

Technical Reference

Capstone Remote Monitoring System (User Edition)

This chapter presents MicroTurbine view control information for the User Edition Capstone Remote Monitoring System (CRMS) software.

Chapter 8: MicroTurbine View Control

General Display Settings

To open the General Display Settings panel, select **[Settings] [General Display]** from the Windows Menu Bar.

Measurement Units

To change the way that user-settable and real-time values are indicated, set the toggle switch to the other (USA or SI units) setting. All screens will update to reflect the new setting. The current selection actively in use is shown in green.

The General Display settings window is shown in Figure 8-1.

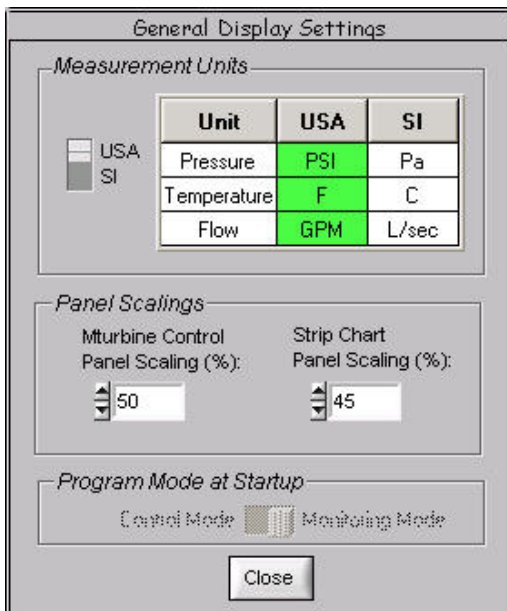


Figure 8-1. General Display Settings

Panel Scalings

MicroTurbine control panels and strip charts can also be scaled by entering a percent increase/decrease.

Program Mode at Startup

The CRMS program can be started in either in control mode or monitoring mode by selecting the Program Mode at Startup switch position. This feature is available only in the Depot CRMS version.

Viewing Status and Fault Information

To view Fault Status for the MicroTurbine, click on the Fault Status LED located in the upper left-hand corner of the MicroTurbine Panel, or select **[Display][Fault Status]** from the MicroTurbine Menu Bar. The user password is required to view the fault information.

Fault Status information will be displayed as shown in Figure 8-2.

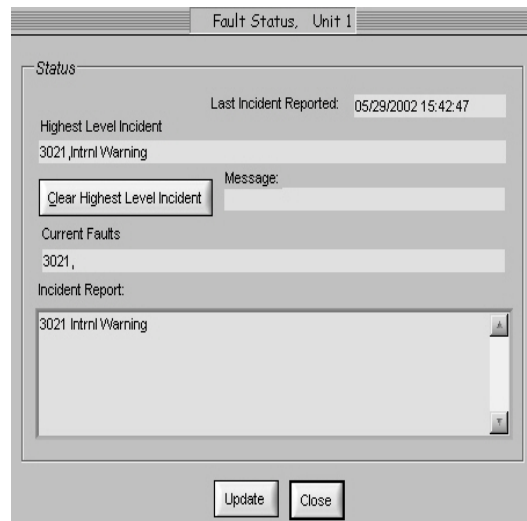


Figure 8-2. Fault Status Panel

- **Last Incident Reported**
Displays the time of the last fault.
- **Highest Level Incident**
Displays the highest-level fault.
- **Clear Highest Level Incident**
Will clear the highest-level fault incident.
- **Current Faults**
Displays the current fault numbers.
- **Incident Report**
Displays the current faults.

Fault Codes

The fault code consists of a general fault group and a specific fault code:

XXXX

Where X is the fault group and YYY is the specific fault code. Table 8-1 provides the general fault groups.

Table 8-1. Fault Groups

| Fault Groups | Fault Code |
|----------------------------|------------|
| No faults exist | 0 |
| Control Board Faults | 1000 |
| Power Board Faults | 2000 |
| Sensor Faults | 3000 |
| Mechanical Hardware Faults | 4000 |
| Software Faults | 5000 |
| Operational Faults | 6000 |
| User Initiated Faults | 7000 |
| Solenoid Faults | 8000 |
| Generator Faults | 9000 |
| Inverter Faults | 10000 |
| Bus Communication Faults | 11000 |
| Battery Controller Faults | 12000 |
| Fuel Cell Fault | 13000 |
| Power Server Faults | 14000 |
| Event Log | 15000 |
| Liquid Fuel Faults | 16000 |
| CHP Application Faults | 17000 |

System Configuration

In order to view the system configuration for your specific MicroTurbine, select **[Display][Configuration]** from the MicroTurbine Menu Bar.

