



# Oztek Power Studio

User's Manual

UM-0052

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# 1 Introduction

This document is intended to provide instruction on how to use the Oztek Power Studio application (SW-90216). The application is a Microsoft Windows based Graphical User Interface (GUI) that provides the user a simple graphical interface for interacting with Oztek's embedded power control products. This document is meant to provide installation instructions as well as detailed descriptions of the available features and how they can be applied in an engineering environment.

## 1.1 Referenced Documents

Ref.	Document	Description
[1]	FS-0046	OzCAN Protocol Functional Specification
[2]	<a href="http://www.modbus.org/specs.php">www.modbus.org/specs.php</a>	Modbus Specification

## 1.2 Definitions

CAN	Controller Area Network
DSP	Digital Signal Processor
GUI	Graphical User Interface
XML	Extensible Markup Language

## 1.3 Requirements

### 1.3.1 System Requirements

The application requires the following hardware and software configuration:

1. Microsoft Windows (7 or newer) based PC with an available USB port
2. .NET (4.8 or higher) Runtime (available via <http://www.microsoft.com> )

### 1.3.2 Supported Protocols and Hardware

#### 1.3.1.1 CAN

The application supports the OzCAN protocol (reference [1]), and the following CAN to USB hardware devices:

Vendor	Device
Vector	CANcaseXL
Peak / Grid Connect	PCAN-USB

### 1.3.1.2 Modbus

The application supports the Modbus RTU serial interface protocol (reference [2]) as well as Modbus TCP. There are no vendor specific hardware requirements for serial Modbus. However, Power Studio has been tested and found to be compatible with the following devices:

Vendor	Device	Description
Advantech B+B	USPTL4-LS	USB to RS-485 Converter
Anybus	AB7702	Modbus RTU to TCP Gateway

## 2 Installation Procedure

Before installing Power Studio, be sure to install all the necessary drivers for the chosen communication device. For instructions on how to install the drivers, please refer to the product's documentation.

After successfully installing a communications device, launch the Power Studio installer by running the SW90216\_setup\_revMM\_mm.exe executable. Note that *MM* represents major revision and *mm* minor revision.

## 3 Overview

Power Studio is an engineering tool that provides a standard interface to the many DSP-based power control products that Oztek produces. Examples of these products include Grid Tie / Active Front Ends (AFEs), Motor Controllers, and DC/DC converters. Power Studio supports communicating with multiple instances of a device.

Power Studio consists of a main window with tabs that provide specific functionality such as "Dashboard," "Instrumentation," "Register Map," "Software Upgrade," and "Data Logging". A menu bar is provided across the top of the window for configuring the tool.

### 3.1 Target Profiles

Power Studio is customized for a particular product using Target Profile files. Target Profiles are XML files used to configure Power Studio with the data, commands, and options that apply to a particular product. They are custom files that are provided by Oztek and can be found at [www.oztekcorp.com](http://www.oztekcorp.com).

### 3.2 Configuration and Register Map Files

Prior to version 5.0, Power Studio utilized Oztek Configuration files (.ozCfg) to document configuration register details including register addresses, data types, default, and user values. In version 5.0, Power Studio's register access was expanded to include all product registers including volatile command and instrumentation registers in addition to the configuration



registers. In doing so a new file type was created, Oztek Register Map files (.ozReg), which includes additional information to support the new features.

Moving forward, Oztek will only provide register map files for new products. However, Power Studio does provide backward compatibility, allowing users to continue to use Oztek Configuration files for existing product families.

### 3.3 Sessions

Session files can be created to store communication settings when connecting to multiple devices. Using a session file saves the time of having to add each of the multiple Target Profiles every time the tool is started. Instead, a single session file can be loaded. Session files can also be used with a single device to store the loaded configuration or register map file, as well as real time graph setup.

### 3.4 Basic View

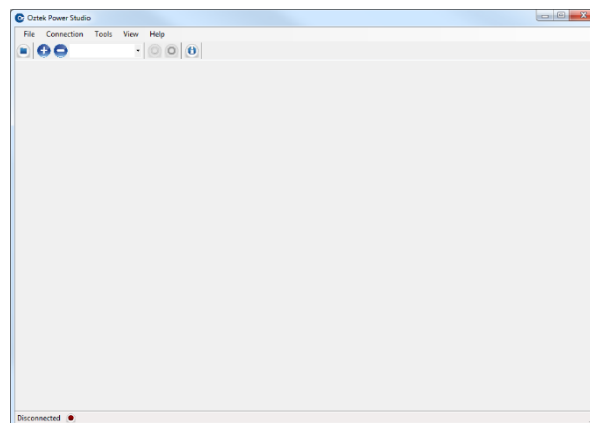









Figure 1 - Initial Launch

When opening the tool, the main area is blank until either a Target Profile is loaded using the  button on the shortcut bar, or Session file is loaded using the  button. The connection status is displayed in the bottom left corner. It will display “Disconnected” when not connected to a target and “Connected to <name of communication device>” when connected to a target. The colored circle indicates a more detailed status:

- Green : Power Studio is communicating successfully with the target device
- Orange : An error was detected in a reply from the target device
- Red : Did not receive a reply from the target or Power Studio is disconnected from the target device

### 3.5 Getting Started

To get started using the tool, follow these simple steps:

- Click the  button on the shortcut bar and select the appropriate Target Profile for the product you are working with
- Use the “Connection→Select Port” menu item to select the communication port you are using to interface with the product
- Click on the  Connect button


## 4 Menu Strip

The menu strip contains menu items that allow the user to configure Power Studio. These items include loading a Session file, connecting to a target, configuring connection settings, and reading from and writing to individual registers.

### 4.1 File Menu

This menu contains options to load or save a Session file and close the GUI. Session files allow the user to save connection settings when connecting to multiple devices, as well as opened OzCfg or OzReg file options.

#### 4.1.1 Open Session

This item is used to browse for and select a Session file that defines a list of target devices and their communication settings. Session files must be created by the user by adding targets via the  button on the shortcut bar, then using the “Save Session” menu item once the devices have been configured. See section 4.6.1 for details about adding target devices.

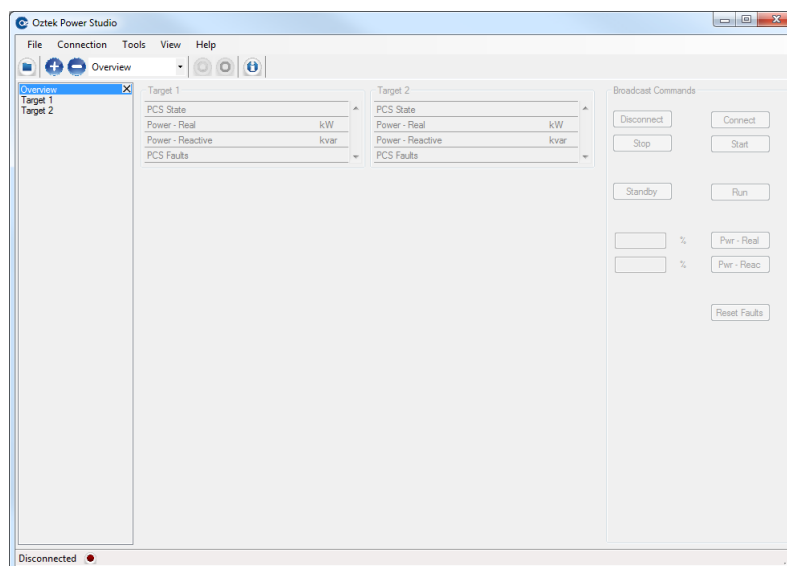


Figure 2 - Open Session File

A panel on the left-hand side will appear if multiple targets are defined in the session. If supported, an Overview page is created with a summary of each device status and commands that are used to send broadcast messages to every device on the list simultaneously.

#### 4.1.2 Save Session

This item saves a Session file containing information about each target that has been added. This can be used after every target device in a system is added to Power Studio to store the system configuration.

#### 4.1.3 Exit

This item closes the GUI. It is identical to clicking the “X” in the top right-hand corner of the GUI.

### 4.2 Connection Menu

This menu contains options to connect to and disconnect from a target and configure connection parameters.

#### 4.2.1 Select Port

This item is used to select a communication port to connect to a target device. It is disabled until a Target Profile is loaded. Once enabled, click on the port in the “Connection→Select Port” submenu to make a port selection. When a single port is found, it is automatically selected. If the desired connection port does not show up in the submenu, click “Connection→Select Port→Refresh” to get a new list of available ports. Once connected to a target, this item is disabled until the connection is disconnected.

#### 4.2.2 Connect

This item is used to connect to a device via the selected communication port. Upon a successful connection, buttons and data that were previously disabled will be enabled and the GUI will start reading data from the target device. If no data appears, disconnect and check the connection settings under “Connection→Configure” or try connecting to another port.

#### 4.2.3 Disconnect

This item is used to disconnect from a target. It is only available when connected to a target and it is disabled otherwise.

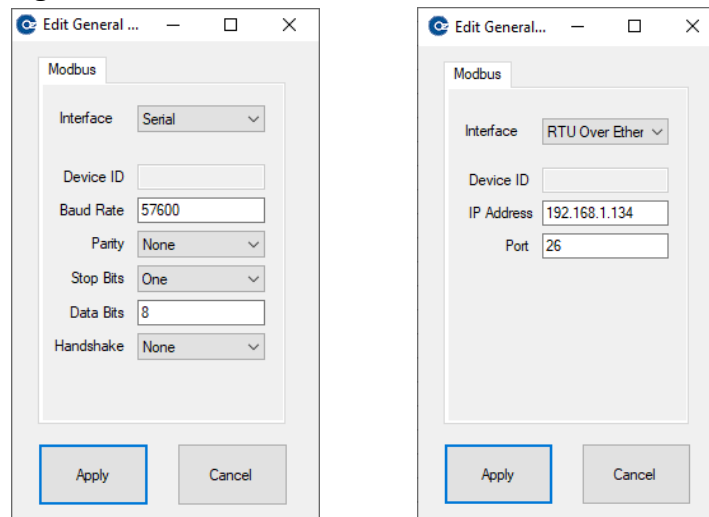
#### 4.2.4 Device ID

This item is used to change the destination device ID.

### 4.2.5 Configure

This menu item is used to change connection settings if needed. It should only have to be used if the target's configuration has been changed from the default settings, as the default Target Profile should contain the correct information. Once the connection settings have been altered, click "Apply" to save the settings

#### 4.2.5.1 Modbus Settings



**Figure 3 - Example Modbus Settings**

Serial:

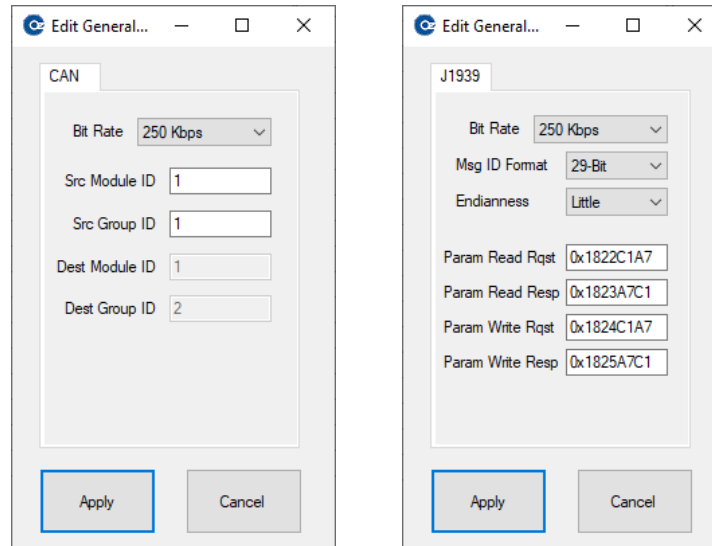
- Device ID: the Modbus address of the target device
- Baud Rate: the baud rate that matches the target device
- Parity: the parity that matches the target device's configuration
- Stop Bits: the stop bits that match the target device's configuration
- Data Bits: how many data bits the target device expects per message
- Handshake: if a handshake is required, this can set the handshake type

RTU Over Ethernet/TCP:

- Device ID: the Modbus address of the target device
- IP Address: IP Address of the converter/gateway
- Port: Port number

If these settings are not correctly set from the Target Profile file, they can be found in the target device's user manual or functional specification.

