
INSTALLATION INSTRUCTIONS

Original Issue Date: 1/01

Models: **Microprocessor-Based Generator Set Controllers and ATS Controllers**

Market: **All**

Subject: **Program Loader Software**

Introduction

The controller application program is a set of instructions that tell the controller how to operate (similar to the operating system on a computer). Use Program Loader software and a personal computer to update the application program on the following controllers:

- Model 550 generator set controllers
- Advanced Digital Control (ADC 2100) generator set controllers
- 16-light microprocessor generator set controllers *
- Series 1000 ATS controllers
- Series 500 ATS controllers
- MPAC™ 550 ATS controllers
- Modbus/KBUS converters for Series 340 controllers

Program Loader also loads personality profiles onto the 550 generator set controller. See Section 1 for more information.

Program Loader overwrites the original programs in the controller's nonvolatile memory.

Use the Program Loader to reload files only in the case of application program upgrade, controller replacement, or file corruption. Load files from the disk shipped with the equipment or obtain new files for your system directly from the manufacturer. (See Requesting Program Loader section.) Make a backup copy of the files onto a disk and store the disks in a safe place.

Program Loader software and controller application program files can be requested through the KOHLERnet. Use your SecurID® to access the KOHLERnet, click on the TechTools button, and follow the instructions to request files.

Read the entire procedure before beginning. Install the program loader software onto a personal computer.

* 16-light microprocessor generator set controllers with red main logic boards, shipped November, 2003 or later

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Then proceed to the appropriate section for your controller. Carefully follow these instructions and any additional instructions that appear on the screen during the upload procedure. Do not attempt to modify the program or data files. Loading incorrect or incomplete files can cause permanent damage to the controller's main logic board.

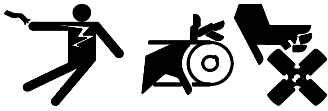
System Requirements

- 100% IBM® PC compatible with a 133 MHz or higher Pentium®-compatible CPU.
- Microsoft® Windows® 98, Windows NT® Workstation Version 4.0, Windows® 2000 Professional, Windows® Me, or Windows XP® operating system.
- CD-ROM drive and minimum of 4 MB hard drive space for installation.
- One 57.6k baud RS-232 serial port, numbered between COM1 and COM16.
- Computers running Windows® 2000 and communicating through USB ports may require a serial adapter card to connect the PC to the ATS controller. (The Socket™ PCMCIA Serial Adapter card is one example).
- Stable power supply. A laptop system with a fully charged battery or desktop system running with a battery backup system is recommended.
- Null modem RS-232 cable with a 9-pin male plug on the controller end (GM16657). (Not required for the 16-light microprocessor controller.)
- For the 16-light microprocessor controller only: RS-232 to RS-485 converter (GM29361) and shielded twisted-pair cable (Belden #9841 or equivalent).

Safety Precautions

Observe the following safety precautions while using the kit.

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.

DANGER



Hazardous voltage. Will cause severe injury or death.

Only authorized personnel should open the enclosure.

DANGER



Hazardous voltage. Will cause severe injury or death.

Disconnect all power sources before opening the enclosure.

Program Loader Version Numbers

The Program Loader software is periodically updated as new controllers are added. Check Figure 1 to determine the Program Loader software version number required to load programs onto your controller.

If the Program Loader software is already installed on your PC, check the software version number by opening the Program Loader software, clicking on the Help menu, and clicking on About Program Loader in the dropdown menu. See Figure 2.

If you already have the required version of Program Loader installed on your PC, proceed to the appropriate section of these instructions for your controller.

Controller	Version Required
Model 550 Generator Set and Series 1000 ATS Controllers	2.2.1 or higher
Advanced Digital Control (ADC 2100) and Digital Control (DC 2200)	2.3.0 or higher
16-light Microprocessor Controller	2.4.0 or higher
MPAC 500 ATS Controller	2.5.0 or higher
Converter, Modbus/KBUS	2.6.0 or higher
MPAC 550 ATS Controller	2.7.0 or higher

Figure 1 Program Loader Software Version Numbers

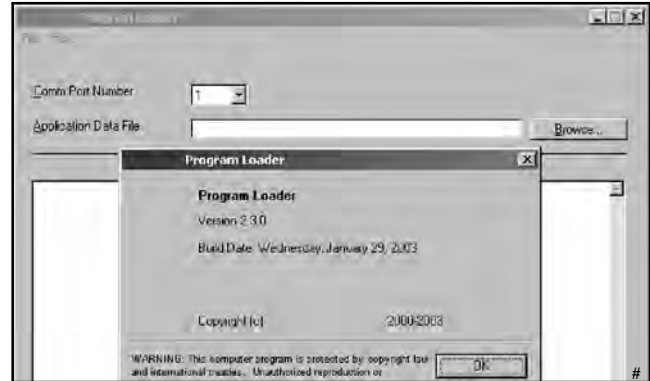


Figure 2 Program Loader Version Number Identification

Requesting Program Loader

Use the following procedure to request Program Loader software through the KOHLERnet.

Procedure to Obtain Program Loader Software

1. Log onto the KOHLERnet using your SecurID® password.
2. In the Kohler® Power Systems opening screen, click on Tech Tools.
3. Choose Industrial from the list of product lines on the screen.
4. On the Industrial screen, click on Software under the Subject heading.
5. On the IndustrialSoftware screen, click on Program Loader under the Subject heading.
6. The next screen gives instructions to request the software. Follow those instructions carefully.
7. The software will be sent in .ZIP formatted files. Create a new directory on your PC and save the files to that new directory. Then use an unzipping program to extract the files. Follow the instructions provided with the unzipping program.
8. Proceed to the next section to install the Program Loader software on your PC.

Installing Program Loader

Note: If you have a previous version of Program Loader installed on your PC and want to install a new version, use your computer's Add/Remove Programs function to remove the old version of Program Loader before installing the new one. (Choose Start→Settings→Control Panel→Add/Remove Programs.)

1. Close all applications.
2. Use your computer's Explorer to open the directory where the Program Loader software files are stored.
3. Select the Setup application file to install the program.
4. The setup procedure will install the program loader on your computer's hard drive (typically drive C) in C:\Program Files\Program Loader. Follow the instructions on the screen to proceed with the installation or to change the directory if you would like the software to be installed in a different directory.
5. If an error occurs, follow the recommendations on the screen to troubleshoot the installation.

After the Program Loader Software is installed onto the PC, proceed to the appropriate section of these instructions for your controller.

1 Model 550 Generator Set Controllers

The Program Loader software is used to load controller application program and/or generator set personality profiles onto the Model 550 generator set controller. The personality profile is a data file that contains the generator set parameters and is specific to the generator set serial number. The files are loaded onto the generator set controller at the factory at the time of manufacture and a backup disk containing the controller application program and the personality profile is shipped with the generator set.

1.1 Prepare the controller and connect to the PC.

1. Save or record the controller's user-defined settings.
 - a. Write the controller's user-defined settings in the chart provided in the controller operation manual. See the controller operation manual for instructions; or
 - b. Use the Monitor III Generator System Monitoring and Control Software to save the user configuration settings to a backup file before uploading new files to the controller. See the Monitor III Software Operation and Installation Manual for instructions.
2. Place the generator set master switch in the OFF/RESET position.
3. Disconnect the power to the generator set battery charger, if equipped.
4. Disconnect the generator set engine starting battery(ies), negative (-) lead first.
5. Remove the screws from the controller's top cover and remove the cover.
6. Remove the top screws on the front side of the controller. Loosen the bottom screws to allow the front panel to swing open.
7. Connect one end of the null modem cable to the controller at the RS-232 connector P18. See Figure 3. Tighten the thumb screws on the connector to hold it securely in place.
8. Connect the other end of the null modem cable to the computer's RS-232 communication (COM) port. Tighten the thumbscrews on the connector to hold it securely in place.

1.2 Load the controller files.

9. Start the Program Loader by selecting the Program Loader from the PC's Start menu. Click on the Start button at the lower left corner of the screen, select Programs, select the directory that contains the Program Loader software, and click on Program Loader.
10. Enter the number of the computer's COM port (number 1 through 16) that is connected to the controller through the communication cable. See Figure 4.

Note: While the program supports COM ports 1 through 16, most computers use only ports 1 through 4. Contact your computer equipment supplier for help determining which port is available.

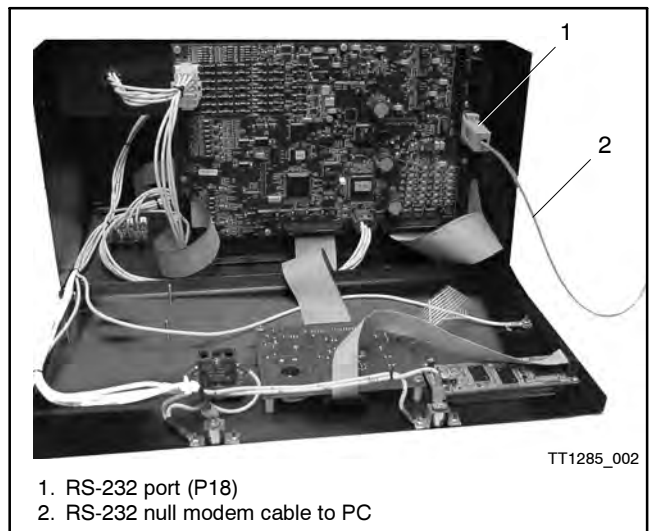


Figure 3 550 Controller RS-232 Connection

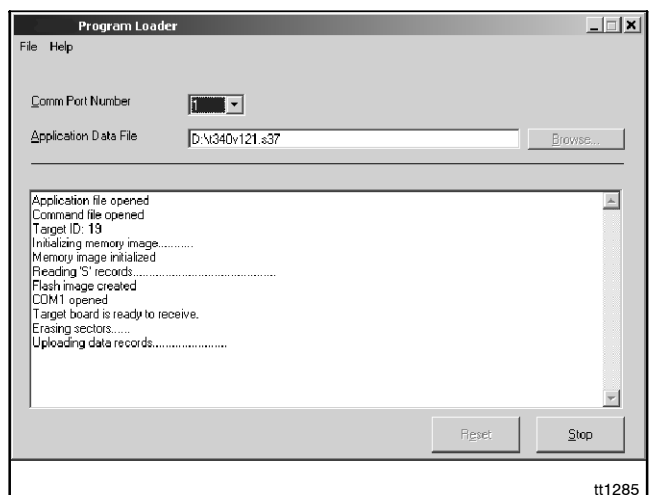


Figure 4 Program Loader Screen

11. If the application files or personality parameter files are stored on a disk, insert the disk into the computer's disk drive.