The current part numbers, serial numbers, revisions, manufacturing date, times and manufacturer location will be displayed for the system hardware configuration.

The version, revision, and part number will be displayed for the software configuration. See Figure 8-3.

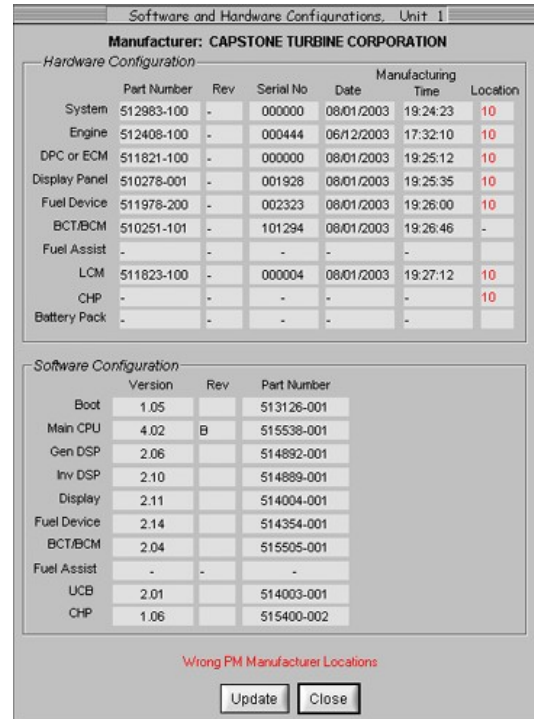


Figure 8-3. Software and Hardware Configurations

Warranty Information

The MicroTurbine Manufacturer Location number is very important for identifying the overall responsibilities for the MicroTurbine during the Warranty period.

Each Original Equipment Manufacturer (OEM) has a unique Manufacturer Location number.

Manufacturer Location numbers for major MicroTurbine sub-assemblies are displayed on the System Configuration Panel. Contact Capstone Technical Support for additional Warranty Service information.

To view the current warranty information, select **[Display][Warranty]** from the MicroTurbine menu bar.

The following information is displayed in Figure 8-4:

- **Manufacturer**
- **Commission Date**
- **Warranty Hours**
- **Warranty Starts**
- **RFC Operating Hours < 5 psi**
(for low pressure ball bearing system only)
- **No. of Aborted Recharges**

| WARRANTY, Unit 1 | |
|-----------------------------|------------|
| Manufacturer: OEM 1 | |
| Warranty | |
| Commission Date | 05/01/2002 |
| Warranty Hours | 0:00:00 |
| Number of Start counts | 0 |
| RFC Operating Hours < 5 psi | 0:00:00 |
| No. of Aborted Recharges | 0 |
| [Update] [Close] | |

Figure 8-4. Warranty Information

Strip Charts

Real-time strip charts are available from the MicroTurbine Control panel. To view the Strip chart display, select **[Display][Strip Chart]** from the MicroTurbine Menu Bar. See Figure 8-5.

The Y-axis values are plotted on a common scale, normalized from 0 to 1. Thus, if a lower limit of 0 and an upper limit of 100,000 are selected, then a Y-axis value of 0.5 corresponds to 50,000.

The X-axis time scale is dependent on the following items:

- (1) The number of points selected, and
- (2) The chart timer.

Thus, if the number of points equals 200 and a chart timer is set to 2 seconds, then an X-axis scale from 0 to 200 will correspond to time: $200 \times 2 = 400$ seconds (or 6 minutes and 40 seconds). The Chart Time Scale is displayed on the Strip Chart.

To adjust the chart timer, select **[View][Timers]** from the Window Menu Bar and set the **Charts** timer control.

The following settings are available from the Strip Charts Panel.

- **Parameter 1 through Parameter 7**

The seven user selectable parameters are available for plotting/displaying data.

- **Lower Limit**

The lower limit for the Y-scale (normalized from 0 to 1).

