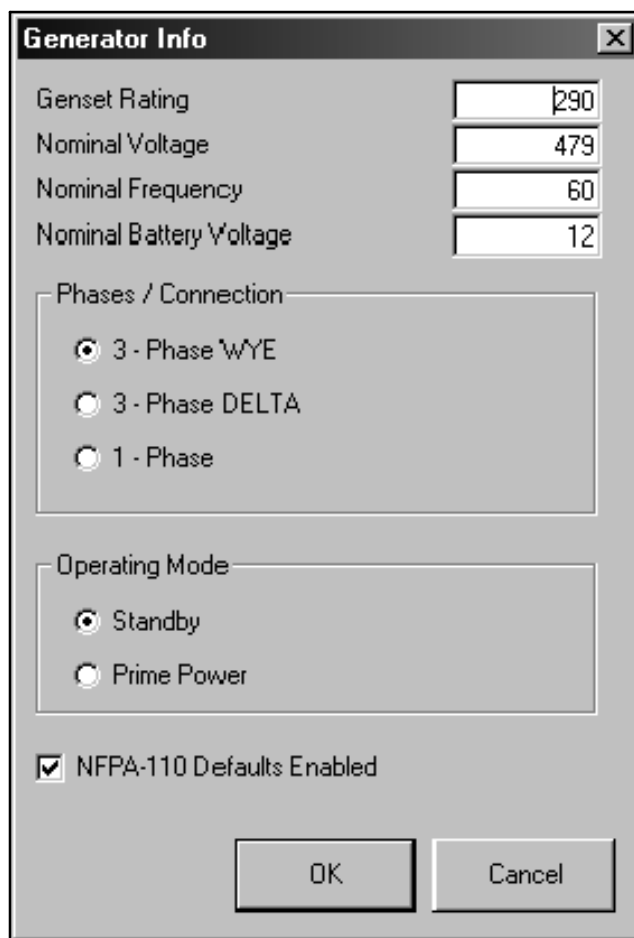e in hours:minutes into the box provided and click on the Set Run Time button. Then click on the Start Engine button to send the engine start signal to the

generator set. The generator set will start and run for the time entered in the Run Time box. To stop the generator set before the run time has elapsed, click on the Stop Engine button.

Click the Reset Maintenance Records button after performing the scheduled generator set maintenance described in the generator set's Operation Manual. Resetting the maintenance records updates the Last Maintenance Date and times since maintenance shown in the Maintenance Display window.
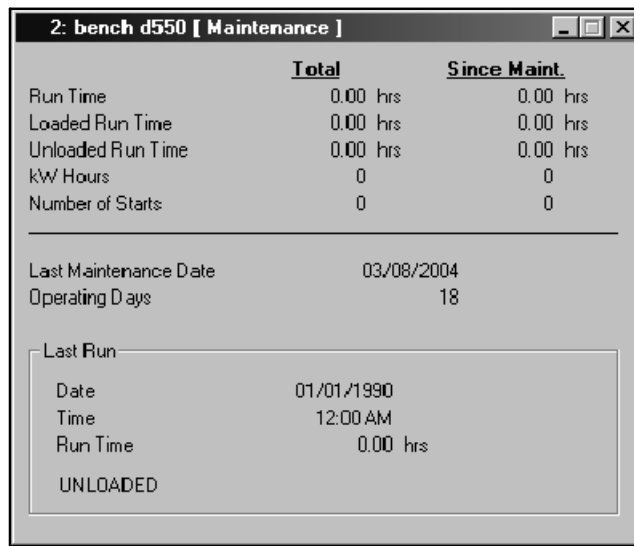
Figure 3-16 Maintenance Display Window
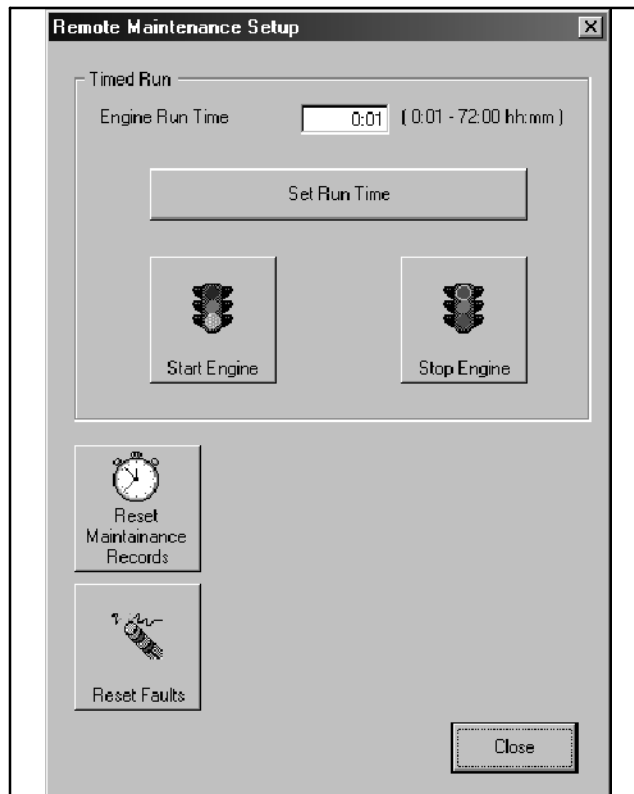
Figure 3-17 Remote Maintenance Setup Window (manual operation)

3.15 Relay Driver Outputs (RDO)

3.15.1 RDO Summary

Use this window to view the controller's relay driver output (RDO) settings.

Double click on any line to open the setup window for that RDO only.

3.15.2 RDO Setup

This window allows the user to set up a single Relay Driver Output (RDO).

The Set Points radio buttons are enabled when the user selects an analog input for assignment to the RDO. Select high or low warnings or shutdowns.

The window will also allow the user to turn a Software Controlled RDO (SCRDO) on or off. The Software Controlled RDO ON checkbox is active for SCRDOs 1–4.

Enabling NFPA-110 defaults (see Figure 3-15, generator info setup), sets selected RDOs to default values. These RDOs cannot be changed from the RDO Setup Screen when NFPA-110 defaults are enabled.

Click on OK to save changes, or Cancel to discard changes.
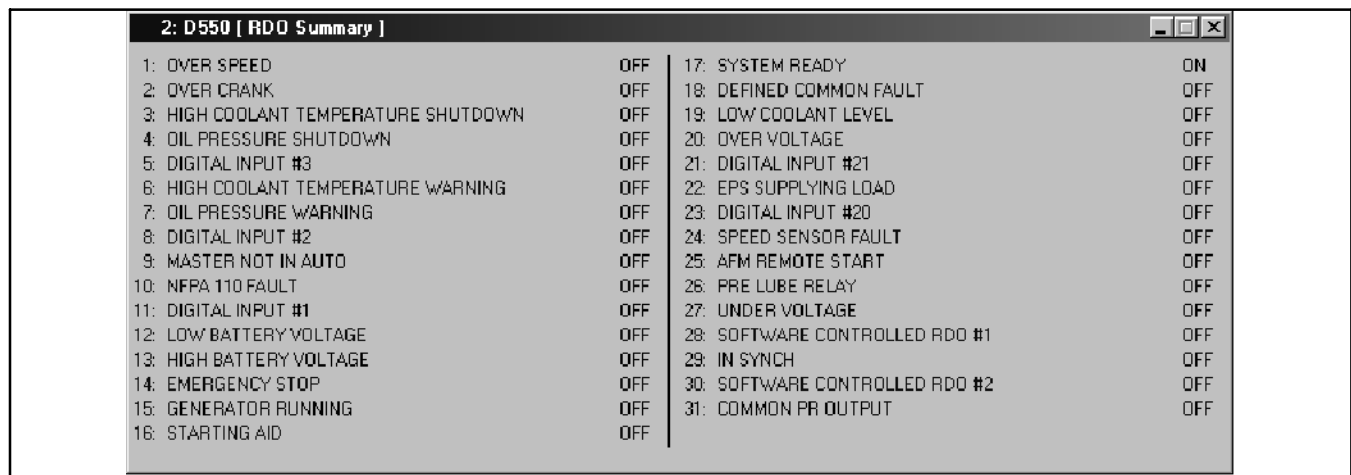
Figure 3-18 RDO Summary Display Window
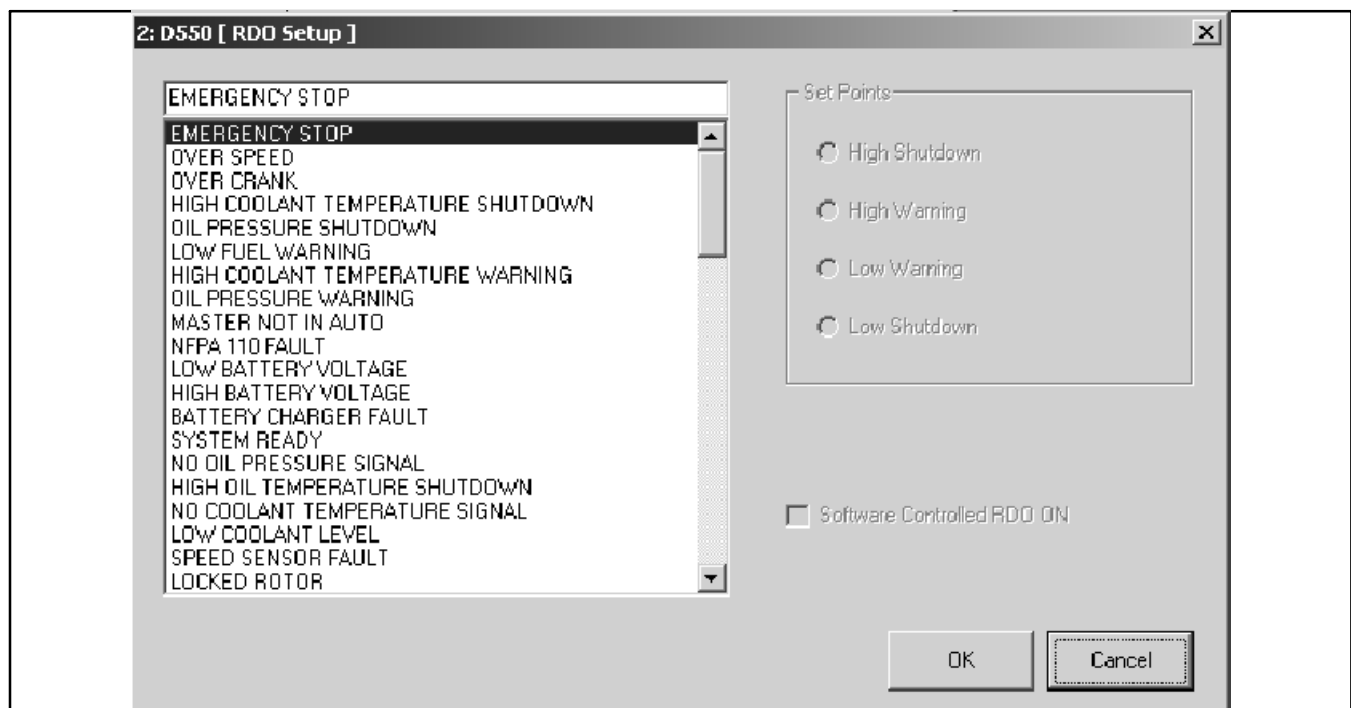
Figure 3-19 RDO Setup Window

3.16 System Info

3.16.1 System Info Display

Use this window to display the system information strings and serial numbers. The top three items are user-defined and can be changed through the setup window. All other information in this window is factory-set and cannot be changed through Monitor III.

Figure 3-20 System Info Display Window

3.16.2 System Info Setup

Double click anywhere on the System Info data window to open the setup window.

Create your own descriptions to identify the generator set by name, location, and load description. Type in the descriptions and click on OK. These descriptions will be used in the System Info Display window to identify the generator set.

Figure 3-21 System Info Setup Window

3.17 Time Delays

3.17.1 Time Delay Display

Use this window to view the controller's time delay settings in minutes:seconds. The maximum crank cycles is shown in number of crank attempts.

Double click anywhere on the window to open the setup window.

Figure 3-22 Time Delay Display Window

3.17.2 Time Delay Setup

Use this window to change the controller's time delay settings. Type in the desired settings in minutes:seconds. The setting must be within the range shown directly to the right of each box.

For Max. Crank Cycles, type in the maximum number of starting attempts (from 1 to 6) to allow before shutting down on an overcrank fault.

Click on the OK button to enter the new settings and close the window. Clicking on Cancel closes the window without changing the settings.

Figure 3-23 Time Delay Setup Window

3.18 Trip Points

3.18.1 Trip Point Display

This window displays the controller's trip points. Note that some trip points are displayed as both % of the rated or nominal value and as the resulting actual value with units. Overspeed is displayed in both output Hz and engine speed in RPM.

3.18.2 Trip Point Setup

Double click anywhere in the trip point data window to open the setup window.

Use this window to change the controller's trip point settings. Type in the Load Shed Output and Voltage and Frequency trip points as percentage of the rated or nominal value. The values entered must be within the range shown directly to the right of each box. See Figure 3-25.

When the user enters a number in the text boxes, the resulting value is displayed in the far right column. For example, in Figure 3-25, for the over voltage trip point the user has typed 116% of the nominal voltage. The application has displayed 556 V for the resulting value. The resulting values are for reference and not sent to the controller.

Click on the OK button to enter the new settings and close the window. Clicking on Cancel closes the window without changing the settings.

2: D550 [Trip Points]		
Load Shed Output	XXX % of Rating	(XXXX kW)
Over Voltage	XXX % of Nominal	(XXXX V)
Under Voltage	XXX % of Nominal	(XXXX V)
Over Frequency	XXX % of Nominal	(XXX Hz)
Under Frequency	XXX % of Nominal	(XX Hz)
Over Speed	XX Hz	(XXXX RPM)
High Battery Voltage	XX.X Vdc	
Low Battery Voltage	XX.X Vdc	
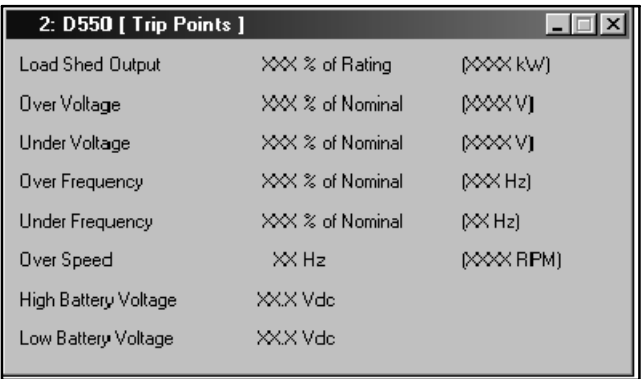
Figure 3-24 Trip Point Display Window

Trip Point Setup			
Load Shed Output	80	(80% - 120% Rating)	232 kW
Over Voltage	116	(105% - 135% Nominal)	556 V
Under Voltage	86	(70% - 95% Nominal)	412 V
Over Frequency	139	(102% - 140% Nominal)	83 Hz
Under Frequency	92	(80% - 98% Nominal)	55 Hz
Over Speed	70	(65 - 70 Hz)	2100 RPM
High Battery Voltage	16	(14.5 - 16.5 Vdc)	
Low Battery Voltage	12	(10.0 - 12.5 Vdc)	

OK   Cancel
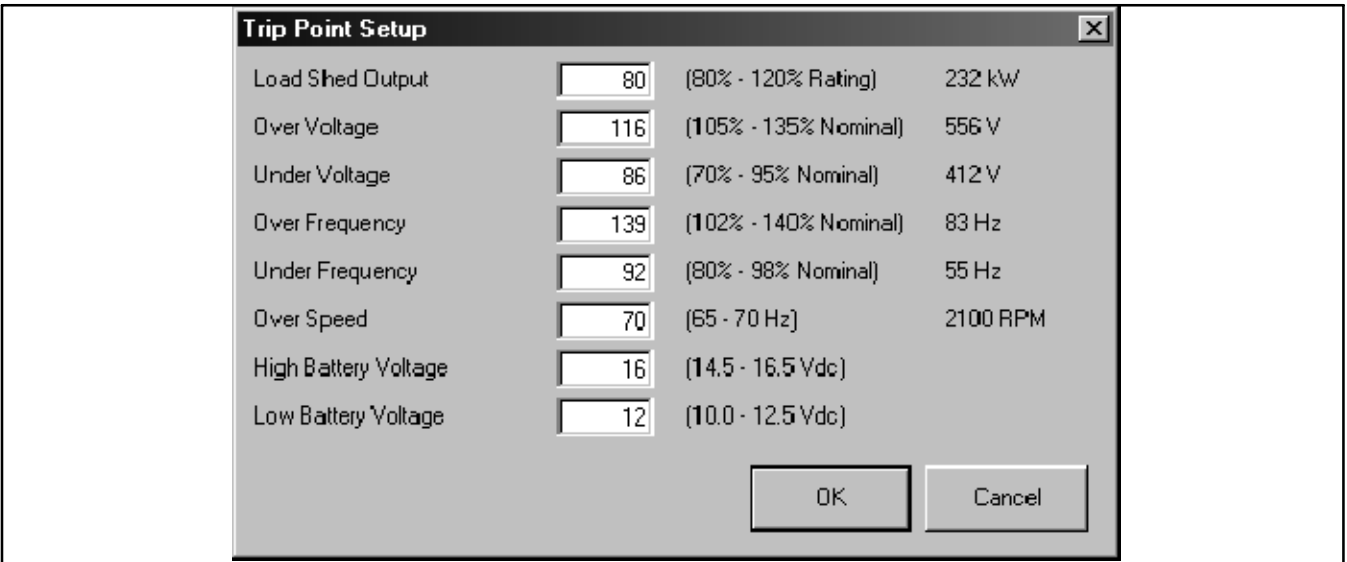
Figure 3-25 Trip Point Setup Window

Notes

4.1 Introduction

Microprocessor-Plus 16-Light Generator Set Controllers equipped with red main logic boards and the communications board accessory shown in Figure 4-2 can be used with Monitor III. The controller communicates at 19200 baud rate.

The communications board is required for Modbus® communication with this controller. The communications board is available either factory-installed or as a field-installed kit. See TT-1377, provided with the kit, for instructions to install and connect the board.
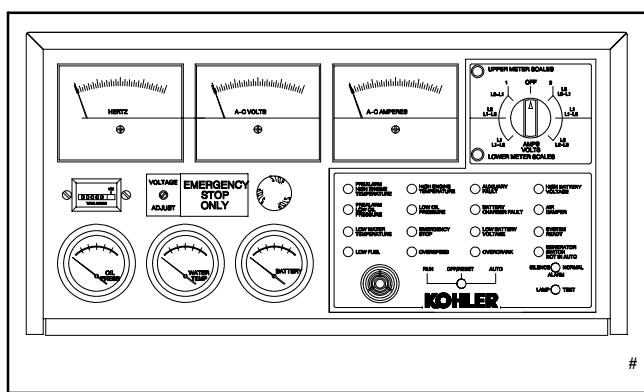
Figure 4-1 Microprocessor-Plus 16-Light Generator Set Controller
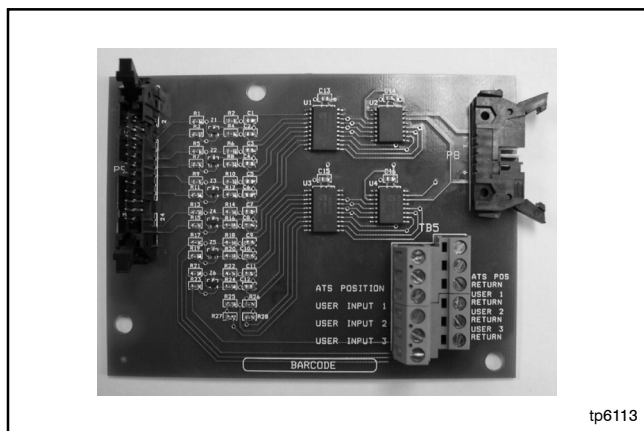
Figure 4-2 Communications Board

4.2 Controller Connection and Setup

Connect the controller to the PC or network and configure the controller for communications. Refer to TT-1405, provided with the Monitor III software kit, for controller connection and setup information.

4.3 Data Windows

Select Window→New Window to open the Add Window screen. Select the generator set/controller from the list on the left. Figure 4-3 illustrates the list of data windows available for this controller.

The Manual Operations window allows remote starting and stopping of the generator set and resetting faults. User or supervisor access is required to perform Manual Operations.

There are no setup windows available for this controller.
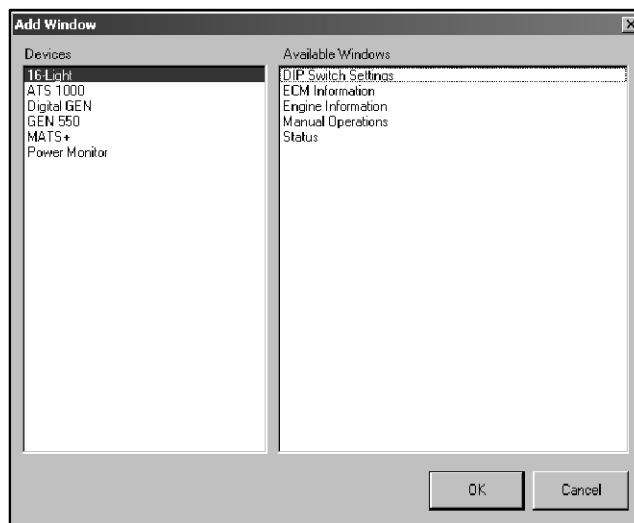
Figure 4-3 Add Window

4.4 Data Window Summary Table

Data Window	Item		Notes
ECM Info	Engine Communication Protocol		J1939
			MTU
			MTU with VSG (variable speed governor)
	DC Voltage at ECM		Analog-type display. Engine starting battery voltage as detected at the ECM
	ECM Hours of Operation		Hours of operation for the engine
	ECM Fault Code		Engine-specific. Refer to the generator set controller Operation Manual for the engine documentation part numbers
	Not ECM Equipped		Displayed for engines that are not equipped with engine control modules (ECM)
Engine Info	Engine Speed		RPM. Analog-type display. Shown for all engines
	Coolant Temperature		°C/°F. Analog-type display. Shown for ECM-equipped engines only
	Fuel Temperature		
	Charge Air Temperature		
	Oil Pressure		PSI/kPa. Analog-type display. Shown for ECM-equipped engines only
	Fuel Pressure		
	Charge Air Pressure		
Manual Operations	Start Engine		Buttons. Read and follow the Safety Precautions in the generator set Operation Manual.
	Stop Engine		
	Reset Faults		
DIP Switch Settings	Overspeed		60 Hz or 70 Hz overspeed
	Temperature Cooldown		Enabled/disabled
	Crank Mode		Continuous/cyclic
	Engine		Non-ECM, DDC/MTU, J1939 equipped, or MTU with VSG
Status	Controller Application Program Version Number	Locked Rotor	
	Run Mode	No AC Voltage	
	Generator Running	Speed Sensor Fault	
	System Ready	Intermittent Speed Sensor	
	Lost ECM Comms	Air Damper Switch	
	Common Fault	Low Fuel	
	High Coolant Temperature	High Battery Voltage	
	Low Coolant Temperature	Low Battery Voltage	
	Low Oil Pressure	Battery Charger	
	Not In Auto	ATS Emergency On	
	Emergency Stop	User Input #1	
	Master Switch Error	User Input #2	
	Overcrank	ECM Red Alarm	
	Overspeed	ECM Yellow Alarm	

4.5 DIP Switch Settings

Use this window to view the controller's DIP switch settings.

The wording will change to indicate the switch position:

- 50 Hz UNIT/60 Hz OVERSPEED or 60 Hz UNIT/70 Hz OVERSPEED

- TEMP. COOLDOWN ENABLED or TEMP. COOLDOWN DISABLED

- CONTINUOUS CRANK MODE or CYCLIC CRANK MODE

- NON-ECM ENGINE, DDC/MTU ENGINE, J1939 EQUIPPED ENGINE, or MTU with VSG ENGINE
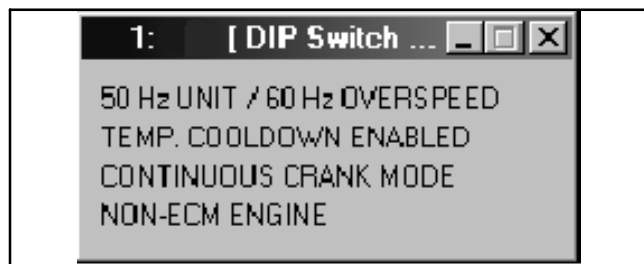
Figure 4-4 DIP Switch Settings Window (display only)

4.6 ECM Info

This window displays engine control module (ECM) information available to the controller. See Figure 4-5.

ECM fault codes are published in the engine documentation. To interpret an ECM fault code, refer to the engine documentation supplied with the generator set or contact your distributor.

Some generator set models are equipped with engine ECMs that do not communicate with the generator set controller over CANbus. The message NOT ECM EQUIPPED appears if the generator set is not equipped with an ECM or if the ECM does not communicate with the generator set controller over CANbus. See Figure 4-6.
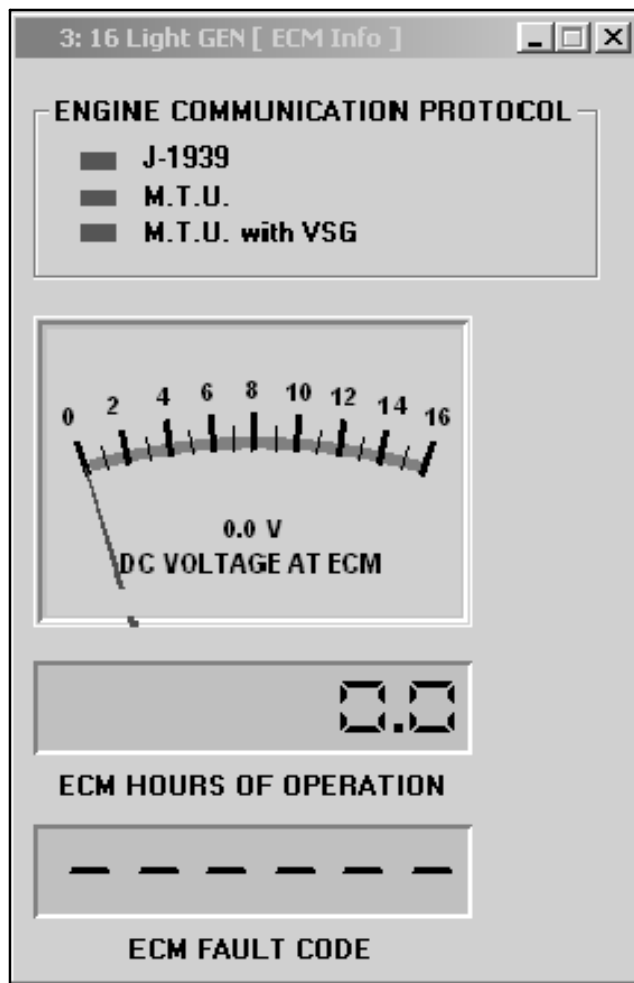
Figure 4-5 ECM Info Display Window (for engines equipped with ECMs)
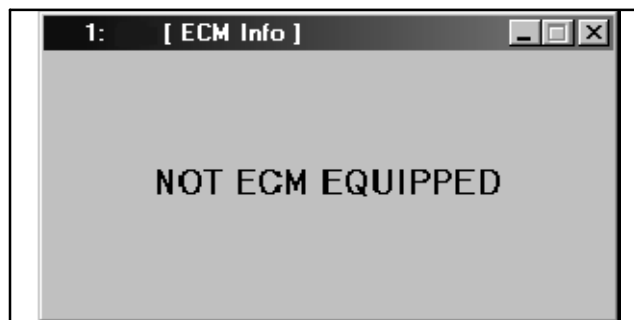
Figure 4-6 ECM Info Display Window (for models without ECMs or CANbus communication)

4.7 Engine Info

This window displays available engine information.

For engines not equipped with ECMs, only engine speed will be shown. See Figure 4-7.