12. Select the application file for your system's engine and alternator. Application files and personality parameter files have ".s19" or ".s37" extensions on the filenames. Use only files obtained directly from the manufacturer. There are different ways to select the file:

- Select File>Open or click on the Browse button to open the standard Windows file open dialog box to select a file; or
- Type the path and filename directly into the Application Data File text box. Do not use spaces or periods in the path name of the directory where the files are stored.

Note: Do not move the application files to a different directory. Two separate files are needed for all uploads: an application file with a ".s19" or ".s37" file extension and a command file with a ".cmd" file extension. Both files must exist in the same directory, even though the user will not see the command file.

13. Click the Run button on the computer screen. The program performs its memory initialization.

Note: If the wrong COM port was selected in step 7, an error message will appear during the initialization. Click RESET, select a different COM port, and click RUN to begin again.

14. The program will prompt you to reset the target controller. Reset the 550 controller by reconnecting the engine start battery cable, negative (-) lead last.

15. A warning dialog box appears providing one last chance to abort the data loading process. Click the OK button to start loading. The loading process may take several minutes.

Note: Do not interrupt the upload process for any reason. An interruption of the upload process could cause permanent damage to the controller's programming, requiring replacement of the controller's main logic board and additional reprogramming.

16. The program indicates whether the file transfer was successful. "Upload complete" indicates that the file transfer was successful.

17. Close the program by selecting File>Exit, or by clicking the Close Window button in the upper right corner of the computer screen.

If you want to use Program Loader again, click the RESET button at the bottom of the screen rather than exiting the program.

1.3 Reset the controller.

18. Reset the controller by disconnecting and then reconnecting the generator set engine starting battery(ies) as instructed in the following steps.

- a. Disconnect the generator set engine starting battery(ies), negative (-) lead first.
- b. Reconnect the generator set engine starting battery, negative (-) lead last.

19. Reconnect power to the battery charger, if equipped.

1.4 If the personality profile was loaded, reset the EEPROM.

Note: If you did not load the personality profile, proceed to step 1.5.

20. Use the controller keypad to go to Menu 14, Programming Mode, and select **programming mode—local**. Use the information from the 550 controller operation manual as necessary.

Note: The factory default access code is the number 0.

21. Press the RESET MENU key on the controller keypad.

22. Use the controller keypad to go to Menu 20, Factory Setup. See Figure 5 or Figure 6 for displays.

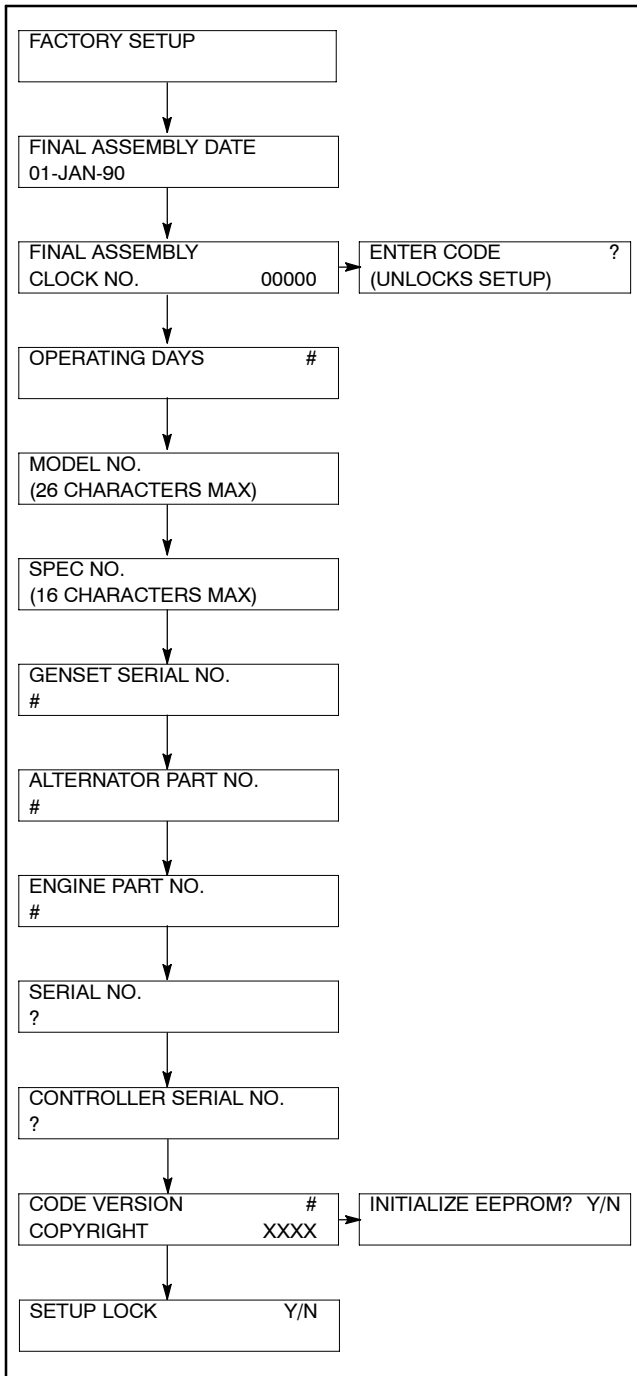


Figure 5 Menu 20, Factory Setup
(prior to version 2.10)

23. Arrow down to the SETUP LOCK display.

If the SETUP LOCK display indicates YES, go to step 24.

If the SETUP LOCK display indicates NO, go to step 25.

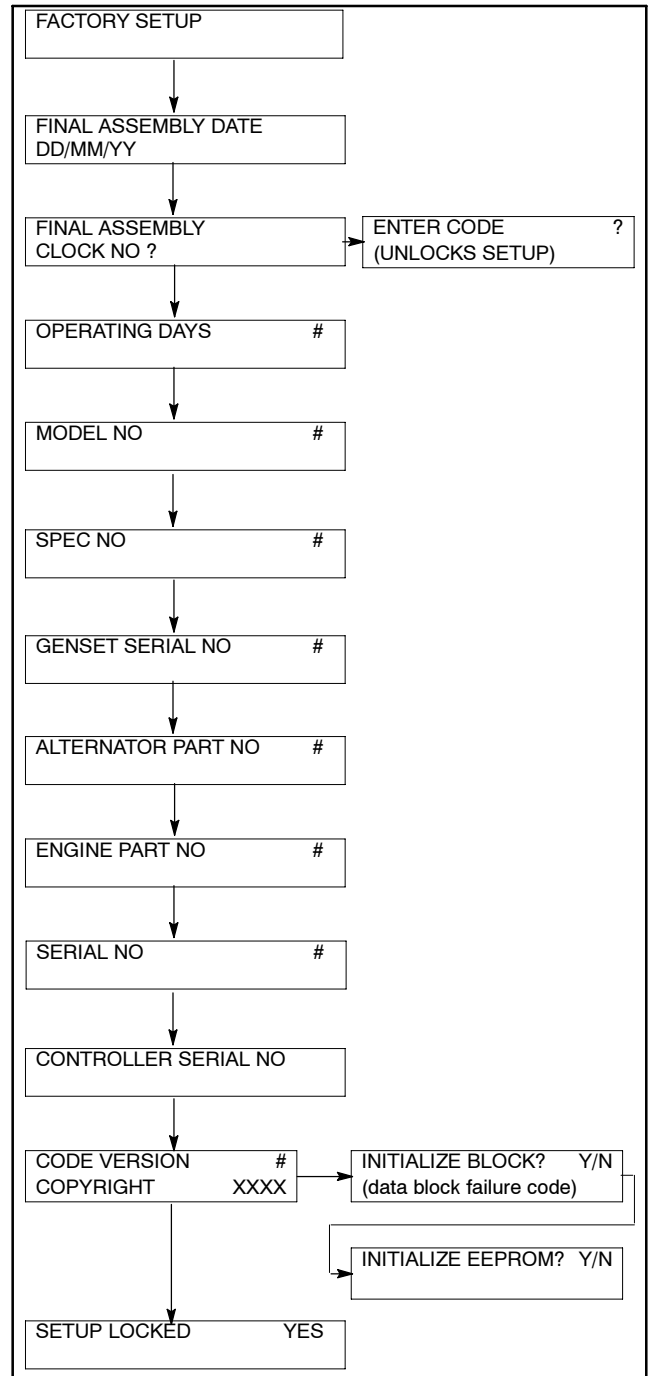


Figure 6 Menu 20, Factory Setup
(version 2.10 or higher)

24. Unlock the setup.

- a. Arrow down to the FINAL ASSEMBLY, CLOCK NO. display. Record the clock number on the controller display.
- b. Arrow right to ENTER CODE display.
- c. Use the controller keypad to enter the clock number previously recorded.
- d. Press the ENTER key. Changes to Menu 20, Factory Setup, are now possible.

25. Initialize the EEPROM.
 - a. Arrow down to the CODE VERSION display.
 - b. Arrow right to the INITIALIZE EEPROM display.
 - c. Press the YES key to initialize the EEPROM.
 - d. Press the ENTER key.
26. Wait for completion of the system reset.
27. If S/N WARNING is displayed, change the serial number. After the personality profile is loaded, the GENSET SERIAL NO. shows the correct serial number for the respective generator set. Use the GENSET SERIAL NO. to update the SERIAL NO. display as follows:
 - a. Go to Menu 20, Factory Setup. See Figure 5 or Figure 6 for displays.
 - b. Arrow down to the SERIAL NO. display.
 - c. Enter the serial number of the generator set using data recorded from the old controller or as shown on the generator set nameplate. If the serial number is six digits, enter a *leading zero* for a seven-digit serial number.
 - d. Press the ENTER key. The GENSET S/N WARNING display no longer appears when the GENSET SERIAL NO. and SERIAL NO. match.
28. Lock the Menu 20, Factory Setup entries.
 - a. Press the RESET MENU key on the controller keypad.
 - b. Use the controller keypad to go to Menu 20, Factory Setup.
 - c. Arrow down to the SETUP LOCK display.
 - d. Press the YES key to lock the setup and prevent alterations to Menu 20, Factory Setup.

1.5 Check the controller settings.

29. Check the controller settings.
 - a. If you used Monitor III software to retrieve the controller's user settings before uploading the new files, you may now use Monitor III to restore those settings to the controller. Follow the instructions in the Software Operation and Installation Manual.
 - b. Otherwise, follow the instructions in the controller operation manual to enter user settings using the controller keypad and display.

1.6 Return to automatic operation.

30. Disconnect the null modem cable from the computer and the controller.
31. Close the enclosure's front panel. Install and tighten the screws.
32. Replace the enclosure's top cover. Install and tighten the screws.
33. Test the generator set operation. Refer to the generator set operation manual for instructions to start and run the generator set.
34. Place the generator set master switch in the AUTO position.