### 4.2.5.2 CAN Settings



**Figure 4 - Example CAN Settings**

#### CAN:

- Bit Rate: the bit rate that the target device is configured for
- Source Module ID: the module ID of Power Studio
- Source Group ID: the group ID of Power Studio
- Destination Module ID: the module ID of the target device
- Destination Group ID: the group ID of the target device

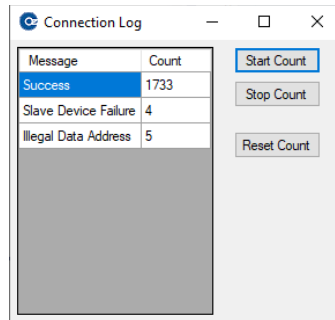
#### J1939/Custom CAN:

- Bit Rate: the bit rate that the target device is configured for
- Msg ID Format: 11-bit or 29-bit message ID
- Endianness: Little or Big Endian
- Parameter Read/Write Request and Responses: Message ID's for Oztek Parameter Read/Write request and response messages

If these settings are not correctly set from the Target Profile file, they can be found in the target device's user manual or functional specification.

### 4.2.6 Connection Log

The Connection Log Shows the number of successful messages, as well as the number of errors.



The most common messages are:

Message	Meaning
Success	The message was received successfully
No Response from Target Device	A response to a message sent by Power Studio was not received from the target. Check the configured communication settings or cable hardware
Illegal Data Address	The PID or address that was requested is not valid in the register map
Slave Device Failure	The message could not be acted upon, most likely due to write data being out of range or an invalid password

### 4.3 Tools Menu

This menu contains other engineering tools that are not a main function of Power Studio.

#### 4.3.1 Register Read/Write

This item allows reading from and writing to specific register addresses. It is only enabled when connected to a target device.

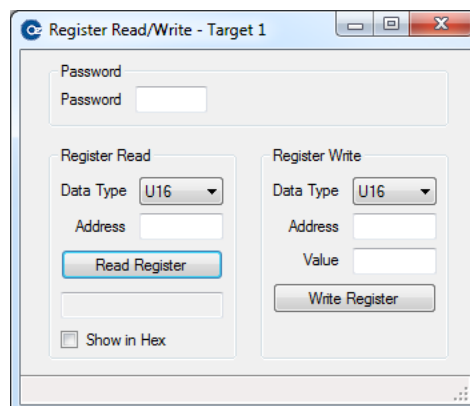


Figure 5 - Register Read/Write Form

**Password Section:** The password section allows access to password-protected registers. If a password register is not defined in the Target Profile or if there are multiple password registers, a dropdown box will be displayed to input or select the password register address.

**Register Read Section:** This section allows for a specific register to be read. Entering the register address in the “Address” textbox and clicking “Read Reg” will display the raw register value in the bottom textbox. If the “Show in Hex” checkbox is checked the result will be displayed in hex, otherwise it will be displayed in decimal. The success or failure status of the read will be displayed in the bottom status bar.

**Register Write Section:** This section allows for a specific register to be written to. Enter the register address in the “Address” textbox, the value to write to it in the “Value” textbox, and click “Write Reg.” The success or failure status of the write will be displayed in the bottom status bar. Note that no scaling is applied to the value, so any required scaling needs to be considered when entering the number.

### 4.3.2 Verify Config

This item allows the user to compare a device’s configuration to a loaded OzCfg or OzReg file and will display a matching or non-matching result. This only compares configuration values, command and instrumentation registers are ignored.

To use this feature, switch to the Register Map tab, open an OzCfg or OzReg file and connect to the target device. Once connected, click the “Tools→Verify Config” button and the tool will compare the device’s configuration to the loaded file. When completed, a message will be displayed with the results of the comparison.

### 4.3.3 Real Time Graph

The graphing tool provides a means to plot parameters live, while a target is operating. All the device registers defined in the OzReg file are available for plotting. Custom parameters can also be created where the user is allowed to apply scaling to display real world values or apply masks and shifts to display certain bits in bitfields. After a graph is stopped, values can be saved to a CSV file, or the graph can be saved as an image. Note that the graphing is only supported for products with a corresponding OzReg Register Map file. The graphing feature does not support OzCfg files.

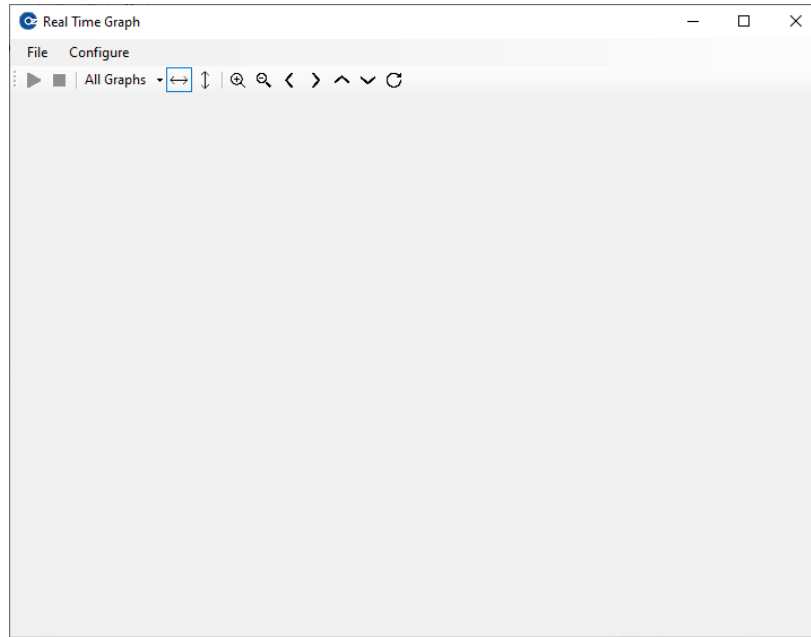


Figure 6 – Real Time Graph Window

#### 4.3.3.1 Configure

Use this menu item to configure the graph, including the amount of time to store data for and which parameters to graph.

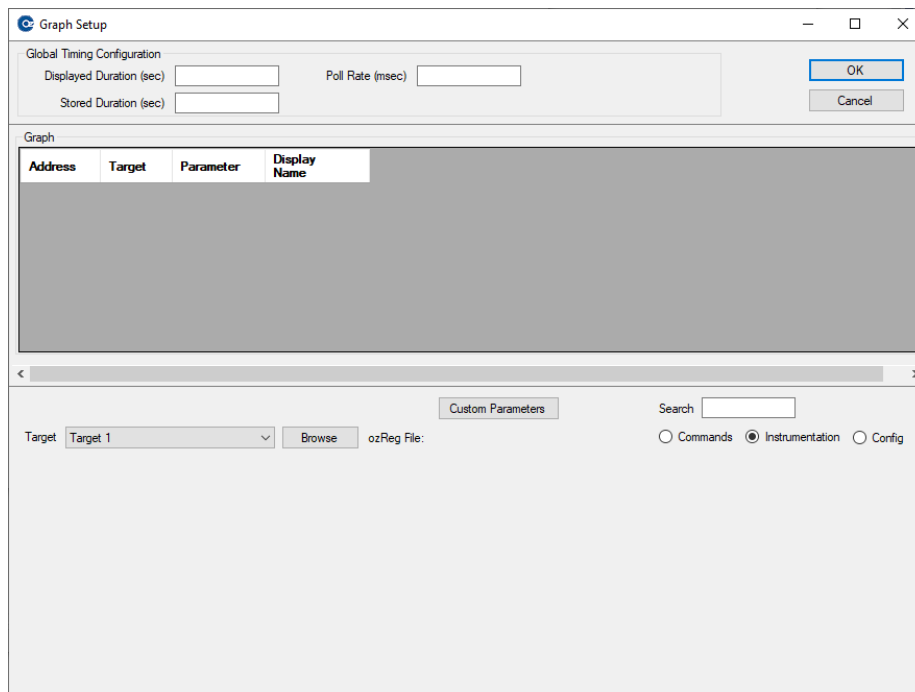


Figure 7 – Initial Graph Setup Form



## Global Timing Configuration

The “Global Timing Configuration” section configures the following:

- Displayed Duration – The amount of time in seconds that is displayed on the live graph.
- Stored Duration – The total amount of time in seconds to store data for. Since the amount of data displayed affects performance, set this longer than the Displayed Duration when larger amounts of data need to be captured but not all of it needs to be displayed at once.
- Poll Rate – How often, in milliseconds, the list of parameters is polled. Faster poll rates will impact communication bandwidth. The fastest allowable poll rate is 50 milliseconds (20 Hz).

## Adding Parameters

The menu section at the bottom of the Graph Setup window is used to select and add parameters to the graph. Selected parameters are displayed in the parameter table located in the middle of the window. If Power Studio is connected to multiple targets, the dropdown next to the “Target” label can be used to select the desired target. Once the desired target device is selected, click the “Browse” button and open the device’s OzReg file to populate the list of parameters to choose from.