Information available from engines equipped with engine control modules (ECMs) is displayed as shown in Figure 4-8.
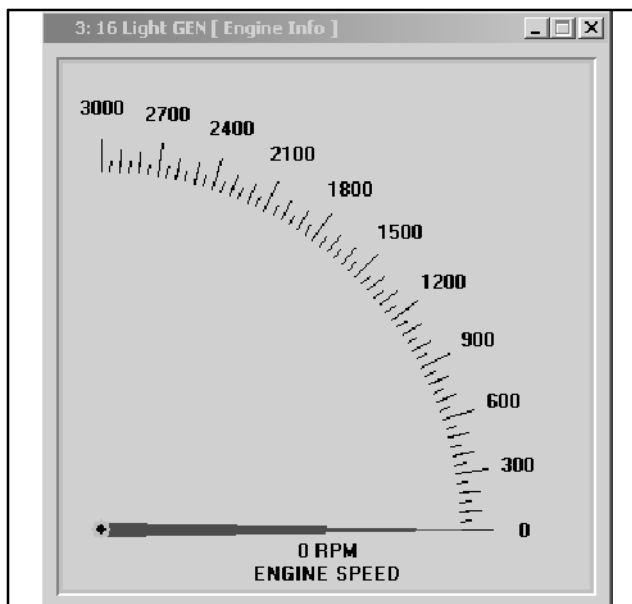
Figure 4-7   Engine Info (non-ECM engines)
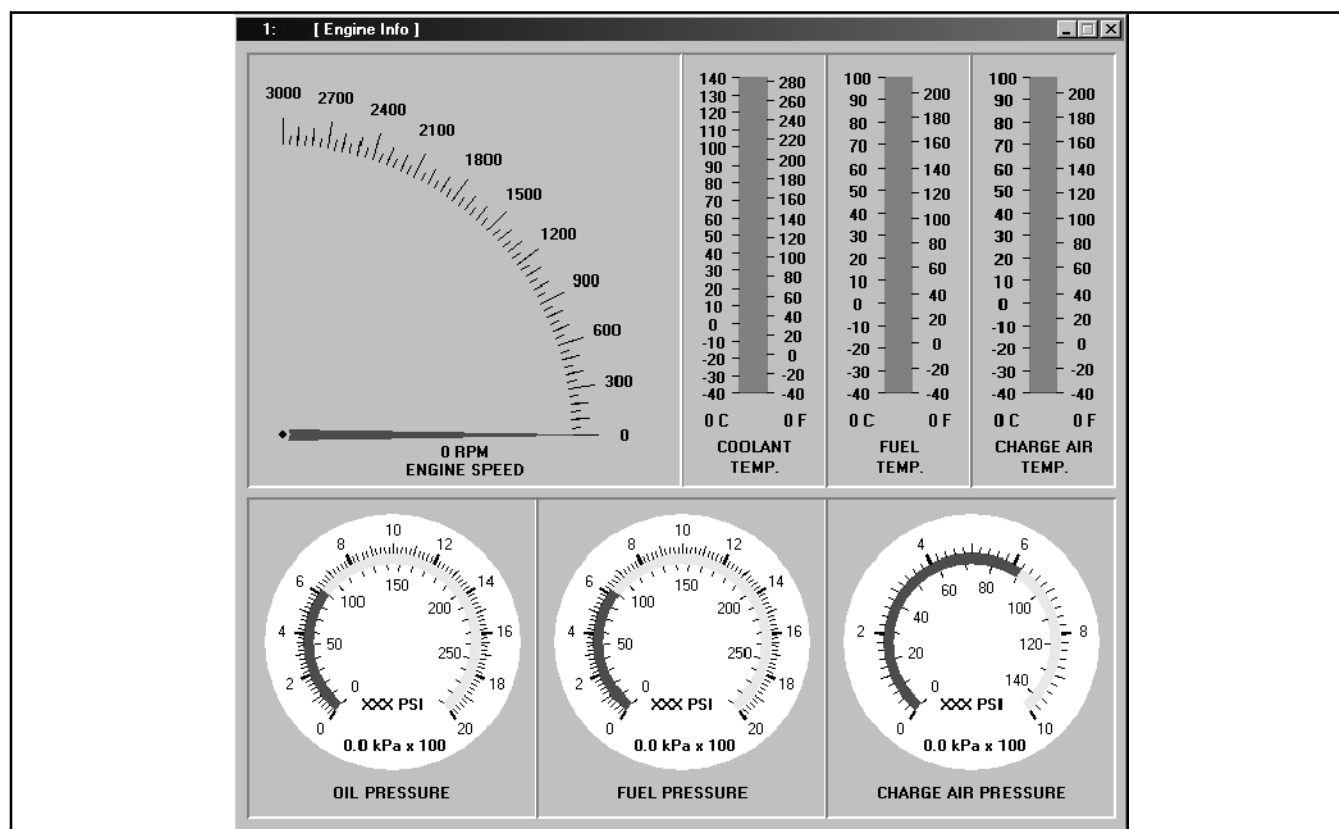
Figure 4-8   Engine Info Window (engines equipped with ECMs)

4.8 Manual Operations

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

This window allows remote starting and stopping of the generator set. See Figure 4-9. Position the cursor on the *Start Engine* or *Stop Engine* button and click.

Supervisor-level access is required in order to reset faults remotely using the *Reset Faults* button. Be sure to identify and correct the cause of any fault.

Figure 4-9   Manual Operations Window

4.9 Status

The status window displays the overall status of the controller using red, green, and yellow indicators. See Figure 4-10. Typically:

* Green indicates systems are functional

* Yellow indicates a warning

* Red indicates a fault or shutdown.

The window also displays the code version of the controller firmware in the upper right corner.

Lost ECM Comms, ECM Red Alarm, and ECM Yellow Alarm indications are disabled for generator sets not equipped with ECMs.
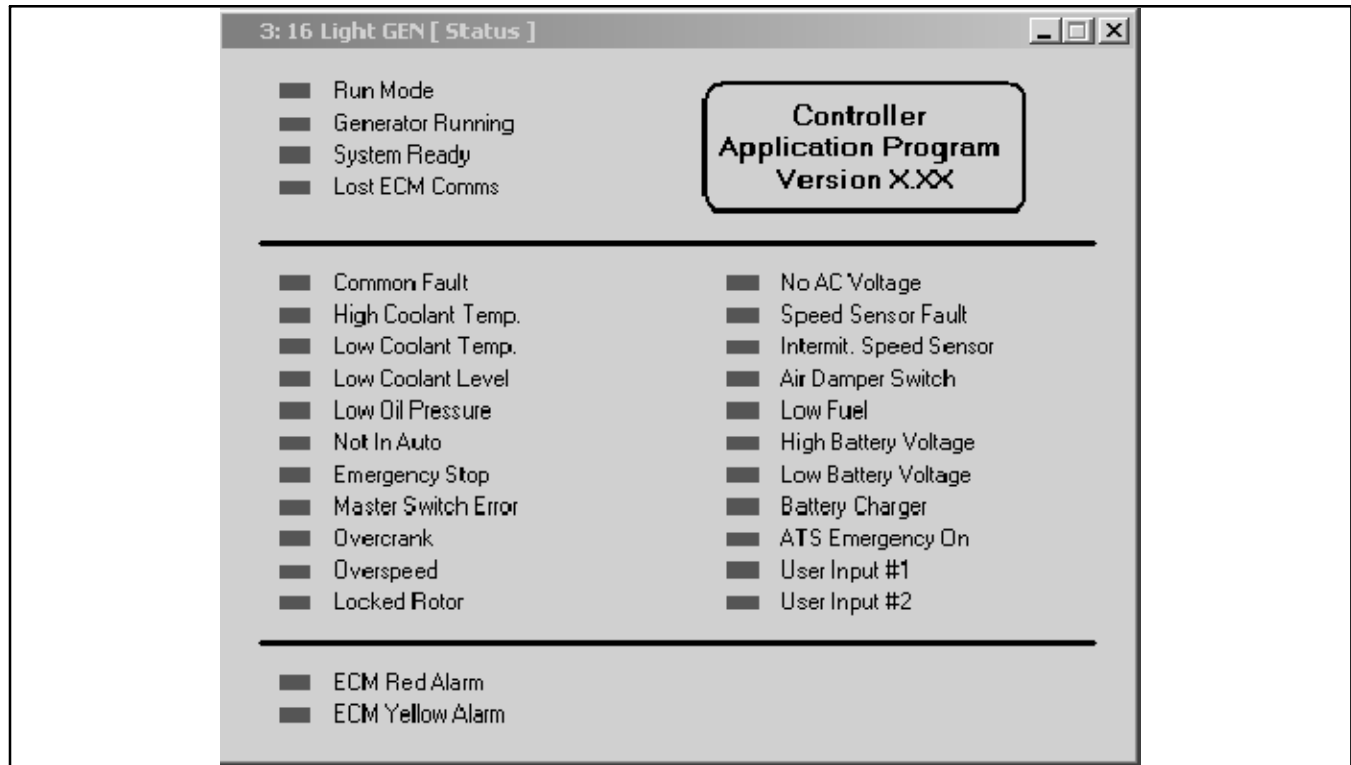
Figure 4-10 Status Window (display only)

5.1   Introduction

Monitor III can be used to monitor system status, view settings, start or stop the generator set, and reset faults.
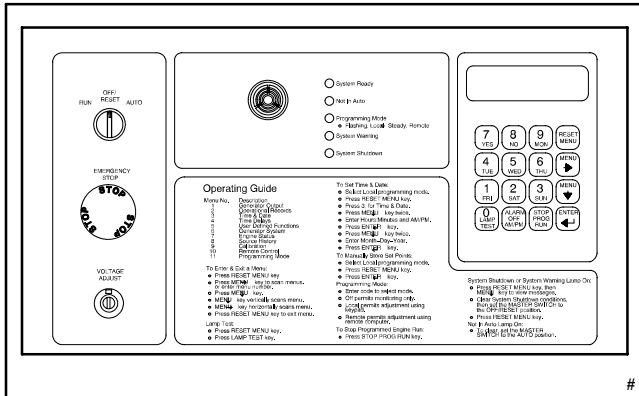
Figure 5-1   Digital Generator Set Controller

5.2   Controller Connection and Setup

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

The Digital controller must be equipped with a KBUS to Modbus® converter module. Refer to the instructions provided with the converter module kit to install and connect the module. Use the DIP switches on the converter module to assign a unique address to the controller.

> **Note:** Use a unique address for each device in a network. Use numbers between 1 and 247. Do not use 0 (zero).

Connect the controller to the PC or network and configure the controller for communications. Refer to TT-1405 for connection diagrams and controller setup information.

5.3   Data Windows

Select Window→New Window to open the Add Window screen. Select the generator set/controller from the list on the left. Figure 5-2 illustrates the list of data windows available for this controller.

The Manual Operations window allows remote starting and stopping of the generator set and resetting faults. User or supervisor access is required to perform Manual Operations.

There are no setup windows available for this controller. Settings can be changed through the controller keypad. Refer to the controller operation manual for instructions. See the List of Related Literature for the document part number.
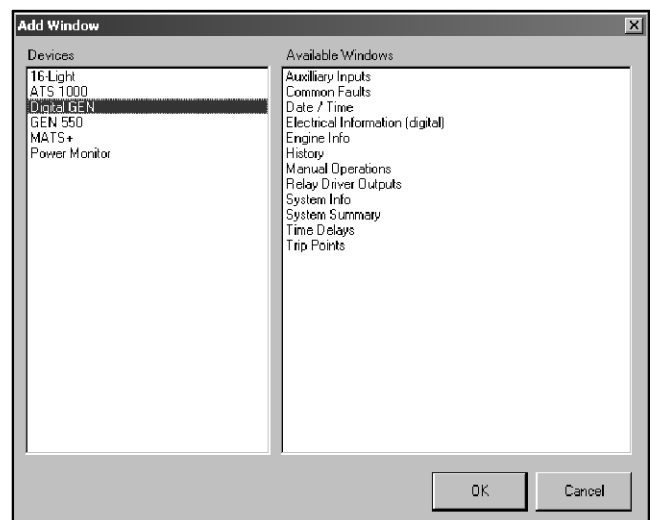
Figure 5-2   Add Window Screen

5.4 Data Window Summary Table

Data Window	Item	Item Description
Auxiliary Inputs	Description	
	Inhibit Time	Time in seconds after engine start before time delay begins counting.
	Delay Time	Time in seconds after initial detection of fault condition before warning or shutdown occurs.
Common Faults		Common Faults 1–6.
		See Section 5.6 to interpret fault codes.
Electrical Info	Line-to-Line Voltage	L1–L2, L2–L3, L3–L1
	Line-to-Neutral Voltage	L1–L0, L2–L0, L3–L0
	Line Current	L1, L2, L3
	Frequency	Actual, Hz
	Power Factor	
	Total kW	Actual, kW
	Power Level	%
History	Time Loaded	Total and Since Last Maintenance
	TIme Unloaded	
	Energy Delivered	
	Days of Operation	
	Number of Starts	
	Last Maintenance Date	Month/date/year of last maintenance record reset (reset through controller keypad)
	System Start Date	Month/date/year
History, continued	Last Run	Start Date
		Start Time
		Run Time
	Shutdown History	Date
		Description (Code)
Manual Operations	Timed Run	Engine Run Time, from 1 minute to 72 hours
		Set Run Time Button.
		Note: Clicking on the set run time button with any engine run time other than 0:00 will cause the engine to start.
	Reset Faults	Button
RDO	RDO1–10	Relay driver outputs.
		See Section 5.10 to interpret the displayed codes.
System Info	Genset Name	
	Location	
	Description	
	Model No.	Factory-set
	Specification No.	
	Genset Serial No.	
	Controller Serial No.	
	Device ID	
System Summary	Switch Position	
	Generator Status	
	Programming Mode	
	Genset Rating	Factory-set ratings
	Nominal Voltage	
	Nominal Frequency	
	Nominal Battery Voltage	
	Status	

Data Window	Item	Item Description
Time Delays	Engine Start	Minutes: seconds
	Engine Cooldown	
	Overvoltage	
	Undervoltage	
	Starting Aid	
	Crank On	
	Crank Pause	
	Max. Crank Cycles	Number of starting attempts before overcrank shutdown
Trip Points	Overvoltage	Displayed in % of nominal and in volts
	Undervoltage	
	Overfrequency	Displayed in % of nominal and in Hz
	Underfrequency	
	Overspeed	Displayed in Hz and RPM
	High Battery Voltage	VDC
	Low Battery Voltage	

5.5 Auxiliary Inputs

The Auxiliary Inputs window displays the description, inhibit time, and delay time for each input and indicates whether the input triggers a warning or a shutdown.

Descriptions are optional and will appear if a description was previously entered using Monitor II software.

Time delays and inhibit times are set through Menu 4 using the controller keypad. Warnings and shutdowns are set through Menu 5.

5.6 Common Faults

The fault codes shown in Figure 5-4 are displayed to indicate the fault conditions. This information corresponds to the items displayed in controller Menu 5.

Each common fault output can indicate up to 8 fault conditions. The codes for multiple fault conditions are added together. For example, in Figure 5-3, an underfrequnecy shutdown (code 8) and an Auxiliary 2 fault (code 128) combine to give a fault code of 136 displayed for Common Fault 1.
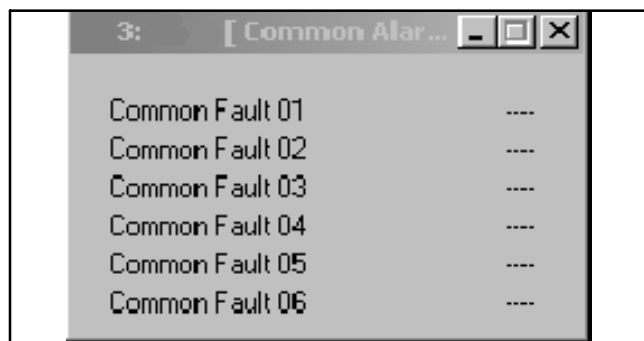
Figure 5-3 Common Faults Window

Common Fault	Fault Code	Description
1	1	Air Damper
	2	Over Voltage
	4	Under Voltage
	8	Underfrequency Shutdown
	16	Low Coolant Level
	32	High Oil Temperature
	64	Auxiliary 1
	128	Auxiliary 2
2	1	Auxiliary 3
	2	Auxiliary 4
	4	Locked Rotor
	8	Internal Error
	16	EPS Supplying
	32	Speed Sensor
	64	Load Shed
	128	kW Overload
3	1	Underfrequency Warning
	2	High Battery Voltage
	4	Temp Signal Loss
	8	Oil Pres Signal Loss
	16	Ground Fault Detected
	32	Over Current
	64	TDEC Running
	128	TDES Running
4	1	Generator Running
	2	NFPA 110 Common Alarm
	4	Starting Aid
	8	Low Oil Pressure
	16	High Coolant Temperature
	32	Over Crank
	64	Over Speed
	128	Emergency Stop
5	1	Not In Auto
	2	System Ready
	4	Low Battery Voltage
	8	Battery Charger Fault
	16	Low Fuel
	32	High Coolant Temperature Warning
	64	Low Oil Pressure Warning
	128	Low Coolant Temperature
6	1	Weak Battery
	2	Load Shed Under Frequency
	4	Load Shed Excess kW
	8	Low AC Output
	16	Over Frequency Shutdown

Figure 5-4 Common Fault Codes

5.7 Electrical Info

The Electrical Info window displays information about the power delivered by the generator set. This information corresponds to the items displayed in Menu 1 on the controller. See the controller Operation Manual for more information.

The Power Level is the % Max kW.
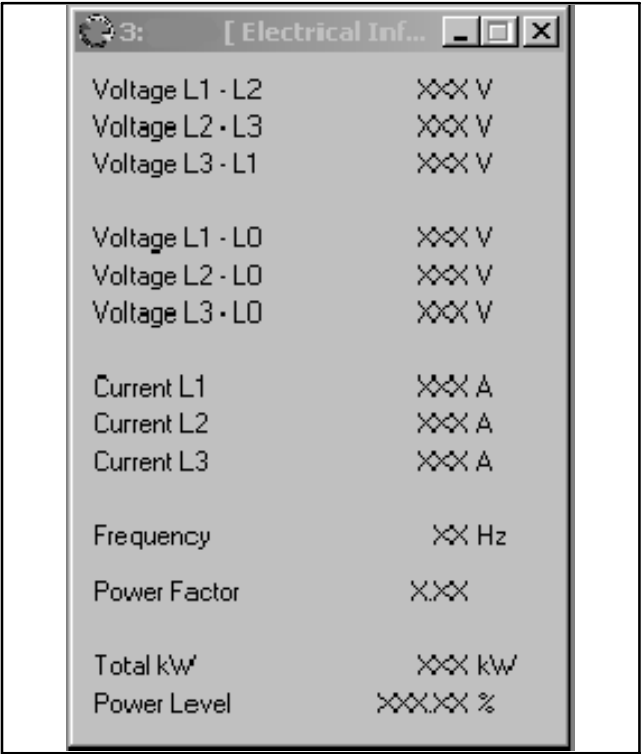
Figure 5-5   Electrical Info Window

5.8 History

The History window displays information about the generator set operaton and the date of the last maintenance record reset. The items in this window correspond to the items in controller Menu 2.

Reset maintenance records using the controller keypad, Menu 2.
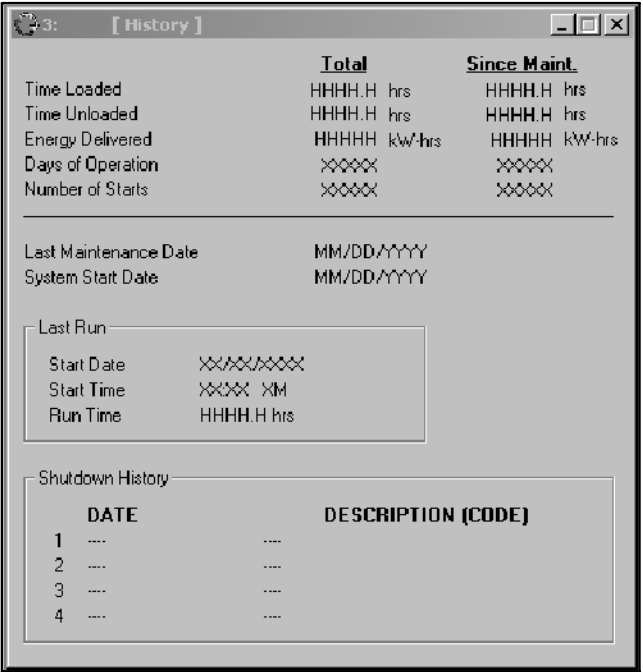
Figure 5-6   History Window

5.9 Manual Operations

⚠ **WARNING**

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

This window allows remote starting and stopping of the generator set. It also allows all faults to be reset remotely.

Enter the desired engine run time, from 1 minute to 72 hours, in hours:minutes. **Clicking on the Set Run Time button starts the engine if the Engine run time is not zero (00:00).** To stop the engine, enter zero (00:00) in the Engien Run Time box and click on the Set Run Time button.

Supervisor-level access is require in order to reset faults remotely using the *Reset Faults* button. Clicking the *Reset Faults* button resets the controller and silences the alarm. It has the same effect as momentarily moving the generator set master switch to the Off/Reset position.

The engine start and run time functions are also accessible using the controller keypad in Menu 7.

Figure 5-7 Manual Operations Window

5.10 Relay Driver Outputs (RDO)

The Relay Driver Outputs window displays codes that identify the function assigned to each relay driver output. For example, the window showed in Figure 5-8 shows that the Underfrequency Shutdown is assigned to RDO 01. See Figure 5-9 for RDO codes.

Relay Outputs are assigned using the controller keypad, Menu 5.

3: [RD...	
RDO 01	----
RDO 02	----
RDO 03	----
RDO 04	----
RDO 05	----
RDO 06	----
RDO 07	----
RDO 08	----
RDO 09	----
RDO 10	----
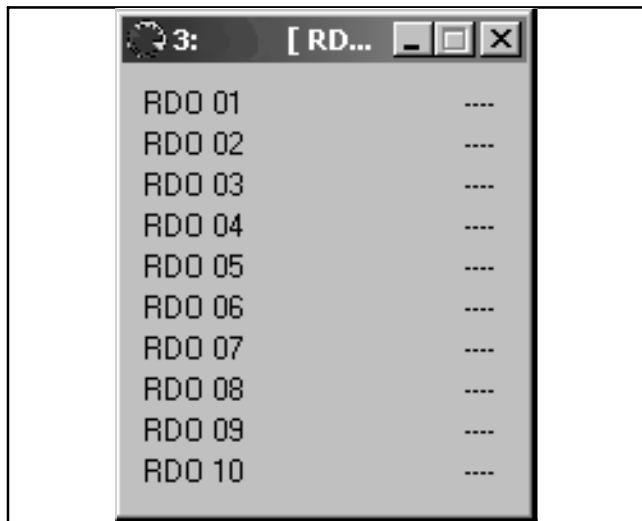
Figure 5-8 Relay Driver Outputs Window

Code	Message Summary
0	Defined Common Fault
1	Air Damper
2	Over Voltage
3	Under Voltage
4	Under Frequency Shutdown
5	Low Coolant Level
6	High Oil Temperature
7	Auxiliary 1
8	Auxiliary 2
9	Auxiliary 3
10	Auxiliary 4
11	Locked Rotor
12	Internal Error
13	EPS Supplying Load
14	Speed Sensor Fault
15	Load Shed
16	kW Overload
17	Under Frequency Warning
18	High Battery Voltage
19	Coolant Temperature Signal Loss
20	Oil Pressure Signal Loss
21	Ground Fault Detected
22	Over Current
23	Engine Cooldown
24	Time Delay Engine Start
25	Generator Running

Code	Message Summary
26	NFPA 110 Common Alarm
27	Starting Aid
28	Low Oil Pressure
29	High Coolant Temperature
30	Overcrank
31	Overspeed
32	Emergency Stop
33	Not In Auto
34	System Ready
35	Low Battery Voltage
36	Battery Charger Fault
37	Low Fuel
38	High Coolant Temperature Warning
39	Low Oil Pressure Warning
40	Low Coolant Temperature
41	Weak Battery
42	Load Shed Underfrequency
43	Load Shed Excess kW
44	Low AC Output
45	Overvoltage L1-L2
46	Overvoltage L2-L3
47	Overvoltage L3-L1
48	Overvoltage L1-L0
49	Overvoltage L2-L0
50	Overvoltage L3-L0
51	Undervoltage L1-L2
52	Undervoltage L2-L3
53	Undervoltage L3-L1
54	Undervoltage L1-L0
55	Undervoltage L2-L0
56	Undervoltage L3-L0
57	Master Switch Open (OFF/RESET)
58	Power-Down Error
59	Overfrequency Shutdown

Figure 5-9 RDO Codes

5.11 System Info

The system Info window displays the generator set information shown in Figure 5-10. The Genset Name, Location, and Load Description are optional and will be displayed if descriptions were previously entered using Monitor II software. The model number, specification number, and serial numbers are factory-set.
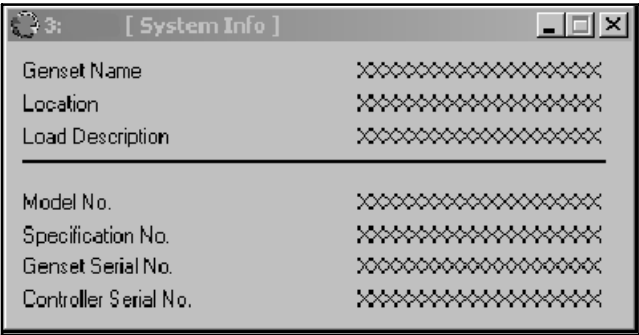
Figure 5-10 System Info Window

5.12 System Summary

The System Summary Window is shown in Figure 5-11.

Switch Position indicates the position of the generator set master switch: Run, Off/Rest, Auto, or Unknown. Generator Status indicates whether the generator set engine is cranking, running, or stopped. Programming mode can be Local, Remote, or Off. See controller Menu 11.

Generator set rating information corresponds to the information from Menu 6.

Status indicates the system status.
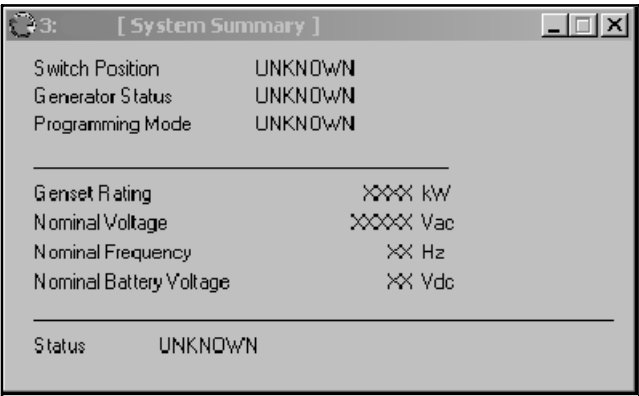
Figure 5-11 System Summary Window

5.13 Time Delays

The Time Delay window displays the time delays and maximum number of crank cycles set using the controller keypad through Menu 4. See Figure 5-12.
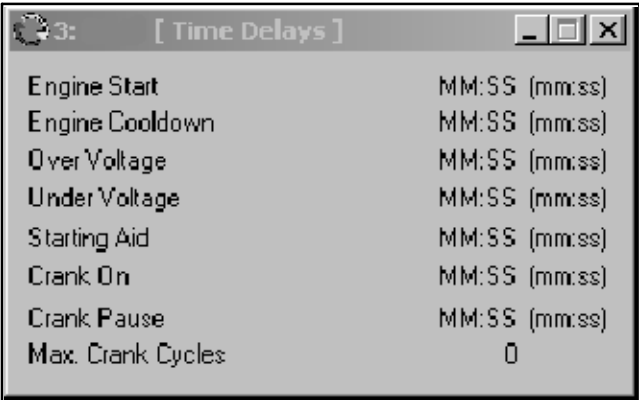
Figure 5-12 Time Delay Window

5.14 Trip Points

Trip points are set through Menu 6 using the controller keypad. Trip points are set as a % of the nominal system voltage or frequency. The software caulates the resulting value in Volts or Hz and displays it to the right of the setting. The overspeed setting is displayed in both Hz and RPM (engine speed). See Figure 5-13.
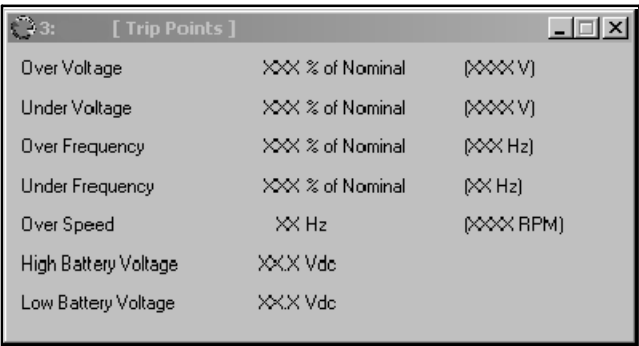
Figure 5-13 Trip Points Window

6.1   Introduction

The Monitor III Program allows viewing and adjustment of selected settings for transfer switches equipped with the DXPower™ 1500 automatic transfer switch controller. Use the software to:

- View and adjust:
    - Source parameters
    - Time delays
    - Voltage and frequency trip points
    - Exerciser settings
    - Date and time
    - Common alarms
    - Audible alarms
    - Load control time delays

- Start and stop a system test, exercise, or peak shave sequence

- Transfer to the OFF position (programmed-transition models only)

- Assign programmable inputs and outputs

- Toggle Modbus®-controlled relay outputs

- View only:
    - System status
    - Active time delays
    - Current (current sensing accessory required)
    - DIP switch settings
    - Event history
    - Maintenance records
    - Input and output status

Be sure to have the transfer switch Operation and Installation Manual available for reference while using Monitor III.

6.2   Controller Connection and Setup

Connect the controller to the PC or network using RS-485 or Ethernet connections and configure the controller for communications.   Refer to the ATS Operation and Installation Manual for controller connection and communications setup instructions.

6.3   Data Windows

The following sections describe data and setup windows. Select *Window>New Window* and select an item from the list to create a data window.   See Figure 6-1.

To open a setup window, first create the associated data window and click on it to activate it. Then double-click on the active data window or choose *Window>Setup* to create the setup window. Refer to Section 2.10, WIndow Menu, for more information about creating and working with setup windows.