2 Advanced Digital Control ADC 2100 and Digital Control DC 2200

Use Program Loader software version 2.3.0 or higher to load the controller application program onto the ADC 2100 and DC 2200 generator set controllers.

Note: Version 2.3.0 or higher of the Program Loader software is required to load programs onto the Advanced Digital Control generator set controller.

After loading the new program onto the ADC 2100 controller, set the generator set parameters (i.e. voltage, unit configuration, engine configuration, 12/24 VDC, etc.). For instructions to set the parameters, see TT-1364 or the generator set Service Manual.

The DC 2200 parameters are factory-set and cannot be changed in the field.

2.1 Prevent the generator set from starting.

1. Move the generator set master switch to the OFF/RESET position.
2. Disconnect power to the battery charger, if equipped.
3. Disconnect the generator set engine starting battery, negative (-) lead first.

2.2 Remove the controller from the generator set.

4. Disconnect the engine wiring harness connector P1 plug (35-pin) from the controller. Disconnect the J15 and J16 connectors. See Figure 7.
5. Remove the controller from the generator set in order to access the back of the controller.

2.3 Prepare the controller and connect to the PC.

6. Note the labels on the three leads connected to the generator set master switch for reconnection later. Disconnect the leads at the pink connectors. See Figure 7, item 3.
7. Remove the controller's back cover.

8. Connect a null modem cable from the serial port of the computer to the RS-232 connector on the back of the ADC controller. See Figure 7, item 2.
9. Reconnect the three pink connectors to the generator set master switch.
10. Reconnect the engine wiring harness connector P1 plug (35-pin) to the controller.
11. Reconnect the generator set engine start battery, negative (-) lead last.
12. Reconnect power to the battery charger, if equipped.

Note: Connect the P1 plug, battery, and battery charger, if equipped, as instructed above to provide power to the controller during the software loading process.

2.4 Load the controller files.

13. Start the Program Loader by selecting the Program Loader from the PC's Start menu. Click on the Start button at the lower left corner of the screen, select Programs, select the directory that contains the Program Loader software, and click on Program Loader.

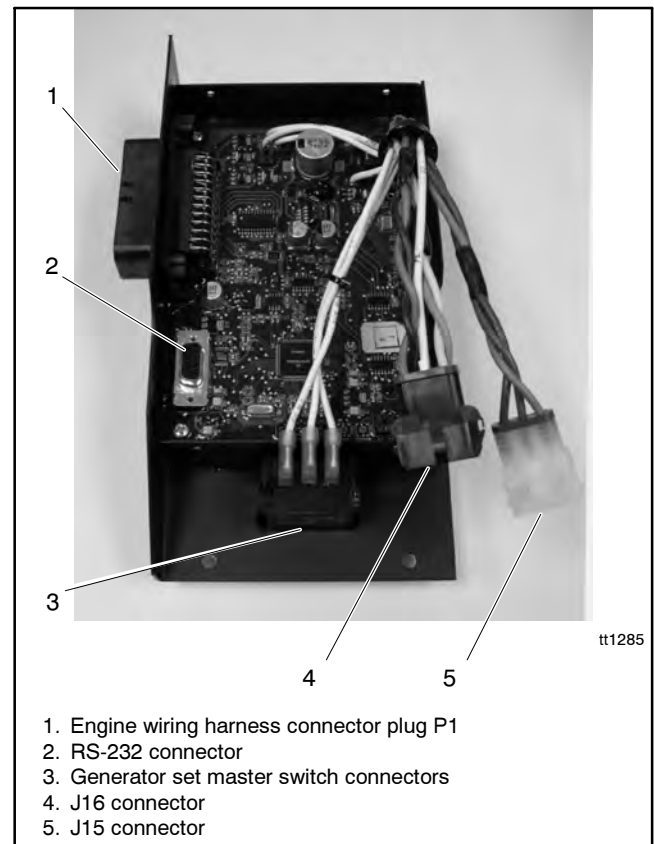


Figure 7 Advanced Digital Control Connections

- Enter the number of the computer's COM port (number 1 through 16) that is connected to the controller through the communication cable. See Figure 8.

Note: While the program supports COM ports 1 through 16, most computers use only ports 1 through 4. Contact your computer equipment supplier for help determining which port is available.

- If the application files are stored on a disk, insert the disk into the computer's disk drive.

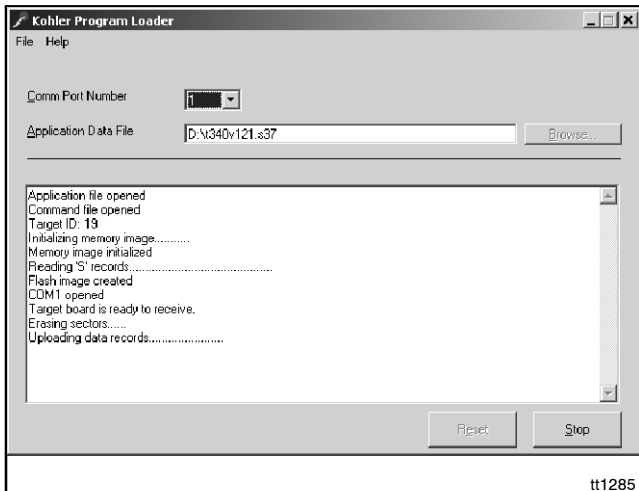


Figure 8 Program Loader Screen

- Select the application file. Application files have “.s19” or “.s37” extensions on the filenames. Use only files obtained directly from the manufacturer. There are different ways to select the file:

- Select File>Open or click on the Browse button to open the standard Windows file open dialog box to select a file; or
- Type the path and filename directly into the Application Data File text box. Do not use spaces or periods in the path name of the directory where the files are stored.

Note: Do not move the application files to a different directory. Two separate files are needed for all uploads: an application file with a “.s19” or “.s37” file extension and a command file with a “.cmd” file extension. Both files must exist in the same directory, even though the user will not see the command file.

- Click the Run button on the computer screen. The program performs its memory initialization.

Note: If the wrong COM port was selected in step 7, an error message will appear during the initialization. Click RESET, select a different COM port, and click RUN to begin again.

- The program will prompt you to reset the target controller. Reset the ADC controller by moving the master switch to the RUN position. The controller display remains dark.
- A warning dialog box appears providing one last chance to abort the data loading process. Click the OK button to start loading. The loading process may take several minutes.

Note: Do not interrupt the upload process for any reason. An interruption of the upload process could cause permanent damage to the controller's programming, requiring replacement of the controller's main logic board and additional reprogramming.

- The program indicates whether the file transfer was successful. “Upload complete” indicates that the file transfer was successful.
- Close the program by selecting File>Exit, or by clicking the Close Window button in the upper right corner of the computer screen.

If you want to use Program Loader again, click the RESET button at the bottom of the screen rather than exiting the program.

2.5 Return to operation.

- Disconnect power to the battery charger, if equipped.
- Disconnect the generator set engine starting battery, negative (-) lead first.
- Disconnect the null modem cable from the computer and the controller.
- Disconnect the three pink connectors from the generator set master switch.
- Replace the controller's back cover and tighten the cover screws.
- Reconnect the three pink connectors to the generator set master switch.
- Reconnect the J15 and J16 connectors.

29. Reconnect the generator set engine starting battery, negative (-) lead last.
30. Reconnect power to the battery charger, if equipped.

2.6 Check the settings and adjust, if necessary. (ADC 2100 only)

31. Use the controller display and keypad to check the generator set parameters (i.e. system voltage, unit configuration, engine configuration, 12/24 VDC, etc.) and set them to the appropriate settings for your system. These settings are password-protected; see the generator set Service Manual or TT-1364, ADC 2100 Replacement, for instructions and system settings.

2.7 Check the application program version number. (ADC 2100 only)

Note: This step is optional.

32. Move the generator set master switch to the OFF/RESET position.
33. Press and hold the Select button on the ADC controller. See Figure 9. Move the generator set master switch to the RUN position. (The generator set will not start if the Select button is pressed.)

34. Watch the LED display on the ADC controller. After approximately 5 seconds, the LED display will change to show the software version number (for example, 1.01).

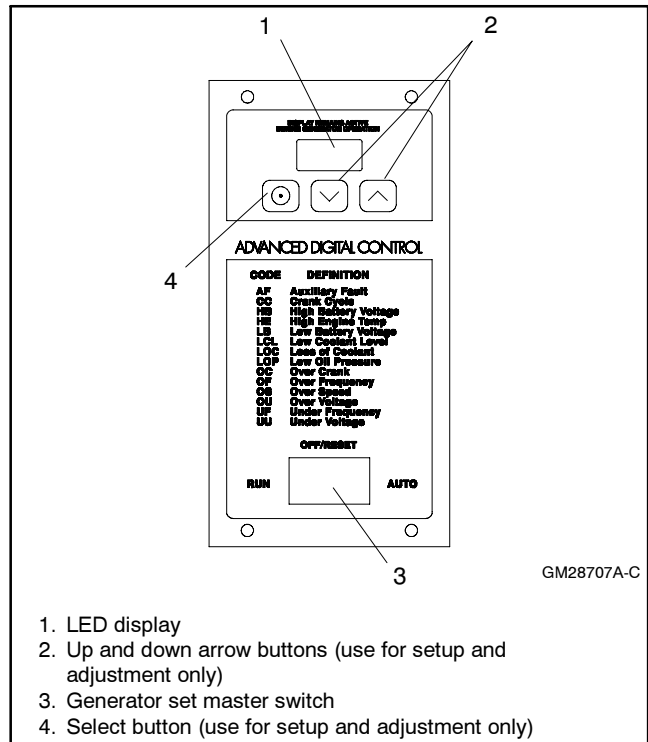


Figure 9 Advanced Digital Control User Interface

3 16-Light Microprocessor Controllers

Use the Program Loader software version 2.4.0 or higher to load controller application program onto 16-light controllers with red main logic boards (shipped November, 2003 or later).

Note: Version 2.4.0 or higher of the Program Loader software is required to load programs onto the 16-light microprocessor controller.

3.1 Prevent the generator set from starting.

1. Move the generator set master switch to the OFF/RESET position.
2. Disconnect power to the battery charger, if equipped.
3. Disconnect the generator set engine starting battery, negative (-) lead first.

3.2 Connect the controller to the personal computer (PC).

Note: Shielded twisted pair cable (customer-supplied, Belden #9841 or equivalent) and an RS-232 to RS-485 converter (available from the factory, part number GM29361) are required in order to connect the controller to a personal computer.

4. Connect the RS-232 side of the RS-232 to RS-485 converter to the serial port on the PC. See Figure 10.
5. Use shielded twisted-pair cable (Belden #9841 or equivalent) to connect the RS-232 to RS-485 converter to the TB5 connector on the controller's main logic board. See Figure 11 and Figure 12.

