

Technical Reference

Capstone Remote Monitoring System (User Edition)

This document presents the control and monitoring features for the User Edition Capstone Remote Monitoring System (CRMS) software.

Chapter 12: MicroTurbine Data Windows

All MicroTurbine parameters can be displayed from MicroTurbine Data Windows. Different CRMS versions display different Data Windows and display parameters.

To select MicroTurbine Data Windows select **[Window][MicroTurbine Data 1]** from the Windows Menu Bar.

Figure 12-1 presents MicroTurbine Data 1 information.

Table 12-1 contains descriptions of the various parameters arranged in the same order as detailed in Figure 12-1.

A different MicroTurbine (or PowerServer) can be selected using the **System** drop-down menu.

Note: Some measurement units may be viewed in either System International (SI) or American (USA) units. These units are temperature (°F or °C), pressure (psi or Pa), and water flow (GPM or L/sec). See User Edition, Chapter 8 for details on changing measurement units.

To review data from different units, click on the **System** pull-down menu and select the MicroTurbine or MultiPac Controller.

The list of available control parameters will be displayed on the MicroTurbine Data Window.

Each listed parameter includes the following controls and indicators:

- **Parameter Number**

Shows the order in which the parameter is listed in the data file

- **Parameter Name**

Shows the parameter description and the measurement units

- **Real-Time Value**

The parameter value, updated real-time

- **Record (On/Off)**

Allows parameter selection for data recording. Each parameter can be selected (to be recorded) by clicking the **Record** button to **ON**.

For more details on Data Recording, see User Edition, Chapter 15, Data Recording section.

System: Master Turbine				MicroTurbine Data 1							
No	Parameter (Units)	Value	Record	No	Parameter (Units)	Value	Record	No	Parameter (Units)	Value	Record
1	Control Date		OFF	28	LFC Prime	0	OFF	55	CHP Water Inlet Temp (°F)	0.0	OFF
2	Control Time		OFF	29	Boost Pump	0	OFF	56	CHP Water Outlet Temp (°F)	0.0	OFF
3	Engine Speed (rpm)	0	OFF	30	LFC Prime state	0	OFF	57	CHP Board Temp (°F)	0.0	OFF
4	Turbine Exit Temp (°F)	0	OFF	31	Boost Pump Status	0	OFF	58	CHP Bridge Current (A)	0.00	OFF
5	Compressor In Temp (°F)	0.0	OFF	32	Drain Pump Status	0	OFF	59	CHP Water Flow (GPM)	0.0	OFF
6	Ambient Pressure (psia)	0.0	OFF	33	Prime Sol. Status	0	OFF	60	CHP Temperature Feedback	0.0	OFF
7	Incident Record	0	OFF	34	RFC DC Bus (V)	0	OFF				
8	Starts	0	OFF	35	Output Frequency (Hz)	0	OFF				
9	Hours		OFF	36	Output Current Phase A (A)	0.0	OFF				
10	System Severity Level	0	OFF	37	Output Current Phase B (A)	0.0	OFF				
11	System State		OFF	38	Output Current Phase C (A)	0.0	OFF				
12	Power Enable	0	OFF	39	Output Current Neutral (A)	0.0	OFF				
13	Power Demand (W)	0	OFF	40	Output Voltage Phase A (V)	0	OFF				
14	Power Supply Voltage (V)	0.0	OFF	41	Output Voltage Phase B (V)	0	OFF				
15	Start Command (0/1)	0	OFF	42	Output Voltage Phase C (V)	0	OFF				
16	Fuel Inlet P LP (psig)	0.0	OFF	43	Output Power Phase A (W)	0	OFF				
17	Fuel Outlet P LP (psig)	0.0	OFF	44	Output Power Phase B (W)	0	OFF				
18	Fuel Inlet P HP (psig)	0.0	OFF	45	Output Power Phase C (W)	0	OFF				
19	SPV Fuel Ex P (psig)	0.0	OFF	46	Output Power (W)	0	OFF				
20	Bat Therm.Temp (°F)	0.0	OFF	47	Bat No. Eq. Charges	0	OFF				
21	Bat SOC (%)	0.0	OFF	48	Meter Watts In (W)	0.0	OFF				
22	Bat Volts (Vdc)	0	OFF	49	Meter Watts Out (W)	0.0	OFF				
23	BC DC Bus (V)	0	OFF	50	Meter VAR In (VAR)	0.0	OFF				
24	Inv DC Bus Volts (Vdc)	0	OFF	51	Meter VAR Out (VAR)	0.0	OFF				
25	LFC Pressure Command (psi)	0	OFF	52	Turbine number	0	OFF				
26	LFC Pressure Feedback (psi)	0	OFF	53	MultiPac Enable	0	OFF				
27	System Prime Status	0	OFF	54	CHP Water Setpoint (°F)	0	OFF				