A summary table in Section 6.4 lists all of the items contained in each window, and indicates whether each item is included in both the display and setup windows. Use the table as a guide to identify the location of individual settings, time delays, or other parameters.
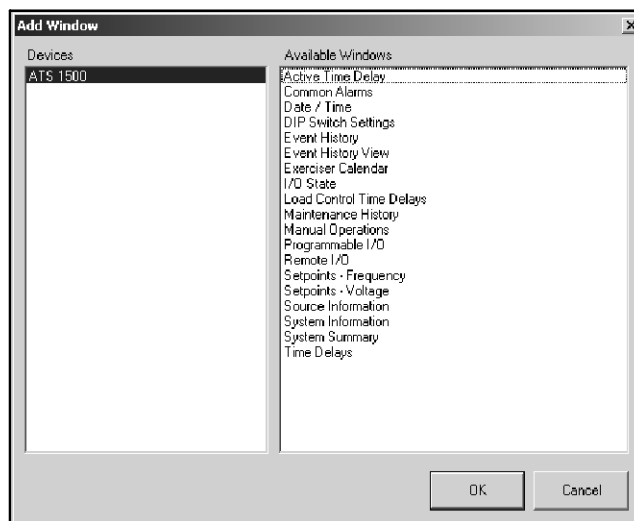
Figure 6-1   Add Window Form

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6.4 Data Window Summary

Window	Display	Setup	Item	Notes
Active Time Delay	✓		Name of active time delay	See Section 6.5, Active Time Delay.
	✓		Time remaining, seconds	
	✓		Percent time delay elapsed	
	✓		Elapsed time graphic display	
	✓		End Delay	Button ends an active time delay.
				Does not end programmed-transition time delays or an exercise run.
				See Section 6.5, Active Time Delay.
Common Alarms	✓		Common Alarms, Assigned Events 1 and 2	Lists events that are assigned as common faults.
		✓	Common Alarms 1 and 2, Available and Assigned Events	Use setup to choose common faults from a list of all available events.
	✓		Audible Alarm Events	Lists events that are assigned to the audible alarm. Alarm module accessory required for audible alarm horn.
		✓	Audible Alarms, Available and Assigned Events	Use setup to assign the audible alarm to selected events or fault conditions.
Date/Time	✓	✓	Date	Does not necessarily match the PC's date.
				Can synch with PC.
				Daylight Savings Time feature available.
	✓	✓	Time	Does not necessarily match the PC clock.
				Can synch with PC.
		✓	Synchronize with Computer	Select button to set time and date to match the PC system clock.
		✓	Daylight Saving Time	Check box to select DST and date boxes to set clock ahead and back.
DIP Switch Settings	✓		Password Enabled/Disabled	Displays the positions of the controller DIP switches.
	✓		Maintenance/Run Mode	
	✓		Switch 3 position	Switches 3 and 4 are not used at this time.
	✓		Switch 4 position	
Event History	✓		Lost Preferred Source	Displays time, date, and duration of last occurrence
	✓		Other Events	Displays up to 100 events
			Clear History	Disabled in the Monitor III Program
	✓		Save History	Button
Event History View	✓		Starting Event	Allows the operator to view events for a selected time period and save them to a file on the computer.
			Ending Event	
			Get Events button	
			Save History button	

Window	Display	Setup	Item	Notes
Exerciser Calendar	✔		Event Number	See Section 7.10, Exerciser.
	✔	✔	Next Start Date	
	✔	✔	Start Time	
	✔	✔	Run Time (hr:min)	
	✔	✔	Loaded (Unloaded)	
	✔	✔	Exercise Interval	
		✔	Repeat Rate	
Load Control Time Delays	✔	✔	Pre- and Post-transfer Time Delays	Separate time delays for disconnect before transfer and reconnect after transfer. Separate time delays for transfers from Source N to E and from Source E to N.
Maintenance	✔		Not in Preferred	Hours, total and since last reset.
	✔		In Standby	
	✔		Operation Time	Total and since last reset.
	✔		Switch Transfers	
	✔		Lost Preferred Source	
	✔		Failures to Transfer	
	✔		System Start Date	Month/Day/Year; factory setting.
	✔		Last Maintenance Reset Date	Month/Day/Year.
	✔		Transfer Time N to E	Milliseconds (mS); factory setting.
	✔		Transfer Time E to N	
		✔	Reset Maintenance Records	Resets time since last maintenance to zero.
		✔	System Start Date	Distributor-level password required to change.
Manual Operation	✔		Peak Shave Start/Stop Button	Disabled if maintenance DIP switch is set to ON.
	✔		System Test: Loaded, Unloaded, and Auto-Load Start/Stop Button	Disabled if maintenance DIP switch is set to ON.
	✔		Auto Test Time	Duration of auto–load test, 1–60 minutes.
	✔		Programmed Transition Transfer to Off/Resume Normal Ops Button	Forces transfer to OFF from Emergency position only. Disabled in standard-transition models or if maintenance DIP switch is set to inhibit transfer
Programmable Input/Output	✔	✔	Programmable Inputs 1, 2	Main logic board input and output function assignments.
	✔	✔	Programmable Outputs 1, 2	
	✔	✔	I/O Module Address	Input/output module input and output function assignments.
	✔	✔	Inputs 1, 2	
	✔	✔	Outputs 1–6	Outputs 1–6 for standard modules, 1–3 for high power modules.
	✔		Alarm Option Module	Displays status of alarm module, if installed.
Remote I/O	✔		Modbus®-Controlled Relay Outputs	Buttons 1 through 4 to toggle relay outputs on or off.
	✔		Remotely Monitored Inputs	Displays status of remotely monitored inputs.
Input/Output State	✔		Inputs 1, 2	Displays the status of main logic board and I/O module inputs and outputs. Indicator is green when input or output is active.
	✔		Outputs 1–6	Outputs 1–2 for main logic board, 1–6 for standard modules, and 1–3 for high power modules.

Window	Display	Setup	Item	Notes
Setpoints–Frequency	✓	✓	Overfreq Dropout	See Section 6.18, Setpoints-Frequency.
	✓	✓	Overfreq Pickup	Displays setting in % and resulting frequency in Hz.
	✓	✓	Underfreq Dropout	
	✓	✓	Underfreq Pickup	
	✓	✓	Freq Dropout Time	
Setpoints–Voltage	✓	✓	Overvoltage Dropout	See Section 6.19, Setpoints-Voltage.
	✓	✓	Overvoltage Pickup	Displays setting in % and resulting voltage.
	✓	✓	Undervoltage Dropout	See Section 6.19, Setpoints-Voltage.
	✓	✓	Undervoltage Pickup	Displays setting in % and resulting voltage.
	✓	✓	Voltage Debounce Time	
Site Overview	✓		Address	Network address, read from the ATS controller
	✓		Description	The ATS description, entered in the Device Form. See Section 2.5.2.
	✓		Status	Displays ATS status. Flashes red to indicate a fault condition.
	✓		Position	Shows the transfer switch position and also uses colors for quick switch position identification: Normal position = green, Off position = yellow, Emergency position = red
	✓		Normal Available	An X in this column indicates that the Normal source is available.
	✓		Emergency Available	An X in this column indicates that the Emergency source is available.
Source Info	✓		Voltage A–B	Measured voltages, three-phase systems.
	✓		Voltage B–C	
	✓		Voltage C–A	
	✓		Voltage A–N	
	✓		Voltage B–N	
	✓		Voltage C–N	
	✓		Voltage A–C	Measured voltage, single-phase systems.
	✓		Frequency	Measured frequency.
	✓		Actual Rotation	ABC or CBA, three-phase systems.
	✓		Phases	Number of phases detected.
	✓		Expected Rotation	ABC or CBA, three-phase systems.
	✓		System Voltage	Nominal system voltage.
	✓		System Frequency	Nominal system frequency.
	✓		Current	Amps. Current sensing accessory required.
System Information	✓	✓	Designation	Enter unique descriptions to identify the transfer switch and loads.
	✓	✓	Location	
	✓	✓	Load Branch	
	✓	✓	Load Description	
	✓	✓	ATS Serial No. *	Factory-set. See footnote. *
	✓	✓	Contactor Serial No. *	
	✓	†	Controller Serial No. †	Factory-set. Not adjustable in the field.
	✓		Device ID	
	✓		Software Version Nos.	
	✓		MAC address	

* Distributor-level password is required in order to change these settings. These settings should be changed only if the controller is replaced in the field.

† Factory set only.

Window	Display	Setup	Item	Notes
System Summary	✔		System State	See Section 6.22, System Summary.
	✔		Contactor Position	N, E, or OFF (programmed-transition only).
	✔		Preferred Source	N or E.
	✔	✔	Mode of Operation	Generator Set to Utility, Utility to Utility, Generator Set to Generator Set, or Utility-Gen-Gen for 3-source systems.
	✔	✔	Util to Gen-Gen Start Mode	For 3-source systems only. Preferred first or both together.
		✔	Preferred Source Toggle	For 3-source systems with Start Preferred First selected.
	✔	✔	Transition Mode *	Open or Programmed-Transition *
	✔	✔	Rated Current	Amps.
	✔		Preferred Source Available	Indicator is green when source is available.
	✔		Standby Source Available	Indicator is green when source is available.
	✔		Ext. Eng. Time Delay	Extended Engine Time Delay: Enabled (requires external battery supply; see Section 6.22) or Disabled.
	✔	✔	Commit to Transfer	Enabled or disabled indicator.
	✔	✔	Peak Shave Delay Bypass	Enabled or disabled indicator.
	✔	✔	Loaded Remote Test	Indicator is green if loaded test is enabled.
	✔	✔	In-Phase Monitor Enabled [Angle]	Indicator is green if in phase monitor is enabled. Angle –20 to 20 degrees, leading or lagging.
	✔	†	Supervised Transfer Mode †	Automatic Override or Non-Automatic. †
	✔		Supervised Transfer Switch Position	Auto or Manual.
Time Delays	✔	✔	Source N Engine Start	See Section 6.23, Time Delays.
	✔	✔	Source E Engine Start	
	✔	✔	Preferred to Standby	
	✔	✔	Standby to Preferred	
	✔	✔	Source N Engine Cooldown	
	✔	✔	Source E Engine Cooldown	
	✔	✔	Fail to Acquire Standby	
	✔	✔	Fail to Acquire Preferred	
	✔	✔	In-Phase Transfer Failure	
	✔	✔	Off to Standby	Programmed-transition models only.
	✔	✔	Off to Preferred	

* Distributor-level password is required in order to change these settings. These settings should be changed only if the controller is replaced in the field.

† Factory set only.

6.5 Active Time Delay

The Active Time Delay window displays the name of the time delay that is currently being executed, the amount of time remaining for that delay, and the percent time elapsed. The bar shows the progression of the time delay as it runs. See Figure 6-2.
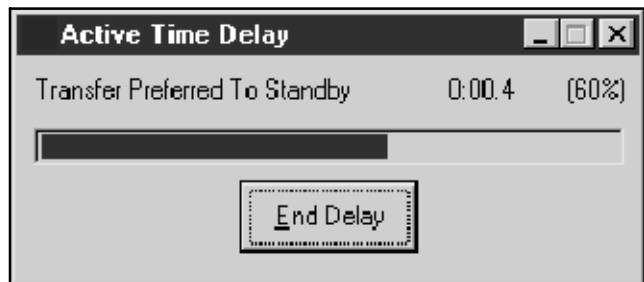
Figure 6-2 Active Time Delay Display

Supervisor-level access is required in order to use the *End Delay* button. Clicking on the *End Delay* button ends only the active time delay. Subsequent programmed time delays will start and run until completion or until the *End Delay* button is activated for each delay.

The *End Delay* button will not end an exercise or a programmed-transition (off-to-standby or off-to-preferred) time delay.

6.6 Common and Audible Alarms

Use the Common Alarms windows to assign and view the events assigned to the controller's common alarms 1 and 2 and audible alarm. Any fault condition assigned to the Common Alarm triggers the Common Alarm programmable output. See Section 7.15.4, Programmable Outputs, for more information about programmable outputs.

Conditions assigned to the audible alarm trigger the alarm horn. The Alarm Module accessory is required for audible alarms.

6.6.1 Common Alarms Data Window

This window displays the events that are assigned to the controller's common alarm. See Figure 6-3 for an example of the Common Alarms Display window with a number of assigned events.
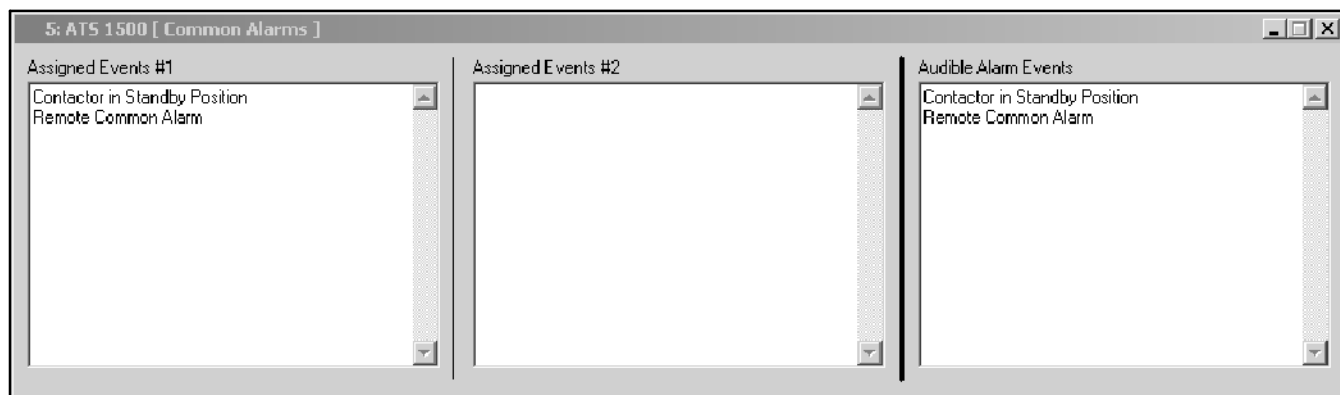
Figure 6-3 Common Alarms Display

6.6.2 Common and Audible Alarm Setup Windows

Double click on one of the three display windows shown in Figure 6-3 to open the corresponding setup window. The common alarms setup window displays a list of all events that can be assigned as common alarms. See Figure 6-4 and Figure 6-5. Select an event from the list and click on the *Add* button to assign it as a common or audible alarm. The event will move from the Available window to the Assigned window. Use the *Remove* button to remove an assigned event.

To assign or remove a block of events, click on the first event in the list, then hold down the *Shift* key and click on the last event in the block. To select several individual events, hold down the control (*Ctrl*) key while clicking on each event. Use the *Add* or *Remove* key to move all of the highlighted events.

Refer to the ATS Operation and Installation Manual for more information about common and audible alarms.

Figure 6-4 Common Alarm Setup

Figure 6-5 Audible Alarm Setup

6.7 Date/Time Windows

View and set the controller's time and date settings, or set the controller's clock to match the personal computer's (PC) clock.

6.7.1 Date/Time Display

The Date/Time display shows the controller's time and date settings. See Figure 6-6.
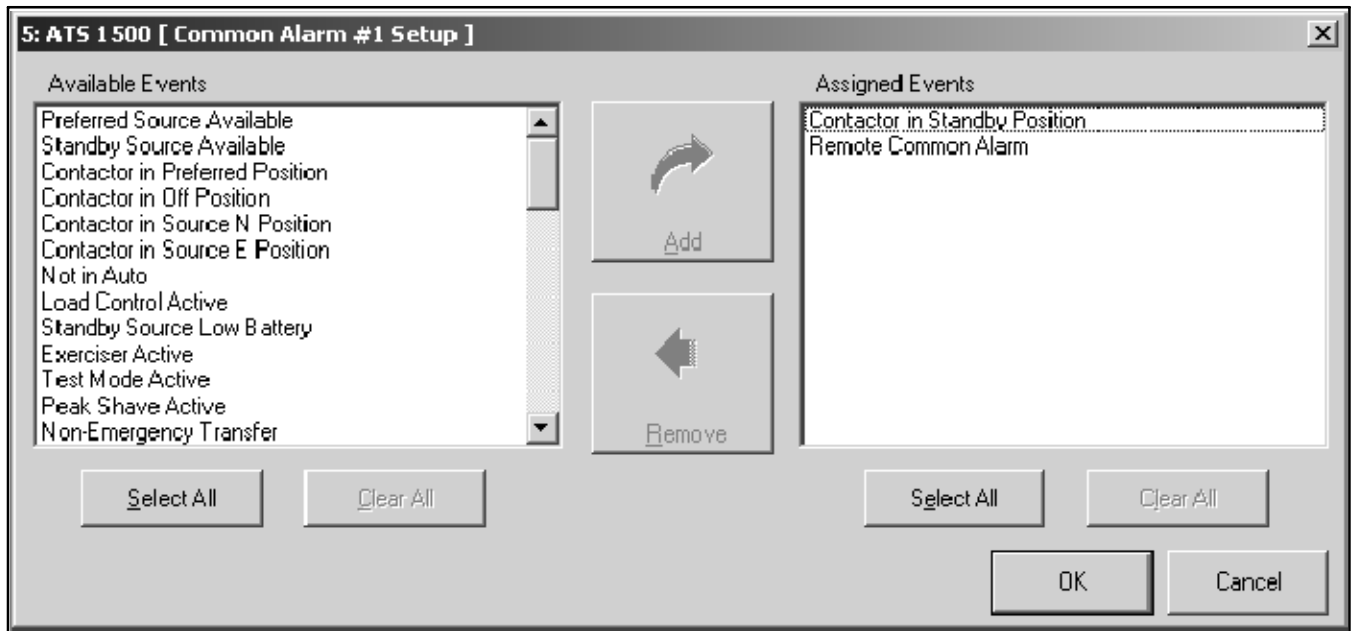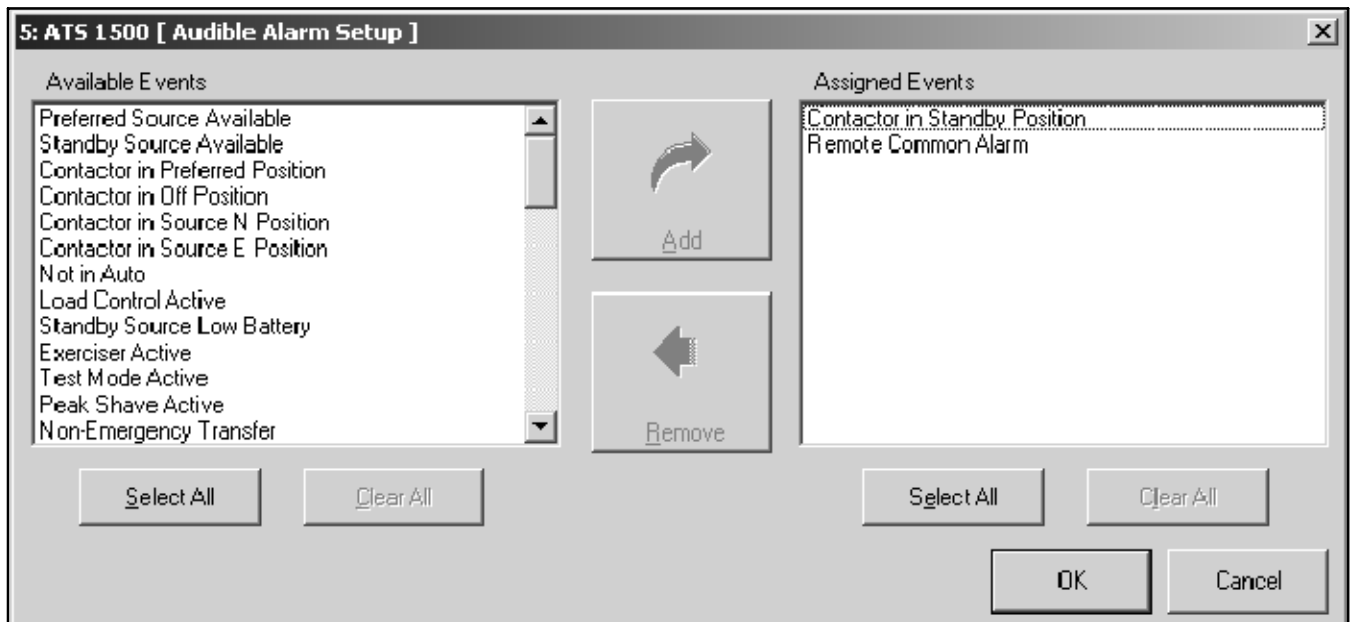
The controller's settings do not necessarily match those of the PC. The setup window allows you to synchronize the ATS clock with the computer clock, if desired.
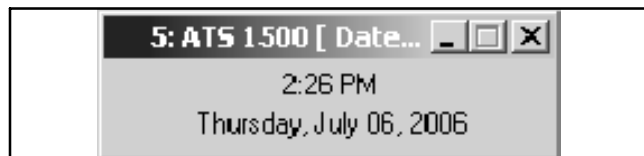
Figure 6-6 Date/Time Display

6.7.2 Date/Time Setup

Use the drop-down arrow to display a date list and click on a date from the list to select it, or select *Today* at the bottom of the calendar. Another way to enter the date is to select the date, month, and year one item at a time and type the current information into the date box. See Figure 6-7. Click on the *OK* button or press *Enter* to enter the settings. The clock does not reset until *OK* is entered.

Use the up and down arrows to set the time or click the *Synchronize with Computer* button to set the controller's clock to match the PC's time.
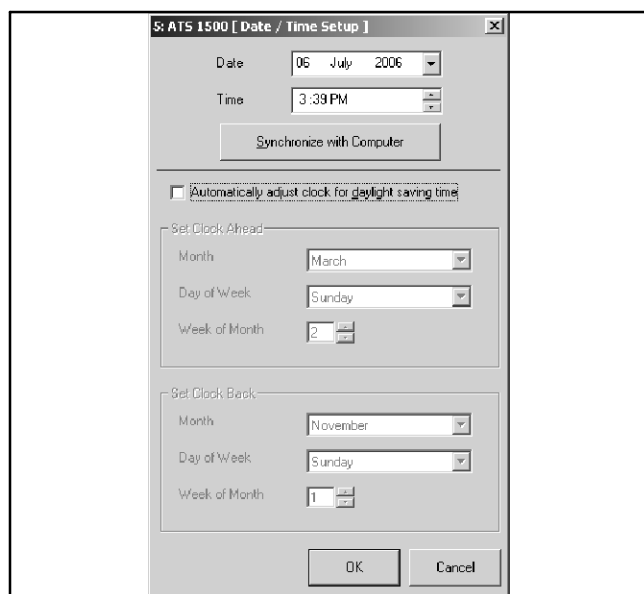
Figure 6-7 Date/Time Setup

6.7.3 Daylight Saving Time

To set the system to automatically reset the clock for Daylight Saving Time, click in the *Automatically adjust clock for daylight saving time* box so that a check mark appears. Enter the month, day, and week to set the clock ahead in the spring and back in the fall.

The clock resets at 2 a.m. If an exercise is scheduled to begin between 2 and 3 a.m. on the day that the time changes, that exercise run will be missed.

6.8 DIP Switch Settings

The DIP switch settings window (see Figure 6-8) displays the positions of the controller's DIP switches:

● Setup password enabled or disabled
● Maintenance Switch: Maintenance or Run position
● Switches 3 and 4 are not used at this time

Figure 6-8 DIP Switch Settings

6.9 Event History

The Event History window displays the time, date, and duration of the last loss of the preferred source. The window also displays all events in the controller's event log, with the time, date, and up to two other parameters associated with the event. The window displays up to 100 events. See Figure 6-9.

The message *EEPROM Access Warning* may appear in the event log. If the EEPROM warning message appears repeatedly, call for service.

Press the *Save History* button to save the event log in an ASCII text file. The system allows the user to select the location to save the file.

Supervisor-level access is required for the Clear History operation. Pressing the *Clear History* button deletes the events in the log.
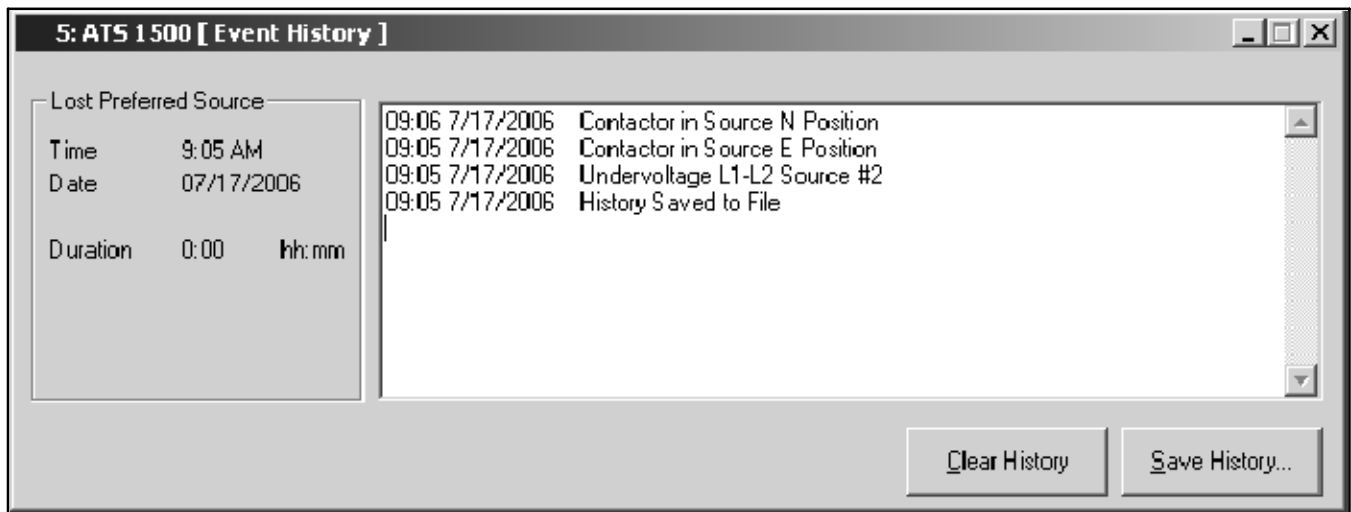
Figure 6-9 Event History Display

6.10 Event History View

The Event History View window allows the operator to view events for a selected time period and save them to a file.

Select the starting and ending dates of the desired time period by clicking on the each Set button and then selecting a date. The Number of Events parameter on the screen will change to show the number of events recorded during that time period.

To save the events to a file, click the *Save History* button. A dialogue box opens. Select the location to save the file and type in a name for the file. Click Save. The file will be saved with the .log extension.

Figure 6-10 Event History View

6.11 Exercise Calendar

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first.
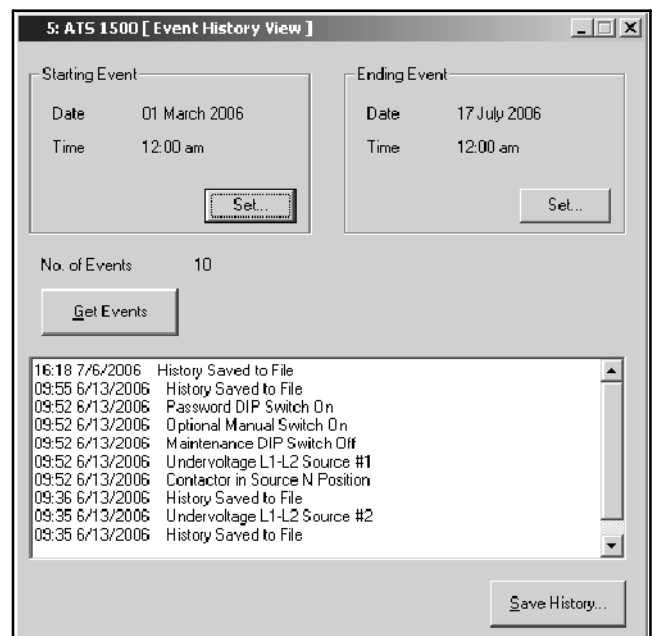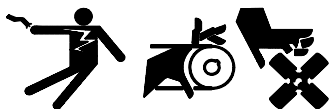
Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

Use the calendar mode to plan up to 21 exercise events that repeat daily, weekly, or monthly, and choose whether each event runs with or without load.

6.11.1 Calendar Data Window

The Calendar Data Window (see Figure 6-11) shows the following plant exerciser information. If an exercise event is disabled, the line is grayed out.

- Event No.
- Start Date
- Start Time
- Run Time
- Loaded or Unloaded
- Exercise period/Interval

Event No.	Next Start Date	Start Time	Run Time (hh:mm)	Loaded	Exercise Interval
1	Sat, 8 July 2006	12:00 AM	0:30		Every Week
2	Mon, 1 January 2001	12:00 AM	0:01		Every Week
3	Mon, 1 January 2001	12:00 AM	0:01		Every Week
4	Mon, 1 January 2001	12:00 AM	0:01		Every Week
5	Mon, 1 January 2001	12:00 AM	0:01		Every Week
6	Mon, 1 January 2001	12:00 AM	0:01		Every Week
7	Mon, 1 January 2001	12:00 AM	0:01		Every Week
8	Mon, 1 January 2001	12:00 AM	0:01		Every Week
9	Mon, 1 January 2001	12:00 AM	0:01		Every Week
10	Mon, 1 January 2001	12:00 AM	0:01		Every Week
11	Mon, 1 January 2001	12:00 AM	0:01		Every Week
12	Mon, 1 January 2001	12:00 AM	0:01		Every Week
13	Mon, 1 January 2001	12:00 AM	0:01		Every Week
14	Mon, 1 January 2001	12:00 AM	0:01		Every Week
15	Mon, 1 January 2001	12:00 AM	0:01		Every Week
16	Mon, 1 January 2001	12:00 AM	0:01		Every Week
17	Mon, 1 January 2001	12:00 AM	0:01		Every Week
18	Mon, 1 January 2001	12:00 AM	0:01		Every Week
19	Mon, 1 January 2001	12:00 AM	0:01		Every Week
20	Mon, 1 January 2001	12:00 AM	0:01		Every Week
21	Mon, 1 January 2001	12:00 AM	0:01		Every Week

Figure 6-11 Exercise Calendar Display

6.11.2 Calendar Setup Window

Use the setup window to set up to 21 exerciser run times, intervals, repeat rates, and loaded/unloaded condition. See Figure 6-12 for the Calendar Setup window.