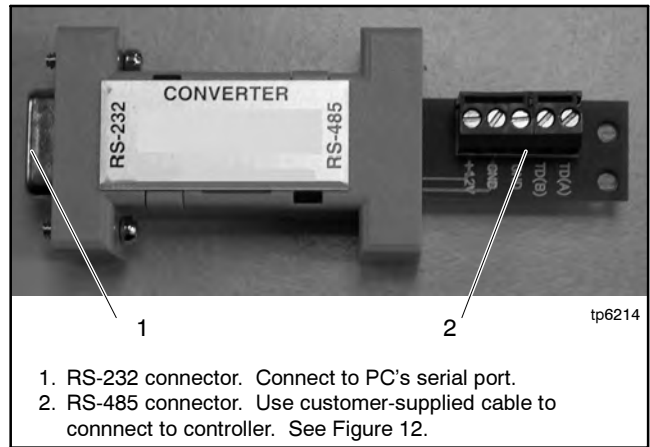


Figure 10 RS-232 to RS-485 Converter (available from the factory)

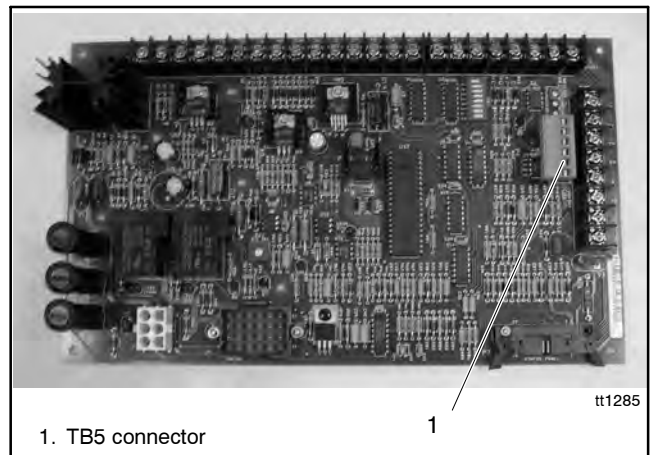


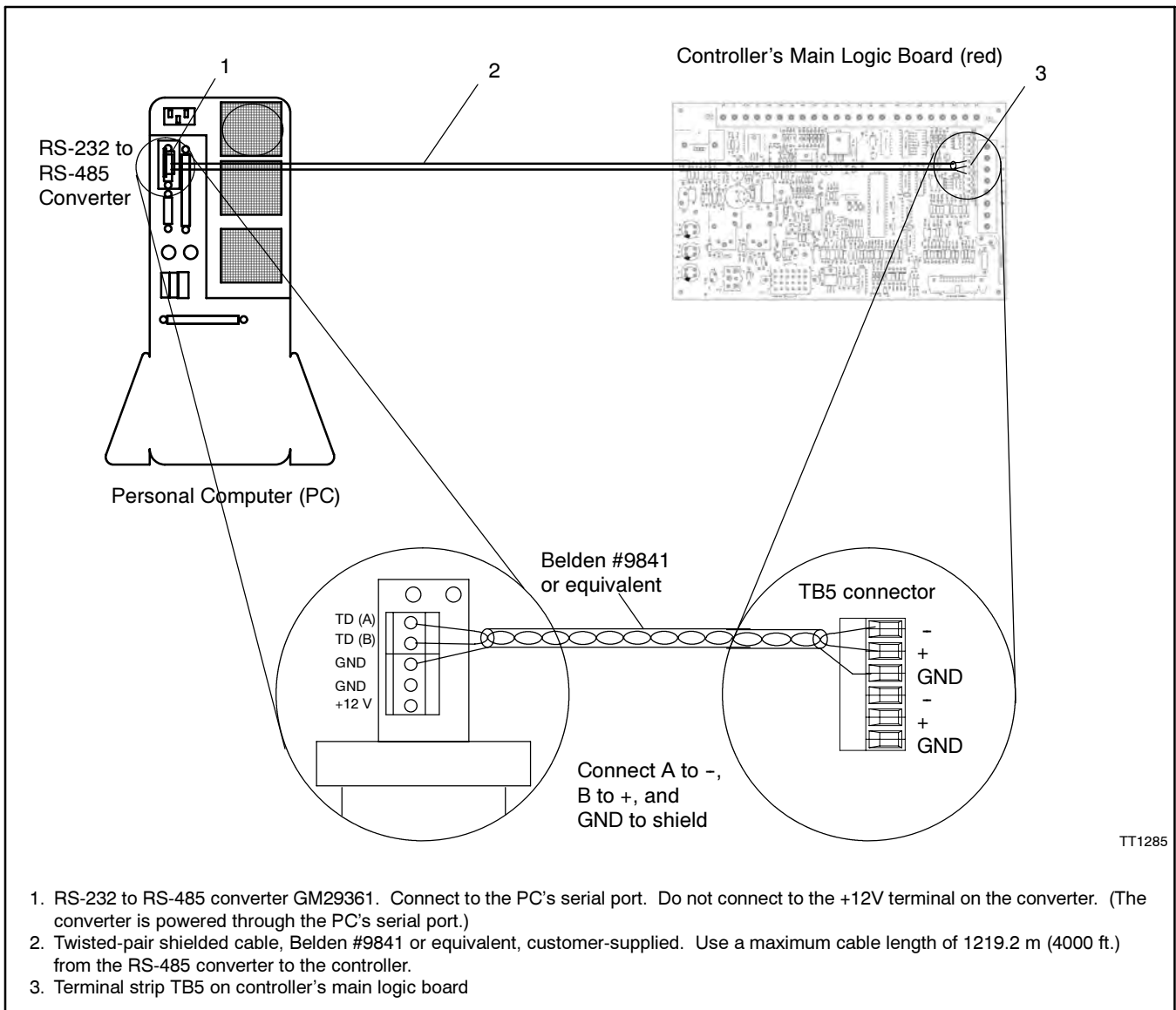
Figure 11 Controller Main Logic Board

3.3 Load the controller files.

6. Start the Program Loader by selecting the Program Loader from the PC's Start menu. Click on the Start button at the lower left corner of the screen, select Programs, select the directory that contains the Program Loader software, and click on Program Loader.
7. Enter the number of the computer's COM port (number 1 through 16) that is connected to the controller through the communication cable. See Figure 13.

Note: While the program supports COM ports 1 through 16, most computers use only ports 1 through 4. Contact your computer equipment supplier for help determining which port is available.

8. Insert the disk containing the application files into the computer's disk drive.



TT1285

Figure 12 16-Light Microprocessor Controller-to-Personal Computer Connection

9. Select the application file for your system's engine and alternator. Application files and personality parameter files have ".s19" or ".s37" extensions on the filenames. Use only files obtained directly from the manufacturer. There are different ways to select the file:

- Select File>Open or click on the Browse button to open the standard Windows file open dialog box to select a file; or
- Type the path and filename directly into the Application Data File text box. Do not use spaces or periods in the path name of the directory where the files are stored.

Note: Do not move the application files to a different directory. Two separate files are needed for all uploads: an application file with a ".s19" file extension and a command file with a ".cmd" file extension. Both files must exist in the same directory, even though the user will not see the command file.

10. Click the Run button on the computer screen. The program performs its memory initialization.

Note: If the wrong COM port was selected in step 7, an error message will appear during the initialization. Click RESET, select a different COM port, and click RUN to begin again.

11. The program will prompt you to reset the target controller. Reset the controller by reconnecting the engine start battery cable, negative (-) lead last.
12. A warning dialog box appears providing one last chance to abort the data loading process. Click the OK button to start loading. The loading process may take several minutes.

Note: Do not interrupt the upload process for any reason. An interruption of the upload process could cause permanent damage to the controller's programming, requiring replacement of the controller's main logic board and additional reprogramming.

13. The program indicates whether the file transfer was successful. "Upload complete" indicates that the file transfer was successful.
14. Close the program by selecting File>Exit, or by clicking the Close Window button in the upper right corner of the computer screen.

If you want to use Program Loader again, click the RESET button at the bottom of the screen rather than exiting the program.

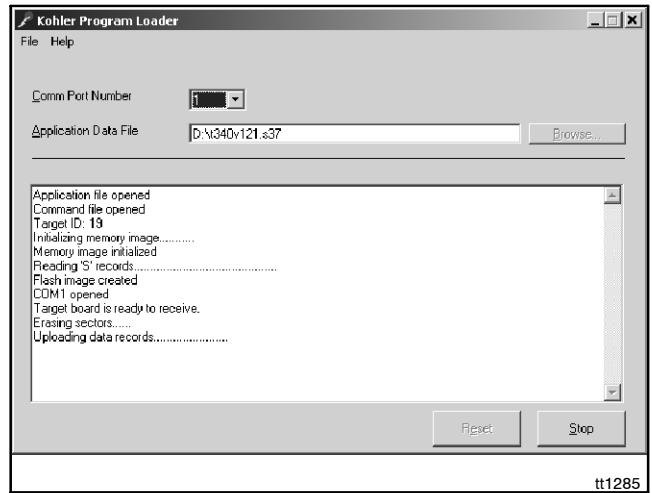


Figure 13 Program Loader Screen

3.4 Return to operation.

15. Disconnect the generator set engine starting battery, negative (-) lead first.
16. Disconnect the communication cable from the controller.
17. Close and secure the controller enclosure.
18. Reconnect the generator set engine starting battery, negative (-) lead last.
19. Reconnect power to the battery charger, if equipped.
20. Place the generator set master switch in the AUTO position for automatic operation.

4 Converter, Modbus/KBUS for 340 Series Controllers

Use the Program Loader software version 2.6.0 or higher to load application program onto the Modbus/KBUS converter module GM39556.

Note: Version 2.6.0 or higher of the Program Loader software is required to load programs onto the Modbus/KBUS converter.

4.1 Prevent the generator set from starting.

1. Move the generator set master switch to the OFF/RESET position.
2. Disconnect power to the battery charger, if equipped.
3. Disconnect the generator set engine starting battery, negative (-) lead first.
4. If the converter is installed in an M340/M340+ transfer switch controller, disconnect power to the controller.

4.2 Connect the converter module to the personal computer (PC).

Note: The converter module has both RS-232 and RS-485 ports. Connect either port to the PC for software upgrade.

5. For RS-232 connections, use a null modem cable (available from the factory, part number GM16657)

Connect P19 on the converter to the PC's serial port. See Figure 15.

OR

6. For RS-485 connections, use an RS-232 to RS-485 converter (available from the factory, part number GM29361) for the PC connection. Shielded twisted pair cable (customer-supplied, Belden #9841 or equivalent) is also required for RS-485 connections. Connect to TB1 on the converter module. See Figure 16.