Figure 12-1. Typical MicroTurbine Data 1 Information

Table 12-1. Descriptions for MicroTurbine Data 1 Window

No.	Parameter (Units)	Description
1	Control Date	Current date set in the controller used in the Incident History and for the day of week calculations used for Time of Use operation. Value displayed in mm/dd/yyyy.
2	Control Time	Current time set in the controller used for time information in the Incident History and for Time of Use operation. Value displayed in hh:mm:ss.
3	Engine Speed (rpm)	Current operating speed of the MicroTurbine in revolutions per minute (rpm).
4	Turbine Exit Temp (°F)	Current average of the two TET thermocouple indications (°F or °C).
5	Compressor In Temp (°F)	Current measurement of the compressor inlet thermistor used to measure the air temperature at the inlet of the compressor wheel in the MicroTurbine generator (°F or °C). This is considered the ambient temperature of the MicroTurbine system.
6	Ambient Pressure (psia)	Measurement of the ambient pressure (psia or kPa). A default value of 14.696 is used if Ambient Pressure failed faults are present.
7	Incident Record	Current incident in the system with the highest system severity level.
8	Starts	Equates to the number of successful bearing starts or engine rotations above zero rpm. This value is used for warranty starts.
9	Hours	Number of operating hours of the system above zero rpm. This value is used for warranty time.
10	System Severity Level	Highest system severity level of any incident currently reported by the system.
11	System State	Current operating system state of the software controls.
12	Power Enable	Value is 1 in Stand Alone mode if the output contactor is closed and actively producing power to the connected loads.
13	Power Demand (W)	Current power demand in the Grid Connect mode in Watts (W).
14	Power Supply Voltage (V)	Current value of the internal power supply voltage in Volts (V).
15	Start Command (0/1)	Value is 1 if a start command is currently issued to the system. Value is zero if a stop command has been issued.
16	Fuel Inlet P LP (psig)	Current inlet pressure on a low-pressure fuel system as reported by the RFC (psig or kPa).
17	Fuel Outlet P LP (psig)	Current downstream pressure indication on a low-pressure fuel system as reported by the RFC (psig or kPa). This value is the same as that for the Fuel Inlet P HP parameter on a Low Pressure Foil Bearing RFC MicroTurbine.
18	Fuel Inlet P HP (psig)	Current inlet pressure as read from the SPV (psig or kPa).
19	SPV Fuel Ex P (psig)	Current downstream pressure indication as reported by the SPV in psig (or kPa).
20	Bat Therm. Temp (°F)	Current temperature indication of the battery pack thermistor (°F or °C).
21	Bat SOC (%)	Calculated state of charge (SOC) of the battery pack. Value displayed in percent (%).
22	Bat Volts (Vdc)	Calculated voltage of the battery pack in Volts DC (Vdc).
23	BC DC Bus (V)	Internal DC Bus voltage of the Battery Controller power board in Volts DC (V).
24	Inv DC Bus Volts (Vdc)	Current DC Bus voltage of the power board in Volts DC (Vdc).