Enabled or Disabled. Click on this box to enable or disable the exercise event. A check mark in the box indicates that the event is enabled. An empty box indicates that the event is disabled and will not run. The event remains on the calendar so that it can be enabled again at a later time.

Start Date. There are several ways to select the start date. Clicking on the month or year reveals up and down arrows that allow you to step up or down to the desired month or year. Selecting the drop-down arrow to right of the data entry box brings up a calendar. Click on the red circle at the bottom to select the current day or use the arrow buttons at the top of the calendar to step to the desired month and then click on the desired start date.

Start Time. Click on the hour, minute, or AM/PM so that the desired section is highlighted on the screen. Then use the arrows to step to the desired hour, minute, or AM/PM setting or type in the setting from the keyboard.

Run Time. This setting determines the duration of the exercise run. Run times over 60 minutes will be automatically converted to hours:minutes. The maximum run time is 24 hours.

5: ATS 1500 [Calendar Setup]

Event No.	Enabled	Start Date	Start Time	Run Time (hh:mm)	Loaded	Interval	Repeat Rate
1	☑	08 July 2006	12:00 AM	0:30	☐	Week	1
2	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
3	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
4	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
5	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
6	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
7	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
8	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
9	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
10	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
11	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
12	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
13	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
14	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
15	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
16	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
17	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
18	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
19	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
20	☐	01 January 2001	12:00 AM	0:01	☐	Week	1
21	☐	01 January 2001	12:00 AM	0:01	☐	Week	1

[OK]   [Cancel]

Figure 6-12 Exercise Calendar Setup

Loaded or Unloaded. A check in the box in the Loaded column indicates a loaded exercise. If the box is not checked, the exercise will start and run the generator set without transferring the load. Click on the box to select or deselect it. This setting overrides the loaded/unloaded DIP switch setting on the main logic board.

Interval. (daily, weekly, monthly, or the same day every month) This setting overrides the 1 week/2 week DIP switch setting on the controller's main logic board. This setting works with the repeat rate to set the time interval between exercise runs.

The Day of Month selection allows you to set the exerciser to run on the same day every month. For example, the exerciser can be set to run the first Sunday of every month. Use caution with the Day of Month selection. For example, selecting Day of Month on the 5th Friday of the month will cause the exerciser to run only during months that have five Fridays.

Repeat Rate. The repeat rate and interval set the time interval between exercise runs. For example, if *Day* is selected in the interval column, and 5 is entered as the repeat rate, then the exercise will repeat every 5 days. Double-click inside the Repeat Rate data box to highlight the contents, then type in a number between 1 and 12. Attempts to enter a number outside the acceptable range cause the box to turn red. Values outside the acceptable range are not accepted by the program.

6.12 Load Control Time Delays

Use the Load Control Time Delay windows to view and adjust the time delays for the load control outputs on the controller's main logic board and on the optional input/output modules. Figure 6-13 shows the Load Control Display window.

Note: The load control function requires the connection and assignment of load control outputs as well as setting the load control time delays. Refer to the ATS Operation and Installation Manual for more detailed information about the load control function.

Two time delay settings apply to each load control output: the load disconnect time before transfer and the reconnect time after transfer. These time delays allow selected loads to be disconnected and reconnected in steps rather than all at once.

See Section 6.16, Programmable Input/Output, to assign load control outputs to the main logic board and I/O modules.

6.12.1 Display

The display window shows the pre- and post-transfer time delay settings in minutes:seconds.

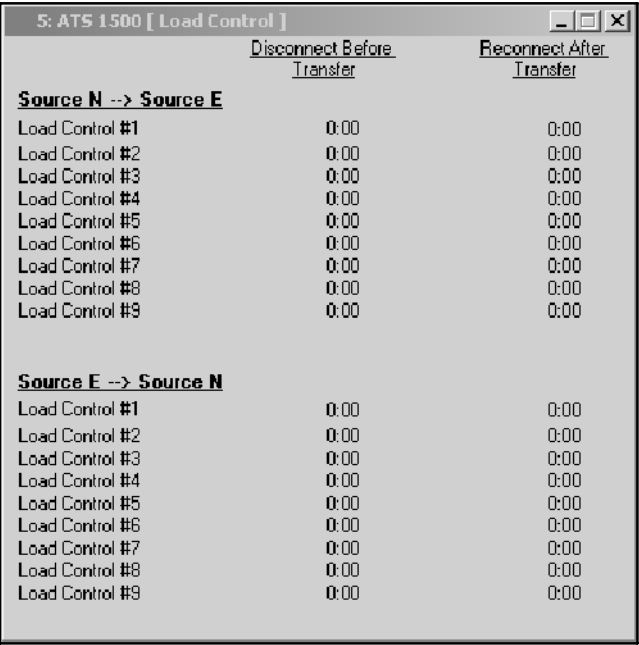| 5: ATS 1500 [Load Control]	Disconnect Before Transfer	Reconnect After Transfer
Source N --> Source E		
Load Control #1	0:00	0:00
Load Control #2	0:00	0:00
Load Control #3	0:00	0:00
Load Control #4	0:00	0:00
Load Control #5	0:00	0:00
Load Control #6	0:00	0:00
Load Control #7	0:00	0:00
Load Control #8	0:00	0:00
Load Control #9	0:00	0:00
Source E --> Source N		
Load Control #1	0:00	0:00
Load Control #2	0:00	0:00
Load Control #3	0:00	0:00
Load Control #4	0:00	0:00
Load Control #5	0:00	0:00
Load Control #6	0:00	0:00
Load Control #7	0:00	0:00
Load Control #8	0:00	0:00
Load Control #9	0:00	0:00

Figure 6-13 Load Control Time Delay Display

6.12.2 Setup

Use the Setup window to set the duration of each load control time delay before and after transfer. Enter a time between 0 seconds and 60 minutes (in minutes:seconds) into each data entry box. Click OK to save the settings or Cancel to exit the setup window without saving the new settings. See Figure 6-14.

```
5: ATS 1500 [ Load Control Setup ]                                        [X]

                        Disconnect Before              Reconnect After
                            Transfer                      Transfer
    Source N --> Source E
    Load Control #1      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #2      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #3      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #4      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #5      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #6      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #7      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #8      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #9      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]

                                                   No. Loads to Add    [ 9 ]  ( 0 - 9 )


    Source E --> Source N
    Load Control #1      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #2      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #3      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #4      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #5      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #6      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #7      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #8      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]
    Load Control #9      [  0:00 ] ( 00:00 - 60:00 ) [mm:ss]    [  0:00 ] ( 00:00 - 60:00 )  [mm:ss]

                                                   No. Loads to Add    [ 9 ]  ( 0 - 9 )


                                                [   OK   ]    [  Cancel  ]
```

Figure 6-14 Load Control Time Delay Setup

6.13 Maintenance History

6.13.1 Maintenance History Data Window

The Maintenance Display window shows the totals and the maintenance records since the last maintenance reset for the items listed in Figure 6-17. Figure 6-15 shows the Display window.

6.13.2 Setup Window

Double click on the Maintenance window to open the Setup window shown in Figure 6-16. After performing routine maintenance on the transfer switch, click on the Reset Maintenance Records button to reset the time since reset to zero. Click OK.

Use the System Start Date calendar to set the system start date to the date of the transfer switch installation. Click on Today at the bottom of the calendar page, or use the arrow buttons to move to the desired month and then click on the date in the calendar. The distributor-level password is required to set the system start date. Contact the DDC/MTU Power Generation Power Systems Service Department to obtain the distributor password. Type the password into the box and then click OK.

Figure 6-16 Reset Maintenance Records

Figure 6-15 Maintenance Display

Historical Data Types		
Item	**Units**	**Description**
Time in Operation	Minutes	Minutes the switch has been under power since leaving the factory
In Standby	Minutes	Minutes the switch operated in the Emergency position
Hours Not in Preferred	Minutes	Minutes the switch operated in any position other than the preferred position
Switch Transfers	—	Number of transfers the switch has completed
Failure to Transfer	—	The number of time that the contactor failed to transfer when commanded
Lost Preferred Source	—	Number of times the switch has lost the preferred power source
System Startup Date	—	The date the system was first started on site
Last Maintenance Reset Date	—	Date of last maintenance record reset
Transfer time N to E	mS	Milliseconds (not adjustable)
Transfer time E to N	mS	Milliseconds (not adjustable)

Figure 6-17 Maintenance Records

6.14 Manual Operation

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

The Manual Operation window (see Figure 6-18) includes the following items:

- Peak Shave Start/Stop buttons
- System Test Start/Stop buttons
  - Unloaded
  - Loaded
  - Auto-Loaded with Test Time setting
- Programmed-Transition Transfer to OFF button

Note: A user logged on as Guest cannot access the Manual Operation window.

Manual transfer operations are inhibited if the Maintenance DIP switch is set to inhibit transfer.

Peak Shave. Select the *Start* button to activate the peak shave function and initiate peak shave operation. The ATS starts the standby generator set and transfers the load to the standby source until the peak shave input is deactivated through the software. Click on the Stop button to transfer back to the preferred source and signal the generator set to stop.

Refer to the transfer switch operation and installation manual for more information about the Peak Shave sequence of operation.

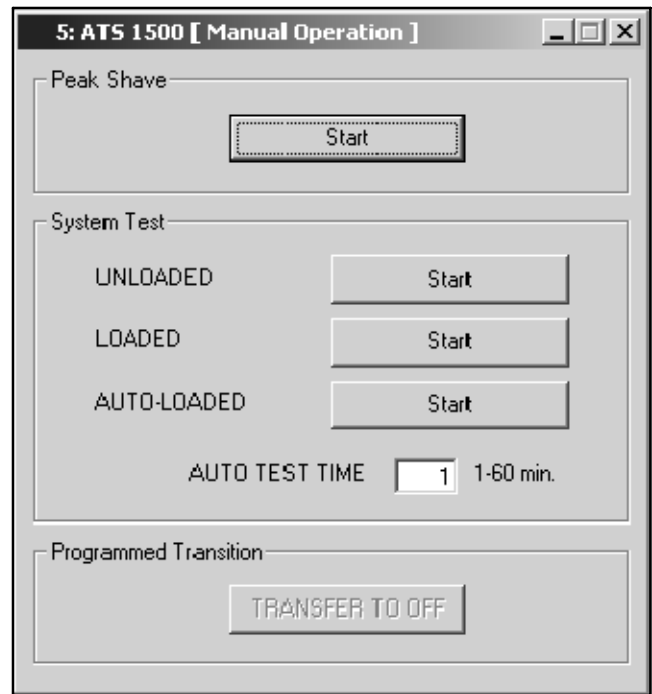**Note:** A peak shave input signal overrides the software buttons.

Figure 6-18 Manual Operation

System Test. Use the software buttons to start or end a loaded, unloaded, or auto-loaded test. The *Test* button on the controller's user interface remains functional, so that a test started by the software can be ended by pressing the *Test* button on the user interface, and a test started by pressing the button on the user interface can be ended by clicking on the *Stop* button in the software.

Note: A remote test input signal overrides the software buttons.

Programmed Transition Transfer to OFF. The programmed-transition Transfer to OFF button is disabled if the transfer switch is not a programmed-transition model. Select the *Transfer to OFF* button to force the transfer switch from the Emergency (Source E) position to the OFF position. The switch then transfers to Source N if it is available. The *Transfer to OFF* button does not function when the transfer switch is in the normal (Source N) position.

Note: A forced transfer to OFF input signal overrides the software buttons.

Select the *Resume Normal Ops* button to end the *Transfer to OFF* function. The ATS will transfer to the preferred source, if available, according to the controller settings.

Refer to the ATS operation and installation manual for more information about the Forced Transfer to OFF (load shed) sequence of operation.

6.15 Input/Output State

Monitor the status of programmed inputs and outputs on the logic board and on optional input/output modules through the Input/Output State window. The indicator is gray when the input or output is not active and turns green when the input or output is active.
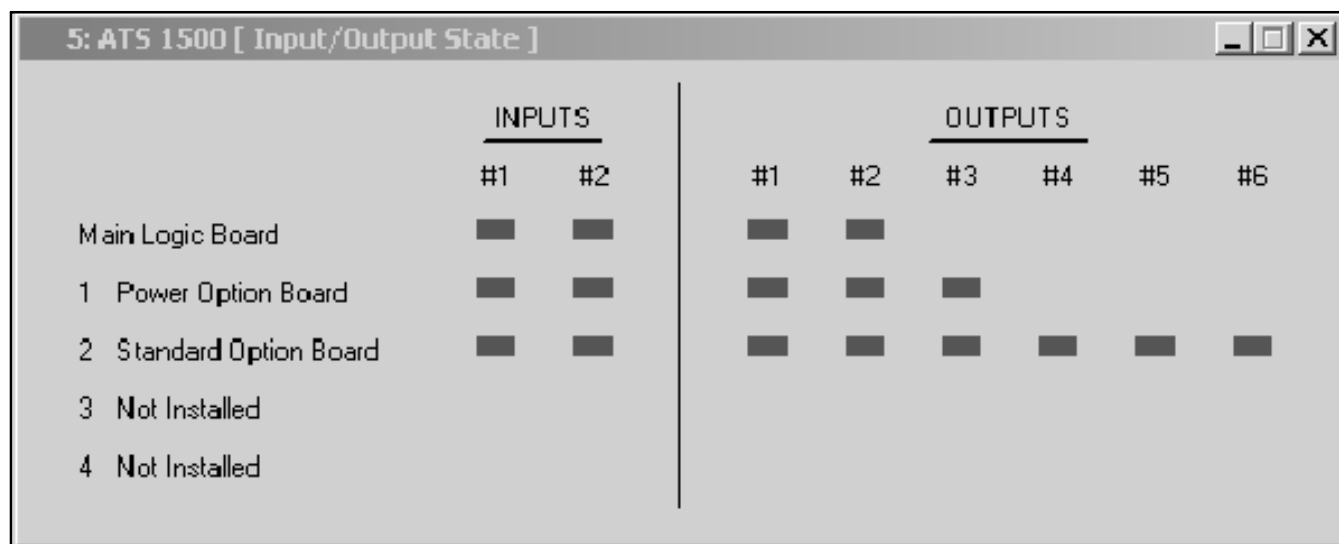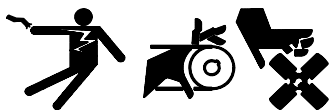

Figure 6-19 I/O State

6.16 Programmable Input/Output

View and assign main logic board and programmable I/O module input and output functions. Refer to the transfer switch Operation and Installation Manual for I/O connection instructions and more information on programmable input and output functions.

Note: Each programmable input and output requires a connection to the transfer switch. Do not change the programmable input/output assignments without verifying the transfer switch input and output connections.

Note: A user logged on as Guest cannot change the programmable input/output assignments.

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

6.16.1 Programmable Input/Output Display Window

The Programmable Input/Output window shows which input and output functions are assigned to the controller main logic board input and output terminals and to the I/O module input and output terminals.

The I/O module address is set by the address DIP switch settings on the I/O module. Use the address up and down arrows to step through the addresses and view the settings for each I/O module.

Each standard I/O module has 2 programmable inputs and 6 programmable outputs. High-power modules have 2 inputs and 3 outputs.
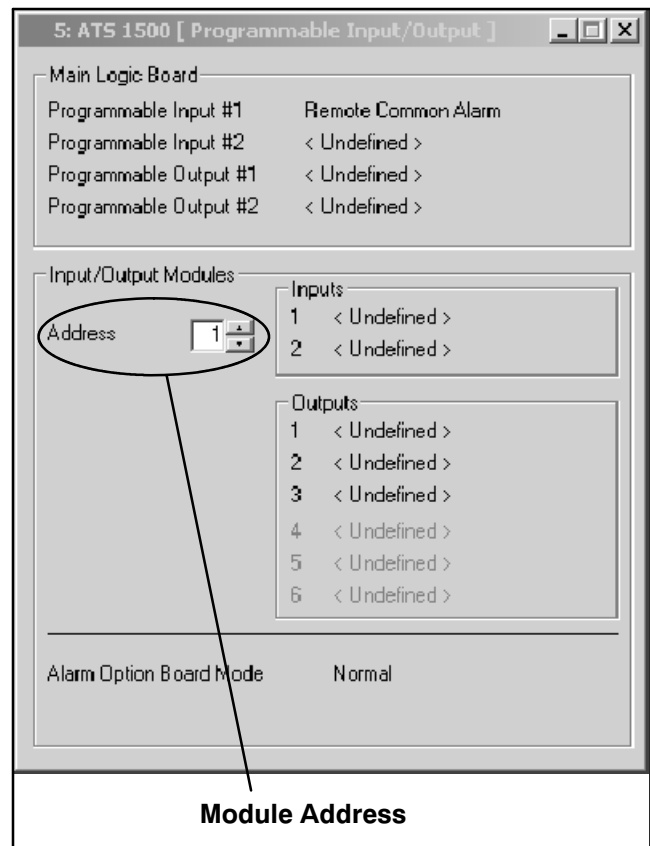

Module Address

Figure 6-20 Programmable Input/Output Display

6.16.2 I/O Setup Window

Double click in the Programmable Input/Output display window to open the setup window. Use the Programmable I/O Setup Window to assign input and output functions to the main logic board and I/O module input and output terminals. See Figure 6-21.

Main Logic Board

The main logic board provides 2 programmable inputs and 2 programmable outputs. Use the Setup window to assign functions to the controller main logic board inputs and output.

Note: Do not change the assignment of MLB input #1 on bypass/isolation switches. On bypass/isolation switches, terminal strip Input #1 is factory-connected and assigned to the Bypass Contactor Disable function.

Note: Switches equipped with the load shed accessory have one input factory-connected and set to Forced Transfer to OFF. Do not change this setting.

Input/Output Modules

Each standard I/O module provides 2 programmable inputs and 6 programmable outputs. High-power modules have 2 inputs and 3 outputs. Monitor III reads the module type from the controller and allows the assignment of only 3 outputs for high-power modules.

Note: Be sure to check the address shown in the address box. See Figure 6-21. The address resets to 1 each time the setup window is opened or the *OK* button is clicked. .

First select the address of the I/O module. Then use the dropdown arrows to select a function for each input or output. Use the up and down arrows to move to the next I/O module and assign functions for that board.

Click on the *OK* button to accept the I/O assignments or *Cancel* to discard the changes.

The same input or output function can be assigned to multiple locations on either the controller board or any attached I/O module. Inputs or outputs assigned the same function will operate together.
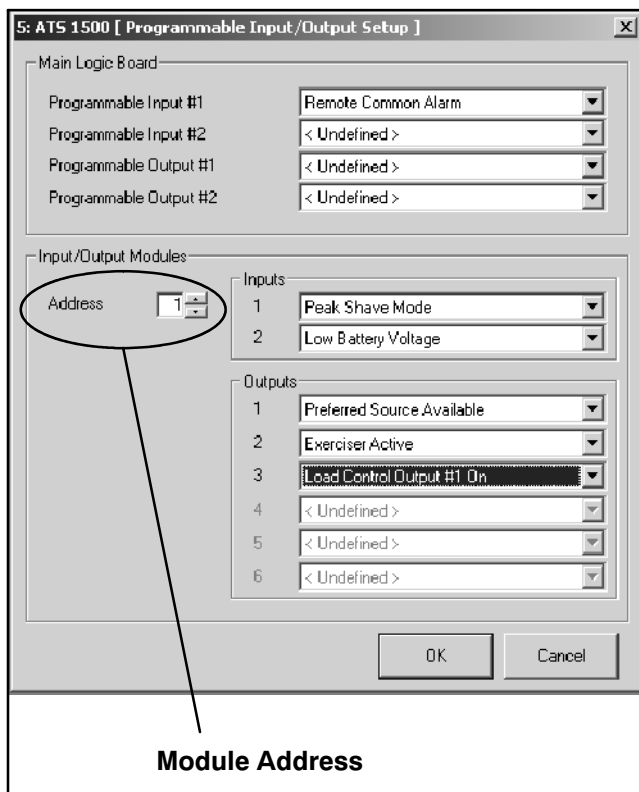

Module Address

Figure 6-21 Programmable Input/Output Setup

6.17 Remote Input/Output

6.17.1 Display Window

The display window is shown in Figure 6-22.

Software(Modbus)-Controlled Outputs

Software(Modbus)-controlled outputs can be turned on and off remotely through the remote input/output window. Click the ON button to activate the output. Click the OFF button to turn it off. The indicator next to each button turns blue when the output is on, and gray when the output is off.

If a Modbus-controlled output is not assigned to an output on the main logic board or an I/O module, the button is not enabled. See Section 6.16 or the transfer switch Operation/Installation manual to assign inputs and outputs.

Remotely Monitored Inputs

The status of Remotely Monitored Inputs can be viewed through this window. Set inputs to user input 1–4 through the Programmable Input/Output window or the controller's setup screens. See Section 6.16 or the transfer switch Operation/Installation manual.
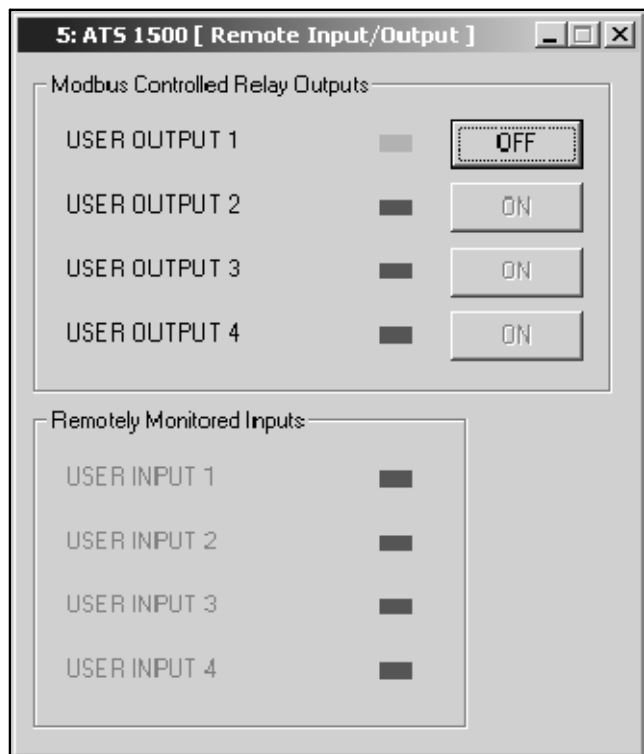
Figure 6-22 Remote Input/Output

6.17.2 Setup Window

The Remote Input/Output Setup window allows the operator to change the names of the inputs and outputs that are shown in Monitor III. (The inputs and outputs displayed on the transfer switch controller's LCD screen will not change.)
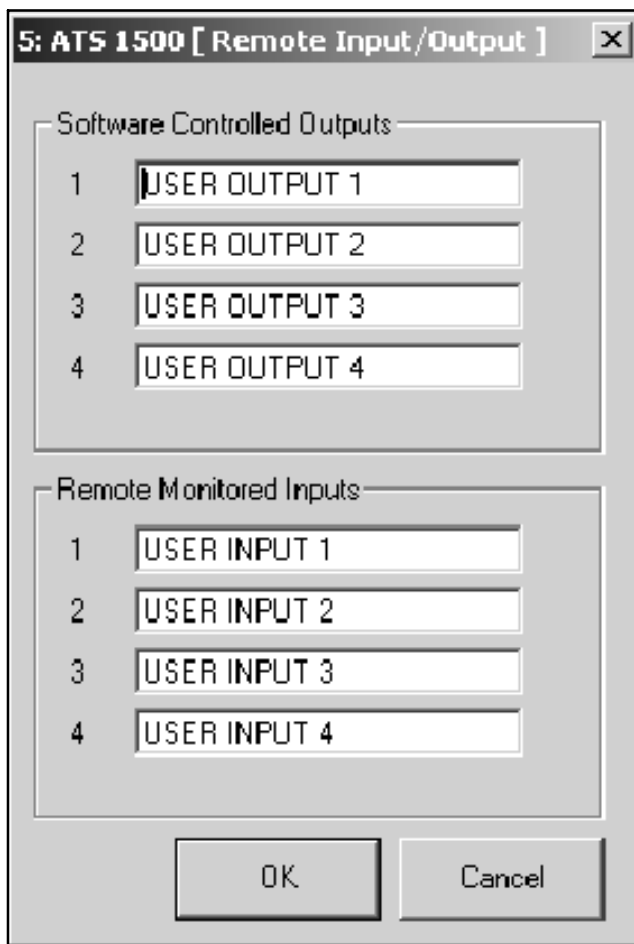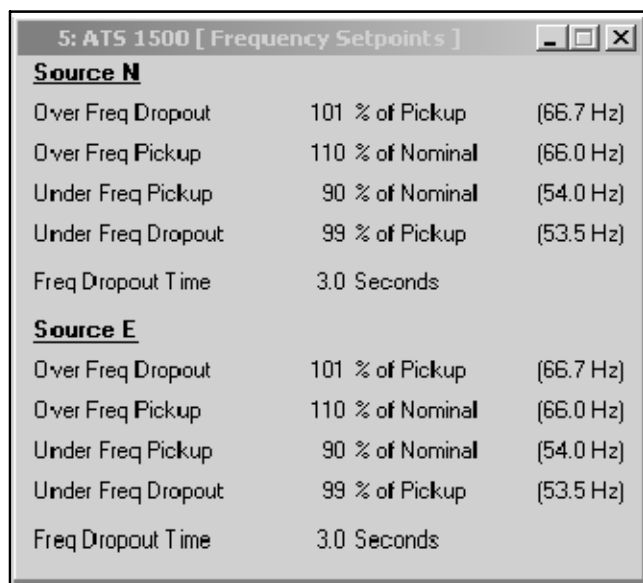

Figure 6-23 Remote Input/Output Setup Window

6.18 Setpoints, Frequency

The Frequency Setpoints data window shows the setpoints in percent of the nominal or the pickup value, and also shows the resulting setting in Hz. Figure 6-24 shows the frequency setpoints data window with the factory default settings.

Figure 6-24 Frequency Setpoints Display
(default settings shown)

6.18.1 Display

The data window shows the pickup and dropout settings as percentages of the nominal or pickup frequency as indicated. The resulting values in Hz are displayed in the column on the right.
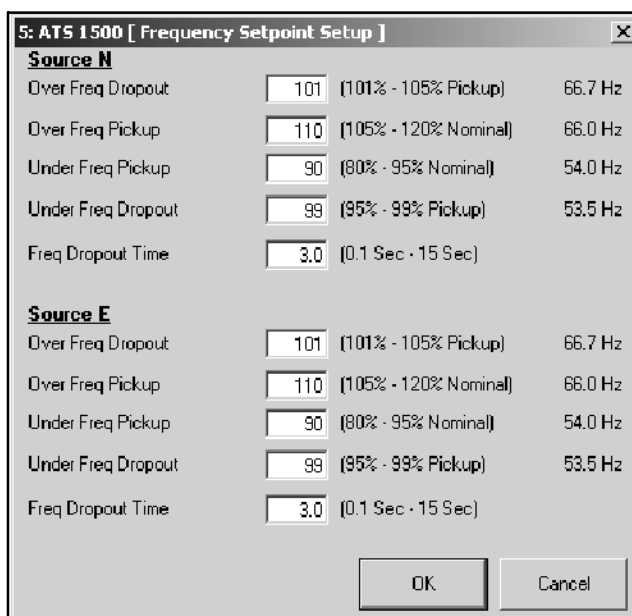
The frequency dropout time is displayed in seconds.

6.18.2 Setup

Note: A user logged on as Guest cannot access the setup window or change the Frequency Setpoints.

Open the setup window to change the overfrequency pickup and dropout settings, the underfrequency pickup and dropout settings, and the frequency dropout time for each source. The adjustment range is shown to the right of each data box. The values shown in Figure 6-25 are the factory default settings.

Click on the data box to be changed and type in the new value, in percent of nominal or pickup frequency as indicated to the right of the box. The resulting frequency will be displayed in the last column. Click on *OK* to apply the new settings or *Cancel* to discard the changes.

Figure 6-25 Frequency Setpoints Setup
(default settings shown)

6.19 Setpoints, Voltage

6.19.1 Display

Figure 6-26 shows the voltage setpoints data window with the factory default settings. The data window shows the pickup and dropout settings as percentages of the nominal dropout or pickup voltage as indicated. The resulting voltages are shown in the column on the right.

The voltage debounce time is displayed in seconds.

Figure 6-26 Voltage Setpoints Display
(default settings shown)

6.19.2 Setup

Note: A user logged on as Guest cannot access the setup window or change the Voltage Setpoints.

Open the Setup window to change the overvoltage pickup and dropout settings, the undervoltage pickup and dropout settings, and the debounce time for each source. The adjustment range is shown to the right of each data box. The values shown in Figure 6-27 are the factory default settings.

Click on the data box to be changed and type in the new value, in percent of nominal, pickup, or dropout voltage as indicated to the right of the box. The resulting voltage will be displayed in the last column. Click on *OK* to apply the new settings or *Cancel* to discard the changes.

Figure 6-27 Voltage Setpoints Setup
(default settings shown)

6.20 Source Information

The software provides source voltage, frequency, and phase information for Source N and Source E.

6.20.1 Display Window

The Source Info data window shows the following information for each source. See Figure 6-28. Single-phase systems will display only the single-phase parameters shown in Figure 6-29.