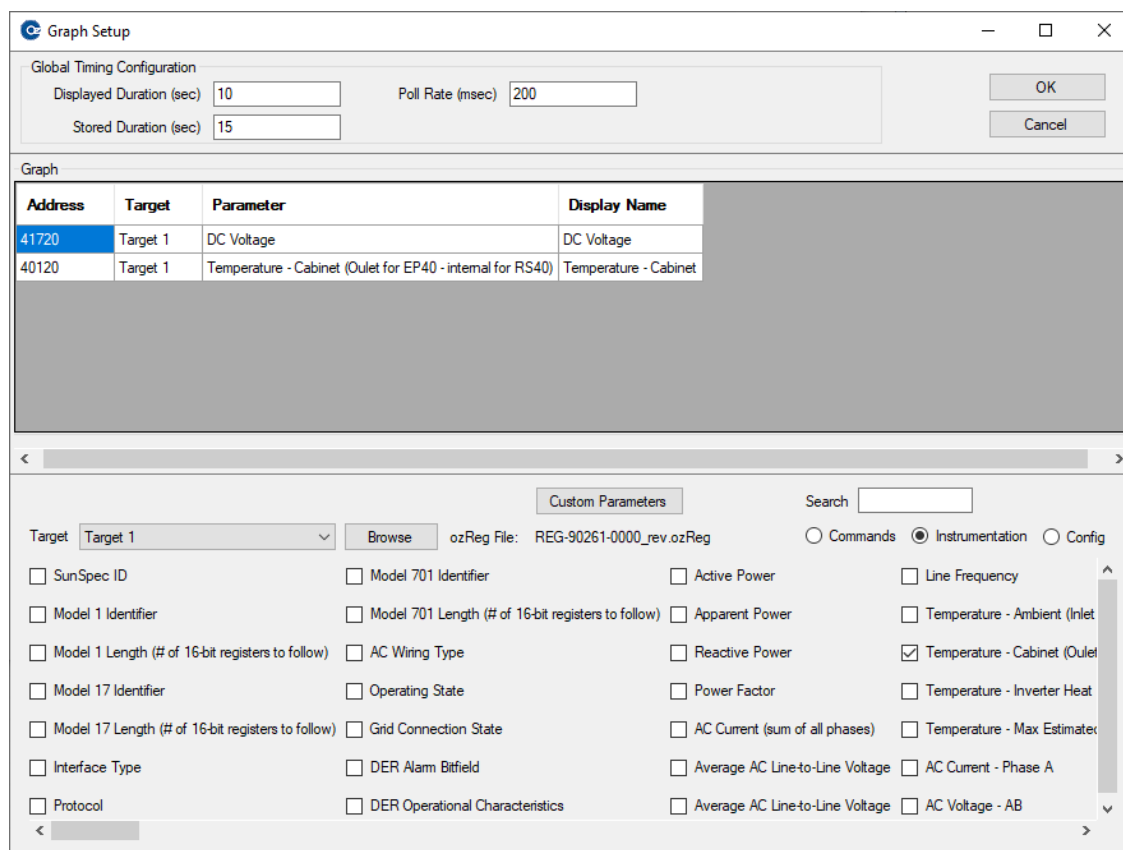


Figure 8 – Graph Setup

Click the checkboxes to add up to ten parameters to the graph. After being added, the Display Name can be changed as desired. In Figure 8, two parameters have been added to the graph, as displayed in the parameter table located in the middle of the window. As an example, the display name of the Cabinet Temperature has been changed to be more concise.

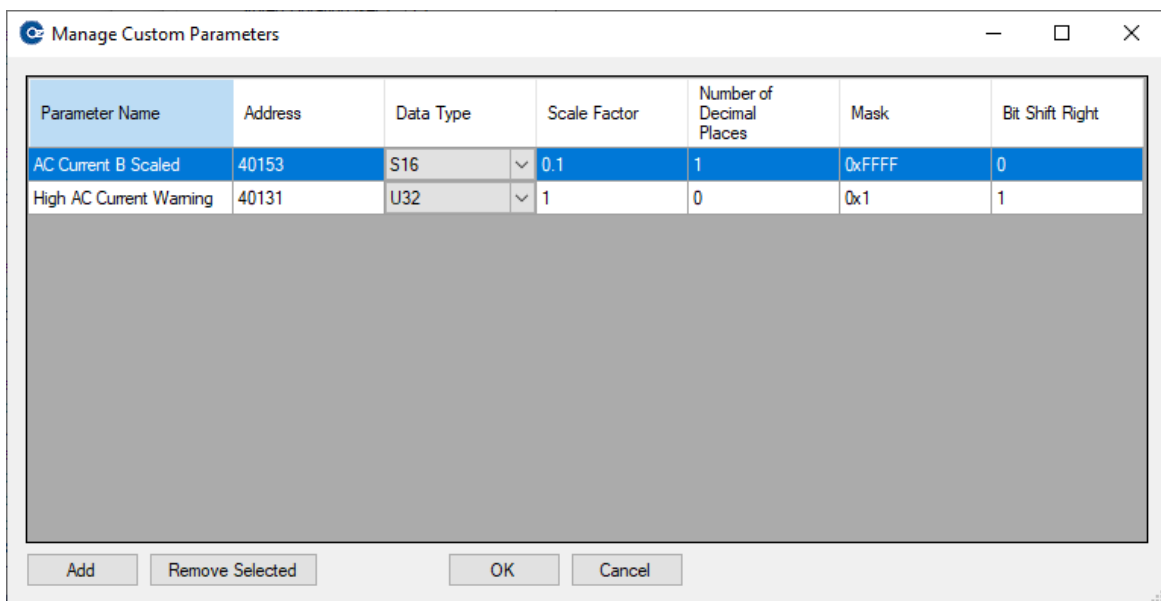
### Filters

The radio buttons on the right can be used to display either command, instrumentation, or configuration parameters. Consult the target device's user manual to determine a given parameter's designation.

The search box can be used to quickly find a desired parameter. Note that the search box ignores the radio button values and will display any parameter that matches the text.

### Custom Parameters

Custom parameters can be created via the Custom Parameters button to apply scaling, bit shifting, and masking. Once created, they will show in the checklist all the way to the right.



**Figure 9 – Custom Parameters**

The plotted parameter is scaled according to the operator precedence in the following formula, in order from left to right:

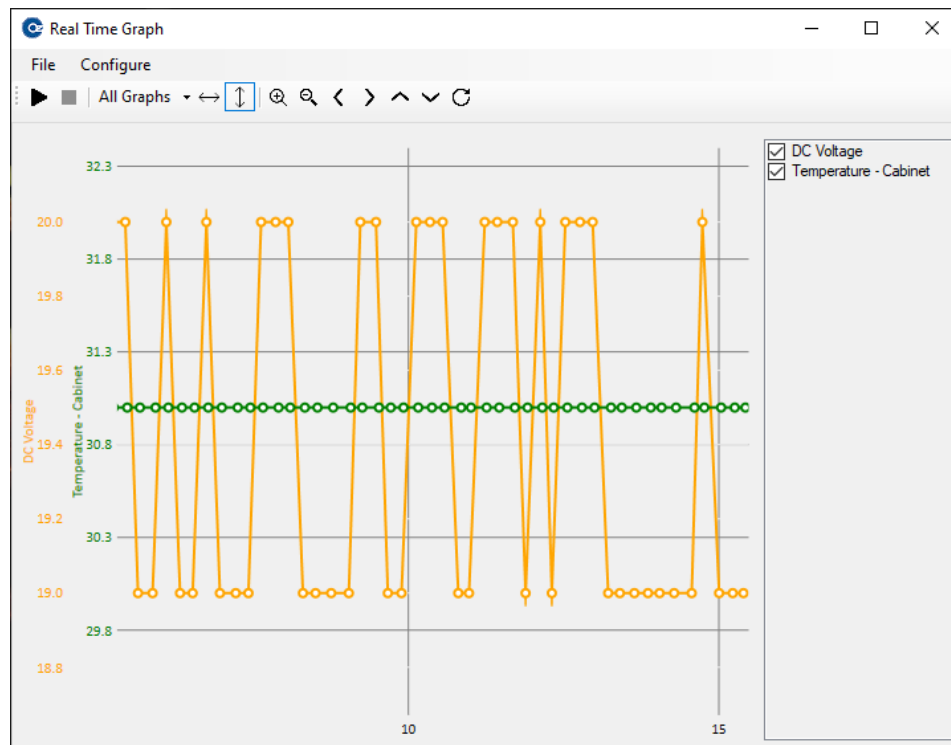
$$\text{Display value} = \text{register value} \gg \text{bitshift} \& \text{mask} \times \text{scale factor.}$$

In Figure 9, if a value of 500 is read from the “AC Current B” register, it would be multiplied by 0.1 with 1 decimal place and be displayed as 50.0. Similarly, assume the “High AC Current

Warning” bit was bit 1 (0x2) of register 40131. Applying the Shift value of 1 and Mask of 0x1 would right justify and isolate that bit in the register such that the displayed value would only ever be 0 or 1.

### 4.3.3.2 Graphing

After configuring the graph and clicking OK, the Real Time Graph window will display the selected parameters listed on the righthand side. The checkboxes next to the names can be used to show or hide each parameter.










The Play button on the top bar enables live updating of the graph while the Stop button disables live updates. When stopped, sample points are displayed which, when hovered over, show the X and Y data for each sample.

When stopped, the graph can be saved to a CSV file through the “File->Save Data to CSV” menu item, or to an image through the “File->Save Graph as Image” menu item.

Zooming options will also become unlocked when the graph is stopped. Use the dropdown next to “All Graphs” on the toolbar to select which parameters the zooming buttons will affect.

- $\leftrightarrow$  When this is selected (surrounded by a blue square), scrolling with the mouse wheel and dragging the mouse affects the X axis
- $\updownarrow$  When this is selected (surrounded by a blue square), scrolling with the mouse wheel and dragging the mouse affects the Y axis

-  Zoom in on the selected axis
-  Zoom out on the selected axis
-  Shift the data to the left
-  Shift the data to the right
-  Shift the selected data up
-  Shift the selected data down
-  Reset the zoom on the selected parameter and axis

If more than the displayed amount of data is captured (Stored Duration is greater than Displayed Duration), select the horizontal arrows and use either the mouse or shift buttons to scroll through previous data.

## 4.4 View Menu

This menu contains items used to show or hide components on the GUI.

### 4.4.1 Target List

This item shows or hides the list of target devices that have been added to the session on the left-hand side of the GUI. The list allows the user to switch to different devices.

## 4.5 Help Menu

This menu contains items used to display information about Power Studio.

### 4.5.1 About





This item displays the Oztek part number, version, and description of Power Studio.

### 4.5.2 User Manual



This item opens this User Manual.

## 4.6 Shortcut Menu Strip

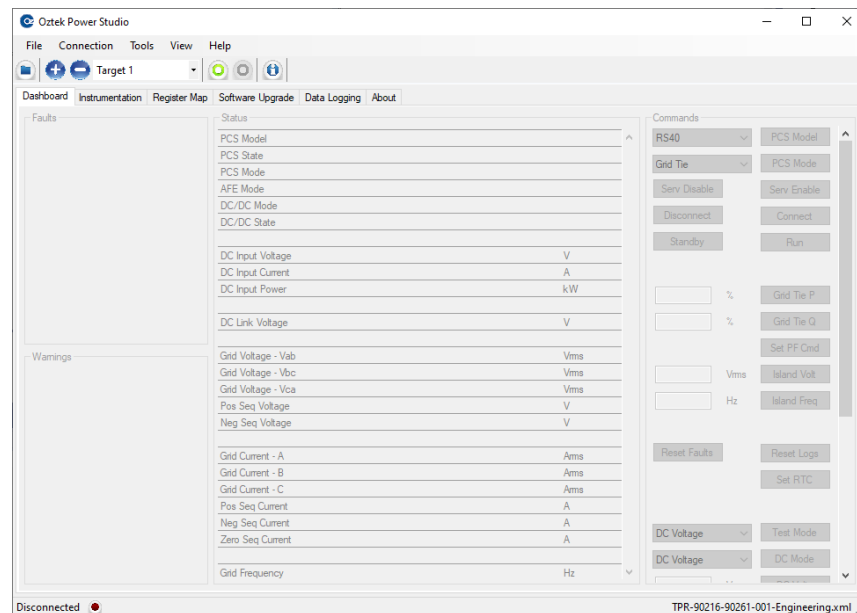
The Shortcut Strip provides shortcut buttons for common tasks as follows:

-  : File→Open Session
-  : Connection→Connect
-  : Connection→Disconnect
-  : Help→User Manual

### 4.6.1 Add/Remove Target

Use the  and  buttons to add and remove targets respectively. Adding a target will prompt for a Target Profile file location and will allow the user to configure connection settings. The dropdown menu adjacent to these buttons provides a means to select a target to communicate with from a list of targets in the session.