4.3 Load the controller files.

7. Start the Program Loader by selecting the Program Loader from the PC's Start menu. Click on the Start button at the lower left corner of the screen, select Programs, select the directory that contains the Program Loader software, and click on Program Loader.
8. Enter the number of the computer's COM port (number 1 through 16) that is connected to the controller through the communication cable. See Figure 13.

Note: While the program supports COM ports 1 through 16, most computers use only ports 1 through 4. Contact your computer equipment supplier for help determining which port is available.

9. If the application files are stored on a disk, insert the disk containing the application files into the computer's disk drive.

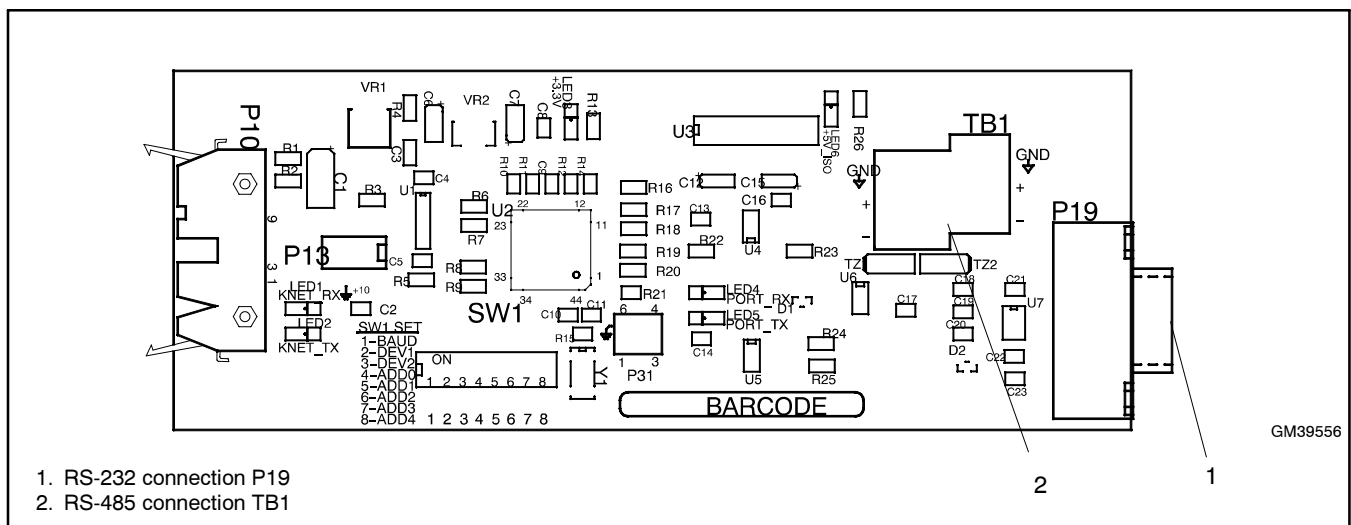


Figure 14 Converter Module, Modbus/Kbus, GM39556 (kit number GM41143-KP3)

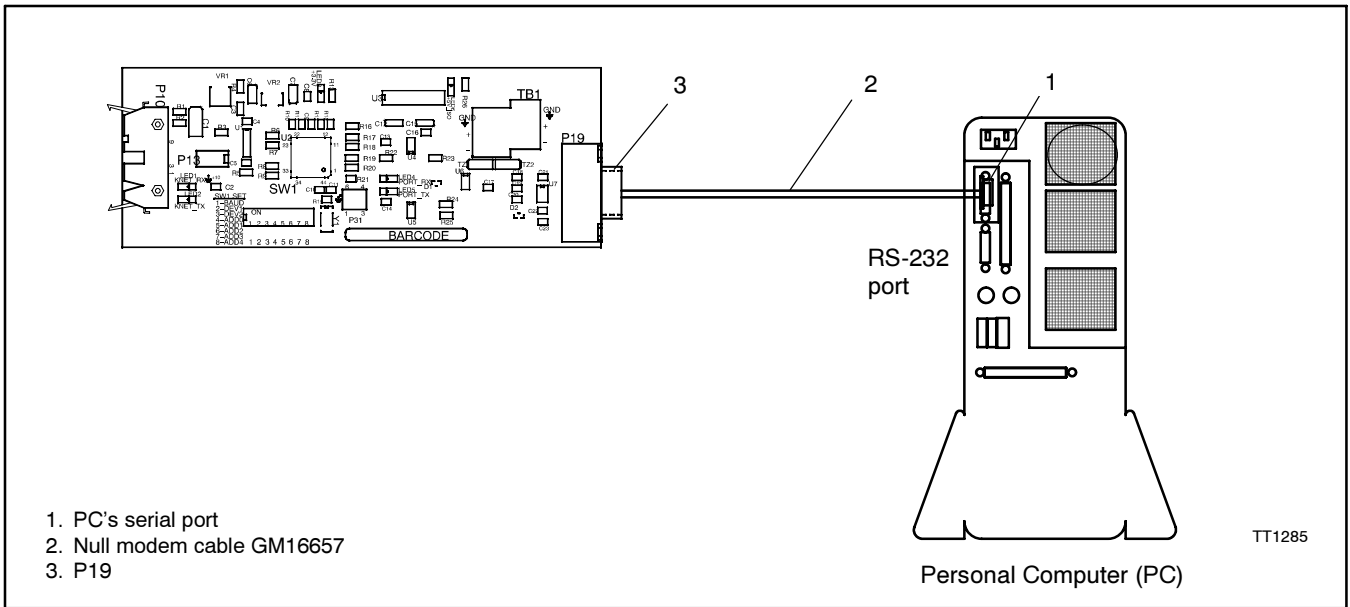


Figure 15 Converter Module-to-Personal Computer RS-232 Connection

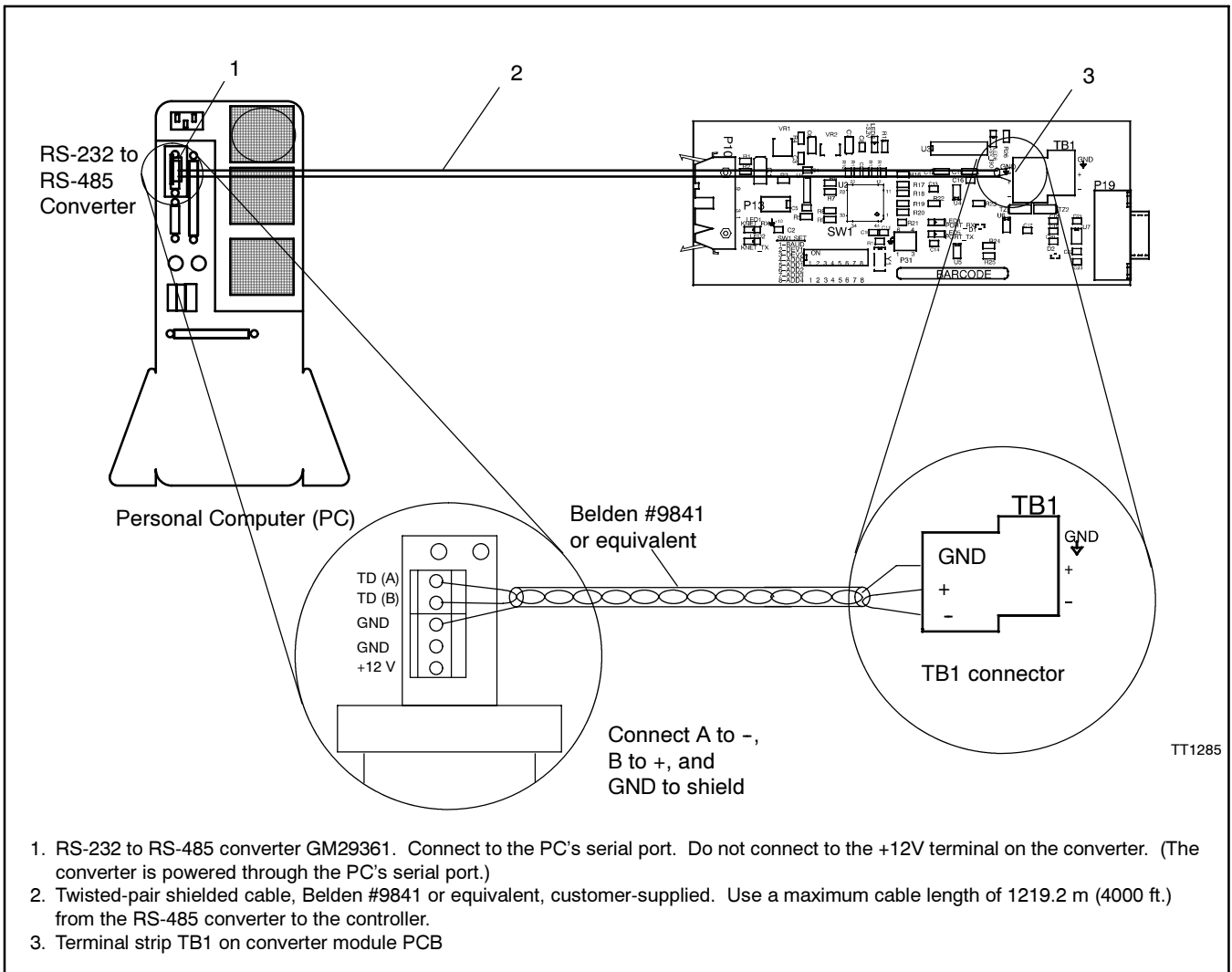


Figure 16 Converter Module-to-Personal Computer RS-485 Connection (Note: RS-232 connection is also possible)

10. Select the application file for the converter. The filename is KMC_App_V102.s19, where V102 indicates the code version and may vary. Use only files obtained directly from the manufacturer. There are different ways to select the file:

- Select File>Open or click on the Browse button to open the standard Windows file open dialog box to select a file; or
- Type the path and filename directly into the Application Data File text box. Do not use spaces or periods in the path name of the directory where the files are stored.

Note: Do not move the application files to a different directory. Two separate files are needed for all uploads: an application file with a “.s19” file extension and a command file with a “.cmd” file extension. Both files must exist in the same directory, even though the user will not see the command file.

11. Click the Run button on the computer screen. The program performs its memory initialization.

Note: If the wrong COM port was selected in step 7, an error message will appear during the initialization. Click RESET, select a different COM port, and click RUN to begin again.

12. The program will prompt you to reset the target controller. Reset the controller by reconnecting power to the transfer switch or reconnecting the generator set battery (negative lead last) as required for the application.

13. A warning dialog box appears providing one last chance to abort the data loading process. Click the OK button to start loading. The loading process may take several minutes.

