

Technical Reference

Capstone Remote Monitoring System (Maintenance Edition)

This document (plus the User Edition), presents the additional capability to monitor, control, and troubleshoot the MicroTurbine via the Capstone Remote Monitoring System (CRMS) software

Chapter 8: PM Uploading

This chapter presents PM Uploading information. The CRMS software is designed to automatically upload PM files selected from the PM Write panel.

The following major PM devices can be part of the MicroTurbine system:

- Frame PM
- Engine PM
- Controller PM (DPC or LCM/ECM)
- Fuel Device PM
- Display PM
- Battery Controller PM
- CPU Control Board PM
- Power Board PM
- Battery Pack PM
- CHP Controller PM
- CPS Controller PM

Depending on the system configuration, the MicroTurbine can include different combinations of PM devices. In order to successfully program all MicroTurbine PM Devices, the user should know precisely the system configuration – including the system serial number and part number plus all of the subassembly part numbers and serial numbers. Any mistake in proper identification of the correct subassemblies during uploading of the PM Devices will cause a MicroTurbine malfunction.

PM Write Panel

To open the PM Write Panel, select **[Settings] [PM Write]** from the Windows Menu Bar, or click on the PM Write icon from the Windows Menu Toolbar. See Figure 8-1.

Each of the PM data structures consists of a header file and a data file.

- Part Number and Serial Number
- Manufacturer Date, Location, and Test Information

The different OEM manufacturers are responsible for servicing and maintaining their various MicroTurbines. The Manufacturer Location (ML) is a key factor in determining the overall responsibilities for servicing.

CRMS has special rules for managing the Original Equipment Manufacturer (OEM) PM devices. In this way, CRMS will not be functional (except for the PM Uploading feature) when the MicroTurbine has a Manufacturer Location number other than the exclusive number assigned to the specific OEM manufacturer.

The OEM Service Providers will not be able to use the CRMS Program for any MicroTurbine with an ML different than their own OEM number.

Depending upon the CRMS Program Registration Strings, the different ASP's will be allowed different rights for programming the Manufacturer Location field:

- The Capstone Authorized Service Provider (OEM No = ML No = 0) allows programming PM Devices only for a MicroTurbine with the manufacturer location ML = 0 ("0" is assigned as the Capstone Manufacturer Location number) or re-programming PM devices with the existing system manufacturer location number.
- The OEM Service Providers with (ML No = OEM No > 0) are allowed to program PM modules devices only with an assigned OEM manufacturer location number.
- In the case of changing PM Manufacturer Locations by the OEM representative, the OEM Manufacturer will assume full ownership of the system, and will be fully responsible for all Warranty and Service obligations.

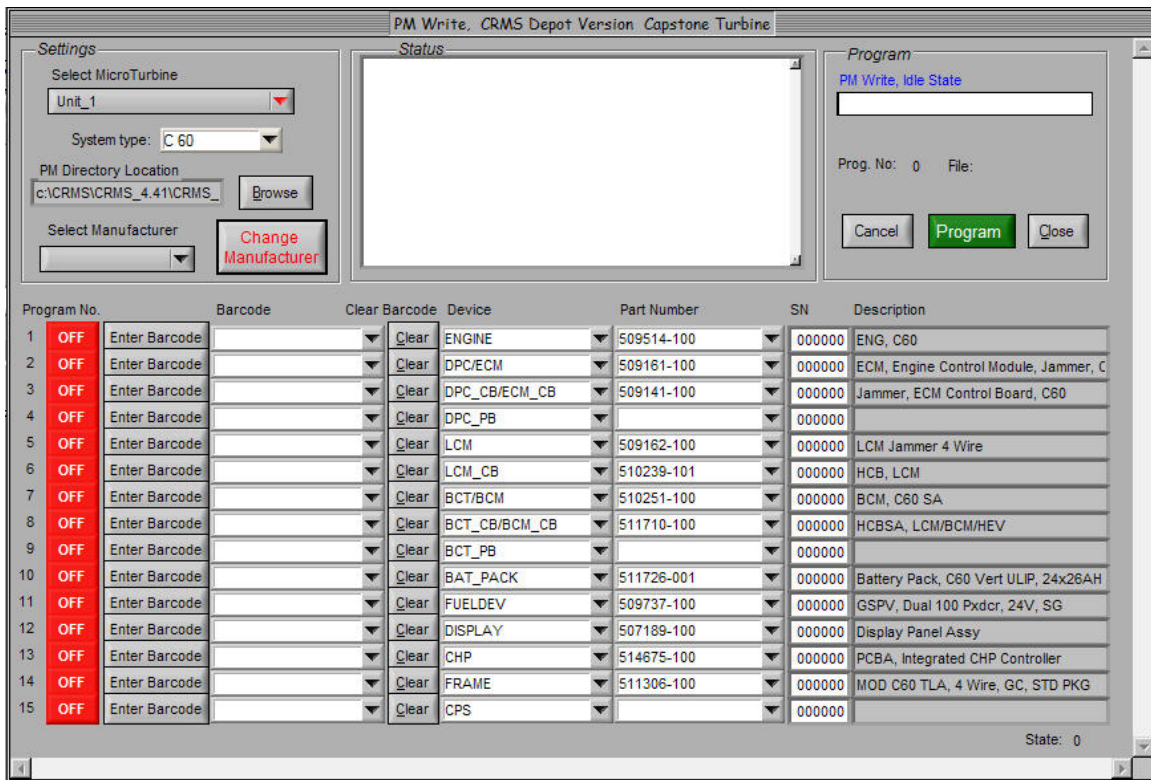


Figure 8-1. PM Write Panel

PM Uploading Procedures

To upload PM Device data, perform the following steps:

1. Establish successful communications with the MicroTurbine.
2. Select the MicroTurbine unit. Click on the **Select MicroTurbine** pull-down menu on the PM Write panel. Select the MicroTurbine from the viewable list.
3. Click on the **Browse** button and specify the PM directory location where the PM files (or PM Program disc) reside. PM files installed during CRMS installation can be found in the PM subdirectory of the installation directory.
Note: In the case of selecting PM files from the network, the network directory should be mapped to a network drive.
4. Decide on and identify the necessary PM devices to be programmed.

CAUTION: Programming an incorrect PM device will cause the MicroTurbine to malfunction.

5. Click on the down arrow to the immediate right of a **Device** field.
6. Select the PM device from the viewable list. As a device type is selected, the **OFF** button located next to the number of the **Program No** slot will switch to an **ON** button.
7. To select a part number, click on the down arrow to the immediate right of the **Part Number** field, of the same **Program No** slot for which a device type was just selected. The CRMS program automatically detects the controller type (C30, C60, HEV) and displays different sets of part numbers applicable to specific devices and controller type. The detected controller type is indicated in the 'System type:' field.

8. Select the correct part number from the Part Number pull-down menu.

Note 1:

In the event there is not a correct part number located in the Part Number pull-down menu, contact your Capstone Technical Support Representative.

Note 2: CRMS version (4.41 and higher) will require use of 2.09 PM Programmer (or higher) version. CRMS version 4.34 (or lower) will only be compatible with PM Programmers version 2.08 (or lower). The PM Programmer version is installed in the PM directory of the CRMS installation directory. Contact your Capstone Technical Support Representative for the newest PM Programmer version updates.

Caution: Programming an incorrect PM part number will cause the MicroTurbine to malfunction.

9. Type a 6-digit serial number within the **SN** field, for that same **Program No** slot for which a part number was just selected, and press the Enter key on the computer keyboard.
10. The **Barcode** and **Description** fields will automatically update based on the part number selected and the serial number entered.

Note 1: The Operator can use the barcode scanner for selecting and entering serial and part numbers. In this way, the part number and serial number will be automatically updated based on the barcode information.

Note 2: The Operator can elect to manually type in the barcode information by clicking on the **Enter Barcode** button of the same **Program No.** slot for which a device type was just selected.
11. Verify that both the part number and the device descriptions agree with the MicroTurbine hardware configuration.
12. Select the **Program** command button to begin the PM uploading process. The software should start the PM uploading.
13. Monitor the progress from the **Status** window and from the **Program** progress bar. When the uploading is complete, the **Status** window will indicate **PM Program Complete** and the Controller will automatically reboot.
14. Upon completion of the rebooting, the MicroTurbine (controller) will be ready to operate.

Observe the following three guidelines during the upload operation.

Note 1: During the PM uploading, the mouse pointer will change to a “Busy” style pointer. The operator must wait until the mouse pointer changes back to its original style following the completion of a controller reboot operation.

Note 2: If the Frame PM has been programmed, then the **State** field of the MicroTurbine Panel has been set to BAD CONFIG. This means that the utility connection has been re-programmed to zero (default value), and should be reset within the Control Settings window.

Note 3: Special care should be taken while uploading GSPV and SPV Fuel Device PM information. The PM data for these devices contains calibration information that is specific for each valve (LVDT Offset, Position MAX, PI Max Command), and should be entered by the Operator during the PM uploading process. **It is strongly recommended that the Operator NOT attempt to program these devices.** The changing of calibration values for GSPV and SPV PM devices will cause MicroTurbine malfunctions.

Programming Error Messages

Error messages during programming will be displayed in the **Status** window text box.

In case of failure in uploading any of the PM devices, the program will automatically repeat the upload operation. In case of a second failure, the upload operation will be aborted.

Canceling the PM Uploading

An Operator can cancel the PM uploading activity at any time by clicking on the **Cancel** button.

Checking Hardware Configuration

After programming the PM devices, it is good practice to verify the hardware configuration.

To verify the hardware configuration, select **[Display] [Configuration]** from the menu bar of the MicroTurbine control panel.

Changing PM Manufacturer Locations

In some cases, the OEM Manufacturer may find it necessary to change the PM Manufacturer Location (ML) without changing the rest of PM data structure.

This task can be accomplished by clicking on the **Change Manufacturer** command button. In this case, the PM uploading process will only upload the “header files” containing information about PM Manufacturer Locations.

During the change of manufacturer process, the program will automatically reconfigure the PM Write panel for all existing MicroTurbine hardware.

The **Change Manufacturer** command button allows for automatic PM files selection and speedy change of the Manufacturer Location number in the PM. This feature assumes that all subassembly devices have been programmed with the correct part number and the correct serial number.

Note: During the change of manufacturer number for the GSPV and SPV fuel devices, respond to the prompt that appears on the screen: "While placing the cursor in a DOS Window, please hit 'ENTER' key, until the DOS Windows disappears."

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