● Measured voltage
● Measured frequency
● Number of phases
● Expected phase rotation (3-phase only)
● Actual phase rotation (3-phase only)
● Nominal system voltage
● Nominal system frequency
● Line current (current sensing accessory required)

Figure 6-28 Source Info Display, Three-Phase Source

Figure 6-29 Source Info Display, Single-Phase Source

6.20.2 Setup Window

Set the nominal voltage and frequency, the number of phases, and phase rotation for 3-phase sources in this window. Verify that the settings match the transfer switch ratings.

Figure 6-30 Source Setup

6.21 System Information

The System Information window includes load descriptions, ATS information, and software version numbers.

6.21.1 System Information Display

See Figure 6-31 for the Source Information Display window.

Figure 6-31 System Info Display

6.21.2 System Information Setup

Note: A user logged on as Guest cannot access the setup window or change the system information settings.

The System Information Setup window (see Figure 6-32) allows changes to the following information:

- System designation
- System location
- Load branch
- Load description

Type in unique descriptions to clearly identify the system, location, and connected loads. Descriptions are limited to 20 alphanumeric characters, including spaces.

The serial numbers for the transfer switch, contactor, and controller are entered at the factory and should not be changed in the field unless the controller is replaced.

A distributor-level password is required to change the transfer switch and contactor serial numbers. Change these serial numbers only if the transfer switch controller is replaced. Contact the Power Systems Service Department to obtain the distributor password.

The controller serial number is factory-set and cannot be changed using the distributor-level password.

Software version numbers are read from the hardware and cannot be changed with the setup software.

Figure 6-32 System Info Setup

6.22 System Summary

The System Summary window displays the transfer switch status. See Figure 6-33.

6.22.1 System Summary Display

System State may indicate System Ready or a fault condition such as Failure to Acquire Standby. The controller obtains the system state from the hardware.

For those items with colored status indicators, the inidcator is blue or green if the associated condition is active, and gray if the condition is not active.

See the ATS Operation and Installation Manual for more information about system status messages and three-source systems.
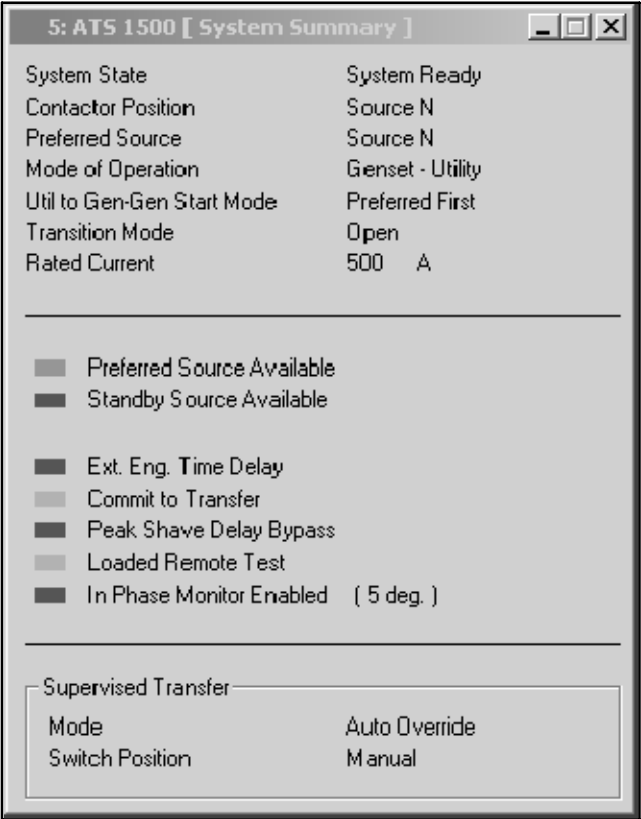
Figure 6-33 System Summary Display

6.22.2 System Summary Setup

The System Summary Setup window is analogous to the System Setup menu on the controller.

The Util to Gen-Gen settings are for three-source systems. See the ATS Operation and Installation Manual for information about three-source systems.

The transition mode (open or programmed) is factory-set and should not need to be changed unless the controller is replaced. Verify that the setting matches the contactor type, open (standard) or programmed-transition. The distributor password is needed to change the Transition Mode setting. Obtain the distributor password from the manufacturer's Power Systems Service Department.

The Supervised Transfer (non-automatic or automatic override) setting is factory-set. The setting cannot be changed in the field.
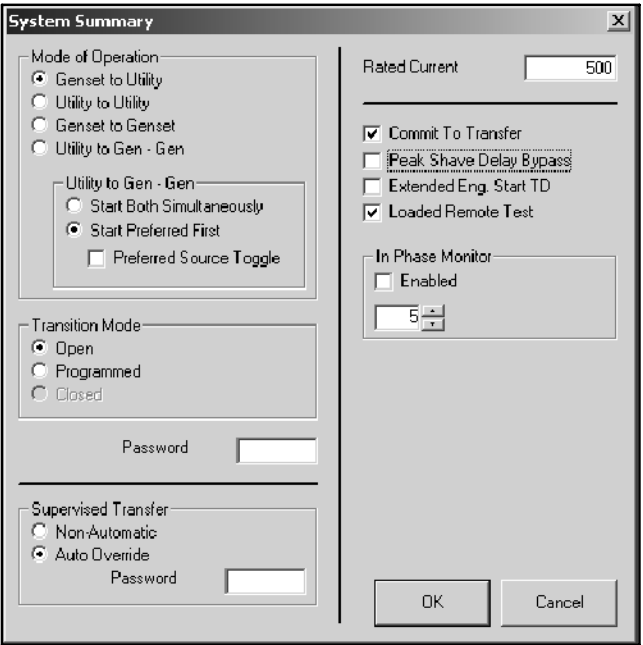
Figure 6-34 System Summary Setup Window

6.23 Time Delays

The monitoring program allows a user to view and adjust the ATS time delays.

Note: A user logged on as Guest cannot change the time delay settings.

6.23.1 Time Delay Data Window

The Time Delay Display window displays the settings for the time delays shown in Figure 6-35.

The Off to Standby and Off to Preferred delays are displayed only for programmed-transition models.

Note: The settings shown in the figures are not necessarily the factory default settings. Refer to the transfer switch Operation/Installation Manual for default settings.
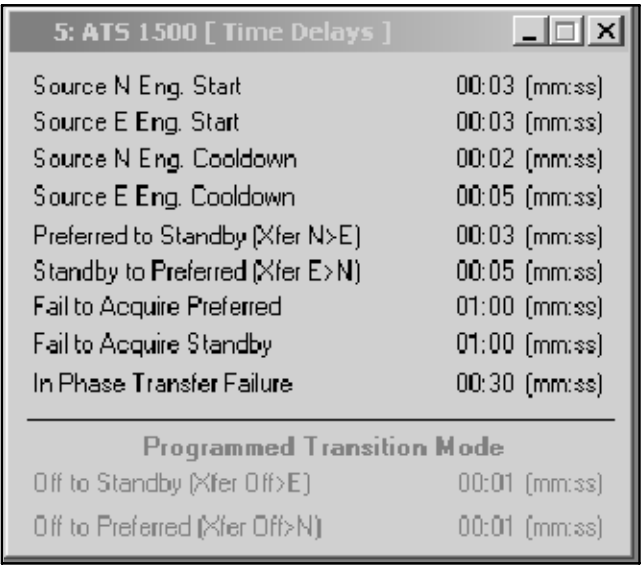
Figure 6-35 Time Delays Display

6.23.2 Time Delay Setup Window

The Time Delay Setup window (see Figure 6-36) allows the user to change the ATS delays. The adjustment range is shown to the right of each data entry box. Refer to the transfer switch Operation/Installation Manual for default settings.

Note: A user logged on as Guest cannot access the setup window or change the time delay settings.

To change the length of a time delay, double-click inside the data entry box and type in the new setting in minutes:seconds. Verify that the new setting falls within the range shown after the data entry box. Values outside the range will not be accepted. Click on the *OK* button or press the *Enter* key to enter the change.

Note: Extended time delays (longer than 6 seconds) require the use of an External Battery Supply Module (EBSM) Kit with a battery. Enable Extended Engine Start Time Delay in the System Summary setup window after connecting the battery to allow longer engine start time delays.
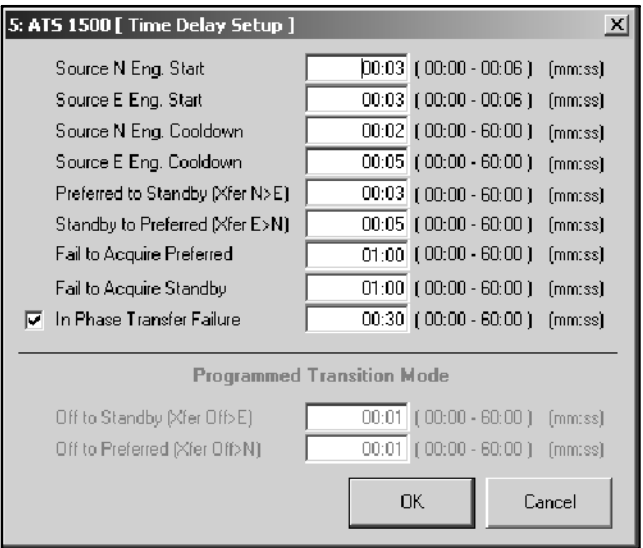
Figure 6-36 Time Delay Setup

Section 7 DXPower 1000 ATS Controller

7.1 Introduction

The Monitor III Program allows viewing and adjustment of selected settings for transfer switches equipped with the DXPower™ 1000 automatic transfer switch controller. Use the software to:

- View and adjust:

  - Time delays
  - Voltage and frequency trip points
  - Exerciser settings
  - Date and time
  - Common alarms
  - Load control time delays

- Start and stop a system test, exercise, or peak shave sequence

- Transfer to the OFF position (programmed-transition models only)

- Assign programmable inputs and outputs

- Toggle Modbus®-controlled relay outputs

- View only:

  - Source parameters
  - System status
  - Active time delays
  - DIP switch settings
  - Event history
  - Maintenance records

The view only items listed above can be changed using the Setup Program running on a PC connected to the ATS controller's RS-232 port.

The Monitor III Program cannot be used to view or adjust the transfer switch's communication settings, i.e. the network address or the network interface baud rate. Use the Setup Program to view and adjust ATS communication settings.

Note: Version 1.21 or higher of the ATS controller's application software is required for the Monitor III program to communicate successfully with the transfer switch. Check the software version number in the System Information data window; see Section 7.19.

7.2 Controller Connection and Setup

Connect the controller to the PC or network and configure the controller for communications. Refer to TT-1405, provided with the Monitor III software kit, for controller connection and setup instructions.

7.3 Data Windows

The following sections describe data and setup windows. Select *Window>New Window* and select an item from the list to create a data window. See Figure 7-1.

To open a setup window, first create the associated data window and click on it to activate it. Then double-click on the active data window or choose *Window>Setup* to create the setup window. Refer to Section 2.10, WIndow Menu, for more information about creating and working with setup windows.

A summary table in Section 7.4 lists all of the items contained in each window, and indicates whether each item is included in both the display and setup windows. Use the table as a guide to identify the location of individual settings, time delays, or other parameters.
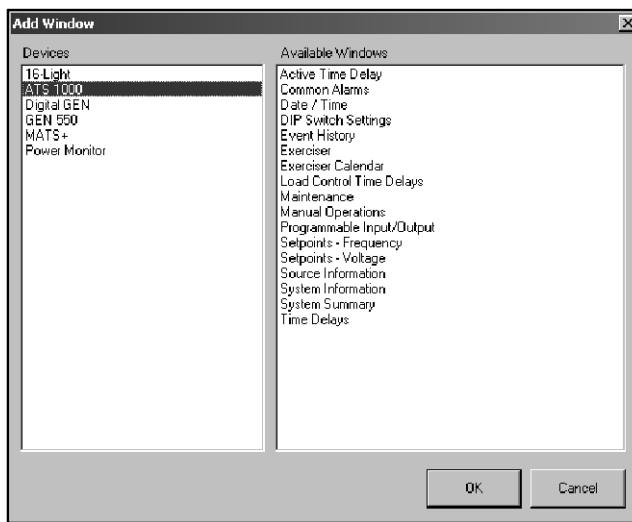
Figure 7-1 Add Window Form

7.4 Data Window Summary

Window	Display	Setup	Item	Notes
Active Time Delay	✓		Name of active time delay	See Section 7.5, Active Time Delay
	✓		Time remaining, seconds	
	✓		Percent time delay elapsed	
	✓		Elapsed time graphic display	
	✓		End Delay	Button ends an active time delay
				Does not end programmed-transition time delays or an exercise run
				See Section 7.5, Active Time Delay
Common Alarms	✓	✓	Assigned Events	Lists events that are assigned as common faults
		✓	Available Events	Use setup to choose common faults from a list of all available events
Date/Time	✓	✓	Date	Does not necessarily match the PC's date
				Can synch with PC
				Daylight Savings Time feature available
	✓	✓	Time	Does not necessarily match the PC clock
				Can synch with PC
		✓	System Clock	Select button to set time and date to match the PC system clock
		✓	Daylight Saving Time	Check box to select DST and date boxes to set clock ahead and back
DIP Switch Settings	✓		Transfer Inhibited (Red)/Permitted (Black)	Displays the positions of the controller DIP switches
	✓		Loaded/Unloaded Test	
	✓		Exercise Inhibited/Permitted	
	✓		1 Week/2 Week Manual Exercise	
	✓		Loaded/Unloaded Exercise	
Event History	✓		Lost Preferred Source	Displays time, date, and duration of last occurrence
	✓		Other Events	Displays up to 100 events
			Clear History	Disabled in the Monitor III Program
	✓		Save History	Button
Exerciser	✓	✓	Manual Mode	Select exerciser mode
	✓	✓	Calendar Mode with Override	Select button in setup window to enter Calendar Mode with Override
	✓	✓	Calendar Mode	Select button in setup window to enter Calendar Mode
	✓		Exercise Inhibited	Displays if the Inhibit Exercise DIP switch is activated
	✓		Transfer Inhibited	Displays if the Inhibit Transfer DIP switch is activated
	✓	✓	Next Manual Exercise Start Date	See Section 7.10
	✓	✓	Next Manual Exercise Start Time	
	✓	✓	Manual Exercise Period	
	✓	✓	Manual Exercise Loaded/Unloaded	DIP switch setting
	✓	✓	Manual Exercise Run Time	Hrs:min.
		✓	Manual Exercise Disable	Button
		✓	Push to Set/End	Button allows remote start/stop of exercise run

Window	Display	Setup	Item	Notes
Exerciser Calendar	✓		Event Number	See Section 7.10, Exerciser
	✓	✓	Next Start Date	
	✓	✓	Start Time	
	✓	✓	Run Time (hr:min)	
	✓	✓	Loaded (Unloaded)	
	✓	✓	Exercise Interval	
		✓	Repeat Rate	
Load Control Time Delays	✓	✓	Main Logic Board Load Control	Separate time delays for disconnect before transfer and reconnect after transfer
	✓	✓	I/O Module Load Control #1–8	Separate time delays for transfers from Source N to E and from Source E to N
Maintenance	✓		Not in Preferred	Hours, total and since last reset
	✓		In Standby	
	✓		Operation Time	Total and since last reset
	✓		Switch Transfers	
	✓		Lost Preferred Source	
	✓		Failures to Transfer	
	✓		System Start Date	Month/Day/Year; factory setting
	✓		Last Maintenance Reset Date	Month/Day/Year
	✓		Transfer Time N to E	Milliseconds (mS); factory setting
	✓		Transfer Time E to N	
Manual Operation	✓		Peak Shave	Start and Stop buttons
				Disabled if transfer inhibit DIP switch is set to ON
	✓		System Test	Start and Stop buttons
				Disabled if transfer inhibit DIP switch is set to ON
	✓		Programmed Transition	Transfer to Off and Resume Normal Ops Buttons
				Disabled in standard-transition models or if transfer inhibit DIP switch is set to ON
	✓		Modbus®-Controlled Relay Outputs	Buttons 1 through 4 to toggle relay outputs on or off
Programmable Input/Output	✓	✓	Terminal Strip Input #1	Main Logic Board
	✓	✓	Terminal Strip Input #2	
	✓	✓	Programmable Output	
	✓	✓	I/O Module Address	Input/Output Modules
	✓	✓	Input Event #1	
	✓	✓	Input Event #2	
	✓	✓	Outputs 1–6	
Setpoints– Frequency	✓	✓	Underfreq Dropout	See Section 7.16, Setpoints-Frequency
	✓	✓	Underfreq Pickup	
	✓	✓	Overfreq Dropout	
	✓	✓	Overfreq Pickup	
	✓	✓	Freq Dropout Time	
Setpoints– Voltage	✓	✓	Undervoltage Dropout	See Section 7.17, Setpoints-Voltage
	✓	✓	Undervoltage Pickup	
	✓	✓	Overvoltage Dropout	
	✓	✓	Overvoltage Pickup	
	✓	✓	Voltage Debounce Time	

Window	Display	Setup	Item	Notes
Site Overview	✓		Address	Network address, read from the ATS controller
	✓		Description	The ATS description, entered in the Device Form. See Section 2.5.2.
	✓		Status	Displays ATS status. Flashes red to indicate a fault condition.

	✓		Position	Shows the transfer switch position and also uses colors for quick switch position identification:
				    Normal position = green
				    Off position = yellow
				    Emergency position = red

	✓		Normal Available	An X in this column indicates that the Normal source is available
	✓		Emergency Available	An X in this column indicates that the Emergency source is available
Source Info	✓		Voltage A–B	Measured voltages, three-phase systems
	✓		Voltage B–C	
	✓		Voltage C–A	
	✓		Voltage A–N	
	✓		Voltage B–N	
	✓		Voltage C–N	
	✓		Voltage L1–L2	Measured voltage, single-phase systems
	✓		Frequency	Measured frequency
	✓		Actual Rotation	Three-phase systems
	✓		Phases	Number of phases detected
	✓		Expected Rotation	ABC or CBA
	✓		System Voltage	Nominal system voltage
	✓		System Frequency	Nominal system frequency
System Information	✓	✓	Designation	Enter unique descriptions to identify the transfer switch and loads
	✓	✓	Location	
	✓	✓	Load Branch	
	✓	✓	Load Description	
	✓		ATS Serial No.	Factory-set, not accessible in the field
	✓		Contactor Serial No.	
	✓		Controller Serial No.	
	✓		Device ID	
	✓		Software Version Nos.	

Window	Display	Setup	Item	Notes
System Summary	✓		System State	See Section 7.20, System Summary
	✓		Contactor Position	N, E, or OFF (programmed-transition only)
	✓		Preferred Source	N or E
	✓		Mode of Operation	Generator Set to Utility, Utility to Utility, or Generator Set to Generator Set
	✓		Transition Mode	Open or Programmed-Transition
	✓		Ext. Eng. Time Delay	Extended Engine Time Delay: Enabled (requires external battery supply; see Section 7.20) or Disabled
	✓		Preferred Source Available	Yes= source is available, No = source is not available
	✓		Standby Source Available	Yes= source is available, No = source is not available
	✓		Supervised Transfer Mode	Automatic Override or Non-Automatic
	✓		Supervised Transfer Switch Position	Auto or Manual
	✓		Commit to Transfer	Enabled or Disabled
	✓		Peak Shave Delay Bypass	Enabled or Disabled
	✓		In-Phase Monitor	Enabled or Disabled
	✓		In-Phase Monitor Transfer Angle	–20 to 20 degrees, leading or lagging
	✓		Rated Current	Amps
	✓		Number of I/O Modules Expected	Maximum of 4
Time Delays	✓	✓	Source N Engine Start	See Section 7.21, Time Delays
	✓	✓	Source E Engine Start	
	✓	✓	Preferred to Standby	
	✓	✓	Standby to Preferred	
	✓	✓	Source N Engine Cooldown	
	✓	✓	Source E Engine Cooldown	
	✓	✓	Acquire Standby Source	
	✓	✓	In-Phase Monitor Output	
	✓	✓	Off to Standby	Programmed-transition models only
	✓	✓	Off to Preferred	

7.5 Active Time Delay

The Active Time Delay window displays the name of the time delay that is currently being executed, the amount of time remaining for that delay, and the percent time elapsed. The bar shows the progression of the time delay as it runs. See Figure 7-2.
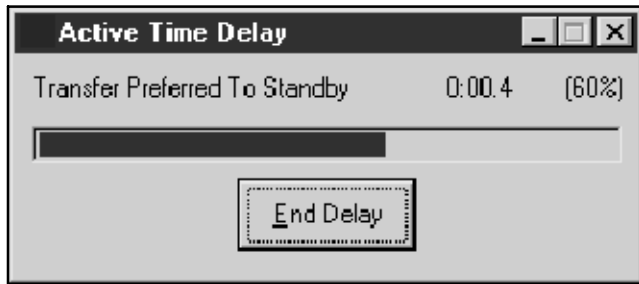

Figure 7-2 Active Time Delay Display

Supervisor-level access is required in order to use the *End Delay* button. Clicking on the *End Delay* button ends only the active time delay. Subsequent programmed time delays will start and run until completion or until the *End Delay* button is activated for each delay.

The *End Delay* button will not end an exercise or a programmed-transition (off-to-standby or off-to-preferred) time delay.

7.6 Common Alarms

Use the Common Alarms windows to assign and view the events assigned to the controller's common alarm. Any fault condition assigned to the Common Alarm triggers the Common Alarm programmable output. See Section 7.15.4, Programmable Outputs, for more information about programmable outputs.

7.6.1 Common Alarms Data Window

This window displays the events that are assigned to the controller's common alarm. See Figure 7-3 for an example of the Common Alarms Display window with a number of assigned events.
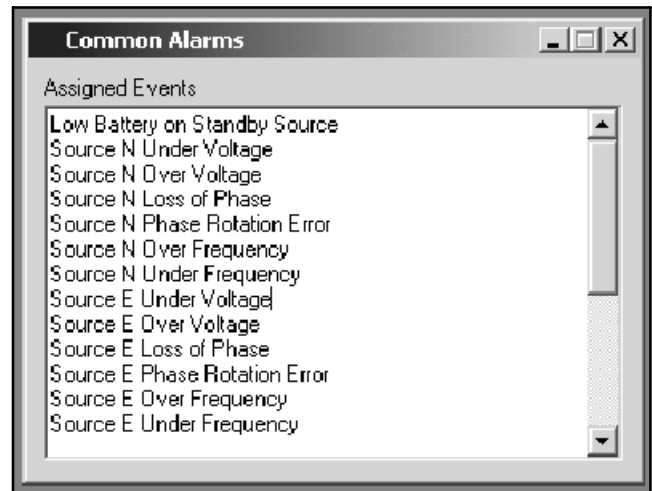
Figure 7-3 Common Alarms Display

7.6.2 Common Alarm Setup Window

The common alarms setup window displays a list of all events that can be assigned as common alarms. See Figure 7-4. Select an event from the list and click on the *Add* button to assign it as a common alarm. The event will move from the Available window to the Assigned window. Use the *Remove* button to remove an assigned event.

To assign or remove a block of events, click on the first event in the list, then hold down the *Shift* key and click on the last event in the block. To select several individual events, hold down the control (*Ctrl*) key while clicking on each event. Use the *Add* or *Remove* key to move all of the highlighted events.

Refer to Figure 7-5 for a typical list of events that can be assigned as common alarms.
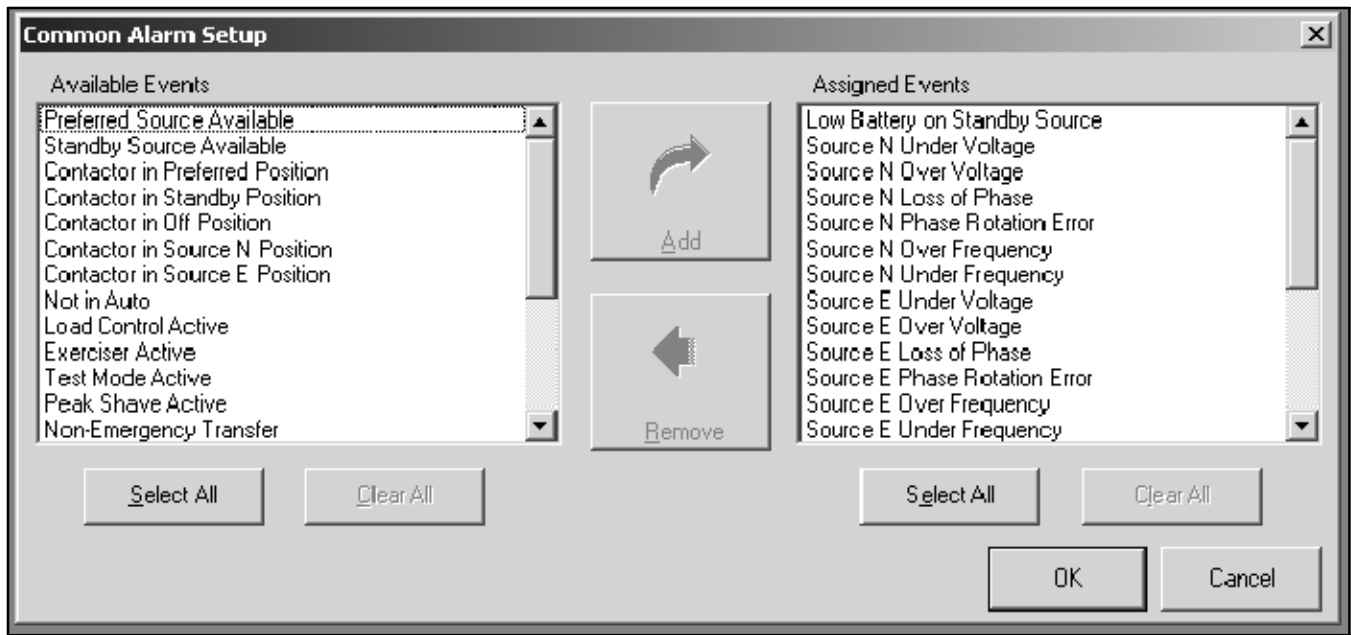
Figure 7-4 Common Alarm Setup

Preferred Source Available	Source N Undervoltage
Contactor in Preferred Position	Source N Overvoltage
Contactor in Standby Position	Source N Loss of Phase
Contactor in Off Position	Source N Phase Rotation Error
Contactor in Source N Position	Source N Overfrequency
Contactor in Source E Position	Source N Underfrequency
Not in Auto	Source E Undervoltage
Load Control Active	Source E Overvoltage
Exerciser Started	Source E Loss of Phase
Test Mode Active	Source E Phase Rotation Error
Peak Shave Active	Source E Overfrequency
Non-Emergency Transfer	Source E Underfrequency
Load Bank Activate	Failure to Acquire Standby
In-Phase Monitor Waiting for Synch	Failure to Transfer
Modbus-controlled RDO #1	I/O Module Comms Lost
Modbus-controlled RDO #2	I/O Module Not Found
Modbus-controlled RDO #3	I/O Module Not Installed
Modbus-controlled RDO #4	Aux. Switch Fault
System Ready	Aux. Switch Open
Source N Available	Remote Common Alarm
Source E Available	Critical (immediate) Service Required
Low Battery on Standby Source	Non-Critical Service Required

Figure 7-5 Typical Common Alarms

7.7 Date/Time Windows

View and set the controller's time and date settings, or set the controller's clock to match the personal computer's (PC) clock.

7.7.1 Date/Time Display

The Date/Time display shows the controller's time and date settings. The controller's settings do not necessarily match those of the PC. See Figure 7-6.
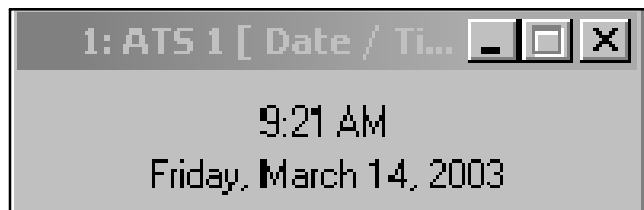

Figure 7-6 Date/Time Display

7.7.2 Date/Time Setup

Use the drop-down arrow to display a date list and click on a date from the list to select it, or select *Today* at the bottom of the calendar. Another way to enter the date is to select the date, month, and year one item at a time and type the current information into the date box. See Figure 7-7. Click on the *OK* button or press *Enter* to enter the settings. The clock does not reset until *OK* is entered.

Use the up and down arrows to set the time or click the *System Clock* button to set the controller's clock to match the PC's time.
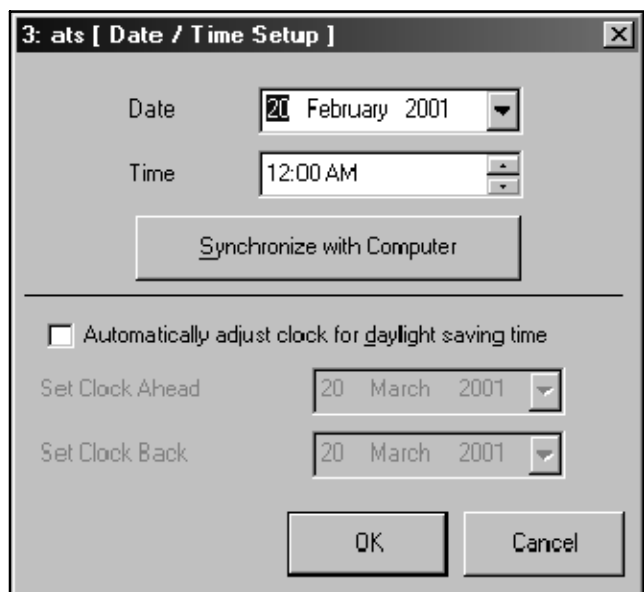
Figure 7-7 Date/Time Setup

7.7.3 Daylight Saving Time

To set the system to automatically reset the clock for Daylight Saving Time, click in the box so that a check mark appears. Enter the dates to set the clock ahead in the spring and back in the fall. Use the drop-down arrows to bring up a calendar or type the dates into the box in the same way as described for setting the current date.

