Software Installation Guide

NOTE: Read the entire Software Installation Guide before using the APM for Windows software.

SAFETY CONSIDERATIONS

Installing and servicing heating equipment can be hazardous due to gas and electrical components. Only trained and qualified service personnel should install, repair, or service heating equipment.

Untrained personnel can perform basic maintenance functions such as cleaning coils, or cleaning and replacing filters. All other operations should be performed by trained service personnel. When working on heating equipment, observe precautions in literature, on tags, and on labels attached to or shipped with the unit, and other safety precautions that may apply.

Follow all safety codes. In the United States, follow all safety codes including the National Fuel Gas Code (NFGC) NFPA 54/ANSI Z223.1-2006. In Canada, refer to the National Standard of Canada Natural Gas and Propane Installation Codes (NSCNGPIC), CAN/CSA149.1-05.

Wear safety glasses and work gloves. Have a fire extinguisher available during start-up, adjustment procedures, and service calls.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the furnace and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. The words DANGER, WARNING, and CAUTION are used with the safety-alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies hazards which could result in personal injury or death. CAUTION is used to identify unsafe practices which would result in minor personal injury, or product and property damage. NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

⚠ CAUTION

UNIT COMPONENT DAMAGE HAZARD

Failure to follow this caution could result in unit component damage.

This CAUTION only applies to the older style furnace control boards P/N HK42FZ001, HK42FZ002, AND CESO130004-00. Do not use the furnace APM program with a computer using external power with a ground. Damage to the furnace control board or B&B RS485 adapter will occur. Use this furnace APM only with a computer using battery power or external power without a ground connection to the computer power cord. If using an externally powered computer without the ground connection, voltage spikes (during thunderstorms for instance) may result in damage to the computer.

INTRODUCTION

The Advanced Product Monitor - APM (Furnace Version) is a software package that can be used for sales demonstrations, training, and to start-up and troubleshoot Variable Speed Furnaces. APM (Furnace Version) has been tested and approved for use on furnace control boards P/N HK42FZ001, HK42FZ002, CESO130004-00, HK42FZ003, HK42FZ012, HK42FZ021, HK42FZ022, HK42FZ024, HK42FZ026, and HK42FZ031.

Because the Advanced Product Monitor runs on a portable laptop PC, it can be carried anywhere to provide the service technician with local access to any Variable Speed Furnace.

The Advanced Product Monitor enables a service technician to perform the following tasks:

- Monitor furnace parameters.
- Save furnace parameters to disk.
- Data Log furnace parameters.
- Force the furnace into high fire. (All Boards except P/N HK42FZ021, HK42FZ022, HK42FZ024, HK42FZ026, & HK42FZ031)
- Force the furnace into low fire. (Board P/N HK42FZ003 & HK42FZ012 only)
- Review the entire furnace fault history.
- Review the recent faults in furnace fault history.
- Review the last fault that occurred. (Board P/N HK42FZ003, HK42FZ012, HK42FZ021, HK42FZ022, HK42FZ024, HK42FZ026, & HK42FZ031 only)
- Display troubleshooting information for each fault code.
- Save the furnace fault history to disk.
- Clear the furnace fault history.
- Review the furnace statistics.
- Save the furnace statistics to disk.

The Advanced Product Monitor has the following NEW capabilities:

- Supports new Step-Modulating furnaces.
- Supports SPP gas-fired units with ABCD User Interface Connections.
- Can be spliced into any ABCD User Interface Connection point. This allows furnace troubleshooting at the outdoor unit.

The Advanced Product Monitor is designed for ease of operation. It utilizes menus, special function keys, plain language prompts, and standardized screen format.

If you have a PC, or are considering purchasing a PC, the following general requirements should apply:

- PC using Pentium 233 or higher microprocessor. PCs with 486 to Pentium 200 microprocessor's will work but the ABCD

connector to the User Interface must be disconnected.