Target Profile files define fault, warning, command, instrumentation, and connection data for each target device in a system. The data in this file is loaded into the tool and is used to query the target.

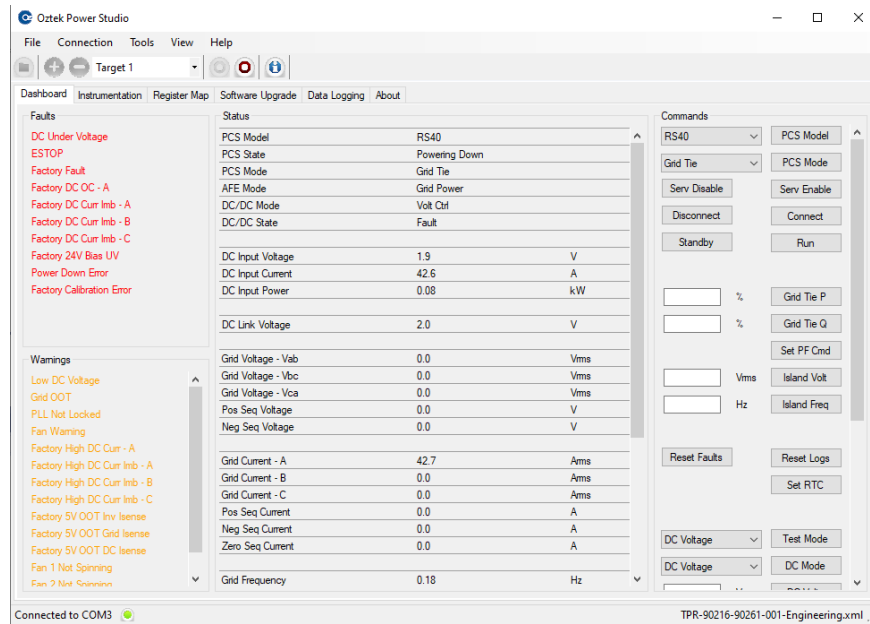


**Figure 10 - Target Profile Opened**

When a Target Profile is opened, the GUI is populated with fields specific to that target. Most of the populated GUI items will be disabled (grayed out) until connected to a target.

## 5 Dashboard

The Dashboard tab is split up into four sections: Faults, Warnings, Status, and Commands. It is meant to provide general target device status and displays basic overall operational information. The selection of what data is displayed on this tab is defined in the Target Profile file provided by Oztek.



**Figure 11 - Active Dashboard**

**Fault Section:** This section is used to display active faults on the target device. Active faults are displayed on individual lines in red. If no faults are active, “No Faults” will be displayed in green.

**Warning Section:** This section is used to display active warnings on the target device. Active warnings are displayed on individual lines in orange. If no warnings are active, “No Warnings” will be displayed in green.

**Status Section:** This section is used to display the main instrumentation data on the target device. It is split up into three columns: register description, value, and units. Values are either raw register values, enumerated values, or scaled values depending on input from the Target Profile. These values are updated at a rate specified in the Target Profile.

**Command Section:** This section allows specific commands to be sent to the target device. There are three types of command controls: button, textbox, and dropdown.

- **Button:** Sends a single value to a specific register
- **Textbox:** Sends the numeric value entered into the textbox when the corresponding button is clicked. This value is checked against minimum and maximum values, scaled to match what the target device expects, and then sent out if it passes the min/max check
- **Dropdown:** Sends a value to a specific register based on the chosen enumerated value when the corresponding button is clicked

## 6 Instrumentation

The Instrumentation tab is used for displaying instrumentation data in more detail than what may be shown on the Dashboard tab. The parameters displayed on this tab are specified in the Target Profile file. Items are disabled and not updated when disconnected from a target device.

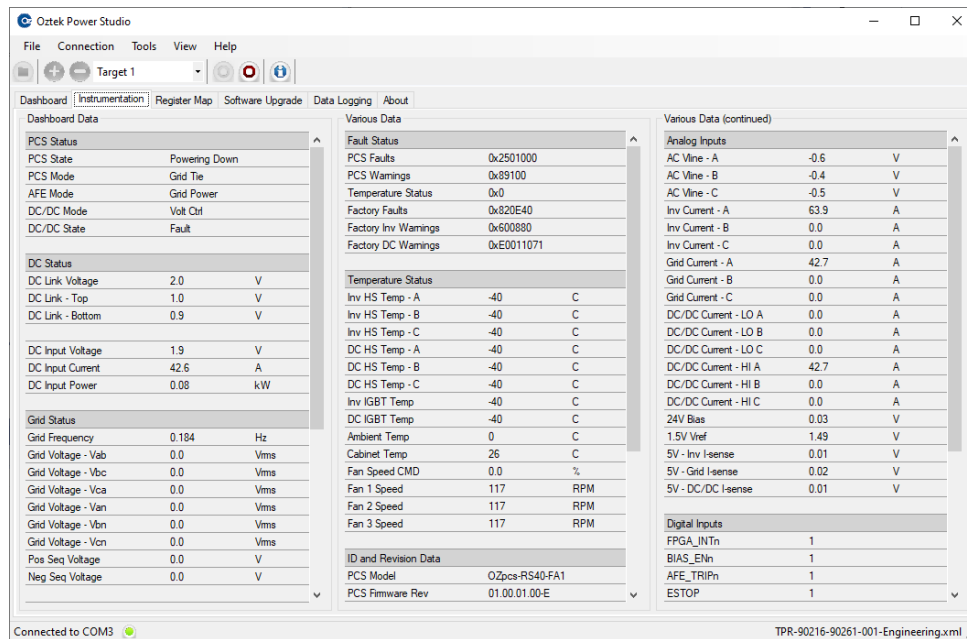


Figure 12 - Active Instrumentation

Instrumentation values are displayed on this tab using multiple sections. Each section is split up into three columns: register description, value, and units. Values are either enumerated values, raw register values, or scaled values. These values are updated at a rate specified in the Target Profile.

## 7 Register Map

The Register Map tab allows viewing and modifying parameters within the target itself. These parameters are read in through an Oztek Config (.ozCfg) file or a Register Map (.ozReg) file provided by Oztek. Consult the product's user manual or functional specification for details regarding a particular target device's register map. Note that when first switching to the Register Map tab, some options are disabled until the tool is connected to a target device.

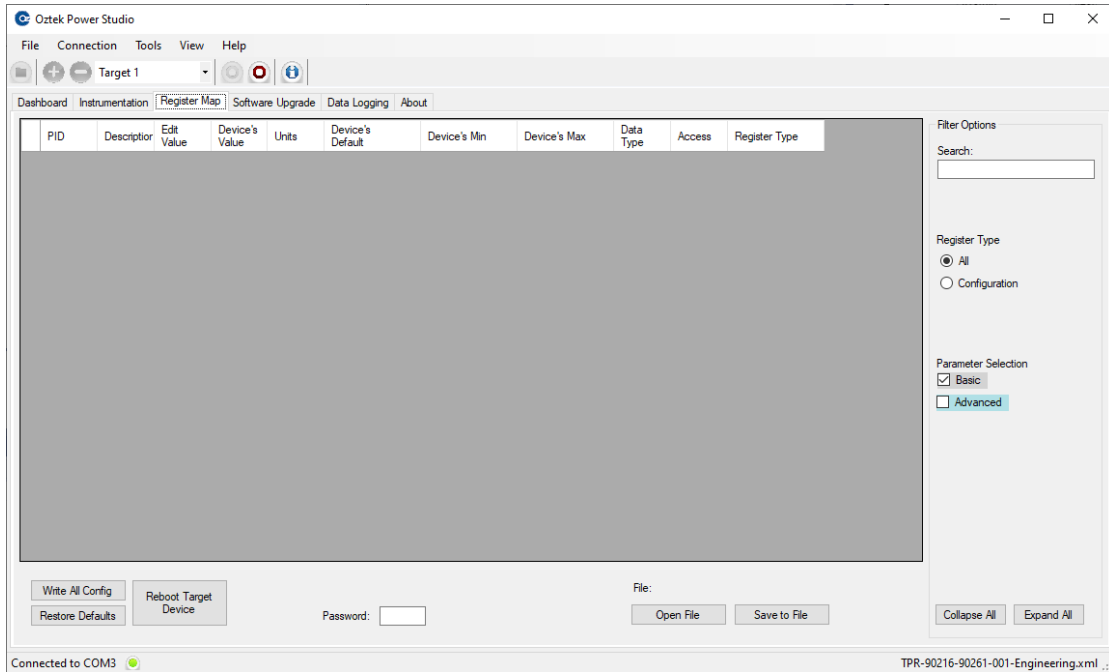


Figure 13 - Initial Register Map Tab

### 7.1 Open File

This button is used to browse for and open an OzCfg or OzReg file which is used to populate the list of available registers. The file may take several seconds to open.

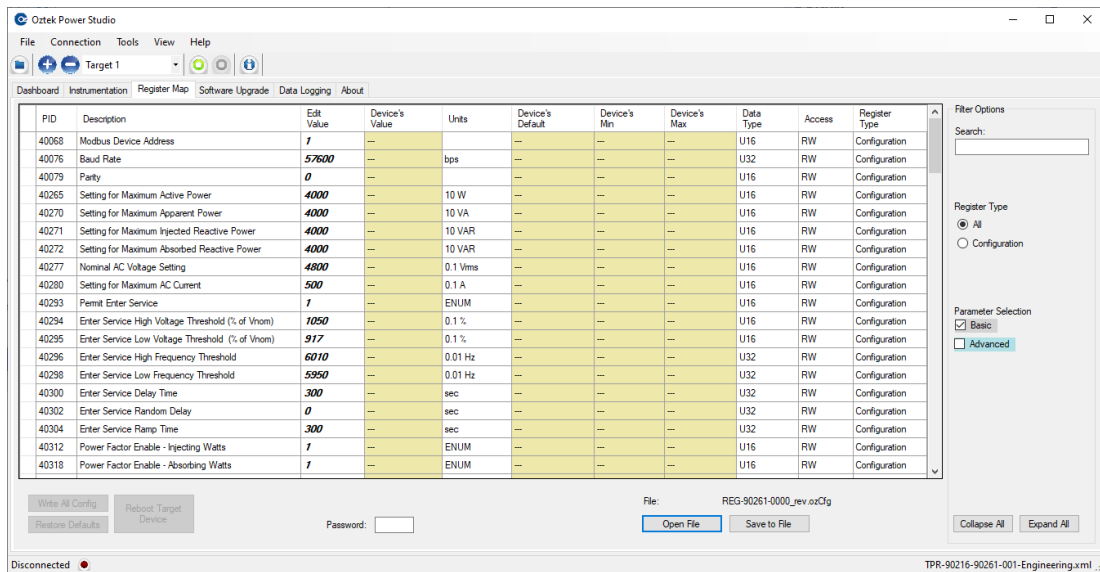


Figure 14 – Configuration File Opened when Disconnected from Target



After a file is opened, its name is displayed above the “Save to File” button. If not connected to a target, the resulting Device’s Value column will contain “---.”