Table 12-1. Descriptions for MicroTurbine Data 1 Window (Continued)

No.	Parameter (Units)	Description
25	LFC Pressure Command	Not used.
26	LFC Pressure Feedback	Reports fuel manifold pressure (psig or kPa gauge).
27	System Prime Status	Displays 1 if system has been primed and zero (0) if not primed.
28	LFC Prime	Displays 1 if system is currently primed and 0 if not currently primed.
29	Boost Pump	Displays 1 if boost pump is installed and 0 if boost pump is not installed.
30	LFC Prime State	Current priming state: 0 = Ready for prime 1 = Beginning line fill 2 = Filling lines into drain tank 3 = Pulsing priming solenoid 4 = Completing line fill 5 = Draining tank 6 = Verifying completion 7 = Priming sequence complete
31	Boost Pump Status	Displays 1 if boost pump is "ON" and 0 if boost pump is "OFF"
32	Drain Pump Status	Displays 1 if drain pump is "ON" and 0 if drain pump is "OFF"
33	Prime Solenoid Status	Displays 1 if the Prime Solenoid is opened and 0 if it is closed.
34	RFC DC Bus (V)	Current RFC DC Bus voltage in Volts (V).
35	Output Frequency (Hz)	Current output operating frequency in Hertz (Hz).
36	Output Current Phase A (A)	Measurement of phase "A" output current in Amps (rms).
37	Output Current Phase B (A)	Measurement of phase "B" output current in Amps (rms).
38	Output Current Phase C (A)	Measurement of phase "C" output current in Amps (rms).
39	Output Current Neutral (A)	Measurement of the neutral output current in Amps (rms).
40	Output Voltage Phase A (V)	Current measurement of the phase "A" to neutral output voltage in Volts (V). Equivalent to Battery Voltage for HEV systems.
41	Output Voltage Phase B (V)	Current measurement of the phase "B" to neutral output voltage in Volts (V). Equivalent to Battery Voltage for HEV systems.
42	Output Voltage Phase C (V)	Current measurement of the phase "C" to neutral output voltage in Volts (V). Equivalent to Battery Voltage for HEV systems.
43	Output Power Phase A (W)	Current measurement of the output phase "A" power in Watts (W). Not applicable to HEV systems.
44	Output Power Phase B (W)	Current measurement of the output phase "B" power in Watts (W). Not applicable to HEV systems.
45	Output Power Phase C (W)	Current measurement of the output phase "C" power in Watts (W). Not applicable to HEV systems.
46	Output Power (W)	Current measurement of the total output power in Watts (W).
47	Bat No. Eq. Charges	The number of battery equalization charges that have been performed and completed on the system battery pack.
48	Meter Watts In (W)	Indication from the power meter for positive power flow in Watts (W).
49	Meter Watts Out (W)	Indication from the power meter for negative power flow in Watts (W).
50	Meter VAR In (VAR)	Not used.
51	Meter VAR Out (VAR)	Not used.

Table 12-1. Descriptions for MicroTurbine Data 1 Window (Continued)

No.	Parameter (Units)	Description
52	Turbine Number	The MicroTurbine number identification for the MicroTurbine system as part of a MultiPac.
53	MultiPac Enable	Displays 1 if the MicroTurbine is part of a MultiPac, and displays 0 if the MicroTurbine is not part of a MultiPac.
54	CHP Water Setpoint	Displays requested CHP water temperature (°F or °C).
55	CHP Water Inlet Temp	Displays the current CHP water inlet temperature (°F or °C).
56	CHP Water Outlet Temp	Displays the current CHP water outlet temperature (°F or °C).
57	CHP Board Temp	Displays the CHP Control Board Temperature (°F or °C).
58	CHP Bridge Current (A)	Displays the CHP actuator motor current in Amps (rms)
59	CHP Water Flow (GPM)	Displays the CHP water flow (external sensor only) (GPM or L/sec)
60	CHP Temperature Feedback (°F)	Displays the temperature (°F or °C) from the user-selected input: 1) external sensor, 2) RTD input, or 3) RTD output

Notes and Related Information