- At least 16Mb (or more) of system memory.
- At least 6Mb (or more) of free hard drive storage space.
- 3.5” floppy drive or CD-ROM drive.
- Windows 95, 98, ME, NT, 2000, XP or Vista.
- RS232 port. Adapter required for USB only computers.
- VGA display.

Included with the Advanced Product Monitor is a B&B RS485 adapter and an interface cable that will connect any of the following furnace control boards P/N HK42FZ003, HK42FZ012, HK42FZ021, HK42FZ022, HK42FZ024, HK42FZ026, & HK42FZ031 to a PC. This cable has 3 stripped and tinned leads on one end and three separate connections on the other end. The stripped leads connect to the B&B RS485 adapter. The WHITE housing connects to furnace control P/N HK42FZ003 or HK42FZ012 at the 3-pin communication connector PL-6. The GREEN ABCD PLUG housing connects to furnace control HK42FZ021, HK42FZ022, HK42FZ024, HK42FZ026 or HK42FZ031 at the 4-pin ABCD connector PL7. The GREEN ABCD RECEPTACLE housing in combination with the GREEN ABCD PLUG housing allows you to splice in the APM at any ABCD User Interface connection point except for the one at the User Interface. This allows you to check the furnace from the outdoor unit.

NOTE: You will need an APM adapter harness to connect the interface cable to first generation furnace control boards P/N HK42FZ001, HK42FZ002, or CESO130004. These adapter harnesses were distributed years ago and are no longer available.

This installation guide has the following sections:

I. INSTALL RS232/485 ADAPTER
II. INSTALLING APM SOFTWARE
III. CONNECTING FURNACE TO PC
IV. RUNNING APM
V. PALM PILOT APM VERSION
VI. WINDOWS MOBILE 5 APM VERSION

I. INSTALL RS232/485 ADAPTER

In order to interface the Advanced Product Monitor to the variable speed furnace a B&B RS485 adapter (B&B 485SD9TB) is supplied in the APM kit.

A. Using the B&B converter

Plug the B&B RS485 adapter into the serial port of your PC. NOTE: If your PC has a 25 pin connector, an DB25F-DB9M adapter will be required. This standard adapter is available online or at some retail outlets.

NOTE: If your PC has only USB connections, a USB to RS-232 adapter will be required. These adapters are available online or at most retail outlets that also sell computers. Reference Appendix A in the APM manual installed on the CD for a list of websites that have compatible adapters. The APM manual is located in the **Manual** folder. You will need to install the USB serial driver that comes with your USB to RS- 232 adapter prior to hardware installation.

The B&B RS485 adapter has a terminal block with 5 terminals. You will need to connect the interface cable to the terminal block on the B&B RS485 adapter. Follow the instructions below to connect the interface cable to the B&B RS485 adapter terminal block. (See Fig. 1).

1. Insert the **BLACK** wire into the terminal labeled **TD(A)** on the B&B RS485 adapter and tighten the screw.
2. Insert the **GREEN** wire into the terminal labeled **TD(B)** on the B&B RS485 adapter and tighten the screw.
3. Insert the **WHITE** wire into the terminal labeled **GND** on the B&B RS485 adapter and tighten the screw.
4. Route wire tie through holes in circuit board portion of B&B RS485 adapter and tighten around cable to provide strain relief.

NOTE: The terminals labeled **GND** and **+12V** are generally not used because most PCs supply power to the serial port. In the event your PC does not supply power to the serial port you will need to supply external power to the B&B RS485 adapter using a 12 VDC power supply or a 9 volt transistor battery.

II. INSTALLING APM SOFTWARE

In the instructions that follow, it is assumed that the E: drive letter corresponds to the computer’s CD-ROM drive and that the A: drive letter corresponds to the computer’s floppy drive. If this is not the case, please modify the instructions accordingly for your computer’s drive letters.