- **Upper Limit**

The upper limit for Y-scale (normalized from 0 to 1). Thus, if the speed range is specified at 0-100,000 and the speed is 96,000 rpm, then the normalized Y-scale is 0.96.

- **On/Off**

Controls the strip chart display.

- **Fat Line, Thin Line**

Controls the Line style of the plotting activity.

- **Hold/Plot**

Holds or stops the strip-chart display, or continues the plotting activity for those parameters that have the ON status selected.

- **Reset**

Clears strip chart display.

- **Print**

Allows printing of the Strip Chart Panel.

- **No. (of) Points**

Number of points sets the maximum number of points that can be visible on the Strip Chart. Number of points presented on the Strip Chart until the data becomes invisible.

- **Save**

Allows saving Strip Chart as a bitmap file.

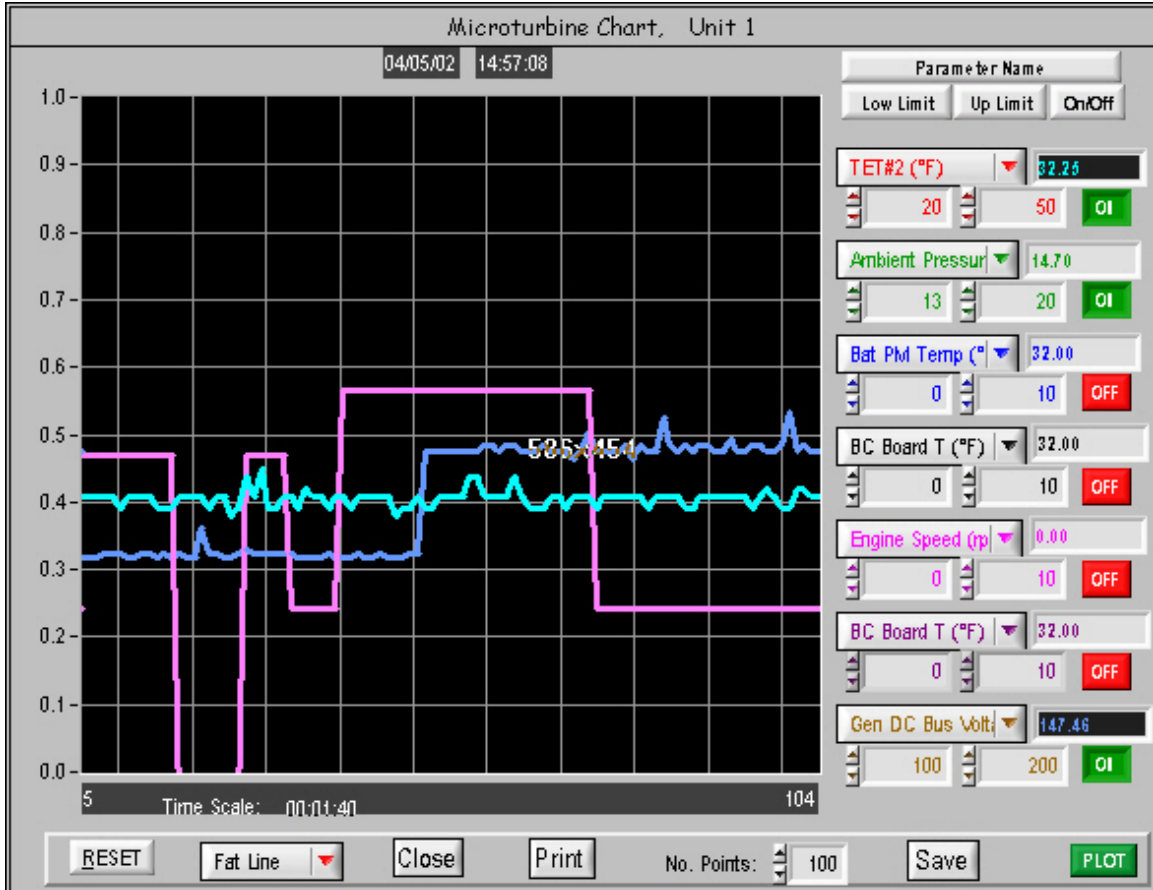


Figure 8-5. Strip Chart Display