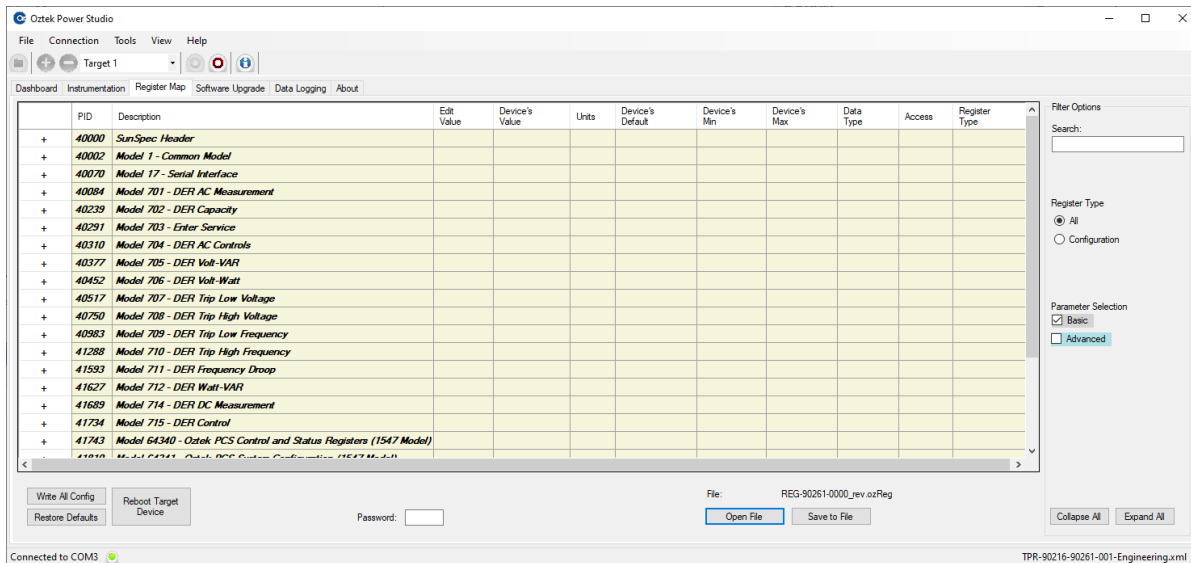


Figure 15 – Register Map File Opened when Disconnected from Target

OzReg files are more comprehensive than OzCfg files and display header groups for parameters. The “+” and “-” symbols to the left headers may be clicked to expand and collapse groups. The file opens with all groups collapsed, as shown in Figure 15.

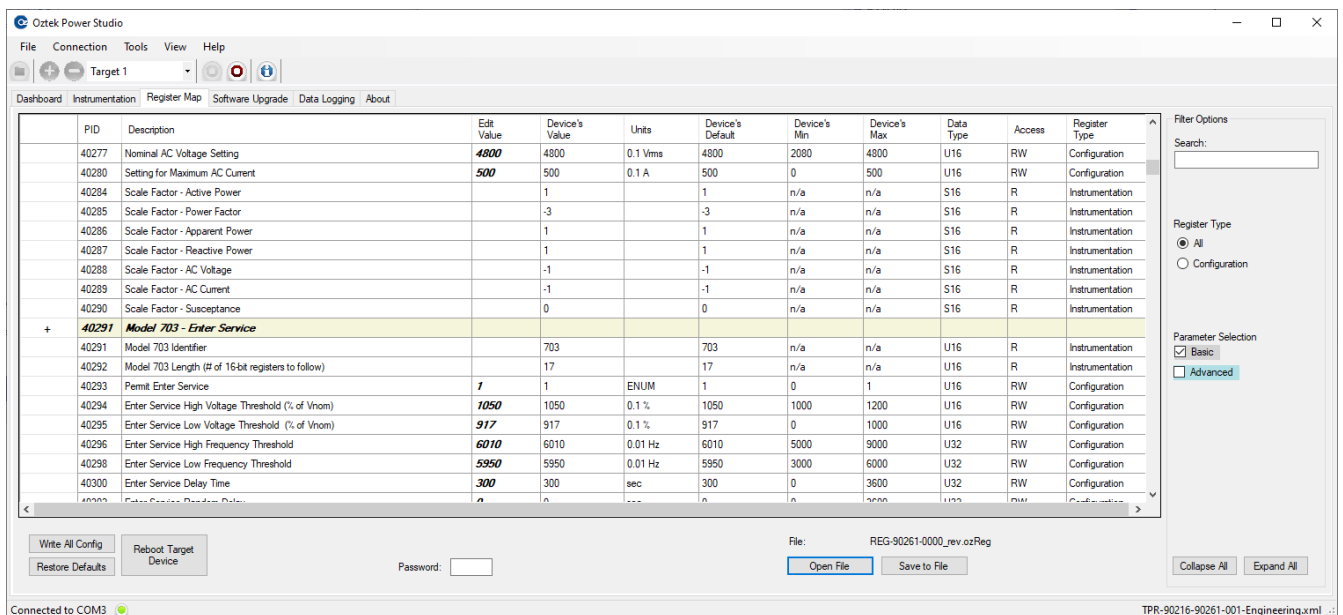


Figure 16 – Register Map When Connected to Target

Once connected, Power Studio will read each of the parameters displayed in the window and display the result. If a Configuration value in the Edit Value column does not match a value read from the target and displayed in the Device's Value column, the value in the Edit Value column will be displayed in red. Parameters that are read-only do not show a value in the Edit Value column and cannot be written to.

## 7.2 Save to File

This button allows the user to save an OzCfg or OzReg file based on the file type that was originally opened. Files can be saved with either the Edit Value column to capture custom user settings or the Device's Value column to capture the target device's settings. Note that when saving device settings, all device values must be read, which may take a minute or longer on some targets.

## 7.3 Writing Single Values

To write a single value to the target, enter the desired value in the Edit Value column and leave the cell or press "Enter." The value will be checked against the minimum and maximum values and then it will be sent to the device if it passes the check. After the value is written, it will be read back and displayed in the Device's Value column. The target must be connected to write values. Note that some products include registers that only update working values on power up. For these registers the "Reboot Target Device" button will need to be pressed or power will need to be cycled for changes in the target's operational control variables to take effect. Consult your products User Manual to identify registers with this constraint.

## 7.4 Write All

The "Write All" button will attempt to write all Configuration values in the Edit Value column to the device. This is useful when commissioning a product by loading a previously saved, custom configuration. Generally, it is good practice to press the "Reboot Target Device" button or cycle power after performing a "Write All" to ensure all changes take effect.

## 7.5 Reboot Target Device

Pressing this button sends the "Configuration Reload" command which causes the target to load the configuration parameters from non-volatile memory into the internal operating control variables in RAM.

## 7.6 Restore Defaults

This button sends the "Restore Defaults" command to the device. This causes the device to reset all configuration parameters back to their factory default settings. Pressing this button

resets the Device's Value column. Note that this command may require a password to be typed into the Password textbox.

## 7.7 Filter Options

The "Filter Options" section allows the user to selectively show or hide parameters either by specifying key words in the Description column or by selecting which register type or group to show.

### 7.7.1 Show Filter

Use the textbox to show only the parameters that contain the text in the Description column. For example, typing "Volt" will display any parameters that contain "Volt" in the description and still match the rest of the filter options.

### 7.7.2 Register Type

These radio buttons filter on the Register Type column in the grid view. The options are to show all parameters or only ones that are Configuration values.

### 7.7.3 Basic/Advanced Checkboxes

These checkboxes toggle the visibility of basic and advanced parameters. Parameters can be grouped into basic parameters which change generic operational settings and advanced parameters which change specific application-related settings. Advanced parameters will show up in Power Studio as a different color than basic parameters (blue). See a product's user manual for a list of parameters in each group. If a user manual does not mention these groups, it is assumed all the parameters are basic parameters.

### 7.7.4 Expand and Collapse All

Use these buttons to expand or collapse all header groups when using an OzReg file. These buttons have no effect when using an OzCfg file.

## 8 Software Upgrade

The Software Upgrade tab is used to download an application using the target's embedded bootloader.

The steps to download an image are as follows and are expanded upon within this section:

1. Connect to a communication port.
2. Select an image to download.
3. Download an image.

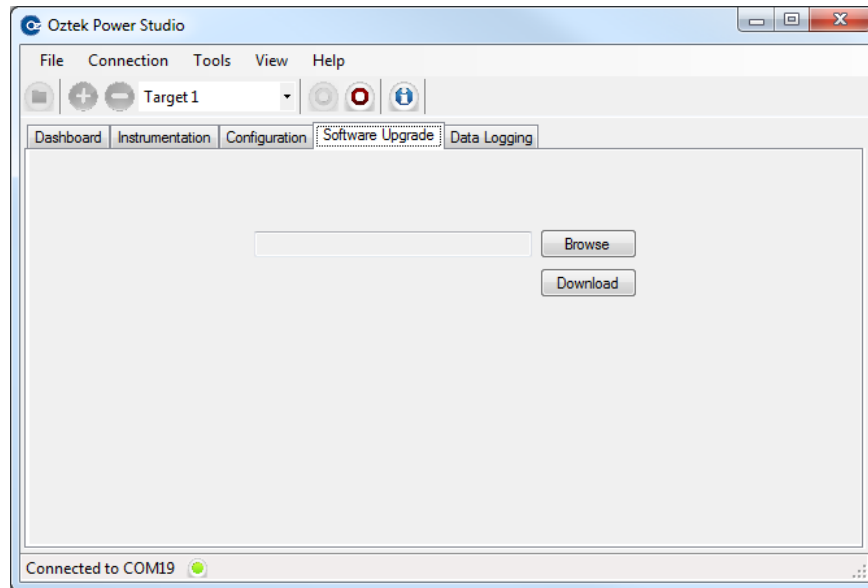


Figure 17 - Software Upgrade Tab

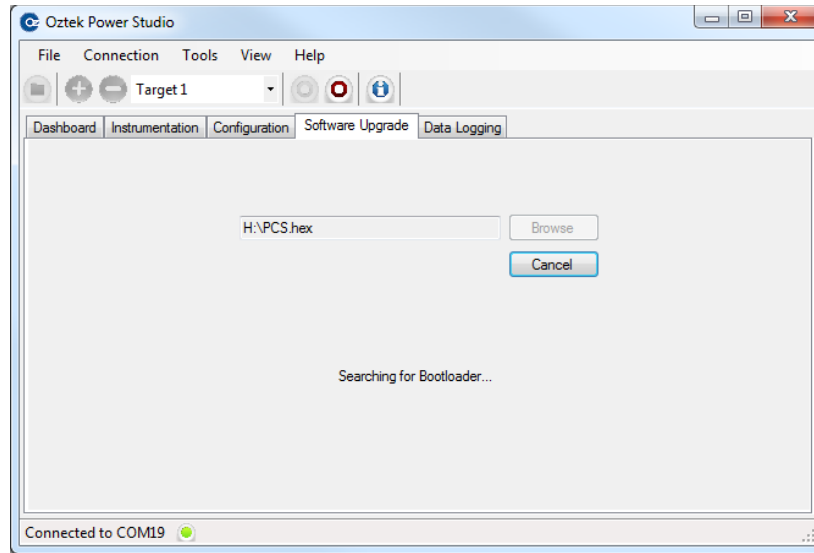
## 8.1 Selecting an Image to Download

Use the “Browse” button to browse for and select an image to download. The selected file should be in the format of “SW90\*\*\*\_revX\_Y.out” or “SW90\*\*\*\_revX\_Y.hex” where \*\*\* is the Oztek software number, X is the major software revision, and Y is the minor software revision. The selected file path will be shown in the textbox next to the “Browse” button.