B. Creating Floppy Disk Install Set

If you are installing the APM software onto a computer that does not have a CD-ROM drive, you must first create the floppy disk images. The APM CD-ROM contains compressed self-extracting floppy disk images of the APM install program that need to be copied to 4 blank, IBM formatted, 1.44Mb, 3.5” floppy disks. In order to create the floppy disk images, you will need to use a computer that has both a CD-ROM drive and a floppy disk drive.

To create the floppy disk images and extract them to the target computer’s hard drive, follow these steps:

1. Start windows and insert the APM CD into your CD-ROM drive. The APM installation routine should automatically launch. Click **Cancel** to stop the installation.
2. Click on the **Start** button at the bottom left corner and select **Run**... from the resulting menu. Type **E:\mkfloppy A: E:** in the text field of the resulting Run dialog then click the **OK** button.
3. When prompted, insert a blank, IBM-formatted, 1.44Mb floppy disk into the computer’s floppy drive and press the **Enter** key. When the copy has completed, eject the floppy disk and label it **APM Disk 1 of 4.**
4. Insert another blank, IBM-formatted, 1.44Mb floppy disk into the computer’s floppy drive and press the **Enter** key. When the copy has completed, eject the floppy disk and label it **APM Disk 2 of 4.**
5. Repeat this methodology until all 4 disk images are created.
6. To extract these files to a computer without a CD-ROM drive insert **APM Disk 1 of 4** into the A: drive and click on the **Start** button at the bottom left corner and select **Run**... from the resulting menu. Type **A:\apm.exe** in the text field of the resulting Run dialog then click the OK button. These files will be extracted to a temporary folder named **C:\apmtemp.**
7. When prompted insert each APM disk until all the compressed files are extracted.

C. Installing APM

Before you can run the APM program, you must install it. If your computer does not have a CD-ROM drive, you need to create floppy disk images and extract them to the target computer’s hard drive by following the instructions in the previous section.

The following instructions apply whether you are installing from the CD-ROM or the extracted files loaded on a computer’s hard drive using floppy disk images.

To install the APM software follow these steps:

1. Start windows and insert the APM CD into your CD-ROM drive. The APM installation routine should automatically launch. If it does not automatically launch click on the **Start** button at the bottom left corner and select **Run**... from the resulting menu. Type **E:\setup** in the text field of the result-

ing Run dialog then click the **OK** button.

If your computer does not have a CD-ROM and you extracted the floppy disk images to computer's hard drive then click on the **Start** button at the bottom left corner and select **Run**... from the resulting menu. Type **C:\apmtemp\setup** in the text field of the resulting Run dialog then click the **OK** button.

2. Click **Next** and follow the on-screen instructions.
3. Choose a destination location for the software. The setup program will automatically install the APM program in the folder shown in the window, or you may select another folder. Make your selection and click **Next**.

NOTE: When installing in **Windows Vista** change the default folder to **C:\APM\.** Windows Vista prevents programs from writing to any file located in the Program Files folder. If the APM program is installed in the default folder the APM program will not be able to data log or save any views to file. In addition you will have to select the proper COM port every time the APM program is started.

4. If you would like to change any selections click on the **< Back** button, otherwise click on the **Install** button.
5. Once the installation is complete, click on the **Finish** button.
6. Upon successful completion, the installation program will put two new icons on the desktop. Use the **APM** icon to launch the APM application. The **APM Output Files** folder icon is the location in which any files created by the APM application are stored.

III. CONNECTING FURNACE TO PC

The interface cable is connected between the furnace control and the B&B RS485 adapter as shown in Fig. 1. The GREEN ABCD PLUG housing connects to furnace control HK42FZ021, HK42FZ022, HK42FZ024, or HK42FZ026 at the 4-pin ABCD connector PL7. The GREEN ABCD RECEPTACLE housing in combination with the GREEN ABCD PLUG housing allows you to splice in the APM at any ABCD User Interface connection point except for the one at the User Interface. The WHITE housing is an alternate connector that connects to furnace control P/N HK42FZ003 or HK42FZ012 at the 3 pin communication connector PL6.

