



Power Control Center (PCC)

User's Manual

UM-0036

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Table of Contents

1. Introduction.....	1
1.1 Referenced Documents	1
1.2 Definitions.....	1
1.3 Requirements.....	2
1.3.1 System Requirements.....	2
1.3.2 Supported CAN to USB Hardware	2
2. Installation Procedure.....	2
3. Overall Description	3
3.1 Main Window.....	3
3.1.1 Menu Items	4
3.1.1.1 File Menu	4
3.1.1.2 View Menu.....	4
3.1.1.3 Connect Menu	4
3.1.1.4 Window Menu	4
3.1.1.5 Help Menu	4
3.1.2 Toolbar Buttons.....	4
3.1.2.1 Emergency Stop	5
3.1.3 Status Bar.....	5
3.1.3.1 Communication Status.....	5
3.1.3.2 Fault Status	5
3.2 Session Files	5
3.3 Configure Window	6
3.3.1 Product Type.....	7
3.3.2 Target Name	7
3.3.3 Port Selection	7
3.3.4 Baud Rate	7
3.3.5 Protocol	7
3.3.6 Target Id / Source Id	7
3.3.7 Connect / Disconnect	7
3.3.8 Add Target	8
3.3.9 Delete Target	8
3.4 Dashboard Windows.....	8
3.4.1 Faults	9
3.4.2 Status	10
3.4.3 System Control	10
3.4.4 Version Info	10
3.5 Target Configuration Windows.....	11
3.5.1 Config Files.....	11
3.5.2 Sorting Target Data.....	12
3.5.2.1 Show Filter	12
3.5.2.2 Hide Filter.....	12
3.5.2.3 Custom Filter.....	12
3.5.3 Reading Target Data	12
3.5.4 Writing Target Data	12
3.5.5 Resetting Target Data	13
3.6 Monitor Windows.....	13
3.7 Programming Window	13

Warranty and Product Information.....	14
Return Material Authorization Policy.....	16

Table of Figures

Figure 1 – PCC Main window.....	3
Figure 2 – Open Session message box	6
Figure 3 – Target Configure Window	6
Figure 4 – Delete Target Message Box.....	8
Figure 5 – Oztek Motor Controller Dashboard.....	9
Figure 6 – Version Message Box.....	10
Figure 7 – Target Config Window.....	11

1. Introduction

This document is intended to provide instruction on how to use the Oztek Power Control Center (PCC) application (SW90118). The PCC 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]	UM-0021	OZGTI3000 Users Manual
[2]	FS-0046	OzCan Protocol Function Specification
[3]	FS-0047	OzCan AFE Device Profile

1.2 Definitions

AFE	Active Front End
CAN	Controller Area Network
DSP	Digital signal processor
EEPROM	Electrically Erasable Programmable Read Only Memory
EMC	Electro-magnetic compatibility
EMI	Electro-magnetic interference
FOC	Field Oriented Control
GND	Ground, low side of input power supply
GTI	Grid Tied Inverter
GUI	Graphical User Interface
HMI	Human Machine Interface
IPM	Intelligent Power Module
N.C.	Not connected
PCB	Printed Circuit Board
PCC	Power Control Center
PLC	Programmable Logic Controller
PLL	Phase Locked Loop
POR	Power On Reset
PWM	Pulse width modulation
SVM	Space Vector Modulator
VMI	Voltage Mode Inverter

1.3 Requirements

1.3.1 System Requirements

In order for the application to run, the following hardware and software requirements must be met:

1. Microsoft Windows (XP or newer) based PC with an available USB port
2. .NET 3.5 Runtime (available via <http://www.microsoft.com>)

1.3.2 Supported CAN to USB Hardware

The application supports multiple CAN to USB hardware devices. In order for the device to work, the drivers must be previously installed on the system, and the associated DLL files located in the same directory as the application.

Vendor	Device	DLLs	Supported Version
Vector	CANcaseXL	vxlapl.dll, vxlapl_NET20.dll	6.7.60.0, 6.7.0.20874
Softing	CANusb	canL2.dll, CANusbM.dll, CANL2dotNET.dll	5.11.0.1, 5.11.0.1, 1.0.0.0
Peak / Grid Connect	USB/CAN	PCANBasic.dll	1.0.0.4



ATTENTION: Hardware devices should be connected to the computer before launching the Oztek Power Control Center.

