

# Oorja Remote User Interface

**Introduction:** Oorja customers can access the UI shown in Figure 1 through a web portal so they can monitor their system live, in real time. All parameters are stored as historical records. An FTP server can be set up to transfer the data to local databases for their records. Alarms and notifications required for end users for all parameters can be set up once certain conditions are met.

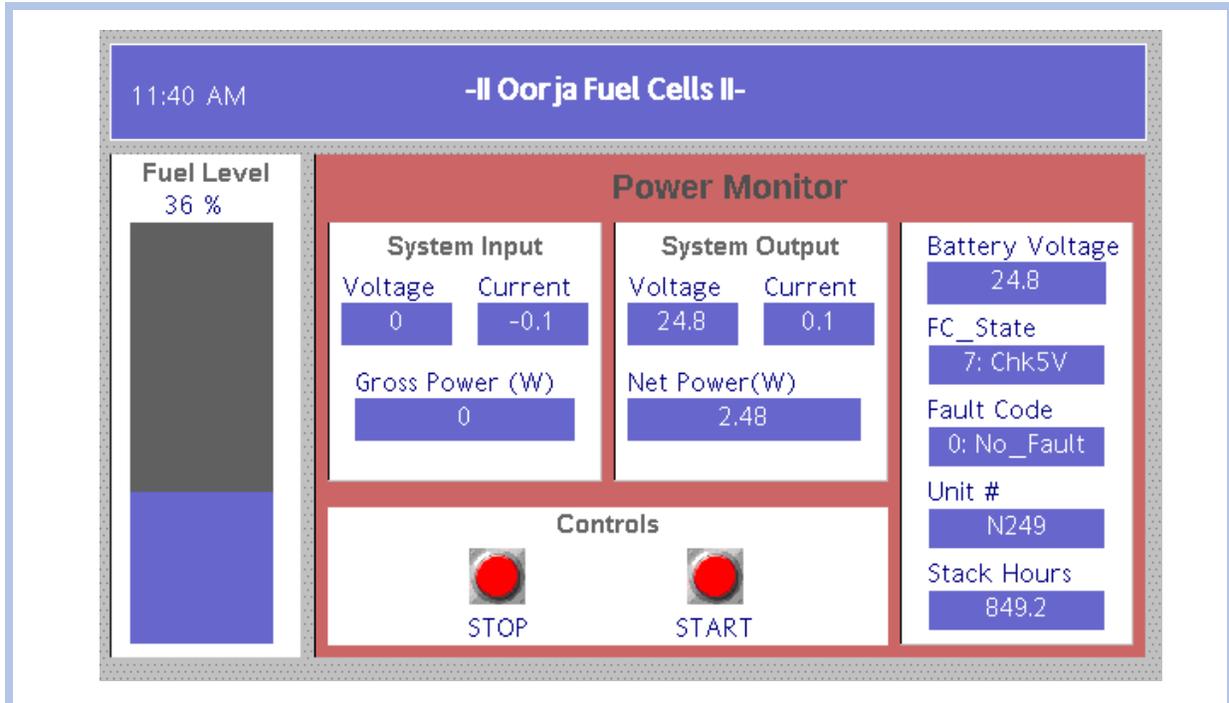


Figure 1. Remote user interface for live monitoring of Oorja systems

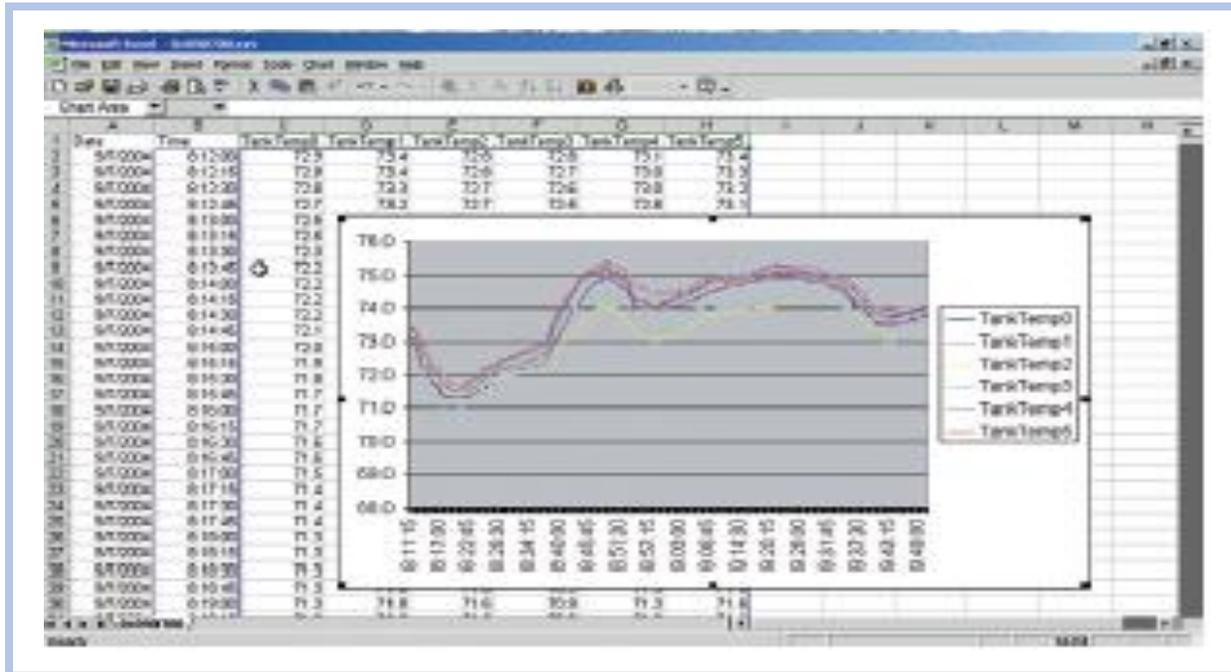
## Parameters:

Table 1. Parameters to be monitored

Parameters	Value
System input voltage	VDC (stack input voltage)
System input Current	Current (stack input current)
Gross Current	Watts
System output voltage	VDC (battery voltage)
System output current	Current (output stack current)
Net power	Watts
Battery voltage	VDC
Fault codes	Descriptive
Stack hours	Numeric
System state	Descriptive
Fuel level	Numeric percentage

**Data Logging:** Characteristics of data logging are described next, and an example is shown in Figure 2.

- The user decides how often data is recorded.
- The system generates a new data file every 24 hours.
- Files are stored onto a local SD flash card on the Red Lion device.
- Users can download data files from anywhere.
- User can open the files in Excel format and generate graphs.
- Users can synchronize the data automatically, using an FTP server.



**Figure 2. An example of data logging format**

**Specifications:**

- A protocol conversion feature converts numerous protocols simultaneously.
- An extensive built-in driver list allows easy data mapping to PLCs, PCs, and SCADA systems.
- 2 RS-232 serial ports.
- 1 RS-422/485 serial port.
- 10 Base-T/100 Base-TX Ethernet connection can connect to multiple devices via up to 10 protocols simultaneously.
- Independent serial ports provide virtually unlimited integration methods.
- UL Listed for use in hazardous locations. (See literature for class and division details.)