NOTE: You will need an APM adapter harness to connect the interface cable to first generation furnace control boards P/N HK42FZ001, HK42FZ002, or CESO130004. These adapter harnesses were distributed years ago and are no longer available.

The following steps should be performed when connecting the interface cable and B&B RS485 adapter between the furnace control P/N HK42FZ021, HK42FZ022, HK42FZ024, or HK42FZ026 and PC:

1. Turn off power at main disconnect.
2. Remove access doors.
3. Route the interface cable to the furnace control.
4. Connect GREEN ABCD PLUG housing on the interface cable to the furnace board 4-pin ABCD connector PL7 just behind the model plug on the lower left side of the furnace board. See Fig. 1 for location. If a User Interface connection is currently connected to the 4-pin ABCD connector PL7 disconnect it and plug it into the GREEN ABCD RECEPTACLE housing on the interface cable and then connect the GREEN ABCD PLUG housing on the interface cable to the furnace board 4-pin ABCD connector PL7.

⚠ CAUTION

UNIT COMPONENT DAMAGE HAZARD

Failure to follow this caution may result in unit component damage.

Do not route the furnace cable through any access panel or door openings. If this cable gets pinched when the access panel or door is put in place, a direct short of the communication lines to ground may occur. When the communication lines are shorted to ground, the furnace board may be damaged and may have to be replaced.

5. Reinstall access panel and door.
6. Connect the opposite end of the furnace cable to the B&B converter as shown in Fig. 1.
7. Turn on electrical power and wait 10 seconds before running the APM software.