2. Installation Procedure

Before installing the Power Control Center, be sure to install all of 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, locate the PCC installation file (note that *MM* represents major revision and *mm* minor revision):

- SW90118_exe_revMM_mm.zip

Unzip this file to any location on the PC's local hard drive. The result will be a two-level directory structure called "SW90118-0001_exe_revMM_mm/Release". This folder contains the

PCCexecutable and it's supporting files. Open the extracted folder and double-click on "Oztek_PCC.exe" to launch the Power Control Center.

3. Overall Description

The Power Control Center (PCC) 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.

The PCC consists of a main window with many sub-windows. The sub-windows can be of type "Dashboard", "Config", and "Monitor". For some Oztek products, there is also an option to reprogram the embedded software image. There is an additional window used for configuring communication with the embedded products. The PCC can communicate with multiple embedded products, or targets, at the same time.

3.1 Main Window

The PCC main window consists of a File menu, a Toolbar, and a Status bar. Figure 1 shows the major components of the Main window and labels some of the Toolbar and Status bar components.

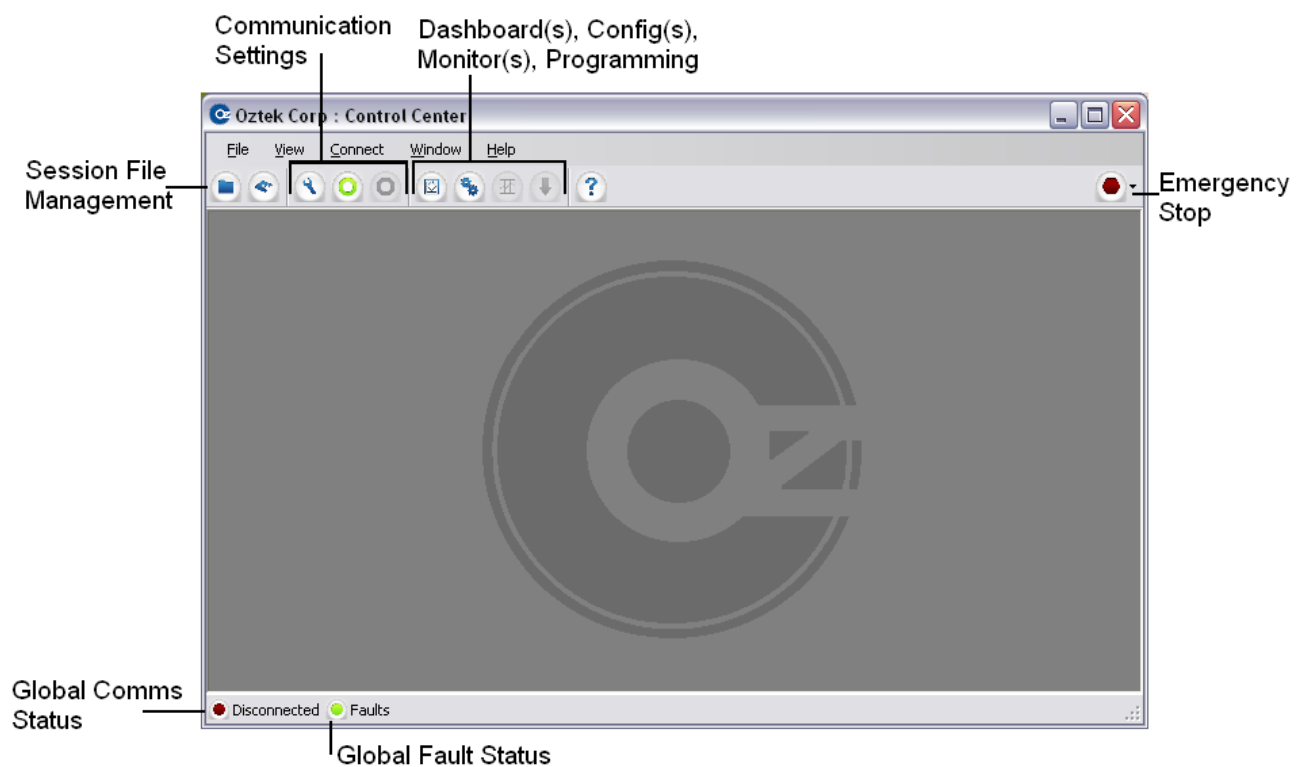




Figure 1 – PCC Main window

3.1.1 Menu Items



3.1.1.1 File Menu

This menu provides Session File Management options as well as an exit button. Session Files are discussed in section 3.2. The functionality available in the File menu is also available as toolbar buttons, Open Session () and Save Session ().