Note: In succeeding years, the controller will reset the clock on the day of the week according to the date set for the first year. For example, if April 7, 2002 is entered, the clock will reset on the first Sunday in April, 2003, and succeeding years.

The clock resets at 2 a.m. If an exercise is scheduled to begin between 2 and 3 a.m. on the day that the time changes, that exercise run will be missed.

7.8 DIP Switch Settings

The DIP switch settings window (see Figure 7-8) displays the positions of the controller's DIP switches:

- Maintenance Switch: Transfer Inhibited (displayed in red) or Permitted
- Test: Loaded or Unloaded
- Exercise: Inhibited or Permitted
- Manual Exercise: 1 Week or 2 week
- Exercise: Loaded or Unloaded

Figure 7-8 DIP Switch Settings

7.9 Event History

The Event History window displays the time, date, and duration of the last loss of the preferred source. The window also displays all events in the controller's event log, with the time, date, and up to two other parameters associated with the event. The window displays up to 100 events. See Figure 7-9.
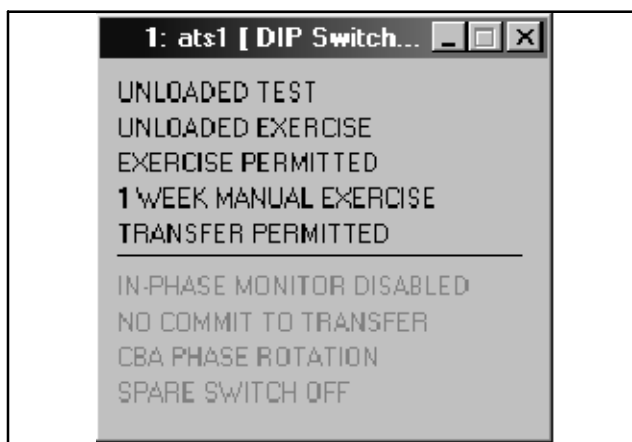
The message *EEPROM Access Warning* may appear in the event log. If the EEPROM warning message appears repeatedly, call for service.

Press the *Save History* button to save the event log in an ASCII text file. The system allows the user to select the location to save the file.

Supervisor-level access is required for the Clear History operation. Pressing the *Clear History* button deletes the events in the log.
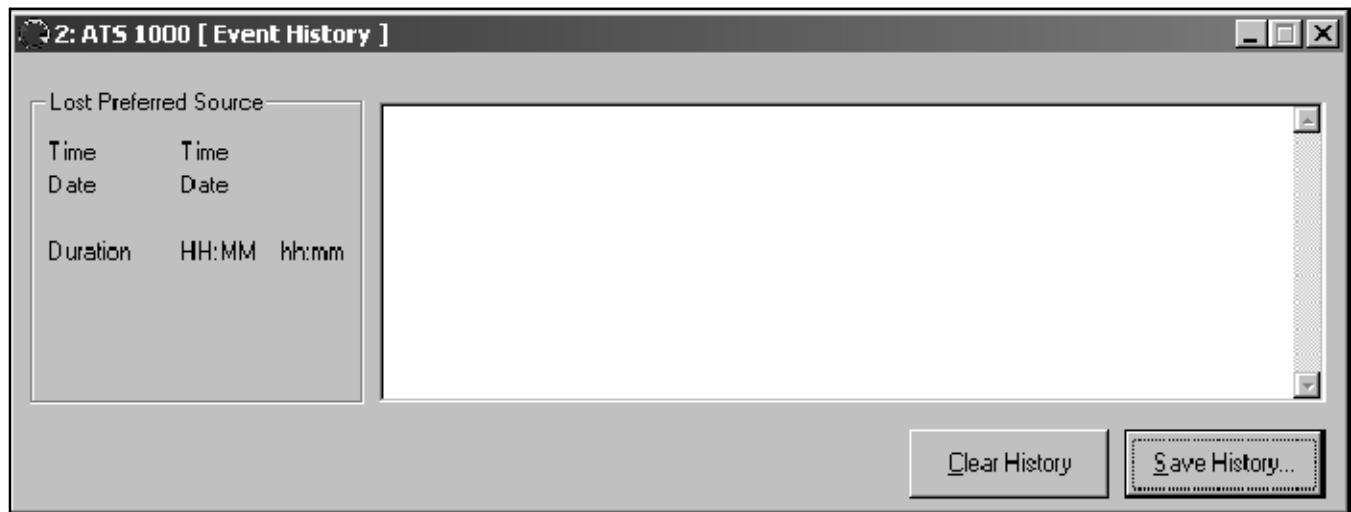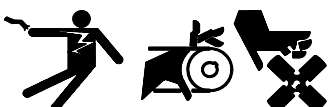
Figure 7-9 Event History Display

7.10 Exerciser

View and adjust the plant exerciser settings that are not directly related to the Calendar mode.

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

7.10.1 Exerciser Data Window

The plant exerciser data window (see Figure 7-10) displays the following:

- Exerciser Mode: Manual Mode, Calendar Mode, or Calendar Mode with Override

- Warnings Window:
  - EXERCISE INHIBITED: displays in red if the Exercise Inhibit DIP switch is set to the ON position
  - TRANSFER INHIBITED: displays in red if the Transfer Inhibit DIP switch is set to the ON position

- Manual Exercise:
  - Next Run Date
  - Next Run Time
  - Period
  - Loaded/Unloaded
  - Run Time

The period, 1 week or 2 weeks, determines how often the exerciser runs. The run time shows the duration of each exercise run. The 1 week/2 week period and loaded/unloaded exercise are set by DIP switches on the controller's main logic board. See the ATS operation and installation manual for more information about DIP switches.
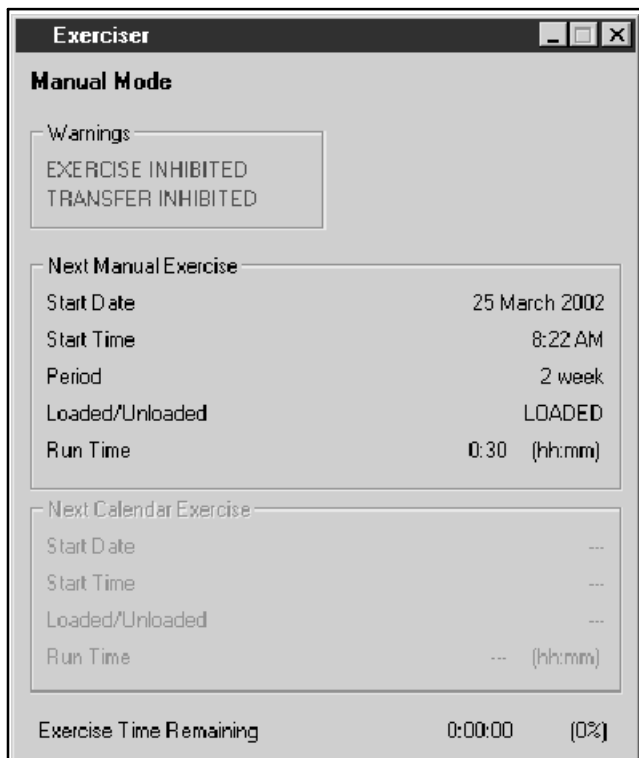
Figure 7-10 Exerciser Display

7.10.2 Exerciser Setup Window

Use the plant exerciser setup window (see Figure 7-11) to set or adjust the following:

- Exerciser Mode: Manual Mode, Calendar Mode, or Calendar Mode with Override
- Manual Exercise:
  - Next Run Date
  - Next Run Time
  - Period
  - Loaded/Unloaded
  - Run Time

The *Manual Exercise Disable* and *Set/End* buttons allow control of the manual exerciser through the software. Selecting the *Disable* button clears the manual exercise settings. Clicking on the *Push to Set/End* button when the exerciser is in manual mode has the same effect as pressing the *Exercise* button on the ATS user interface, starting or ending an exercise run.

Use the *Calendar Mode* or *Calendar Mode with Override* buttons in the exercise setup window to enter the exerciser Calendar mode. Refer to Section 7.11, Exercise Calendar, for more information about the Calendar and Calendar with Override modes.

Figure 7-11 Exerciser Setup

7.11 Exercise Calendar

The calendar provides a method to schedule the exerciser that is more flexible than using the 1 week/2 week DIP switch on the transfer switch's main logic board. Use the calendar mode to plan up to 21 exercise events that repeat daily, weekly, or monthly, and choose whether each event runs with or without load.
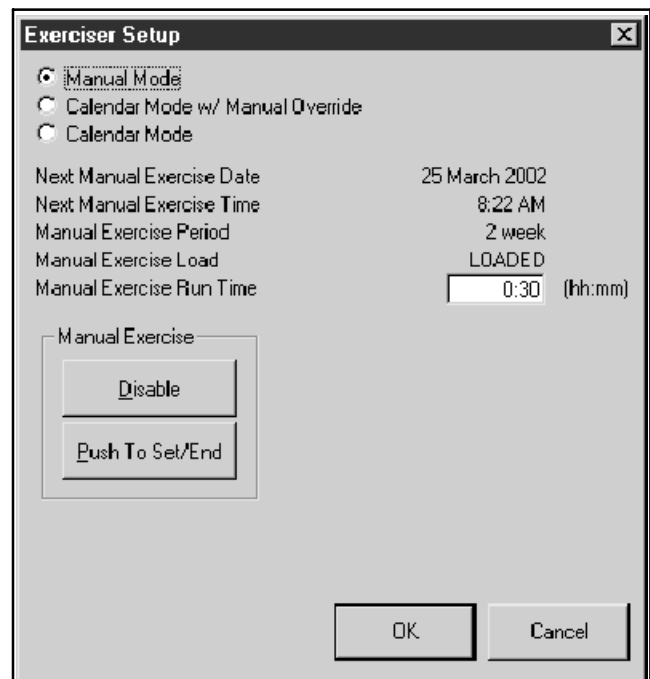
Use the *Calendar Mode* or *Calendar Mode with Override* buttons in the Exercise Setup window to enter the exerciser Calendar modes.

The Calendar Mode and Calendar Mode with Override settings override the 1 week/2 week and loaded/unloaded DIP switch settings.

Exercise Button Function in Calendar Modes

- **Calendar Mode.** In Calendar mode, pressing the *Exercise* button does not change the exercise mode or settings. The Exercise LED flashes quickly for two seconds if the *Exercise* button is pressed when the system is in Calendar Mode.

- **Calendar Mode with Override.** In Calendar Mode with Override, pressing and holding the *Exercise* button on the ATS user interface until the Exercise LED flashes overrides and disables the calendar settings. The calendar settings are saved for future use, but the exerciser runs in manual mode until reset to Calendar Mode or Calendar Mode with Override through the software.

7.11.1 Calendar Data Window

The Calendar Data Window (see Figure 7-12) shows the following plant exerciser information. If an exercise event is disabled, the line is grayed out.

- Event No.
- Start Date
- Start Time
- Run Time
- Loaded or Unloaded
- Exercise period/Interval
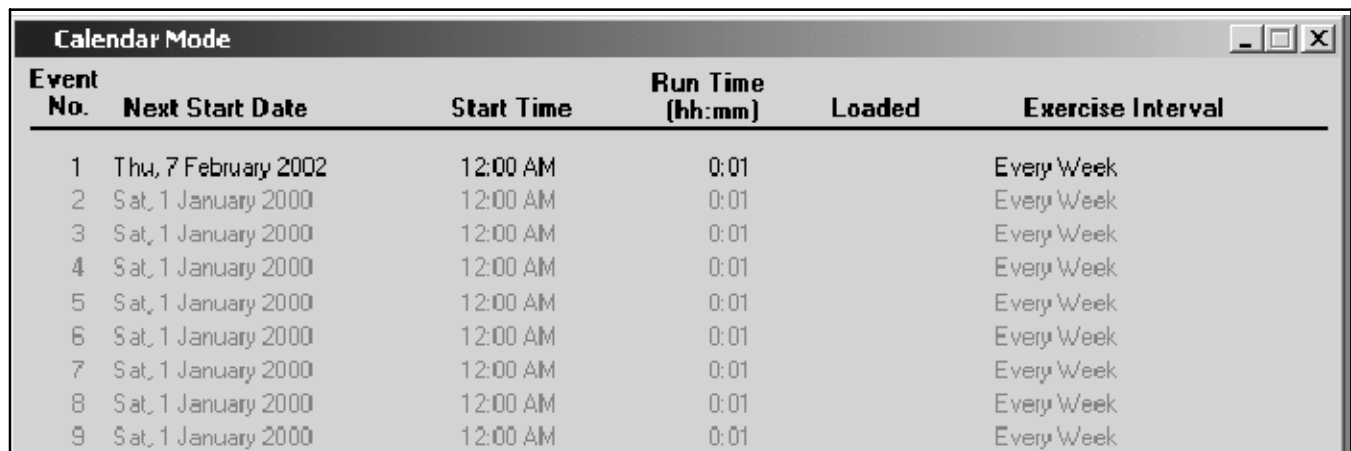
7.11.2 Calendar Setup Window

Use the setup window to set up to 21 exerciser run times, intervals, repeat rates, and loaded/unloaded condition. See Figure 7-13 for the Calendar Setup window.

Enabled or Disabled. Clicking on this box so that the check mark disappears disables that scheduled exercise event so that it does not run. The event remains on the calendar so that it can be enabled again at a later time.

Start Date. There are several ways to select the start date. Clicking on the month or year reveals up and down arrows that allow you to step up or down to the desired month or year. Selecting the drop-down arrow to right of the data entry box brings up a calendar. Click on the red circle at the bottom to select the current day or use the arrow buttons at the top of the calendar to step to the desired month and then click on the desired start date.

Start Time. Click on the hour, minute, or AM/PM so that the desired section is highlighted on the screen. Then use the arrows to step to the desired hour, minute, or AM/PM setting or type in the setting from the keyboard.

Run Time. This setting determines the duration of the exercise run. Run times over 60 minutes will be automatically converted to hours:minutes. The maximum run time is 24 hours.

Event No.	Next Start Date	Start Time	Run Time (hh:mm)	Loaded	Exercise Interval
1	Thu, 7 February 2002	12:00 AM	0:01		Every Week
2	Sat, 1 January 2000	12:00 AM	0:01		Every Week
3	Sat, 1 January 2000	12:00 AM	0:01		Every Week
4	Sat, 1 January 2000	12:00 AM	0:01		Every Week
5	Sat, 1 January 2000	12:00 AM	0:01		Every Week
6	Sat, 1 January 2000	12:00 AM	0:01		Every Week
7	Sat, 1 January 2000	12:00 AM	0:01		Every Week
8	Sat, 1 January 2000	12:00 AM	0:01		Every Week
9	Sat, 1 January 2000	12:00 AM	0:01		Every Week

Figure 7-12 Exercise Calendar Display

Loaded or Unloaded. A check in the box in the Loaded column indicates a loaded exercise. If the box is not checked, the exercise will start and run the generator set without transferring the load. Click on the box to select or deselect it. This setting overrides the loaded/unloaded DIP switch setting on the main logic board.

Interval. (daily, weekly, monthly, or the same day every month) This setting overrides the 1 week/2 week DIP switch setting on the controller's main logic board. This setting works with the repeat rate to set the time interval between exercise runs.

The Day of Month selection allows you to set the exerciser to run on the same day every month. For example, the exerciser can be set to run the first Sunday of every month. Use caution with the Day of Month selection. For example, selecting Day of Month on the 5th Friday of the month will cause the exerciser to run only during months that have five Fridays.

Repeat Rate. The repeat rate and interval set the time interval between exercise runs. For example, if *Day* is selected in the interval column, and 5 is entered as the repeat rate, then the exercise will repeat every 5 days. Double-click inside the Repeat Rate data box to highlight the contents, then type in a number between 1 and 12. Attempts to enter a number outside the acceptable range cause the box to turn red. Values outside the acceptable range are not accepted by the program.

Calendar Mode Setup

Event No.	Enabled	Start Date	Start Time	Run Time (hh:mm)	Loaded	Interval	Repeat Rate
1	☑	07 February 2002	12:00 AM	0:01	☐	Week	1
2	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
3	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
4	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
5	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
6	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
7	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
8	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
9	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
10	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
11	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
12	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
13	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
14	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
15	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
16	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
17	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
18	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
19	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
20	☐	01 January 2000	12:00 AM	0:01	☐	Week	1
21	☐	01 January 2000	12:00 AM	0:01	☐	Week	1

OK   Cancel

Figure 7-13 Exercise Calendar Setup

7.12 Load Control Time Delays

Use the Load Control Time Delay windows to view and adjust the time delays for the load control outputs on the controller's main logic board and on the optional input/output modules.

Two time delay settings apply to each output: the load disconnect time before transfer and the reconnect time after transfer. These time delays allow selected loads to be disconnected and reconnected in steps rather than all at once.

Note: Refer to the transfer switch Operation/Installation Manual for instructions to set up the load control function. The load control setup also requires assignment of load control outputs. See Section 7.15, Programmable Input/ Output, to assign load control outputs.

7.12.1 Display

Figure 7-14 shows the Load Control Time Delay Display window.

Load Control	Disconnect Before Transfer	Reconnect After Transfer
Source N --> Source E		
Main Logic Board Load Control	0:03	0:00
I/O Module Load Control #1	0:00	0:00
I/O Module Load Control #2	0:00	0:00
I/O Module Load Control #3	0:00	0:00
I/O Module Load Control #4	0:00	0:00
I/O Module Load Control #5	0:00	0:00
I/O Module Load Control #6	0:00	0:00
I/O Module Load Control #7	0:00	0:00
I/O Module Load Control #8	0:00	0:00
Source E --> Source N		
Main Logic Board Load Control	0:03	0:00
I/O Module Load Control #1	0:00	0:00
I/O Module Load Control #2	0:00	0:00
I/O Module Load Control #3	0:00	0:00
I/O Module Load Control #4	0:00	0:00
I/O Module Load Control #5	0:00	0:00
I/O Module Load Control #6	0:00	0:00
I/O Module Load Control #7	0:00	0:00
I/O Module Load Control #8	0:00	0:00

Figure 7-14 Load Control Time Delay Display

7.12.2 Load Control Time Delay Setup

Use the Setup window to set the duration of each load control time delay before and after transfer. Enter a time between 0 seconds and 60 minutes into each data entry box. See Figure 7-15.

Figure 7-15 Load Control Time Delay Setup

7.13 Maintenance

7.13.1 Maintenance Data Window

The Maintenance Display window shows the totals and the maintenance records since the last maintenance reset for the items listed in Figure 7-17. Figure 7-16 shows the Display window.

Maintenance information cannot be changed or reset through Monitor III. Use the ATS Setup program to reset maintenance records or reload default settings when necessary.

Figure 7-16 Maintenance Display

Historical Data Types		
Item	**Units**	**Description**
Time in Operation	Minutes	Minutes the switch has been under power since leaving the factory
In Standby	Minutes	Minutes the switch operated in the Emergency position
Hours Not in Preferred	Minutes	Minutes the switch operated in any position other than the preferred position
Switch Transfers	—	Number of transfers the switch has completed
Failure to Transfer	—	The number of time that the contactor failed to transfer when commanded
Lost Preferred Source	—	Number of times the switch has lost the preferred power source
System Startup Date	—	The date the system was first started on site
Last Maintenance Reset Date	—	Date of last maintenance record reset
Transfer time N to E	mS	Milliseconds (not adjustable)
Transfer time E to N	mS	Milliseconds (not adjustable)

Figure 7-17 Maintenance Records

7.14 Manual Operation

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

The Manual Operation window (see Figure 7-18) includes the following items:

- Peak Shave Start and Stop buttons
- System Test Start and Stop buttons
- Programmed-Transition Transfer to OFF button

● Modbus® Controlled Relay Outputs

Note: A user logged on as Guest cannot access the Manual Operation window.

Manual transfer operations are inhibited if the Maintenance DIP switch is set to inhibit transfer.

Peak Shave. Select the *Start* button to activate the peak shave function and initiate peak shave operation. The ATS starts the standby generator set and transfers the load to the standby source until the peak shave input is deactivated through the software. Refer to the transfer switch operation and installation manual for more information about the Peak Shave sequence of operation.

Note: A peak shave input signal overrides the software buttons.
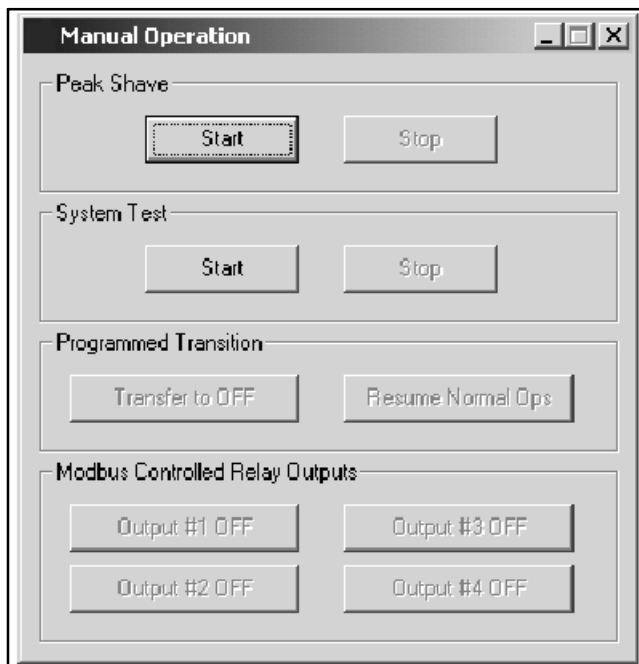
Figure 7-18 Manual Operation

Test. Use the software buttons to start or end a system test. The *Test* button on the user interface remains functional, so that a test started by the software can be ended by pressing the *Test* button on the user interface, and a test started by pressing the button on the user interface can be ended by clicking on the *Stop* button in the software.

Note: A test input signal overrides the software buttons.

Programmed Transition. The programmed-transition buttons are disabled if the transfer switch is not a programmed-transition model. Select the *Transfer to OFF* button to force the transfer switch from the Emergency (Source E) position to the OFF position. The switch then transfers to Source N if it is available. The *Transfer to OFF* button does not function when the transfer switch is in the normal (Source N) position.

Note: A forced transfer to OFF input signal overrides the software buttons.

Select the *Resume Normal Ops* button to end the *Transfer to OFF* function. The ATS will transfer to the preferred source, if available, according to the controller settings.

Refer to the ATS operation and installation manual for more information about the Forced Transfer to OFF (load shed) sequence of operation.

Modbus®-Controlled Relay Outputs. The buttons allow activation of Modbus®-controlled outputs assigned to the programmable outputs on the Main Logic Board or I/O Modules. The button displays *Output OFF* when the output is off. Clicking on the button activates the output. The button displays *Output ON*. Click on it again to deactivate the output.

7.15 Programmable Input/Output

View and assign main logic board and programmable (I/O) module input and output functions. Refer to the transfer switch Operation and Installation Manual for I/O connection instructions.

Note: Each programmable input and output requires a connection to the transfer switch. Do not change the programmable input/output assignments without verifying the transfer switch input and output connections.

Note: A user logged on as Guest cannot change the programmable input/output assignments.

⚠ **WARNING**

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

7.15.1 I/O Data Window

The Programmable Input/Output window shows which input and output functions are assigned to the controller main logic board terminal strip input and output terminals and to the I/O Module input and output terminals.
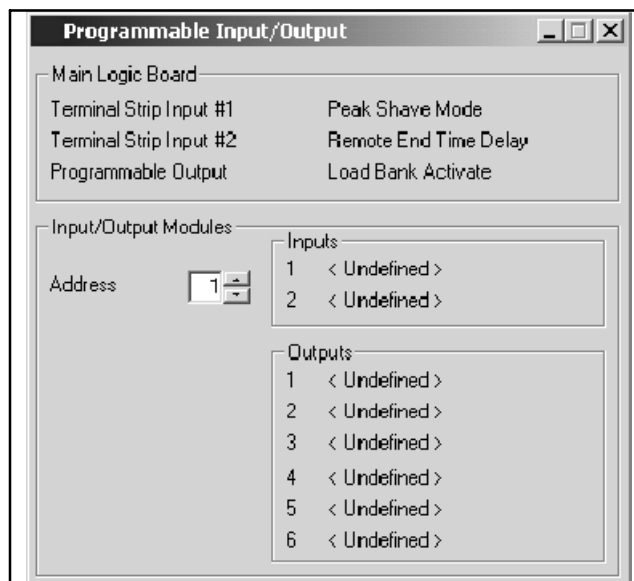
Figure 7-19 Programmable Input/Output Display

The I/O module address identifies the I/O board and must match the address DIP switch settings on the I/O board.

Bypass/isolation switches have only one programmable input available for reassignment on the main logic board. Programmable input 1 is used for a safety interlock circuit on bypass/isolation switches and is not available for customer use.

7.15.2 I/O Setup Window

Use the Programmable I/O Setup Window to assign input and output functions to the main logic board and I/O module input and output terminals. See Figure 7-20.

Figure 7-20 Programmable Input/Output Setup

The main logic board provides 2 programmable inputs and 1 programmable output. Use the Setup window to assign functions to the following controller main logic board inputs and output:

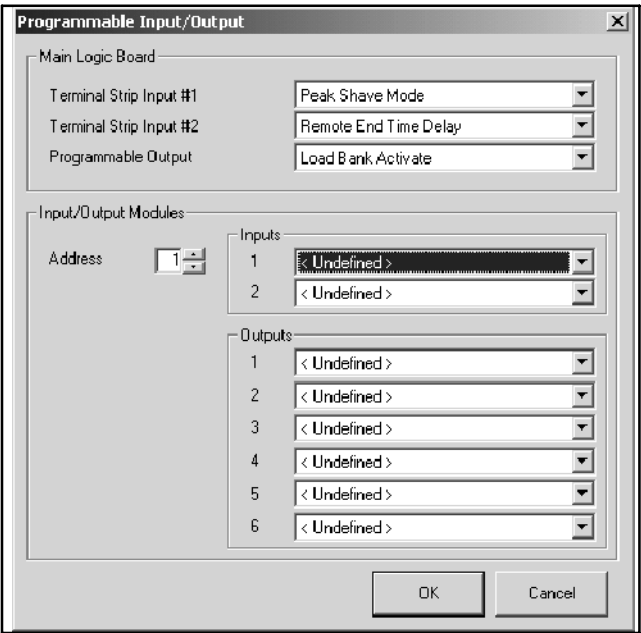- Terminal strip Input 1 (See note.)
- Terminal strip Input 2
- Programmable output

Note: Terminal strip input 1 is available for field-connection and assignment on standard switches only. On bypass/isolation switches, terminal strip Input 1 is factory-assigned and connected to the Bypass Contactor Disable function. *Do not change the assignment of MLB input #1 on bypass/isolation switches!*

Each I/O module provides 2 programmable inputs and 6 programmable outputs. As many as 4 I/O modules can be added to the ATS, for total of 10 programmable inputs (9 for bypass/isolation switches) and 25 programmable outputs. Use the dropdown arrows to select a function for each input or output. Use the up and down arrows to move to the next I/O module and assign functions for that board.

Click on the *OK* button to accept the I/O assignments or *Cancel* to discard the changes.

Note: Be sure to select the address of the I/O module before assigning I/O module inputs and outputs. The address resets to 1 each time the *OK* button is clicked.

The same input or output function can be assigned to multiple locations on either the controller board or any attached I/O module. Inputs or outputs assigned the same function will operate together.

7.15.3 Programmable Inputs

The available input functions are listed in Figure 7-21 and described in more detail after the table.

Battery Low Fault
Peak Shave
Inhibit Transfer
Remote Bypass
Remote Test
Forced Transfer to OFF
Remote Common Fault
Bypass Contactor Disable (factory-set for bypass switches *only*)
Three-Source System Disable

Figure 7-21 Programmable Inputs

Battery Low Fault. Indicates that a low battery signal (contact closure) has been received from an external device. The Service Required LED illuminates steadily and the system records an event in the Event Log.

Peak Shave Active. Starts the generator set and transfers to the standby source. The system attempts to transfer to the preferred source when the input is removed or the connected source fails. Ignores the Time Delay Engine Start and standby-to-preferred time delays if the peak shave delay bypass is selected.

Inhibit Transfer. Prevents all transfers and causes the Not-in-Auto LED to flash. This input has the same effect as the Maintenance DIP switch.

Remote Bypass. Functions the same way as the *End Time Delay* button on the user interface, ending any time delay that is operating when the input is activated except for the programmed transition off-to-preferred and off-to-standby time delays. If more than one time delay is programmed, a separate input signal must be sent to end each time delay.

Remote Test. Has the same effect as pressing the *Test* button on the User Interface. It initiates a system test, which simulates a preferred source failure and tests the

transfer switch operation. If a system test is running, this input will stop the test. To stop tests initiated by this input, either deactivate the input or press the *Test* button on the user interface.

Forced Transfer to OFF Position. (Programmed transition units only.) Bypasses all time delays and immediately moves the contactor from Source E to the OFF position. The ATS will proceed to transfer to Source N if it is available. When this input is removed, the system transfers to the preferred source if it is available. If the preferred source is not available but the standby source is available, the system transfers to the standby source.

Remote Common Fault. Any common fault input causes the Service Required LED to flash.