Note: Do not interrupt the upload process for any reason. An interruption of the upload process could cause permanent damage to the controller’s programming, requiring replacement of the controller’s main logic board and additional reprogramming.

14. The program indicates whether the file transfer was successful. “Upload complete” indicates that the file transfer was successful.

15. Close the program by selecting File>Exit, or by clicking the Close Window button in the upper right corner of the computer screen.

If you want to use Program Loader again, click the RESET button at the bottom of the screen rather than exiting the program.

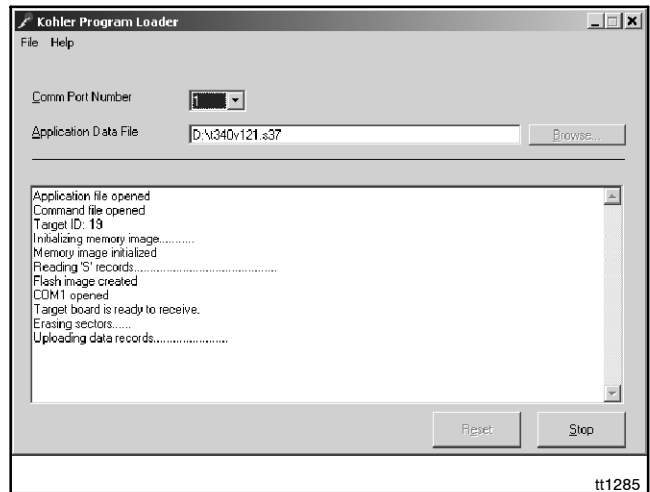


Figure 17 Program Loader Screen

4.4 Return to operation.

16. Disconnect the generator set engine starting battery, negative (-) lead first.

17. Disconnect the communication cable from the controller.

18. Close and secure the controller enclosure.

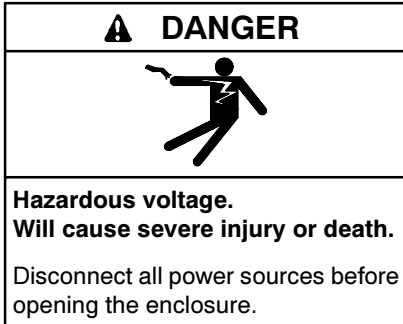
19. Reconnect the generator set engine starting battery, negative (-) lead last.

20. Reconnect power to the battery charger, if equipped.

21. Place the generator set master switch in the AUTO position for automatic operation.

5 Series 1000 ATS Controllers

Use the Program Loader software to load the controller application program onto the Series 1000 ATS controller, shown in Figure 18. After loading the new program onto the controller, use the Setup program to set the transfer switch parameters if they are different from the default settings. See the Setup Program Software Operation and Installation Manual for instructions.



5.1 Prepare the controller and connect to the PC.

1. If possible, use the Setup Program to save the system settings to a backup file or record the user-defined controller settings before uploading new files to the controller. See the Setup Program Operation and Installation Manual for instructions.
2. Place the generator set master switch in the OFF/RESET position.
3. Disconnect the power to the generator set battery charger, if equipped.
4. Disconnect the generator set engine starting battery(ies), negative (-) lead first.

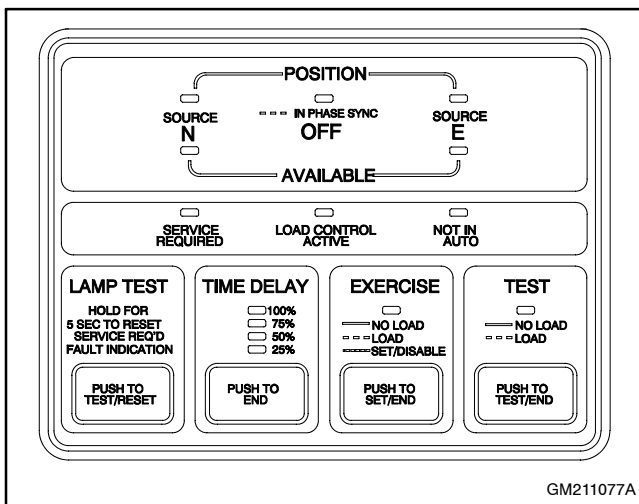


Figure 18 Series 1000 ATS Controller

5. Disconnect all power sources to the transfer switch by opening switches or circuit breakers.
6. Open the transfer switch enclosure door.
7. Connect one end of the null modem cable to the controller at the RS-232 connector. See Figure 20. Tighten the thumb screws on the connector to hold it securely in place.
8. Connect the other end of the null modem cable to the computer's RS-232 communication (COM) port. Tighten the thumbscrews on the connector to hold it securely in place.
9. Close the enclosure door and reconnect power to the transfer switch. The transfer switch controller must have power connected during the software download.

5.2 Load the controller files.

1. Start the Program Loader by selecting the Program Loader from the PC's Start menu. Click on the Start button at the lower left corner of the screen, select Programs, select the directory that contains the Program Loader software, and click on Program Loader.
2. Enter the number of the computer's COM port (number 1 through 16) that is connected to the controller through the communication cable. See Figure 19.

Note: While the program supports COM ports 1 through 16, most computers use only ports 1 through 4. Contact your computer equipment supplier for help determining which port is available.

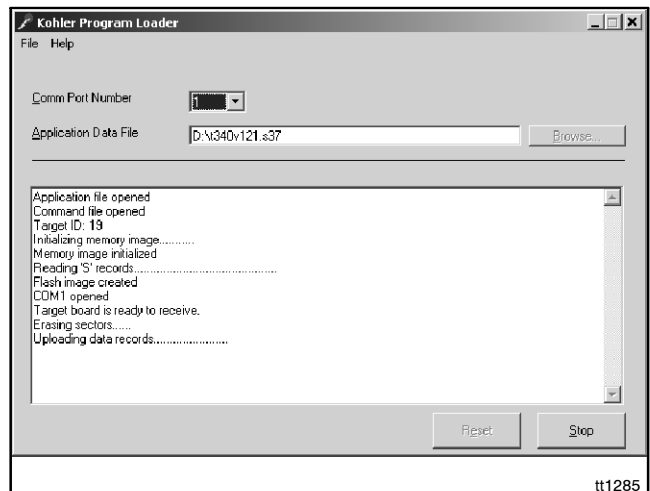


Figure 19 Program Loader Screen

3. If the application files are stored on a disk, insert the disk into the computer's disk drive.
4. Select the application file. Application files have ".s19" or ".s37" extensions on the filenames. Use only files obtained directly from the manufacturer. There are different ways to select the file:

- Select File>Open or click on the Browse button to open the standard Windows file open dialog box to select a file; or
- Type the path and filename directly into the Application Data File text box. Do not use spaces or periods in the path name of the directory where the files are stored.

Note: Do not move the application files to a different directory. Two separate files are needed for all uploads: an application file with a ".s19" or ".s37" file extension and a command file with a ".cmd" file extension. Both files must exist in the same directory, even though the user will not see the command file.

5. Click the Run button on the computer screen. The program performs its memory initialization.

Note: If the wrong COM port was selected in step 7, an error message will appear during the initialization. Click RESET, select a different COM port, and click RUN to begin again.

6. The program will prompt you to reset the target controller. Reset the transfer switch controller by performing the following steps:
 - Hold down the Lamp Test button until the controller LEDs flash. Do not release the button.
 - Continue to hold down the Lamp Test button and press the End Time Delay button. The LEDs flash when the controller resets.
7. A warning dialog box appears providing one last chance to abort the data loading process. Click the OK button to start loading. The loading process may take several minutes.

Note: Click OK on the Program Loader screen within 5 seconds after resetting the controller and watch for the program to indicate "Uploading data records." The ATS controller LEDs flash rapidly during file transfer. If the "Uploading data records" message does not appear, click the STOP button in the lower right corner of the screen and start again.

Note: Do not interrupt the upload process for any reason. An interruption of the upload process could cause permanent damage to the controller's programming, requiring replacement of the controller's main logic board and additional reprogramming.

8. The program indicates whether the file transfer was successful. "Upload complete" indicates that the file transfer was successful.
9. Close the program by selecting File>Exit, or by clicking the Close Window button in the upper right corner of the computer screen.

If you want to use Program Loader again, click the RESET button at the bottom of the screen rather than exiting the program.

5.3 Check the controller settings.

10. Check the controller settings, including system parameters, time delays, and exerciser settings. Follow the instructions in the Setup Program Software Operation and Installation Manual to enter settings using the PC.
11. Check the DIP switch settings on the controller's main logic board. See the Transfer Switch Operation and Installation Manual for instructions.

5.4 Return to automatic operation.

12. Disconnect power to the transfer switch.
13. Disconnect the null modem cable from the computer and the controller.
14. Close and secure the ATS enclosure door.

15. Reconnect power to the transfer switch.
16. Reconnect the generator set engine starting battery, negative (-) lead last.
17. Reconnect power to the battery charger, if equipped.
18. Place the generator set master switch in the AUTO position.
19. If the ATS controller is set for manual exercise mode, press the Exercise button on the controller user interface to start an exercise run and set the exercise time.
20. Run a test to check the transfer switch operation. Refer to the Transfer Switch Operation and Installation Manual for the test procedure.

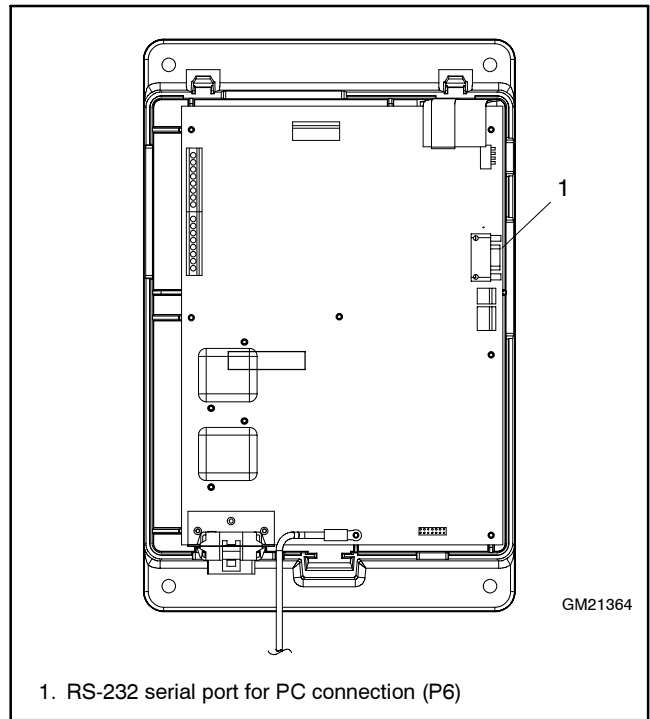
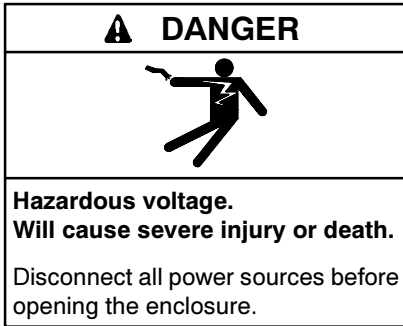


Figure 20 ATS Controller RS-232 Connection

6 Series 500 ATS Controllers

Use the Program Loader software version 2.5.0 or higher to load the controller application program onto the Series 500 ATS controller, shown in Figure 21.