## 8.2 Using the Bootloader

The target’s embedded bootloader can be launched using one of two possible methods depending on what the device supports:

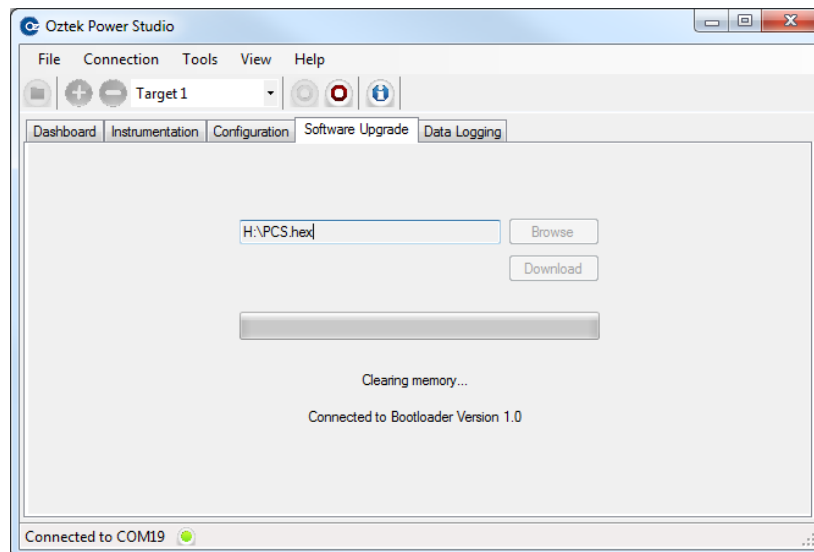
1. With the device powered off, connect to the communication port using the “Connection→Connect” menu item. With an image selected, click “Download” and the text “Searching for Bootloader...” will appear in the middle of the GUI. Wait 4 seconds and power on the device and the bootloader should run and connect.
- 2.
3. While the device is powered on but not running, use the “Connection→Connect” menu item to connect to the device’s communication port. With an image selected, click “Download” and the text “Searching for Bootloader...” will appear in the middle of the GUI and the bootloader will be launched. If the bootloader does not connect and the “Searching for Bootloader...” text persists, then the device may not support this method and method 1 will have to be used. Figure 18 illustrates Power Studio searching for the bootloader.



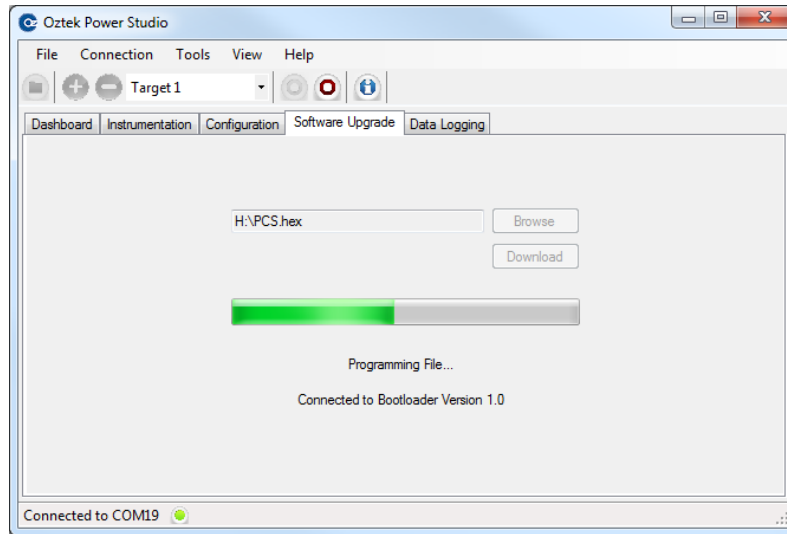
**Figure 18 - Searching for Bootloader**

Once Power Studio connects to a bootloader, the bootloader version is displayed, and the download process starts automatically.

The download consists of two phases: Clearing Memory and Programming. A progress bar is shown during each phase.

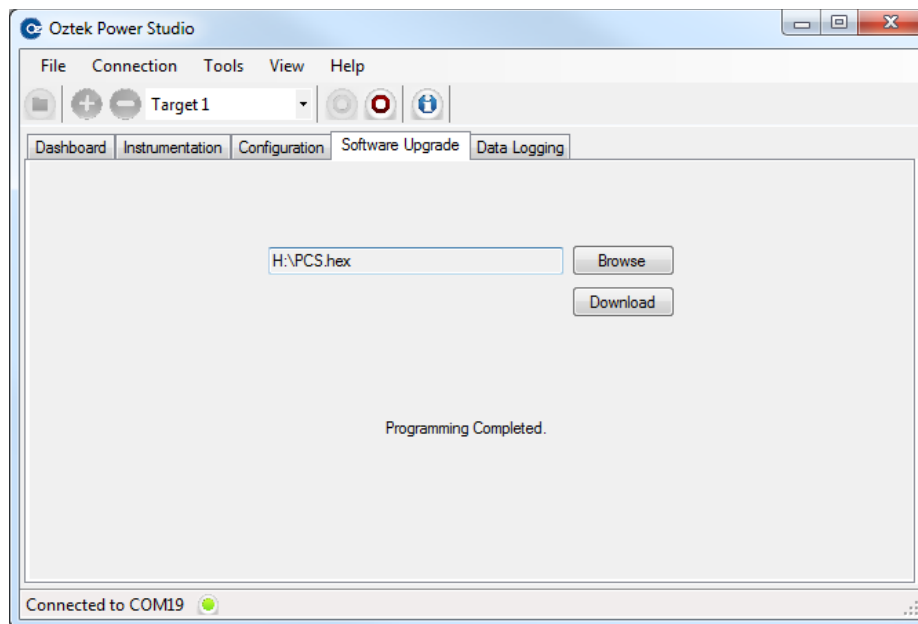


**Figure 19 - Clearing Memory Phase**



**Figure 20 - Programming Phase**

If an error occurs during either of these phases, it is displayed in the middle of the GUI. Otherwise, “Programming Completed” is shown.



**Figure 21 - Programming Completed**

Once a download is complete, the downloaded application is automatically launched. If the application does not launch within a few seconds, the target will need to be power cycled for it to run.

If an error is detected during programming, a Clear Memory command will be sent to wipe the target device of any partial image. If this happens, check the physical device connections, and try downloading the application image again.

## 9 Data Logging

The Data Logging tab is only visible if the target device supports the data logging features. The various features are listed on the left-hand side and only the supported features are enabled.

### 9.1 Fault Log

The Fault Log reads a log consisting of samples taken when a fault occurs. The number of samples captured before or after a fault occurs is device-specific, as well as the maximum number of logs that can be stored.

Timeline	PCS State	PCS Faults	PCS Warnings	DC Voltage	DC Current	AC Voltage AB	AC Voltage BC
0.630	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.620	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.610	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.600	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.590	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.580	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.570	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.560	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.550	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.540	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.530	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.520	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.510	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.500	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.490	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.480	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.470	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.460	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9
0.450	Fault	0x2100000	0x9101	2.3	42.5	0.9	0.9

Figure 22 - Fault Log

A log header is read and displayed across the top of the log detailing the date and time of the fault as well as the number of samples (rows) captured. A timeline is shown in the first column. Positive numbers indicate the time in seconds after the fault occurred and negative numbers indicate the time before the fault.

The controls are shown on the right-hand side, along with the number of logs currently stored on the device. Use the “Get Log List” button to read the timestamp for each log and select which log to read using the dropdown menu. Reading a log can be paused and resumed and the log can be saved to a CSV file once reading is completed.

## 9.2 User Log

The User Log allows the user to collect data based on a configurable event. This data is stored in volatile memory so it will not persist between device POR's.

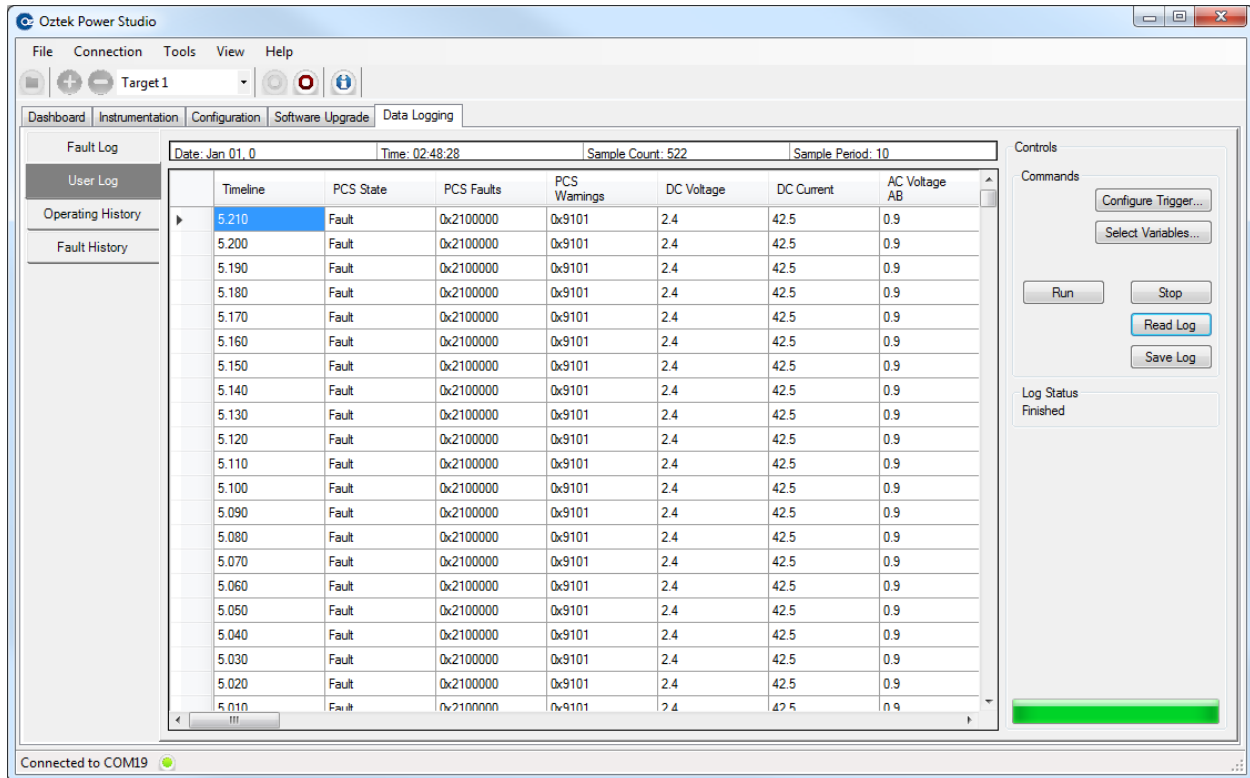


Figure 23 - User Log

Like the Fault Log, the User Log displays a log header above the table of data detailing the date and time as well as the number of samples (rows) captured.