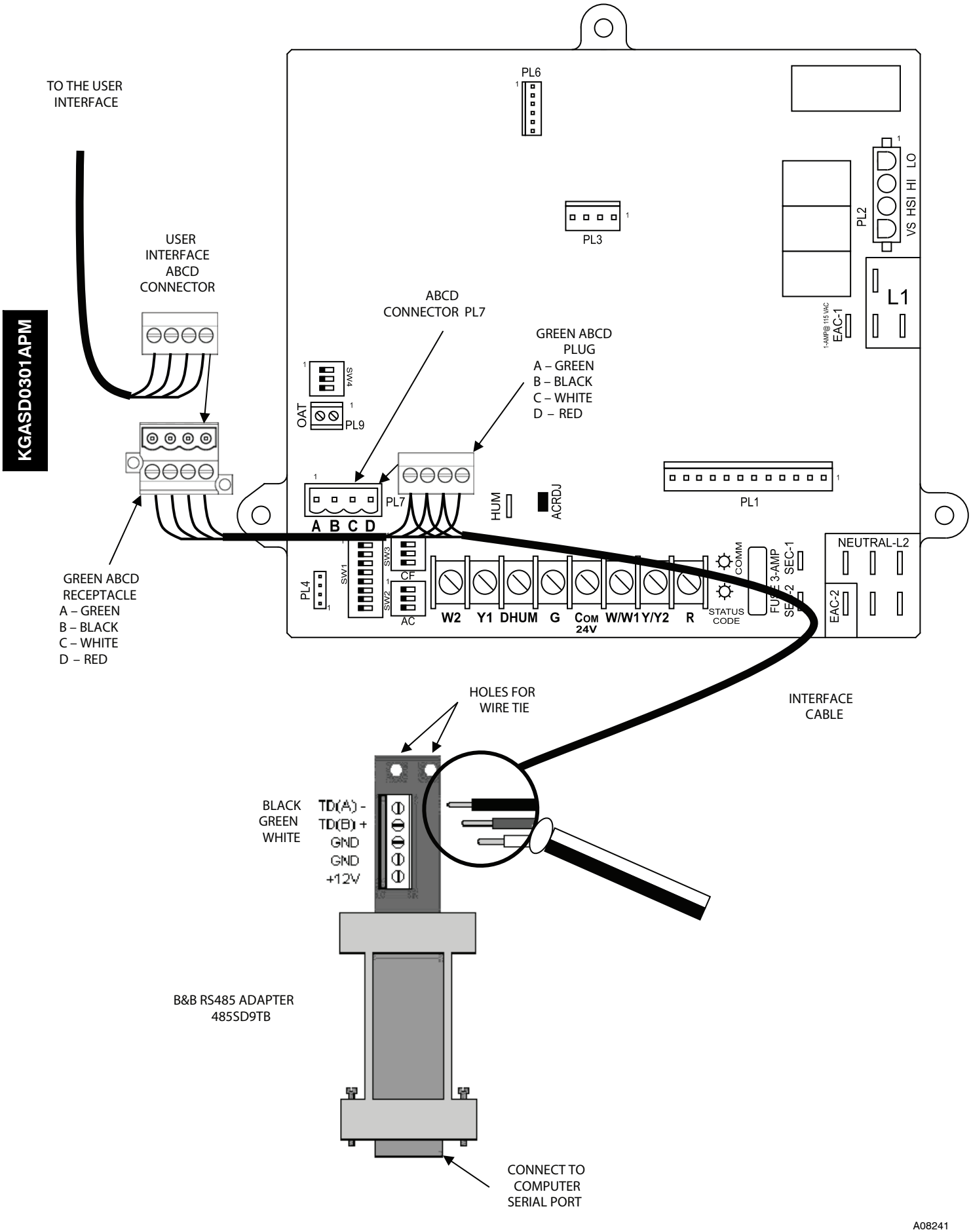

Fig. 1 - Furnace Control

IV. RUNNING APM

This section gives you a quick tour of the Advanced Product Monitor so you can start using it right away. To run the Advanced Product Monitor follow these steps:

1. Start windows.
2. Double-click on the icon labeled **APM** on your desktop.
3. If everything is connected properly the computer will prompt you to enter the serial number of the unit (1 to 10 characters) and click the **OK** button.

NOTE: It may take as long as 30 seconds before the computer prompts you to enter the serial number. When prompted at least one character must be entered. In addition a name can be given instead of a serial number. See the example shown in Fig. 2, where ”thisunit” is entered:

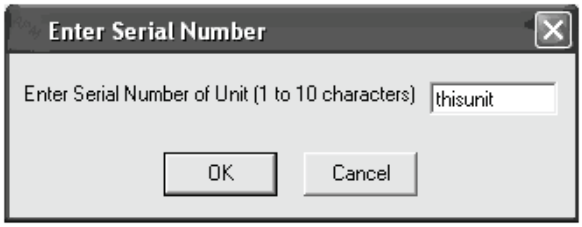

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Fig. 2 - Serial Number Example

If the screen shown in Fig. 3 appears, check your wiring, connector orientation, and whether the board is powered. If OK change your COM port because your PC may already be using COM1 for a modem. If you are still having problems you may need to power the RS485 adapter. Refer to the last **NOTE** in Section I.

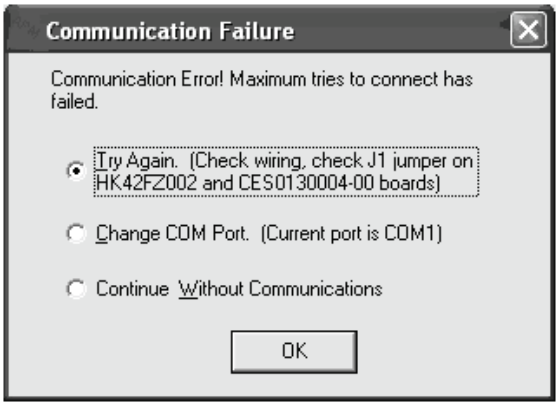

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Fig. 3 - Communications Failure Dialog

4. After entering the serial number the screen shown in Fig. 4 should appear when using furnace control board P/N HK42FZ021, HK42FZ022, HK42FZ024, or HK42FZ026. Similar screens will appear with older controls.