6.1 Prepare the controller and connect to the PC.

1. Place the generator set master switch in the OFF/RESET position.
2. Disconnect the power to the generator set battery charger, if equipped.
3. Disconnect the generator set engine starting battery(ies), negative (-) lead first.
4. Disconnect all power sources to the transfer switch by opening switches or circuit breakers.
5. Open the transfer switch enclosure door.

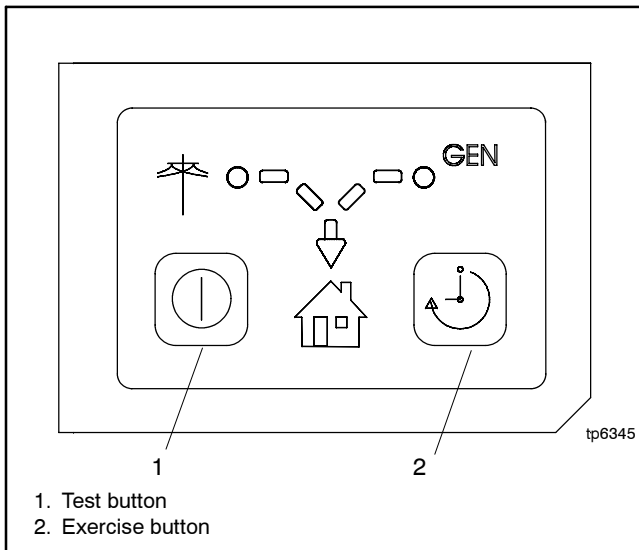


Figure 21 Series 500 ATS Controller

6. Connect one end of the null modem cable to the controller at the RS-232 connector. See Figure 22. Tighten the thumb screws on the connector to hold it securely in place.
7. Connect the other end of the null modem cable to the computer's RS-232 communication (COM) port. Tighten the thumbscrews on the connector to hold it securely in place.
8. Close the enclosure door and reconnect power to the transfer switch. The transfer switch controller must have power connected during the software download.

6.2 Load the controller files.

1. Start the Program Loader by selecting the Program Loader from the PC's Start menu. Click on the Start button at the lower left corner of the screen, select Programs, select the directory that contains the Program Loader software, and click on Program Loader.

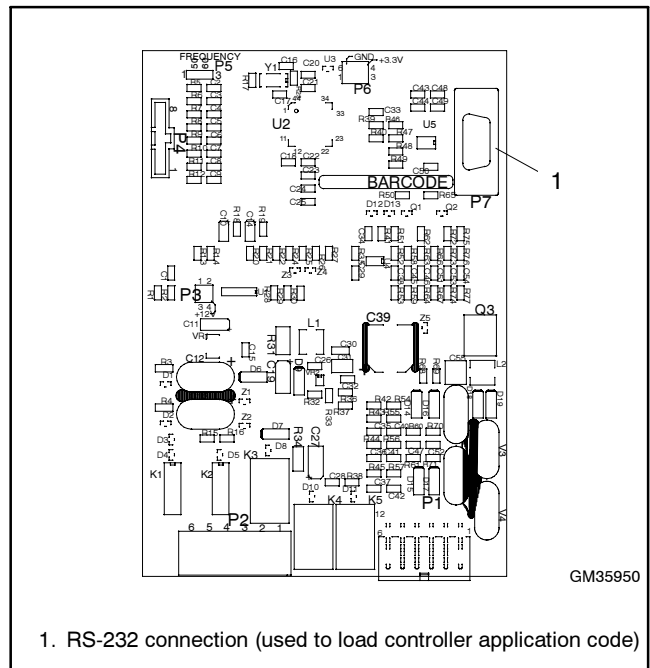


Figure 22 Series 500 ATS Controller RS-232 Connection

2. Enter the number of the computer's COM port (number 1 through 16) that is connected to the controller through the communication cable. See Figure 23.

Note: While the program supports COM ports 1 through 16, most computers use only ports 1 through 4. Contact your computer equipment supplier for help determining which port is available.

3. If the application files are stored on a disk, insert the disk into the computer's disk drive.
4. Select the application file. Application files have .s19 extensions on the filenames. Use only files obtained directly from the manufacturer. There are different ways to select the file:
 - Select File>Open or click on the Browse button to open the standard Windows file open dialog box to select a file; or
 - Type the path and filename directly into the Application Data File text box. Do not use spaces or periods in the path name of the directory where the files are stored.

Note: Do not move the application files to a different directory. Two separate files are needed for all uploads: an application file with a .s19 file extension and a command file with a .cmd file extension. Both files must exist in the same directory, even though the user will not see the command file.

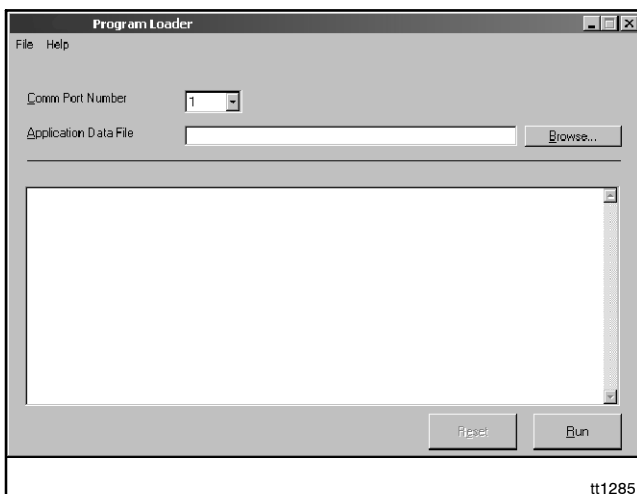


Figure 23 Program Loader Screen

5. Click the Run button on the computer screen. The program performs its memory initialization.

Note: If the wrong COM port was selected in step 7, an error message will appear during the initialization. Click RESET, select a different COM port, and click RUN to begin again.

6. The program will prompt you to reset the target controller. Reset the transfer switch controller by holding both the Test and Exercise buttons for at least six (6) seconds. See Figure 21.

Note: The controller LEDs may flash after three seconds. Be sure to continue to hold both buttons for at least six seconds to completely reset the controller.

7. A warning dialog box appears providing one last chance to abort the data loading process. Click OK on the Program Loader screen within 5 seconds after resetting the controller and watch for the program to indicate "Uploading data records." The ATS controller LEDs flash rapidly during file transfer. If the "Uploading data records" message does not appear, click the STOP button in the lower right corner of the screen and start again.

The upload may not start if the controller's diagnostic function is sending information at the same time. Try starting again until the program indicates it is uploading the data records.

Note: The loading process may take several minutes. Do not interrupt the upload process for any reason.

8. The program indicates whether the file transfer was successful. "Upload complete" indicates that the file transfer was successful.
9. Close the program by selecting File>Exit, or by clicking the Close Window button in the upper right corner of the computer screen.

If you want to use Program Loader again, click the RESET button at the bottom of the screen rather than exiting the program.

6.3 Return to automatic operation.

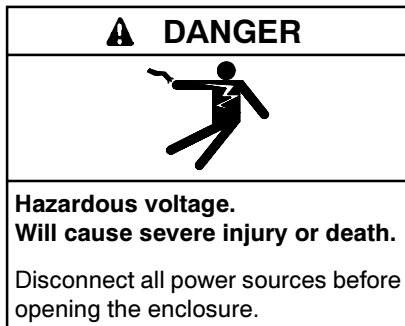
10. Disconnect power to the transfer switch.
11. Disconnect the null modem cable from the computer and the controller.
12. Close and secure the ATS enclosure door.
13. Reconnect power to the transfer switch.
14. Reconnect the generator set engine starting battery, negative (-) lead last.
15. Reconnect power to the battery charger, if equipped.
16. Place the generator set master switch in the AUTO position.
17. To start an exercise run and set the exercise time, press the Exercise button on the controller user interface. See Figure 21.
18. Run a test to check the transfer switch operation. Refer to the Transfer Switch Operation and Installation Manual for the test procedure.

7 MPAC™ 550 ATS Controllers

Use the Program Loader software version 2.7.0 or higher to load the controller application program onto the MPAC™ 550 ATS controller for the Model RSB Transfer Switch, shown in Figure 24.

The following items are required:

- Programming kit GM57621. The kit includes an RS-232 to RS-485 converter (GM41096) and a 4-pin mating connector (GM40557) for the controller.
- Belden #9841 shielded twisted-pair cable or equivalent (customer-supplied)
- A 24 VDC power supply.



7.1 Prevent the generator set from starting.

1. Place the generator set master switch in the OFF/RESET position.
2. Disconnect the power to the generator set battery charger, if equipped.
3. Disconnect the generator set engine starting battery(ies), negative (-) lead first.
4. Disconnect all power sources to the transfer switch by opening switches or circuit breakers.
5. Open the transfer switch enclosure door.

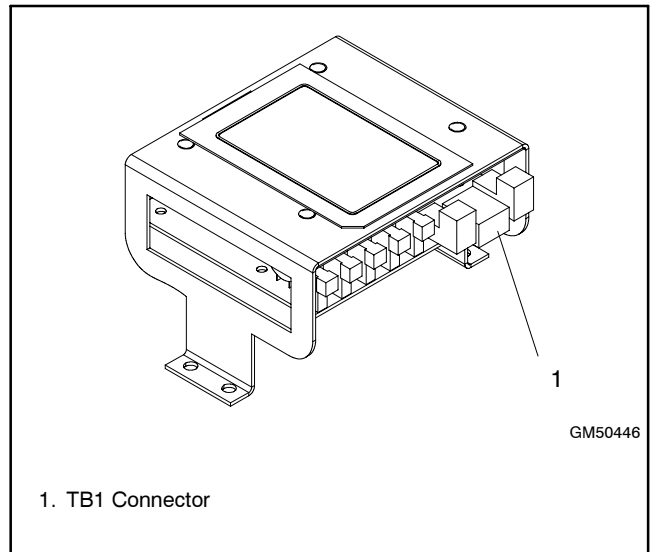


Figure 24 MPAC™ 550 ATS Controller

7.2 Connect the controller to the personal computer (PC).

6. Connect the RS-232 side of the RS-232 to RS-485 converter to the serial port on the PC. See Figure 10.
7. Disconnect the communication cable from TB1 on the MPAC™ 550 controller. See Figure 24.
8. Use shielded twisted-pair cable (Belden #9841 or equivalent) to connect the RS-232 to RS-485 converter to the TB1 connector on the controller's main logic board. See Figure 24 and Figure 25.
9. Connect the 24 VDC power supply to pins 3 and 4 of the 4-pin connector. Do not turn on the power supply until instructed to do so during the file loading procedure.