Log controls are located on the right-hand side and the status of the data logger is displayed. Use the “Run” button to arm the log and “Stop” button to force it to stop logging. This log can be read with the “Read Log” button and the “Save Log” button can be used to save the data to a CSV file after reading is completed.

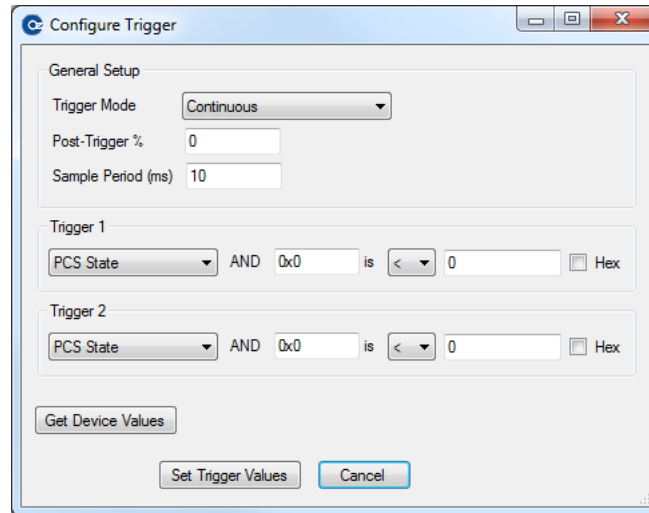
The Log Status shows the current state of the User Log:

- Idle: The log is waiting to be armed
- Running (Pre-Trigger): The log is waiting for the trigger to occur
- Running (Post-Trigger): A trigger has occurred, and post-trigger data is being captured
- Finished: The log has finished capturing data and is ready to be read or rearmed



### 9.2.1 Configure Trigger

Up to two events can be configured as triggers to capture data. Data that is stored can be a mix of before and after the trigger occurs.



**Figure 24 - User Log Trigger Configuration**

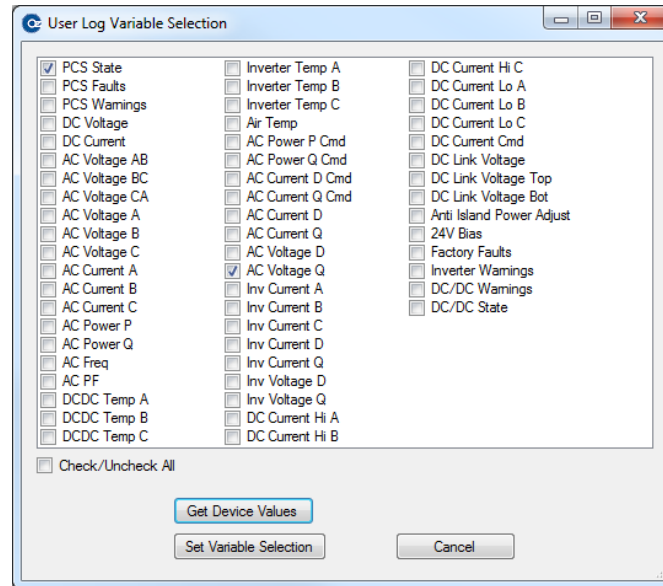
The “Get Device Values” button can be used to query the device and fill in the fields for the currently selected configuration.

- Trigger Mode: Selects the number of trigger events to use
  - Continuous: No trigger. Data is always being logged until the “Stop” button is pressed
  - Single: Only the criteria for Trigger 1 is used as an event to capture data
  - Trigger 1 OR Trigger 2: Captures data when the criteria for either Trigger 1 or Trigger 2 is met
  - Trigger 1 AND Trigger 2: Captures data when the criteria for both Trigger 1 and Trigger 2 are met simultaneously
- Post Trigger %: The percentage of the maximum number of samples to store after the trigger occurs. This varies by target device
- Sample Period: The time in milliseconds between samples
- Trigger 1 and 2: Sets up the events for each trigger. The variable and value threshold to trigger on can be set and specific bits can be masked

Use the “Set Trigger Values” button to send the configuration to the device.

### 9.2.2 Select Variables

This form allows the user to select which variables get stored in the log. The number of samples stored depends on how many variables are selected.



**Figure 25 - User Log Variable Selection**

Use the “Get Device Values” button to retrieve the currently selected variables on the target device. Once the requested variable checkmarks are checked, use the “Set Variable Selection” button to send the configuration to the device.

## 9.3 Operating History

The Operating History log consists of three categories which store data over the life of the device. The categories can be accessed via the tabs at the top of the window.

The controls are on the right-hand side of the GUI. The “Read Log” and “Save Log” buttons read data and save data from the currently selected log.

### 9.3.1 Durations

This log stores the amount of time the device has spent at each operating point in seconds.

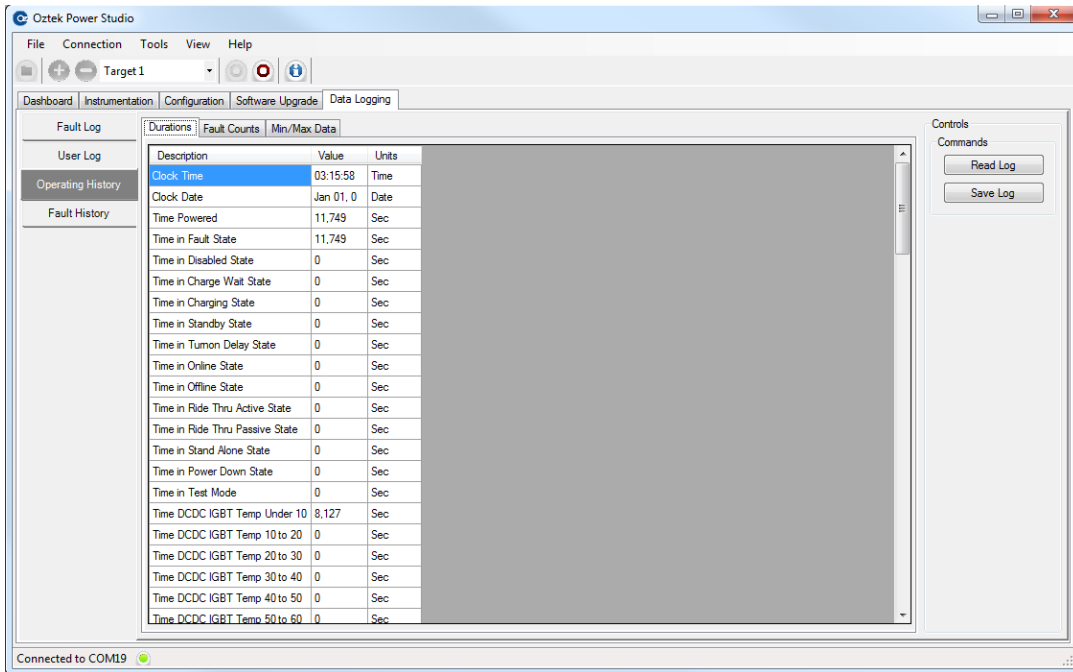


Figure 26 - Operation Log Durations

### 9.3.2 Fail Counts

This log stores the number of times each fault has occurred over the life of the device.

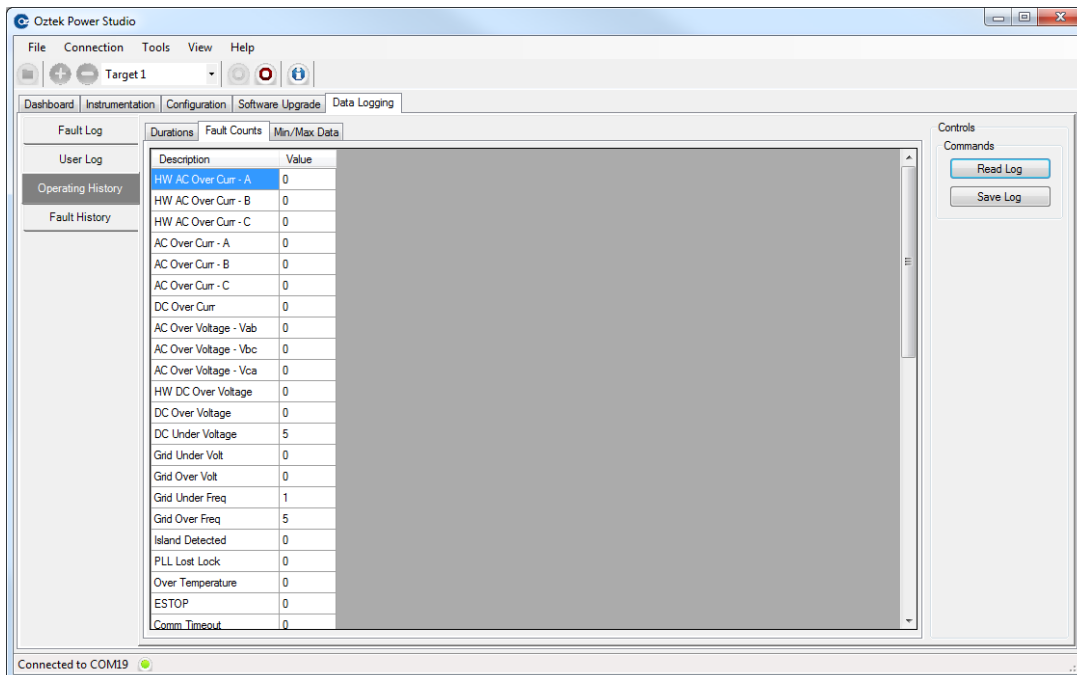


Figure 27 - Operation Log Fault Counts

### 9.3.3 Min/Max Data

This log stores the minimum and maximum values of various measurements over the life of the device.

Description	Value	Units
Max AC Voltage RMS AB	470.0	V
Max AC Voltage RMS BC	480.0	V
Max AC Voltage RMS CA	490.0	V
Max AC Voltage RMS A	390.0	V
Max AC Voltage RMS B	394.0	V
Max AC Voltage RMS C	398.0	V
Max AC Gnd Current RMS A	56.6	A
Max AC Gnd Current RMS B	12.0	A
Max AC Gnd Current RMS C	14.0	A
Max AC Inv Current RMS A	56.8	A
Max AC Inv Current RMS B	22.0	A
Max AC Inv Current RMS C	24.0	A
Max AC Power Real	1,000	
Max AC Power Reactive	1,200	
Max AC Frequency	60.0	Hz
Max DC Link Voltage	900.0	V
Max DC Link Voltage Top	440.0	V
Max DC Link Voltage Bot	460.0	V
Max DC Voltage In	600.0	V
Max DC Current In	56.5	I
Max DC Current Hi A	56.6	I
Max DC Current Hi R	10.0	I

Figure 28 - Operation Log Min/Max Data

### 9.4 Fault History Log

This log shows the timestamps of the last few occurrences of each fault. The number of timestamps stored may vary by product.