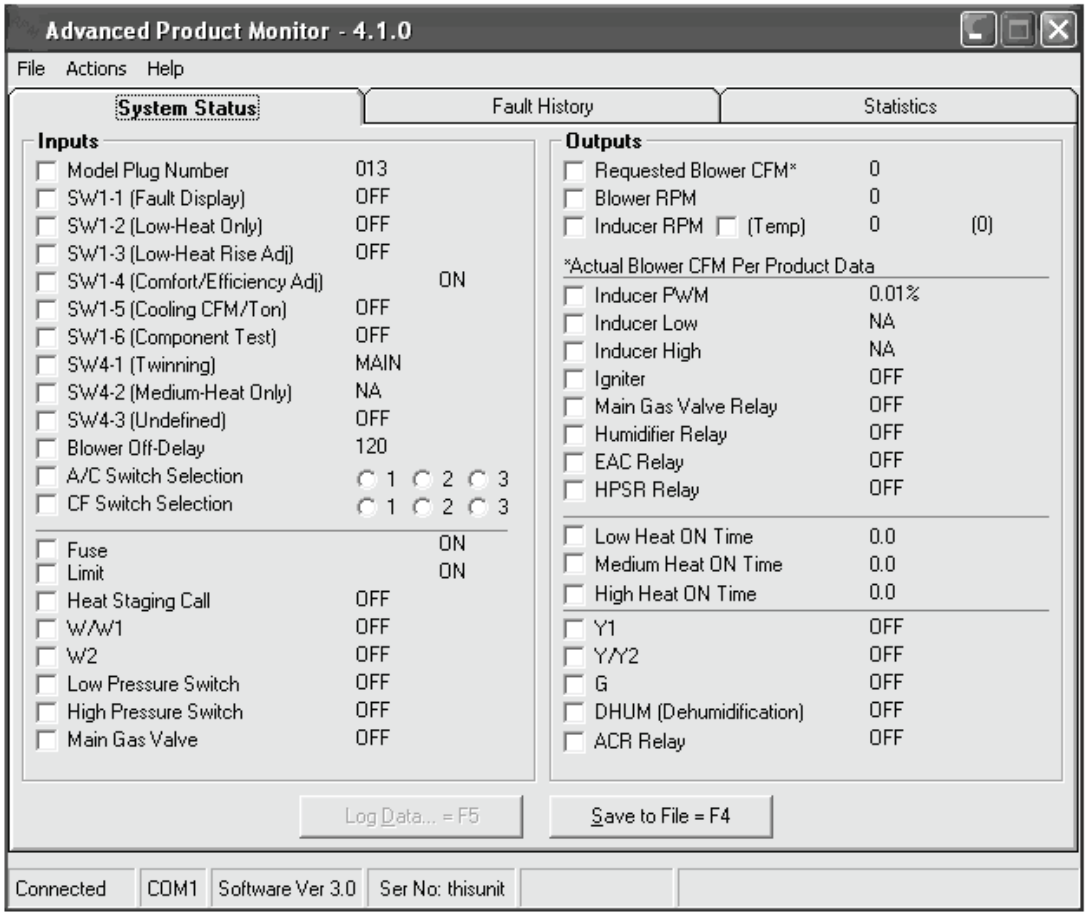

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Fig. 4 – Screen Image

— To monitor the system, click on the **System Status** tab.

— To review the furnace fault codes and error messages, click on the **Fault History** tab.

— To review the furnace statistics, click on the **Statistics** tab.

— To exit the program, select **File | Exit** from the menu bar.

NOTE: To take full advantage of the APM software features, please refer to the APM manual installed on the CD. It is located in the **Manual** folder.

V. PALM PILOT APM VERSION

Included on the APM for Windows CD is a Palm Pilot version of the software. Complete instructions are located in the **palmAPM** folder.

VI. WINDOWS MOBILE 5 APM VERSION

Included on the APM for Windows CD is a Windows Mobile 5 version of the software. Complete instructions are located in the **winmobileAPM** folder.

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