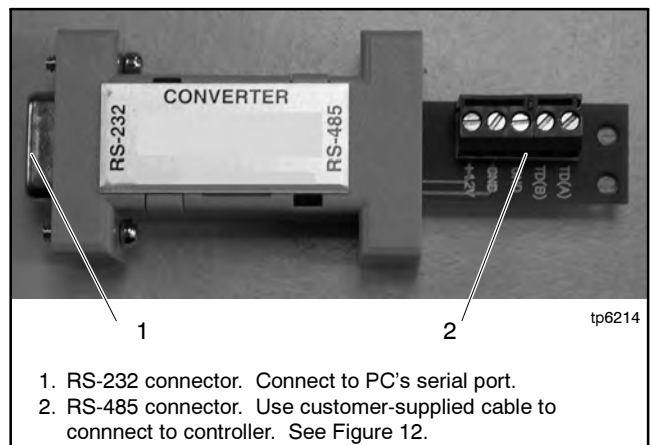


Figure 25 RS-232 to RS-485 Converter (available from the factory)

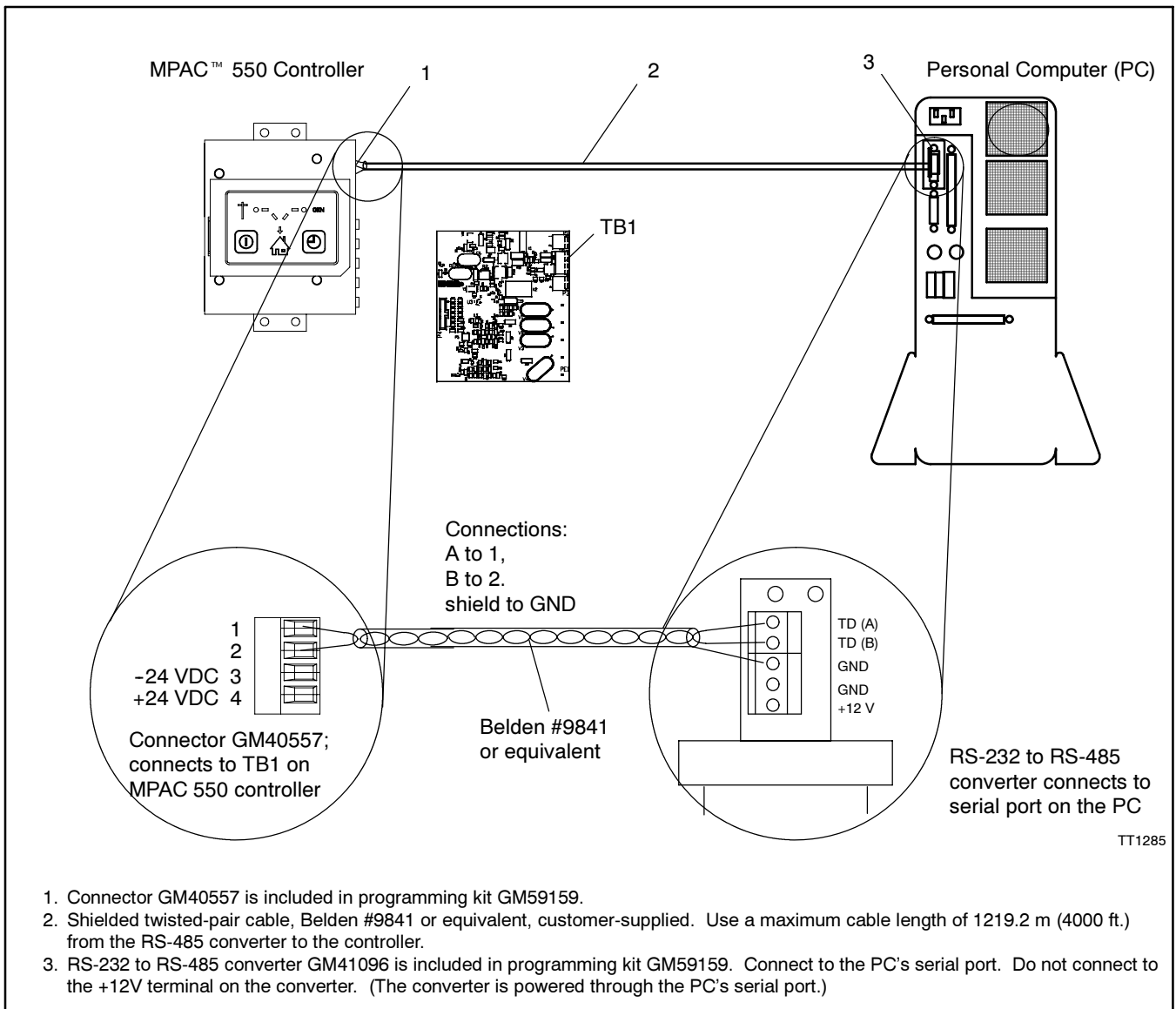


Figure 26 MPAC™ 550-to-Personal Computer Connection

7.3 Load the controller files.

1. Start the Program Loader by selecting the Program Loader from the PC's Start menu. Click on the Start button at the lower left corner of the screen, select Programs, select the directory that contains the Program Loader software, and click on Program Loader.
2. Enter the number of the computer's COM port (number 1 through 16) that is connected to the controller through the communication cable. See Figure 23.

Note: While the program supports COM ports 1 through 16, most computers use only ports 1 through 4. Contact your computer equipment supplier for help determining which port is available.

3. If the application files are stored on a disk, insert the disk into the computer's disk drive.
4. Select the application file. Application files have .s19 extensions on the filenames. Use only files obtained directly from the manufacturer. There are different ways to select the file:
 - Select File>Open or click on the Browse button to open the standard Windows file open dialog box to select a file; or
 - Type the path and filename directly into the Application Data File text box. Do not use spaces or periods in the path name of the directory where the files are stored.

Note: Do not move the application files to a different directory. Two separate files are needed for all uploads: an application file with a .s19 file extension and a command file with a .cmd file extension. Both files must exist in the same directory, even though the user will not see the command file.

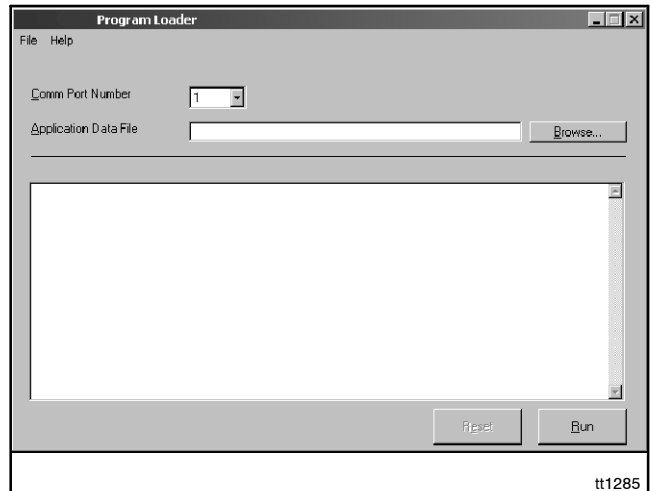


Figure 27 Program Loader Screen

5. Click the Run button on the computer screen. The program performs its memory initialization.

Note: If the wrong COM port was selected in step 7, an error message will appear during the initialization. Click RESET, select a different COM port, and click RUN to begin again.

6. The program will prompt you to reset the target controller. Reset the transfer switch controller by applying 24VDC to terminals 3 and 4 of TB1. See Figure 26.
7. A warning dialog box appears providing one last chance to abort the data loading process. Click OK on the Program Loader screen within 5 seconds after resetting the controller and watch for the program to indicate *Uploading data records*. The ATS controller LEDs flash rapidly during file transfer. If the *Uploading data records* message does not appear, click the STOP button in the lower right corner of the screen and start again.

Note: The loading process may take several minutes. Do not interrupt the upload process for any reason.

8. The program indicates whether the file transfer was successful. *Upload complete* indicates that the file transfer was successful.
9. Close the program by selecting File>Exit, or by clicking the Close Window button in the upper right corner of the computer screen.

If you want to use Program Loader again, click the RESET button at the bottom of the screen rather than exiting the program.

7.4 Return to automatic operation.

10. Remove the 24 VDC power supply.
11. Disconnect the programming cable from the MPAC™ 550 controller.
12. Reconnect the transfer switch communication cable to TB1 on the MPAC 550 controller.
13. Close and secure the ATS enclosure door.
14. Reconnect power to the transfer switch.
15. Reconnect the generator set engine starting battery, negative (-) lead last.
16. Reconnect power to the battery charger, if equipped.
17. Place the generator set master switch in the AUTO position.
18. To start an exercise run and set the exercise time, press the Exercise button on the controller user interface. See Figure 21.
19. Run a test to check the transfer switch operation. Refer to the Transfer Switch Operation and Installation Manual for the test procedure.

8 Online Help

Use the program's online help system to help you diagnose error messages or problems encountered while running the program. Figure 28 lists the error codes. Refer to the online help system for more information about error codes and suggestions for correcting the errors.

Error Code	Description
2000	Unable to open application file
2001	Unable to open command file
2002	Unable to determine command file name
2003	Unable to get target ID
2004	Unable to establish communication with target
2005	Application not designed for this target board
2006	Maximum number of resends requested
2007	Flash chip programming error

Figure 28 Error Codes

9 Optional File Storage

It is possible, but not necessary, to store the generator set personality profile and controller application files on your computer's hard drive or network. The command and application program files must be stored in the same directory.

Model 550 generator set controller application files are named D550Vxxx.s37 and D550Vxxx.cmd, where xxx is a number indicating the software version. Application files for other controllers use similar types of filenames, with the first few characters identifying the model, a number indicating the software version, and the file extensions .s37 or .s19 and .cmd.

The personality profile files for the Model 550 controller are named p_params.s37 and p_params.cmd.

Set up a separate directory or folder on the computer's hard drive or network for each piece of equipment. Give each directory a name that uniquely identifies the generator set or transfer switch. Use Windows® Explorer to copy the files for each generator set or transfer switch from the disk supplied with the equipment into one directory or folder. Store the command and application program files together in the same directory.

Note: Do not modify the files. Loading modified files can cause permanent damage to the controller's main logic board.

Notes