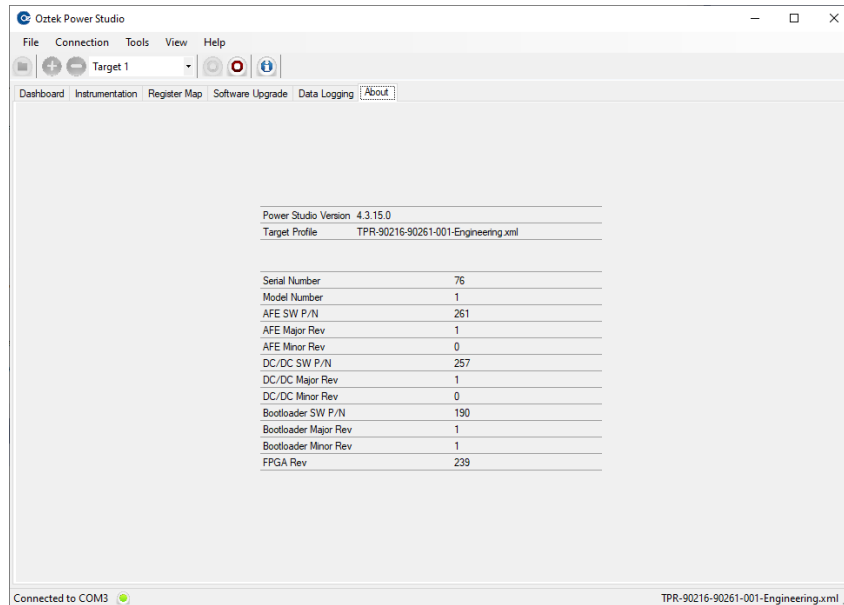
Fault	Most Recent	Least Recent
HW AC Over Curr - A		
HW AC Over Curr - B		
HW AC Over Curr - C		
AC Over Curr - A		
AC Over Curr - B		
AC Over Curr - C		
DC Over Curr		
AC Over Voltage - Vab		
AC Over Voltage - Vbc		
AC Over Voltage - Vca		
HW DC Over Voltage		
DC Over Voltage		
DC Under Voltage	Jan 01, 0 01:04:14	Jan 01, 0 01:03:48
Grid Under Volt		
Grid Over Volt		
Grid Under Freq		
Grid Over Freq	Jan 01, 0 01:04:14	Jan 01, 0 01:03:48
Island Detected		
PLL Lost Lock		
Over Temperature		
ESTOP	Jan 01, 0 03:04:30	Jan 01, 0 02:04:30
Comm Timeout		
Power Down Error		

Figure 29 - Fault History Log

The timestamps are read left to right from most recent to least recent and can be read and saved via the buttons on the right.

## 10 About

The About tab displays information regarding both Power Studio and the Target. Older TPR files do not have support for this page and will only display Power Studio information.



## Warranty and Product Information

### Limited Warranty

**What does this warranty cover and how long does it last?** This Limited Warranty is provided by Oztek Corp. ("Oztek") and covers defects in workmanship and materials in Oztek products. This Warranty Period lasts for 18 months from the date of purchase at the point of sale to you, the original end user customer, unless otherwise agreed in writing. You will be required to demonstrate proof of purchase to make warranty claims. This Limited Warranty is transferable to subsequent owners but only for the unexpired portion of the Warranty Period. Subsequent owners also require original proof of purchase as described in "What proof of purchase is required?"

**What will Oztek do?** During the Warranty Period Oztek will, at its option, repair the product (if economically feasible) or replace the defective product free of charge, provided that you notify Oztek of the product defect within the Warranty Period, and provided that through inspection Oztek establishes the existence of such a defect and that it is covered by this Limited Warranty.

Oztek will, at its option, use new and/or reconditioned parts in performing warranty repair and building replacement products. Oztek reserves the right to use parts or products of original or improved design in the repair or replacement. If Oztek repairs or replaces a product, its warranty continues for the remaining portion of the original Warranty Period or 90 days from the date of the return shipment to the customer, whichever is greater. All replaced products and all parts removed from repaired products become the property of Oztek.

Oztek covers both parts and labor necessary to repair the product, and return shipment to the customer via an Oztek-selected non-expedited surface freight within the contiguous United States and Canada. Alaska, Hawaii and locations outside of the United States and Canada are excluded. Contact Oztek Customer Service for details on freight policy for return shipments from excluded areas.

**How do you get service?** If your product requires troubleshooting or warranty service, contact your merchant. If you are unable to contact your merchant, or the merchant is unable to provide service, contact Oztek directly at:

USA  
Telephone: 603-546-0090  
Fax: 603-386-6366  
Email [techsupport@oztekcorp.com](mailto:techsupport@oztekcorp.com)

Direct returns may be performed according to the Oztek Return Material Authorization Policy described in your product manual.

**What proof of purchase is required?** In any warranty claim, dated proof of purchase must accompany the product and the product must not have been disassembled or modified without prior written authorization by Oztek. Proof of purchase may be in any one of the following forms:

- The dated purchase receipt from the original purchase of the product at point of sale to the end user
- The dated dealer invoice or purchase receipt showing original equipment manufacturer (OEM) status
- The dated invoice or purchase receipt showing the product exchanged under warranty

**What does this warranty not cover?** Claims are limited to repair and replacement, or if in Oztek's discretion that is not possible, reimbursement up to the purchase price paid for the product. Oztek will be liable to you only for direct damages suffered by you and only up to a maximum amount equal to the purchase price of the product. This Limited Warranty does not warrant uninterrupted or error-free operation of the product or cover normal wear and tear of the product or costs related to the removal, installation, or troubleshooting of the customer's

electrical systems. This warranty does not apply to and Oztek will not be responsible for any defect in or damage to:

- a) The product if it has been misused, neglected, improperly installed, physically damaged or altered, either internally or externally, or damaged from improper use or use in an unsuitable environment
- b) The product if it has been subjected to fire, water, generalized corrosion, biological infestations, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the Oztek product specifications including high input voltage from generators and lightning strikes
- c) The product if repairs have been done to it other than by Oztek or its authorized service centers (hereafter "ASCs")
- d) The product if it is used as a component part of a product expressly warranted by another manufacturer
- e) The product if its original identification (trade-mark, serial number) markings have been defaced, altered, or removed
- f) The product if it is located outside of the country where it was purchased
- g) Any consequential losses that are attributable to the product losing power whether by product malfunction, installation error or misuse.

## Disclaimer

### Product

THIS LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY PROVIDED BY OZTEK IN CONNECTION WITH YOUR OZTEK PRODUCT AND IS, WHERE PERMITTED BY LAW, IN LIEU OF ALL OTHER WARRANTIES, CONDITIONS, GUARANTEES, REPRESENTATIONS, OBLIGATIONS AND LIABILITIES, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE IN CONNECTION WITH THE PRODUCT, HOWEVER ARISING (WHETHER BY CONTRACT, TORT, NEGLIGENCE, PRINCIPLES OF MANUFACTURER'S LIABILITY, OPERATION OF LAW, CONDUCT, STATEMENT OR OTHERWISE), INCLUDING WITHOUT RESTRICTION ANY IMPLIED WARRANTY OR CONDITION OF QUALITY, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE TO THE EXTENT REQUIRED UNDER APPLICABLE LAW TO APPLY TO THE PRODUCT SHALL BE LIMITED IN DURATION TO THE PERIOD STIPULATED UNDER THIS LIMITED WARRANTY. IN NO EVENT WILL OZTEK BE LIABLE FOR: (a) ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, LOST REVENUES, FAILURE TO REALIZE EXPECTED SAVINGS, OR OTHER COMMERCIAL OR ECONOMIC LOSSES OF ANY KIND, EVEN IF OZTEK HAS BEEN ADVISED, OR HAD REASON TO KNOW, OF THE POSSIBILITY OF SUCH DAMAGE, (b) ANY LIABILITY ARISING IN TORT, WHETHER OR NOT ARISING OUT OF OZTEK'S NEGLIGENCE, AND ALL LOSSES OR DAMAGES TO ANY PROPERTY OR FOR ANY PERSONAL INJURY OR ECONOMIC LOSS OR DAMAGE CAUSED BY THE CONNECTION OF A PRODUCT TO ANY OTHER DEVICE OR SYSTEM, AND (c) ANY DAMAGE OR INJURY ARISING FROM OR AS A RESULT OF MISUSE OR ABUSE, OR THE INCORRECT INSTALLATION, INTEGRATION OR OPERATION OF THE PRODUCT. IF YOU ARE A CONSUMER (RATHER THAN A PURCHASER OF THE PRODUCT IN THE COURSE OF A BUSINESS) AND PURCHASED THE PRODUCT IN A MEMBER STATE OF THE EUROPEAN UNION, THIS LIMITED WARRANTY SHALL BE SUBJECT TO YOUR STATUTORY RIGHTS AS A CONSUMER UNDER THE EUROPEAN UNION PRODUCT WARRANTY DIRECTIVE 1999/44/EC AND AS SUCH DIRECTIVE HAS BEEN IMPLEMENTED IN THE EUROPEAN UNION MEMBER STATE WHERE YOU PURCHASED THE PRODUCT. FURTHER, WHILE THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, YOU MAY HAVE OTHER RIGHTS WHICH MAY VARY FROM EU MEMBER STATE TO EU MEMBER STATE OR, IF YOU DID NOT PURCHASE THE PRODUCT IN AN EU MEMBER STATE, IN THE COUNTRY YOU PURCHASED THE PRODUCT WHICH MAY VARY FROM COUNTRY TO COUNTRY AND JURISDICTION TO JURISDICTION.

## Return Material Authorization Policy

Before returning a product directly to Oztek you must obtain a Return Material Authorization (RMA) number and the correct factory "Ship To" address. Products must also be shipped prepaid. Product shipments will be refused and returned at your expense if they are unauthorized, returned without an RMA number clearly marked on the outside of the shipping box, if they are shipped collect, or if they are shipped to the wrong location.

When you contact Oztek to obtain service, please have your instruction manual ready for reference and be prepared to supply:

- The serial number of your product
- Information about the installation and use of the unit
- Information about the failure and/or reason for the return
- A copy of your dated proof of purchase

## Return Procedure

Package the unit safely, preferably using the original box and packing materials. Please ensure that your product is shipped fully insured in the original packaging or equivalent. This warranty will not apply where the product is damaged due to improper packaging. Include the following:

- The RMA number supplied by Oztek clearly marked on the outside of the box.
- A return address where the unit can be shipped. Post office boxes are not acceptable.
- A contact telephone number where you can be reached during work hours.
- A brief description of the problem.

Ship the unit prepaid to the address provided by your Oztek customer service representative.

**If you are returning a product from outside of the USA or Canada** - In addition to the above, you MUST include return freight funds and you are fully responsible for all documents, duties, tariffs, and deposits.

## Out of Warranty Service

If the warranty period for your product has expired, if the unit was damaged by misuse or incorrect installation, if other conditions of the warranty have not been met, or if no dated proof of purchase is available, your unit may be serviced or replaced for a flat fee. If a unit cannot be serviced due to damage beyond salvation or because the repair is not economically feasible, a labor fee may still be incurred for the time spent making this determination.

To return your product for out of warranty service, contact Oztek Customer Service for a Return Material Authorization (RMA) number and follow the other steps outlined in "Return Procedure".

Payment options such as credit card or money order will be explained by the Customer Service Representative. In cases where the minimum flat fee does not apply, as with incomplete units or units with excessive damage, an additional fee will be charged. If applicable, you will be contacted by Customer Service once your unit has been received.