Bypass Contactor Switch Disable. Disables the transfer switch on bypass/isolation switches while the contactor is being inserted or removed. This input is used only on bypass/isolation switches. It is factory-assigned to programmable input 1 on the main logic board (MLB) terminal strip (TB1 terminals 6 and 7). *Do not reassign MLB input 1 on bypass isolation switches!*

Three-Source System Disable. Prevents the second ATS in a three-source system from starting either generator set when the Normal source connected to the first ATS is available. The three-source system disable output from ATS 1 is connected to the three-source system disable input on ATS 2. See TT-1340, External Battery Supply Module Installation Instructions, for more information about three-source systems.

7.15.4 Programmable Outputs

Programmable monitoring, control, and fault detection outputs are available through the MLB terminal strip on the controller or through the programmable input/output (I/O) modules. The table in Figure 7-22 lists the available programmable outputs.

Not-in-Auto. Any of the following conditions triggers the Not-in-Auto output:

- The maintenance switch is activated, preventing automatic transfer.
- Forced transfer to OFF is activated (programmed-transition models only).
- The Supervised Transfer Control switch is in the Manual position (non-automatic switches).

Load Control Active. Any of the following conditions triggers the Load Control Active output:

- A pre- or post-transfer signal is active.
- Programmable load control outputs are active.
- Peak shave/area protection is engaged.

Load Bank Control. This output allows the application of a load bank to the generator set during the exercise period if the exerciser is not set to transfer the actual load.

The controller deactivates the load bank control and transfers to the standby source if the preferred source is lost during an exercise period.

Start Source N Generator. Use this engine start output signal for systems that use a generator set for Source N (Normal Source). This output is always assigned to the same generator set regardless of the preferred source selector switch position.

Peak Shave/Area Protection Active. Indicates that the system is running on the standby source as a result of a peak shave command.

Non-Emergency Transfer. Active during peak shave, loaded exercise, and loaded test sequences.

Synchronization Output Command. Provides a contact closure after the in-phase monitor synch output time delay to indicate that the synch output time delay has expired.

Load Control Outputs. Allows controlled disconnection of selected loads before transfer and reconnection in steps after transfer. The Load Control Time Delays determine the disconnect time before transfer and reconnect time after transfer. If one source is lost, the outputs are activated immediately and then deactivated after the reconnect time delays. Set the disconnect time before transfer and reconnect time after transfer through the Load Control Time Delay window. The times are adjustable from 1 second to 60 minutes. See Section 7.12, Load Control Time Delays, for information about setting the load control time delays.

Select up to nine sequential load control outputs, 0–8. Load control output 0 is always assigned to the main logic board pre-transfer signal output (TB1 terminals 1 and 2). Outputs 0–8 can be assigned to any position on an I/O module board or to the programmable output on the controller board terminal strip. The same function can be assigned to more than one output.

Modbus®-Controlled Relay Driver Outputs (SCRDOs). Use these outputs to transmit signals from a Modbus® master through the ATS controller (acting as a Modbus slave) to connected equipment. Contact DDC/MTU Power Generation for Modbus communications protocol information.

I/O Module Not Found. If the system does not detect an I/O module at an expected address, the Service Required LED flashes and the software logs the message *I/O Module Not Found*. Check that the number of I/O modules installed matches the number expected by the setup program. Check that the I/O modules are connected and the address DIP switches are set correctly. Check the diagnostic LED to verify that the module is receiving power and communicating with the controller.

I/O Module Not Installed. If the software detects an I/O module that is connected but not expected by the setup program, the Service Required LED flashes and the software logs the message *I/O Module Not Installed*. The system ignores the board if it does not find the setup definition. Check that the number of I/O modules expected in the Setup Program matches the number of modules installed on the transfer switch. Check that the I/O module address DIP switches are set correctly. Check the diagnostic LED.

I/O Module Communications Lost. If communication to an I/O module that was previously installed and working is lost, the Service Required LED flashes and the software logs the message *I/O Module Communications Lost.* Check the I/O module connections and diagnostic LED.

Common Alarm. The common alarm output is activated when any of the fault conditions assigned in the Common Alarms window occurs. See Section 7.6, Common Alarms, for more information about assigning common alarms.

Three-Source System Disable. The three-source system disable output provides a signal to prevent the second ATS in a three-source system from starting one of the generator sets when the Normal source connected to the first ATS is available. See TT-1340, External Battery Supply Module Installation Instructions, for more information about three-source systems.

Programmable Output	Type
Preferred Source Available	Monitor
Standby Source Available	Monitor
Contactor Preferred Selected	Monitor
Contactor Standby Selected	Monitor
Contactor in OFF position*	Monitor
Contactor Source N Selected	Monitor
Contactor Source E Selected	Monitor
Not in Auto	Monitor
Load Control Active	Monitor
Low Backup Battery Indicator	Monitor
Exerciser Active	Monitor
Test Active	Monitor
Peak Shave/Area Protection Active	Monitor
Non-Emergency Transfer	Monitor
Load Bank Control	Control
Start Source N Generator	Control
Start Source E Generator	Control
Synchronization Output Command	Control
Common Alarm	Fault
Undervoltage Source N	Fault
Overvoltage Source N	Fault
Loss of Phase Source N	Fault
Phase Rotation Error Source N	Fault
Overfrequency Source N	Fault
Underfrequency Source N	Fault
Undervoltage Source N	Fault
Overvoltage Source E	Fault
Loss of Phase Source E	Fault
Phase Rotation Error Source E	Fault
Overfrequency Source E	Fault
Underfrequency Source E	Fault
Failure to Acquire Standby Source	Fault
I/O Module Lost	Fault
I/O Module Not Found	Fault
I/O Module Not Installed	Fault
Failure to Transfer	Fault
Auxiliary Switch Fault	Fault
Auxiliary Switch Open	Fault
Load Shed Control Output	Control
Software-Controlled Relay Driver Output #1 †	Control
Software-Controlled Relay Driver Output #2 †	Control
Software-Controlled Relay Driver Output #3 †	Control
Software-Controlled Relay Driver Output #4 †	Control
Three-Source System Disable	Control
* Programmed-transition switches only † Abbreviated SCRDO #1–4	

Figure 7-22 Available Programmable Outputs

Modbus® is a registered trademark of Schneider Electric.

7.16 Setpoints, Frequency

The controller senses frequency on both sources with an accuracy of ±2%. The Frequency Setpoints data window shows the setpoints in percent of the nominal or the pickup value, and also shows the resulting setting in Hz. Figure 7-23 shows the frequency setpoints data window with the factory default settings.

Figure 7-23 Frequency Setpoints Display
(default settings shown)

A fault occurs if the frequency of either source falls outside the dropout or pickup settings for a length of time longer than the frequency dropout time. If the fault occurs on the active source, the system attempts to transfer the load to the alternate source.

7.16.1 Display

The data window shows the pickup and dropout settings as percentages of the nominal or pickup frequency as indicated. The resulting values in Hz are displayed in the column on the right.

The frequency dropout time is displayed in seconds.

7.16.2 Setup

Note: A user logged on as Guest cannot access the setup window or change the Frequency Setpoints.

Open the setup window to change the overfrequency pickup and dropout settings, the underfrequency pickup and dropout settings, and the frequency dropout time for each source. The adjustment range is shown to the right of each data box. The values shown in Figure 7-24 are the factory default settings.

Click on the data box to be changed and type in the new value, in percent of nominal or pickup frequency as indicated to the right of the box. The resulting frequency will be displayed in the last column. Click on *OK* to apply the new settings or *Cancel* to discard the changes.

Figure 7-24 Frequency Setpoints Setup
(default settings shown)

7.17 Setpoints, Voltage

A fault occurs when the voltage of either source falls outside the dropout or pickup settings for a length of time longer than the debounce time. If the fault occurs on the active source, the system attempts to transfer the load to the alternate source. The debounce time prevents nuisance transfers caused by brief voltage spikes and dips.

7.17.1 Display

Figure 7-25 shows the voltage setpoints data window with the factory default settings. The data window shows the pickup and dropout settings as percentages of the nominal dropout or pickup voltage as indicated. The resulting voltages are shown in the column on the right.

The voltage debounce time is displayed in seconds.

Figure 7-25 Voltage Setpoints Display
(default settings shown)

7.17.2 Setup

Note: A user logged on as Guest cannot access the setup window or change the Voltage Setpoints.

Open the Setup window to change the overvoltage pickup and dropout settings, the undervoltage pickup and dropout settings, and the debounce time for each source. The adjustment range is shown to the right of each data box. The values shown in Figure 7-26 are the factory default settings.

Click on the data box to be changed and type in the new value, in percent of nominal, pickup, or dropout voltage as indicated to the right of the box. The resulting voltage will be displayed in the last column. Click on *OK* to apply the new settings or *Cancel* to discard the changes.

Figure 7-26 Voltage Setpoints Setup
(default settings shown)

7.18 Source Information

The software provides source voltage, frequency, and phase information for Source N and Source E.

The controller senses voltages on all phases of both sources over a range of 110 to 600 VAC with an accuracy of ±2%. The controller senses frequency on both sources with an accuracy of ±2%.

The Source Info data window shows the following information for each source. See Figure 7-27. Single-phase systems will display only the single-phase parameters shown in Figure 7-28.

- Measured voltage
- Measured frequency
- Number of phases
- Expected phase rotation
- Actual phase rotation
- Nominal system voltage
- Nominal system frequency

The Source Info settings cannot be changed through Monitor III. Use the ATS Setup Program to change settings, if necessary.

Source Info	Source N	Source E
Voltage A-B	0.0 V	0.0 V
Voltage B-C	0.0 V	0.0 V
Voltage C-A	0.0 V	0.0 V
Voltage A-N	0.0 V	0.0 V
Voltage B-N	0.0 V	0.0 V
Voltage C-N	0.0 V	0.0 V
Frequency	0.0 Hz	0.0 Hz
Phases	3	3
Selected Rotation	ABC	ABC
Actual Rotation	N/A	N/A
System Voltage	480 V	480 V
System Frequency	60.0 Hz	60.0 Hz

Figure 7-27 Source Info Display, Three-Phase Source

Source Info	Source N	Source E
Voltage L1 - L2	118.4 V	0.0 V
Frequency	59.6 Hz	0.0 Hz
Phases	1	1
System Voltage	120 V	120 V
System Frequency	60.0 Hz	60.0 Hz

Figure 7-28 Source Info Display, Single-Phase Source

7.19 System Information

The System Information windows include load descriptions, ATS information, and software version numbers.

7.19.1 System Information Display

The Source Information Display window (see Figure 7-29) lists the following items:

- System designation
- System location
- Load branch
- Load description
- ATS serial number
- ATS contactor serial number
- ATS Controller serial number
- Software version numbers
- I/O module software version numbers

Figure 7-29 System Info Display

7.19.2 System Information Setup

Note: A user logged on as Guest cannot access the setup window or change the system information settings.

The System Information Setup window (see Figure 7-30) allows changes to the following information:

- System designation
- System location
- Load branch
- Load description

The serial numbers for the transfer switch, contactor, and controller are entered at the factory. Software version numbers are read from the hardware and cannot be changed with the setup software.

Type in unique descriptions to clearly identify the system, location, and connected loads. Descriptions are limited to 20 alphanumeric characters, including spaces.

Figure 7-30 System Info Setup

7.20 System Summary

The system summary window displays the transfer switch status. See Figure 7-31. The ATS Monitor III software does not allow changes to the parameters displayed in the System Summary Window. Use the Setup Program if changes are required.
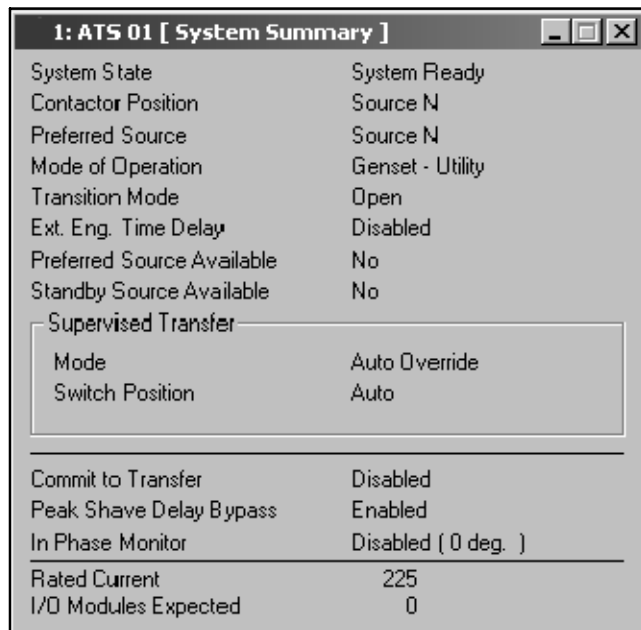
Figure 7-31 System Summary Display

System State may indicate System Ready or a fault condition such as Failure to Acquire Standby. The controller obtains the system state from the hardware. Figure 7-32 lists some typical System State messages.

System State Message	Notes
System Ready	Ready, no fault conditions
Failure to Acquire Standby	See the transfer switch operation and installation manual.
Failure to Transfer	
I/O Module Comms Lost	See Section 7.15.4, Programmable Outputs.
I/O Module Not Found	
I/O Module Not Installed	
Aux. Switch Fault	See the transfer switch operation and installation manual.
Aux. Switch Open	
Low Battery on Standby Source	Low battery on the standby generator set.
Common Alarm	See Section 7.6, Common Alarms.

Figure 7-32 Typical System State Messages

7.21 Time Delays

The monitoring program allows a user to view and adjust the ATS time delays.

Note: A user logged on as Guest cannot change the time delay settings.

7.21.1 Time Delay Data Window

The Time Delay Display window displays the settings for the time delays shown in Figure 7-33.

The Off to Standby and Off to Preferred delays are displayed only for programmed-transition models.

Figure 7-33 Time Delays Display

7.21.2 Time Delay Setup Window

The Time Delay Setup window (see Figure 7-34) allows the user to change the ATS delays.

Note: A user logged on as Guest cannot access the setup window or change the time delay settings.

To change the length of a time delay, double-click inside the data entry box and type in the new setting in minutes:seconds. Verify that the new setting falls within the range shown after the data entry box. Values outside the range will not be accepted. Click on the *OK* button or press the *Enter* key to enter the change.

Note: Extended time delays (longer than 6 seconds) require the use of an External Battery Supply Module (EBSM) Kit with a battery. Use the Setup Program to enable Extended Engine Time Delay in the System Summary data window after connecting the battery to allow longer engine start time delays.

Figure 7-34 Time Delay Setup

Section 8 MATS and MATS+ ATS Controllers

8.1   Introduction

Monitor III can be used to monitor system status, view settings, and start or stop a remote test. Monitor III cannot be used to change settings for these controllers. Refer to the ATS controller Operation Manual for instructions to change settings using the controller keypad. See the List of Related Materials for document part numbers.

8.2   Controller Connection and Setup

⚠ **DANGER**
Hazardous voltage. **Will cause severe injury or death.**
Disconnect all power sources before opening the enclosure.

Servicing the transfer switch. Hazardous voltage can cause severe injury or death. Deenergize all power sources before servicing. Open the main circuit breakers of all transfer switch power sources and disable all generator sets as follows: (1) Move all generator set master controller switches to the OFF position.   (2) Disconnect power to all battery chargers. (3) Disconnect all battery cables, negative (–) leads first. Reconnect negative (–) leads last when reconnecting the battery cables after servicing. Follow these precautions to prevent the starting of generator sets by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer. Before servicing any components inside the enclosure: (1) Remove all jewelry. (2) Stand on a dry, approved electrically insulated mat. (3) Test circuits with a voltmeter to verify that they are deenergized.

The controller must be equipped with a Modbus®/KBUS converter module. Refer to the instructions provided with the converter module kit to install and connect the module. Use the DIP switches on the converter module to assign a unique address to the controller.

> **Note:** Use a unique address for each device in a network. Use numbers between 1 and 247. Do not use 0 (zero).

Connect the controller to the PC or network and configure the controller for communications. Refer to TT-1405, provided with the Monitor III software kit, for controller connection and setup instructions.

8.3   Data Windows

Select Window→New Window to open the Add Window screen. Select the generator set/controller from the list on the left. Figure 8-1 illustrates the list of data windows available for this controller.

The Manual Operations window allows remote starting and stopping of the generator set, resetting faults, and resetting maintenance records.   User or supervisor access is required to perform Manual Operations.

There are no setup windows available for this controller. Settings can be changed locally through the controller keypad. Refer to the controller Operation Manual for instructions.   See the List of Related Literature for document part numbers.
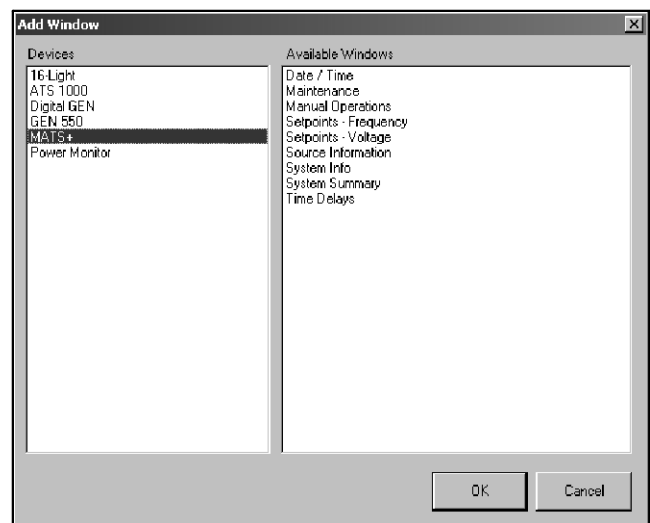
Figure 8-1   Add Window

8.4 Data Window Summary Table

The following table lists and describes the items found in each data window. More detailed information for some of the items is included in the sections after the table.

Data Window	Item	Item Description
Date/Time	Date and time	Read from the controller
Frequency Setpoints	Source N Over Freq Dropout	Displays settings in percent of Nominal frequency and in Hz.
	Source N Over Freq Pickup	
	Source N Under Freq Pickup	
	Source N Under Freq Dropout	
	Source E Over Freq Dropout	
	Source E Over Freq Pickup	
	Source E Under Freq Pickup	
	Source E Under Freq Dropout	
Maintenance History	Time Not in Normal	Total hours and hours since last maintenance displayed
	Time in Emergency	
	Days of Operation	Total and since last maintenance displayed
	Number of Transfers	
	Last Maintenance Date	MM/DD/YY
	System Start Date	
	Exercise: Time Remaining	Minutes
	Exercise: Last Exercise	MM/DD/YY
	Last Outage: Date	MM/DD/YY
	Last Outage: Time	HH:MM
	Last Outage: Duration	Hours
Manual Operations	Engine Run Time	Enter the desired generator set engine run time, in hours:minutes from 1 minute to 72 hours. (00:01 to 72:00)
	Set Run Time Button	CLICKING THIS BUTTON STARTS THE GENERATOR SET if the engine run time displayed is not zero (00:00).
		To stop the generator set, set the run time to zero (00:00).
Source Info	Source N: Voltage A–B	Volts
	Source N: Voltage B–C	
	Source N: Voltage C–A	
	Source N: Frequency	Hz
	Source N: System Voltage	Volts
	Source N: System Frequency	Hz
	Source E: Voltage A–B	Volts
	Source E: Voltage B–C	
	Source E: Voltage C–A	
	Source E: Frequency	Hz
	Source E: System Voltage	Volts
	Source E: System Frequency	Hz

Data Window	Item	Item Description
System Info	ATS Name	Description appears if previously assigned with Monitor II
	Location	Description appears if previously assigned with Monitor II
	Load Description	Description appears if previously assigned with Monitor II
	Branch	Description appears if previously assigned with Monitor II
	ATS Serial Number	Factory-set
	Controller Serial Number	Factory-set
	Number of Poles	Factory-set
	Switch Size	Amps, factory-set
System Summary	Alert Code	See Section 8.11
	Switch Position	Contactor position: Normal, Emergency, or Off
	Programming Mode	Remote, local, or off
	Status messages	Normal source available
		Emergency source available
		Test switch in AUTO
		Manual transfer mode
		Plant exerciser enabled
		Load shed enabled
		In–phase monitor enabled
		Area protection enabled
		Ext. time delays enabled
		Manual override enabled
		Load transfer enabled
Time Delays	Engine Start	Displayed in minutes:seconds
	Normal to Emergency	
	Emergency to Normal	
	Engine Cooldown	
	Before Emergency	
	After Emergency	
	Sequence to Emergency	
	Return to Emergency	
	Before Normal	
	After Normal	
	Sequence to Normal	
	Return to Normal	
Voltage Setpoints	Source N: Over Volt Dropout	Displays settings in percent of Nominal voltage and in Volts.
	Source N: Over Volt Pickup	
	Source N: Under Volt Pickup	
	Source N: Under Volt Dropout	
	Source E: Over Volt Dropout	
	Source E: Over Volt Pickup	
	Source E: Under Volt Pickup	
	Source E: Under Volt Dropout	

8.5 Date/Time

The program reads the date and time from the controller. Set the date and time through the controller keypad, Index 4. See the controller Operation Manual for instructions.
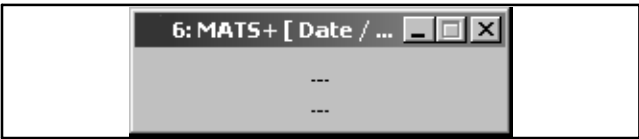
Figure 8-2 Date/Time Window

8.6 Frequency Setpoints

This data window displays normal and emergency source pickup and dropout points as percentages of system frequency and in Hz.

Frequency setpoints can be changed using the controller keypad through Index 6. See the controller Operation Manual for instructions.
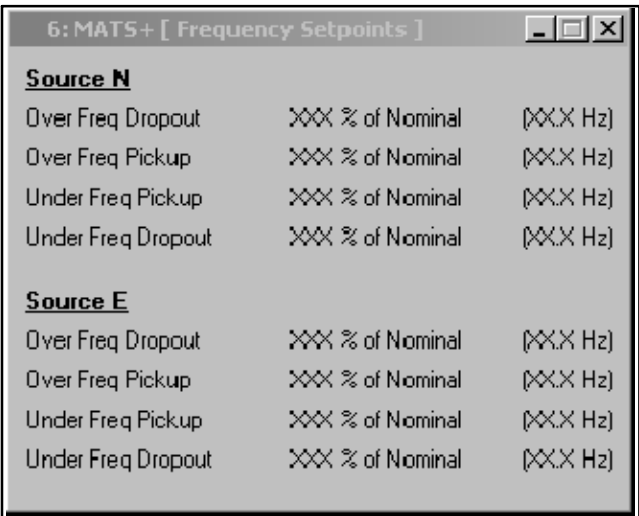
Figure 8-3 Frequency Setpoints Window

8.7 Maintenance History

Items dispalyed in the maintenance history window correspond to the information in controller Index 3.

Reset the Since Maintenance records through the controller keypad. See the controller Operation Manual for instructions. Total records cannot be reset.
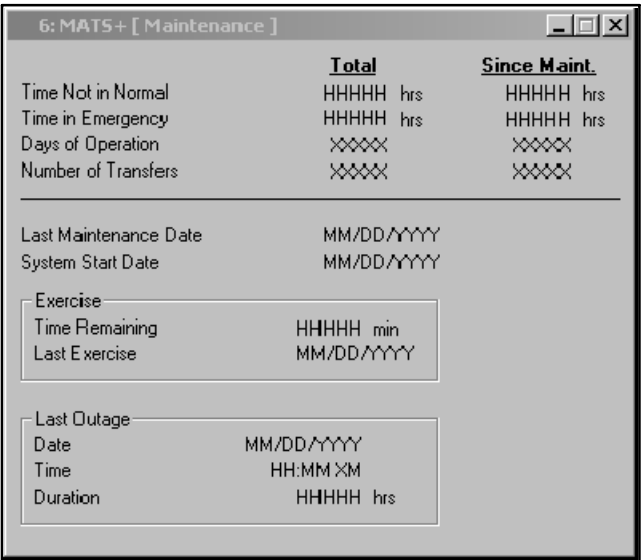
Figure 8-4 Maintenance History Window

8.8 Manual Operations

⚠ **WARNING**

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

The Manual Operations window allows the operator to start and run the generator set that is connected to the ATS engine start contacts. The ATS must have a plant exerciser accessory installed to access the manual operations window.

Note: This data menu allows the software operator to start and run a generator set in a location that is not within sight of the operator. Use care when using this feature to prevent unintended starting of the generator set.

Type the desired engine run time in hours:minutes (from 00:01 to 72:00) in the Engine Run Time box. Click on the Set Run Time button to start the generator set.

To stop the engine before the run time expires, type 00:00 in the Engine Run Time box and click on Set Run Time.

The engine run time returns to 00:00 after the generator set run time elapses or the generator set stops.
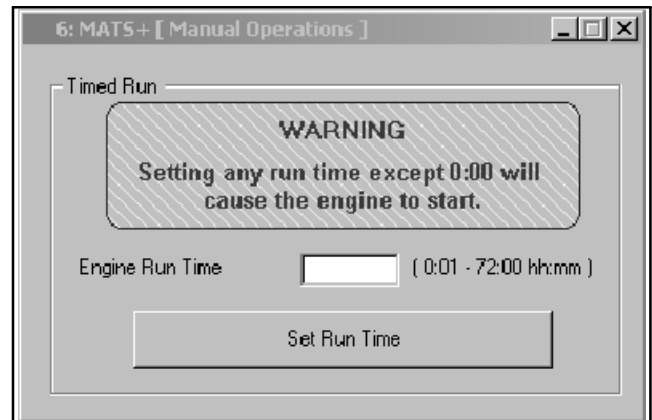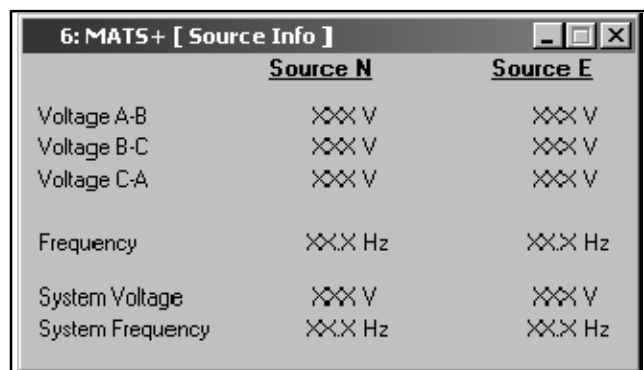
Figure 8-5   Manual Operations Window

8.9 Source Info

The source data displayed in the Source Information window correspond to the information in controller Index 1 and Index 2.

The system voltage and frequency are set using the controller keypad, Index 6.
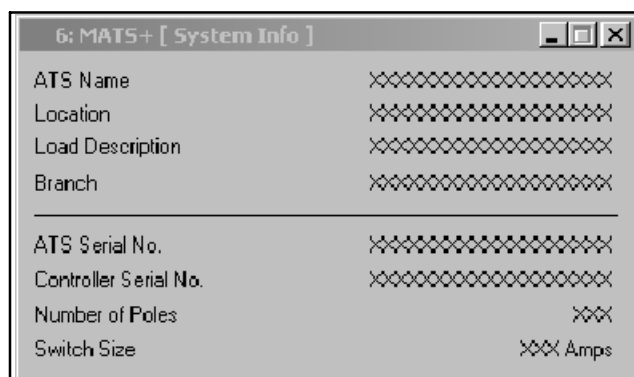
Figure 8-6 Source Info Window

8.10 System Info

Descriptions that have been entered using Monitor II software will be displayed in the System Info window.

Serial numbers, number of poles, and the switch size are factory-set.

Figure 8-7 System Info Window

8.11 System Summary

The System Summary window indicates the status of the transfer switch. See Figure 8-8.