- CompactFlash® slot allows process data to be logged directly to CSV files.
- Up to 640 x 480 virtual HMI offers built-in, PC-based SCADA functionality.
- Webserver provides worldwide access to data logs and virtual HMI.
- Alarm notifications can be sent via email or text messages.

**Connectivity Diagram:** The connectivity diagram is shown in Figure 3.



**Figure 3. The connectivity diagram**

**Fuel Monitoring:** The user will be able to monitor the methanol fuel tank level by looking at the scale. Once the fuel level is lower than a certain percentage, the user will be notified by email or text message that the fuel is running low.

**Alarms:** Auto messages can be sent to customers for fuel warnings.

**Trigger Input:** Trigger input can be set to any level. This will be the output power of the stack going into the DC/DC converters. The user will be able to tell how the stack is performing, and what gross power the system is putting out.

**System Output:** This will be the output power of the system going into the battery. The user will be able to tell how much net power is going into the battery.

**Fault History:** Fault history will keep a track of all the faults for up to one month.

**Mode:** This will identify for the end user which stage the system is in: startup, normal operations, fault stage, or idle stage.

**Battery Voltage:** The end user will be able to monitor the battery voltage status.

**Temperatures:** The end user will be able to monitor temperatures the unit is operating under, which is of special interest for Oorja application engineers.

**Stop and Start Buttons:**

- **Start.** The user can start the system from a remote location.
- **Stop.** The user can stop the system from a remote location.

**Alarms and Notifications:**

- **Fuel outage.** If the fuel level is below 30%, the systems sends an alarm indicating “low fuel.”
- **System faults.** If there is any fault, the systems send an alarm for “system has faulted.”