Alert Codes

Alert codes indicate the operating mode of the unit. See Figure 8-9 for a list of messages that can be displayed. See the ATS controller operation and installation manual for more information.
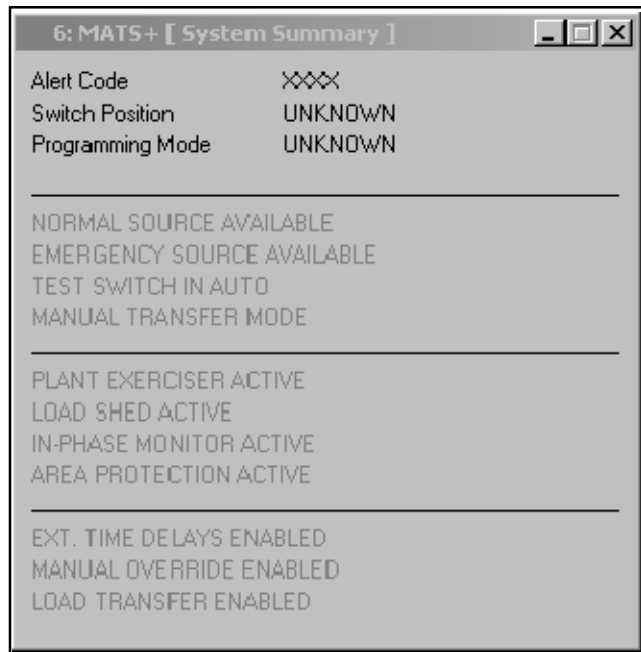
Figure 8-8   System Summary Window
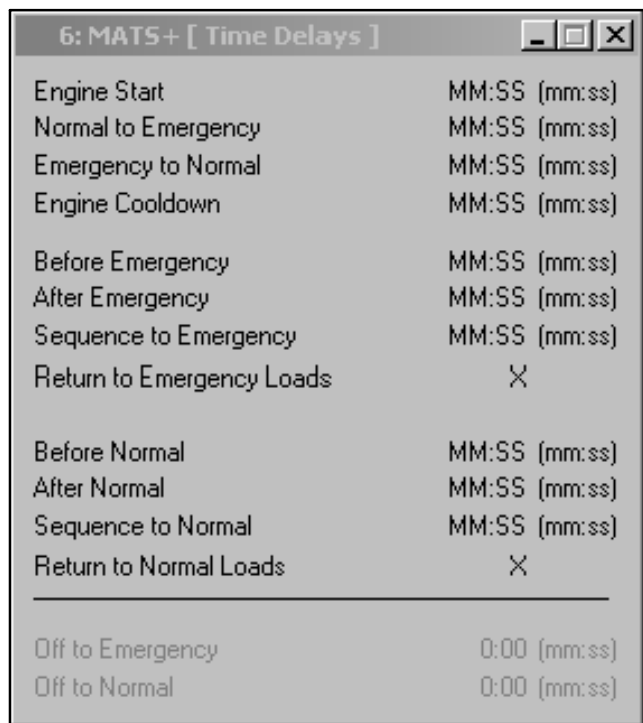
Code	Message Summary
Codes 1–18 apply to 3-phase only	
0	None
1	PH A-B Normal Overvoltage
2	PH B-C Normal Overvoltage
3	PH A-C Normal Overvoltage
4	PH A-B Normal Undervoltage
5	PH B-C Normal Undervoltage
6	PH A-C Normal Undervoltage
7	Normal Overfrequency
8	Normal Underfrequency
9	Normal Phase Loss
10	PH A-B Emergency Overvoltage
11	PH B-C Emergency Overvoltage
12	PH A-C Emergency Overvoltage
13	PH A-B Emergency Undervoltage
14	PH B-C Emergency Undervoltage
15	PH A-C Emergency Undervoltage
16	Emergency Overfrequency
17	Emergency Underfrequency
18	Emergency Phase Loss
Codes 19–26 apply to 1-phase only	
19	Normal Overvoltage
20	Normal Undervoltage
21	Normal Overfrequency
22	Normal Underfrequency
23	Emergency Overvoltage
24	Emergency Undervoltage
25	Emergency Overfrequency
26	Emergency Underfrequency
27	Aux Switch Fault (contactor or controller fault)
28	Dbl Aux Sw Fault (contactor or controller fault)
29	Check Contactor (contactor or controller fault)
30	Power Down Error (controller fault)
31	RAM Error (controller fault)
32	Memory Error (controller fault)
33	Manual Transfer (reset via manual transfer switches)
34	Fault #1 (external fault)
35	Fault #2 (external fault)

Figure 8-9   System Summary Alert Codes

8.12 Time Delays

Engine start, normal-to-emergency, emergency-to-normal, and engine cooldown time delays can be changed using the controller keypad, Index 5.

The rest of the time delays apply to the load shed settings and are set using the controller keypad, Index 9.
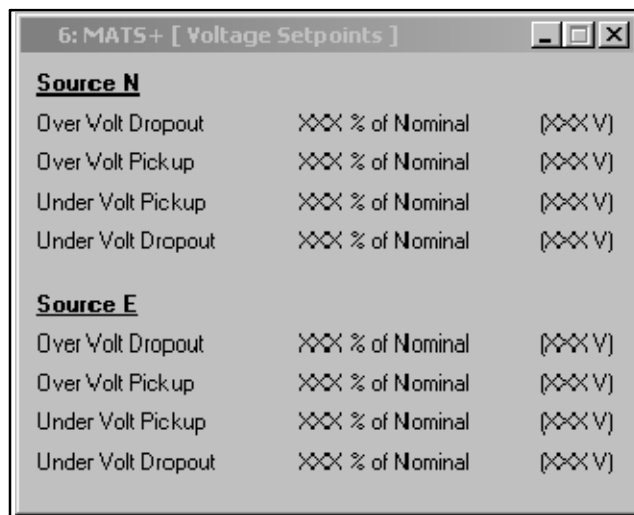
```
┌─────────────────────────────────────────────┐
│ 6: MATS+ [ Time Delays ]           _ □ X     │
├─────────────────────────────────────────────┤
│ Engine Start                MM:SS  (mm:ss)   │
│ Normal to Emergency         MM:SS  (mm:ss)   │
│ Emergency to Normal         MM:SS  (mm:ss)   │
│ Engine Cooldown             MM:SS  (mm:ss)   │
│                                              │
│ Before Emergency            MM:SS  (mm:ss)   │
│ After Emergency             MM:SS  (mm:ss)   │
│ Sequence to Emergency       MM:SS  (mm:ss)   │
│ Return to Emergency Loads      X             │
│                                              │
│ Before Normal               MM:SS  (mm:ss)   │
│ After Normal                MM:SS  (mm:ss)   │
│ Sequence to Normal          MM:SS  (mm:ss)   │
│ Return to Normal Loads         X             │
│ ─────────────────────────────────────────   │
│ Off to Emergency            0:00   (mm:ss)   │
│ Off to Normal               0:00   (mm:ss)   │
└─────────────────────────────────────────────┘
```

Figure 8-10 Time Delays

8.13 Voltage Setpoints

This data window displays normal and emergency source pickup and dropout points as percentages of system voltage and in volts.

Voltage setpoints can be changed using the controller keypad, Index 6. See the controller Operation Manual for instructions.

```
┌─────────────────────────────────────────────────────┐
│ 6: MATS+ [ Voltage Setpoints ]            _ □ X      │
├─────────────────────────────────────────────────────┤
│ Source N                                             │
│ Over Volt Dropout     XXX % of Nominal    (XXX V)    │
│ Over Volt Pickup      XXX % of Nominal    (XXX V)    │
│ Under Volt Pickup     XXX % of Nominal    (XXX V)    │
│ Under Volt Dropout    XXX % of Nominal    (XXX V)    │
│                                                      │
│ Source E                                             │
│ Over Volt Dropout     XXX % of Nominal    (XXX V)    │
│ Over Volt Pickup      XXX % of Nominal    (XXX V)    │
│ Under Volt Pickup     XXX % of Nominal    (XXX V)    │
│ Under Volt Dropout    XXX % of Nominal    (XXX V)    │
└─────────────────────────────────────────────────────┘
```

Figure 8-11 Voltage Setpoints Window

9.1 Introduction

Monitor III can be used to monitor the Power Monitor status and to start or stop a remote test.

The Power Monitor must be equipped with a Modbus®/KBUS converter module. Refer to the instructions provided with the kit to install and connect the converter module.
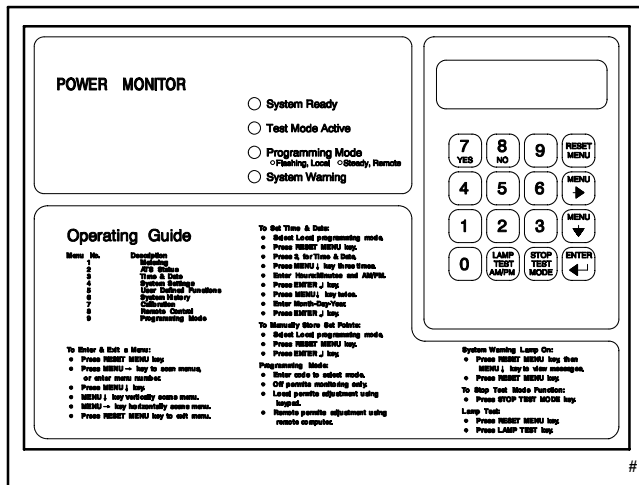
Figure 9-1 Digital Power Monitor

9.2 Power Monitor Connection and Setup
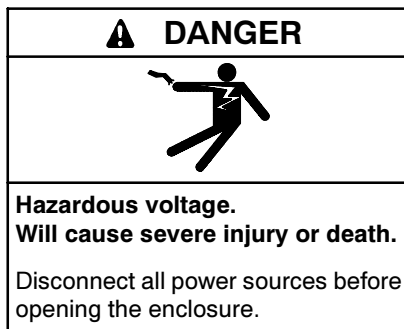
⚠ **DANGER**

Hazardous voltage.
Will cause severe injury or death.

Disconnect all power sources before opening the enclosure.

Opening the power monitor enclosure. Hazardous voltage can cause severe injury or death. A transfer switch or generator set connected to the power monitor could automatically energize the power monitor or accessories. Disconnect all power sources before opening the enclosure. Move the generator set master switch on the controller to the OFF position and disconnect the battery negative (–) lead before proceeding.

The power monitor must be equipped with a Modbus®/KBUS converter module. Refer to the

instructions provided with the converter module kit to install and connect the module.

Use the DIP switches on the converter module to assign a unique address to the controller.

Note: Use a unique address for each device in a network. Use numbers between 1 and 247. Do not use 0 (zero).

Connect the power monitor to the PC or network and configure the device for communications. Refer to TT-1405 for connection diagrams and device setup instructions.

9.3 Data Windows

Select Window→New Window to open the Add Window screen. Select the generator set/controller from the list on the left. Figure 8-1 illustrates the list of data windows available for this controller.

The Manual Operations window allows remote starting and stopping of the generator set, resetting faults, and resetting maintenance records. User or supervisor access is required to perform Manual Operations.

There are no setup windows available for this controller. Settings can be changed locally through the controller keypad. Refer to the controller Operation Manual for instructions. See the List of Related Literature for document part numbers.

Figure 9-2 Add Window

9.4 Data Window Summary

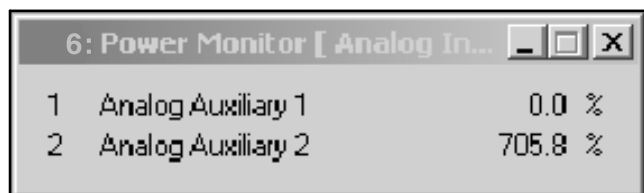| Data Window	Item	Notes
Analog Inputs	Analog Inputs 1 and 2	Displays the measured input in percent of the maximum value, as calibrated at the power monitor. Refer to the power monitor Operation Manual for more information.
Auxiliary Inputs	Inputs 1–6	Inhibit time in minutes and seconds (mm:ss).
		Description, read from the power monitor for each input. Descriptions may have been changed using Monitor II.
Date/Time	Date	Read from the power monitor.
	Time	
Electrical Info	Voltage, line–line	Displays VAC for L1-L2, L2-L3, and L3-L1
	Voltage, line–neutral	Displays VAC for L1-L0, L2-L0, and L3-L0
	Current	Displays amps for L1, L2, and L3
	Frequency	Hz
	Total kW	Kilowatts
	Total kVAR	kVAR
	Power Factor	X.XX
	Power Supply Voltage	VDC
History	Run Time	Normal, hours
		Off, hours
		Emergency, hours
	Event History	Date and event description for the four most recent events
Manual Operations	Engine Run Time	Enter run time in hours:minutes, from 0:00 to 72:00. To stop the generator set, enter zero (0:00) and then click the Set Run Time button.
	Set Run Time	Clicking this button will start the generator set if the Engine Run Time is not zero (0:00)
System Info	Device Name	Displays information previously entered using Monitor II software. Cannot be changed using Monitor III.
	Location	
	Load Description	
	Model No.	
	Specification No.	
	Device Serial No.	Displays information read from the Power Monitor. Cannot be changed using Monitor III.
	Controller Serial No.	
System Summary	System Status	See Section 9.12.
	Contactor Position	Normal, Emergency, Off, or Undefined
	Programming Mode	Local, Off, or Remote
	TEST MODE TIMED	Grayed out if a test is not running
	TEST MODE ACTIVE	Grayed out if a test is not running
	ATS Rating	Read from the power monitor.
	Nominal Voltage	
	Nominal Frequency	
	Phases	
	Connection Type	

9.5 Analog Inputs

The Analog Inputs window displays the readings for analog auxiliary inputs 1 and 2. If the descriptions have been changed using Monitor II software, those descriptions will be displayed.

The scale of the analog input readings depends on the power monitor calibration. Refer to the Power Monitor Operation and Installation manual. See List of Related Literature.
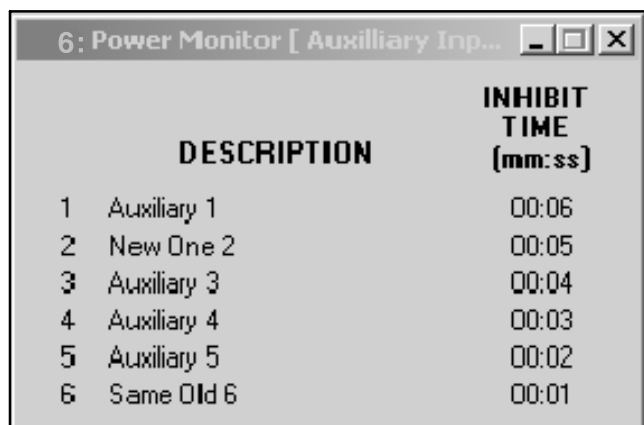
Figure 9-3   Analog Inputs Window

9.6 Auxiliary Inputs

The time delay information displayed in the Auxiliary Inputs window corresponds to the user-defined settings from controller Menu 5.

If the descriptions have been changed using Monitor II software, those descriptions will be displayed.

Figure 9-4   Auxiliary Inputs Window

9.7 Date/Time

The date and time are read from the power monitor. Set the time and date at the power monitor through Menu 3. See the power monitor Operation and Installation manual.

Figure 9-5   Date/Time Window

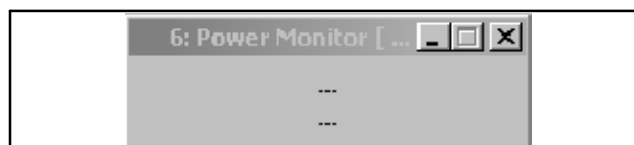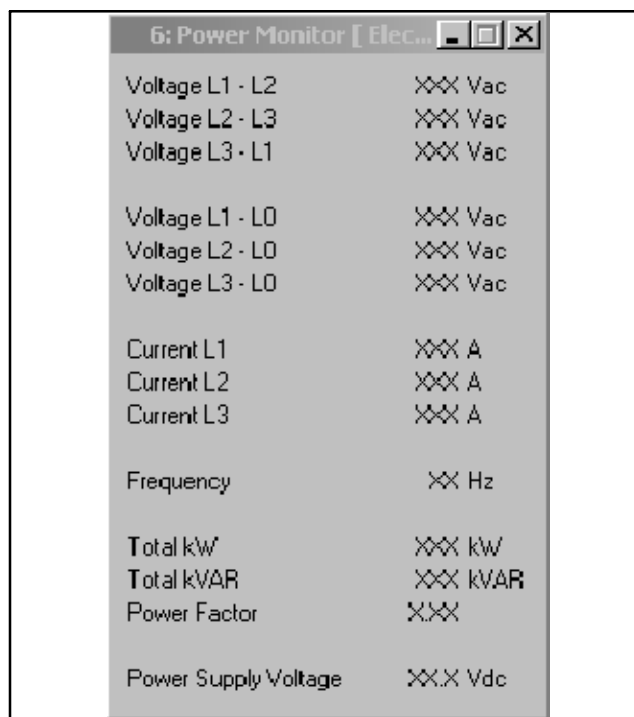## 9.8 Electrical Info

The system information displayed in the Electrical Info window corresponds to the information in power monitor Menu 1. The information cannot be altered.

Figure 9-6   Electrical Info Window

9.9 History

The System History window displays 1 to 4 of the last auxiliary warning or ATS test events, most recent first. This window corresponds to power monitor Menu 6.
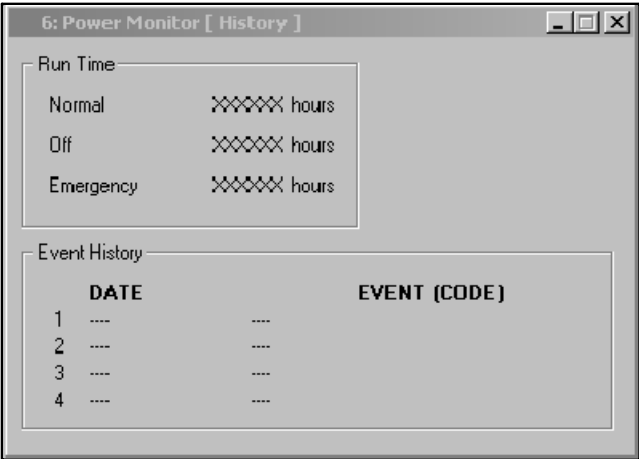
Figure 9-7 History Window

9.10 Manual Operations

⚠ WARNING

Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

The Manual Operations window allows the operator to start a generator set engine or start an ATS test when appropriate input and output connections are made to a generator set or transfer switch. The ATS can start the generator set and transfer the load during the test if the ATS is set up to run a loaded test.

Note: This data menu allows the software operator to start and run a generator set in a location that is not within sight of the operator. Use care when using this feature to prevent unintended starting of the generator set.

Type the desired engine run time in hours:minutes (from 00:01 to 72:00) in the Engine Run Time box. Click on the Set Run Time button to start the generator set.

To stop the engine before the run time expires, type 00:00 in the Engine Run Time box and click on Set Run Time.

Figure 9-8 Manual Operations Window

9.11 System Info

Descriptions and other system information that have been entered using Monitor II software will be displayed in the System Info window.

Serial numbers can be entered using the power monitor keypad through Menu 2. See the Power Monitor Operation and Installation manual.
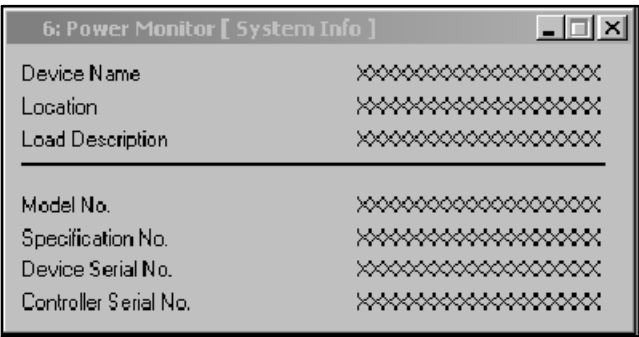
Figure 9-9 System Info Window

9.12 System Summary

The System Summary data window displays power monitor status information.

System Status Messages

Possible system status messages are:

● Test mode active

● System ready

● Power down error

● Auxiliary 1–6. A system warning condition exists and is caused by auxiliary warning contact input 1–6.

The Test Mode Times and Test Mode Active messages are grayed out when the power monitor is not running a test. Starting a test, either through the Manual Operations screen in this software or through the power monitor keypad, activates the Test Mode messages.

Figure 9-10 System Summary Window

Notes

Appendix A Abbreviations

The following list contains abbreviations that may appear in this publication.

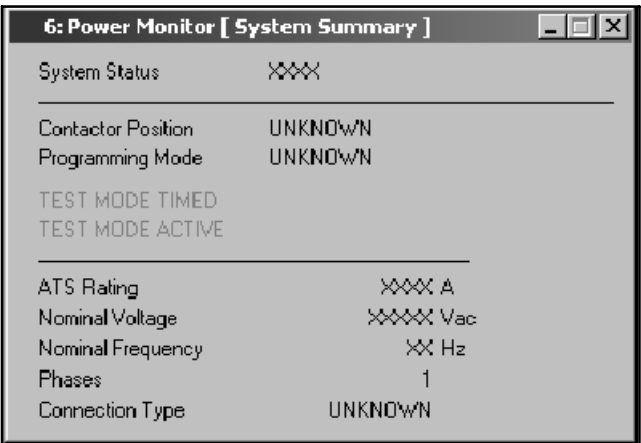|					
A, amp	ampere	cfm	cubic feet per minute	exh.	exhaust
ABDC	after bottom dead center	CG	center of gravity	ext.	external
AC	alternating current	CID	cubic inch displacement	F	Fahrenheit, female
A/D	analog to digital	CL	centerline	fglass.	fiberglass
ADC	analog to digital converter	cm	centimeter	FHM	flat head machine (screw)
adj.	adjust, adjustment	CMOS	complementary metal oxide substrate (semiconductor)	fl. oz.	fluid ounce
ADV	advertising dimensional drawing			flex.	flexible
AHWT	anticipatory high water temperature	cogen.	cogeneration	freq.	frequency
		com	communications (port)	FS	full scale
AISI	American Iron and Steel Institute	coml	commercial	ft.	foot, feet
		Coml/Rec	Commercial/Recreational	ft. lbs.	foot pounds (torque)
ALOP	anticipatory low oil pressure	conn.	connection	ft./min.	feet per minute
alt.	alternator	cont.	continued	g	gram
Al	aluminum	CPVC	chlorinated polyvinyl chloride	ga.	gauge (meters, wire size)
ANSI	American National Standards Institute (formerly American Standards Association, ASA)	crit.	critical	gal.	gallon
		CRT	cathode ray tube	gen.	generator
		CSA	Canadian Standards Association	genset	generator set
				GFI	ground fault interrupter
AO	anticipatory only	CT	current transformer	GND, ⏚	ground
API	American Petroleum Institute	Cu	copper	gov.	governor
approx.	approximate, approximately	cu. in.	cubic inch	gph	gallons per hour
AR	as required, as requested	cw.	clockwise	gpm	gallons per minute
AS	as supplied, as stated, as suggested	CWC	city water-cooled	gr.	grade, gross
		cyl.	cylinder	GRD	equipment ground
ASE	American Society of Engineers	D/A	digital to analog	gr. wt.	gross weight
ASME	American Society of Mechanical Engineers	DAC	digital to analog converter	H x W x D	height by width by depth
		dB	decibel	HC	hex cap
assy.	assembly	dBA	decibel (A weighted)	HCHT	high cylinder head temperature
ASTM	American Society for Testing Materials	DC	direct current	HD	heavy duty
		DCR	direct current resistance	HET	high exhaust temperature, high engine temperature
ATDC	after top dead center	deg., °	degree		
ATS	automatic transfer switch	dept.	department	hex	hexagon
auto.	automatic	dia.	diameter	Hg	mercury (element)
aux.	auxiliary	DI/EO	dual inlet/end outlet	HH	hex head
A/V	audiovisual	DIN	Deutsches Institut fur Normung e. V. (also Deutsche Industrie Normenausschuss)	HHC	hex head cap
avg.	average			HP	horsepower
AVR	automatic voltage regulator			hr.	hour
AWG	American Wire Gauge			HS	heat shrink
AWM	appliance wiring material	DIP	dual inline package	hsg.	housing
bat.	battery	DPDT	double-pole, double-throw	HVAC	heating, ventilation, and air conditioning
BBDC	before bottom dead center	DPST	double-pole, single-throw		
BC	battery charger, battery charging	DS	disconnect switch	HWT	high water temperature
		DVR	digital voltage regulator	Hz	hertz (cycles per second)
BCA	battery charging alternator	E, emer.	emergency (power source)	IC	integrated circuit
BCI	Battery Council International	EDI	electronic data interchange	ID	inside diameter, identification
BDC	before dead center	EFR	emergency frequency relay	IEC	International Electrotechnical Commission
BHP	brake horsepower	e.g.	for example (*exempli gratia*)		
blk.	black (paint color), block (engine)	EG	electronic governor	IEEE	Institute of Electrical and Electronics Engineers
		EGSA	Electrical Generating Systems Association		
blk. htr.	block heater			IMS	improved motor starting
BMEP	brake mean effective pressure	EIA	Electronic Industries Association	in.	inch
bps	bits per second			in. H$_2$O	inches of water
br.	brass	EI/EO	end inlet/end outlet	in. Hg	inches of mercury
BTDC	before top dead center	EMI	electromagnetic interference	in. lbs.	inch pounds
Btu	British thermal unit	emiss.	emission	Inc.	incorporated
Btu/min.	British thermal units per minute	eng.	engine	ind.	industrial
C	Celsius, centigrade	EPA	Environmental Protection Agency	int.	internal
cal.	calorie			int./ext.	internal/external
CARB	California Air Resources Board	EPS	emergency power system	I/O	input/output
CB	circuit breaker	ER	emergency relay	IP	iron pipe
cc	cubic centimeter	ES	engineering special, engineered special	ISO	International Organization for Standardization
CCA	cold cranking amps				
ccw.	counterclockwise	ESD	electrostatic discharge	J	joule
CEC	Canadian Electrical Code	est.	estimated	JIS	Japanese Industry Standard
cert.	certificate, certification, certified	E-Stop	emergency stop		
cfh	cubic feet per hour	etc.	et cetera (and so forth)		

Abbreviation	Definition
k	kilo (1000)
K	kelvin
kA	kiloampere
KB	kilobyte (2^{10} bytes)
kg	kilogram
kg/cm^2	kilograms per square centimeter
kgm	kilogram-meter
kg/m^3	kilograms per cubic meter
kHz	kilohertz
kJ	kilojoule
km	kilometer
kOhm, kΩ	kilo-ohm
kPa	kilopascal
kph	kilometers per hour
kV	kilovolt
kVA	kilovolt ampere
kVAR	kilovolt ampere reactive
kW	kilowatt
kWh	kilowatt-hour
kWm	kilowatt mechanical
L	liter
LAN	local area network
L x W x H	length by width by height
lb.	pound, pounds
lbm/ft^3	pounds mass per cubic feet
LCB	line circuit breaker
LCD	liquid crystal display
ld. shd.	load shed
LED	light emitting diode
Lph	liters per hour
Lpm	liters per minute
LOP	low oil pressure
LP	liquefied petroleum
LPG	liquefied petroleum gas
LS	left side
L$_{wa}$	sound power level, A weighted
LWL	low water level
LWT	low water temperature
m	meter, milli (1/1000)
M	mega (10^6 when used with SI units), male
m^3	cubic meter
m^3/min.	cubic meters per minute
mA	milliampere
man.	manual
max.	maximum
MB	megabyte (2^{20} bytes)
MCM	one thousand circular mils
MCCB	molded-case circuit breaker
meggar	megohmmeter
MHz	megahertz
mi.	mile
mil	one one-thousandth of an inch
min.	minimum, minute
misc.	miscellaneous
MJ	megajoule
mJ	millijoule
mm	millimeter
mOhm, mΩ	milliohm
MOhm, MΩ	megohm
MOV	metal oxide varistor
MPa	megapascal
mpg	miles per gallon
mph	miles per hour
MS	military standard
m/sec.	meters per second
MTBF	mean time between failure
MTBO	mean time between overhauls
mtg.	mounting
MW	megawatt
mW	milliwatt
μF	microfarad
N, norm.	normal (power source)
NA	not available, not applicable
nat. gas	natural gas
NBS	National Bureau of Standards
NC	normally closed
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
Nm	newton meter
NO	normally open
no., nos.	number, numbers
NPS	National Pipe, Straight
NPSC	National Pipe, Straight-coupling
NPT	National Standard taper pipe thread per general use
NPTF	National Pipe, Taper-Fine
NR	not required, normal relay
ns	nanosecond
OC	overcrank
OD	outside diameter
OEM	original equipment manufacturer
OF	overfrequency
opt.	option, optional
OS	oversize, overspeed
OSHA	Occupational Safety and Health Administration
OV	overvoltage
oz.	ounce
p., pp.	page, pages
PC	personal computer
PCB	printed circuit board
pF	picofarad
PF	power factor
ph., ∅	phase
PHC	Phillips head crimptite (screw)
PHH	Phillips hex head (screw)
PHM	pan head machine (screw)
PLC	programmable logic control
PMG	permanent-magnet generator
pot	potentiometer, potential
ppm	parts per million
PROM	programmable read-only memory
psi	pounds per square inch
pt.	pint
PTC	positive temperature coefficient
PTO	power takeoff
PVC	polyvinyl chloride
qt.	quart, quarts
qty.	quantity
R	replacement (emergency) power source
rad.	radiator, radius
RAM	random access memory
RDO	relay driver output
ref.	reference
rem.	remote
Res/Coml	Residential/Commercial
RFI	radio frequency interference
RH	round head
RHM	round head machine (screw)
rly.	relay
rms	root mean square
rnd.	round
ROM	read only memory
rot.	rotate, rotating
rpm	revolutions per minute
RS	right side
RTV	room temperature vulcanization
SAE	Society of Automotive Engineers
scfm	standard cubic feet per minute
SCR	silicon controlled rectifier
s, sec.	second
SI	*Systeme international d'unites,* International System of Units
SI/EO	side in/end out
sil.	silencer
SN	serial number
SPDT	single-pole, double-throw
SPST	single-pole, single-throw
spec, specs	specification(s)
sq.	square
sq. cm	square centimeter
sq. in.	square inch
SS	stainless steel
std.	standard
stl.	steel
tach.	tachometer
TD	time delay
TDC	top dead center
TDEC	time delay engine cooldown
TDEN	time delay emergency to normal
TDES	time delay engine start
TDNE	time delay normal to emergency
TDOE	time delay off to emergency
TDON	time delay off to normal
temp.	temperature
term.	terminal
TIF	telephone influence factor
TIR	total indicator reading
tol.	tolerance
turbo.	turbocharger
typ.	typical (same in multiple locations)
UF	underfrequency
UHF	ultrahigh frequency
UL	Underwriter's Laboratories, Inc.
UNC	unified coarse thread (was NC)
UNF	unified fine thread (was NF)
univ.	universal
US	undersize, underspeed
UV	ultraviolet, undervoltage
V	volt
VAC	volts alternating current
VAR	voltampere reactive
VDC	volts direct current
VFD	vacuum fluorescent display
VGA	video graphics adapter
VHF	very high frequency
W	watt
WCR	withstand and closing rating
w/	with
w/o	without
wt.	weight
xfmr	transformer

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