3.1.1.2 View Menu

This menu provides a menu-based method for accessing all of the windows available for a particular target type, which may include Dashboard, Target Config, Data Monitor, and Reprogram.


3.1.1.3 Connect Menu

This menu provides access to the Communications Window (section 3.3), as well as global Connect () and Disconnect () buttons, also available on the Toolbar.

3.1.1.4 Window Menu












This menu provides the user with a means of organizing all open sub-windows. The options include the Windows-standards of Cascade, Tile Vertical, and Tile Horizontal.

3.1.1.5 Help Menu

This menu can be used to display this user's manual, or show version information about the PCC. This user's manual can also be opened by clicking on the toolbar button ().

3.1.2 Toolbar Buttons

The toolbar provides primary access to many of the functions found in the menus. The toolbar buttons provide the following capabilities:

- Open () a session
- Save () a session
- Configure () a Target Communications
- Connect () to all targets
- Disconnect () from all targets
- Open Dashboard () window(s)
- Open Target Config () window(s)
- Open Data Monitor () window(s)
- Open Reprogramming () window
- Open this User's Manual (),
- Emergency Stop button ().




3.1.2.1 Emergency Stop

The emergency stop button sends the “OFF” command to the all connected targets, or just a specific target. The goal of the emergency stop button is to provide the user a safe, quick way to disable the Oztek embedded application(s).




3.1.3 Status Bar

The status bar displays global status for the communications system as well as Target Faults.





3.1.3.1 Communication Status

The Communication status has three states, Disconnected (), Connected (), and Connecting (). If multiple targets are loaded into the session, Connected will be shown when any of the targets are connected.

3.1.3.2 Fault Status


The Fault status displays a global fault status across all targets. If none of the targets are reporting a fault, the green icon () will be displayed. If any of the targets in the session are reporting a warning (), the orange icon will be displayed. And the red icon () will be displayed if any targets report a fault.

3.2 Session Files

The PCC uses *Session* files, with an extension of .ses to store the user’s setup data. These session files describe the type of Oztek Embedded target(s) that the user may be communicating with. The session files describe what type of data to display on the Dashboard () and Data Monitor () windows, as well as the parameter configuration file to load into the Target Config () sub-window. If a target supports field reprogramming (), it will be specified in the session file.

PCC ships with default session files for all standard Oztek Control products. By using the “Add Target” button in the Configure window (see section 3.3); the user can add multiple targets to their session. This allows the user to communicate with multiple targets, such as two separate motor controllers, in a single PCC window.

As a convenience to the user, PCC automatically saves a session each time PCC is closed as “Last_Session.ses”. This session is automatically loaded the next time PCC is opened, restoring communication settings, and remembering sub-window locations.

When the user selects “File->Open Session File” or presses the Open Session File button () on the toolbar, the message box shown in Figure 2 is displayed. This message box allows the user to select a default Product Session file, or load a saved session file from a previous session.

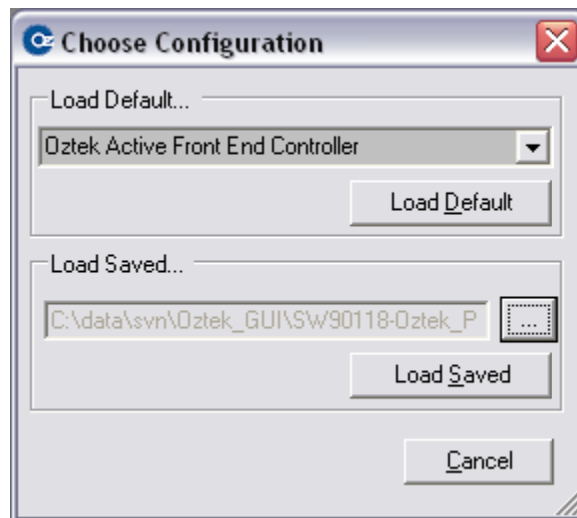


Figure 2 – Open Session message box

3.3 Configure Window

The Configure window allows the user to configure what type of target(s) to communicate with, and how to communicate with them. The following sections describe the elements in the Configure window, shown in Figure 3.

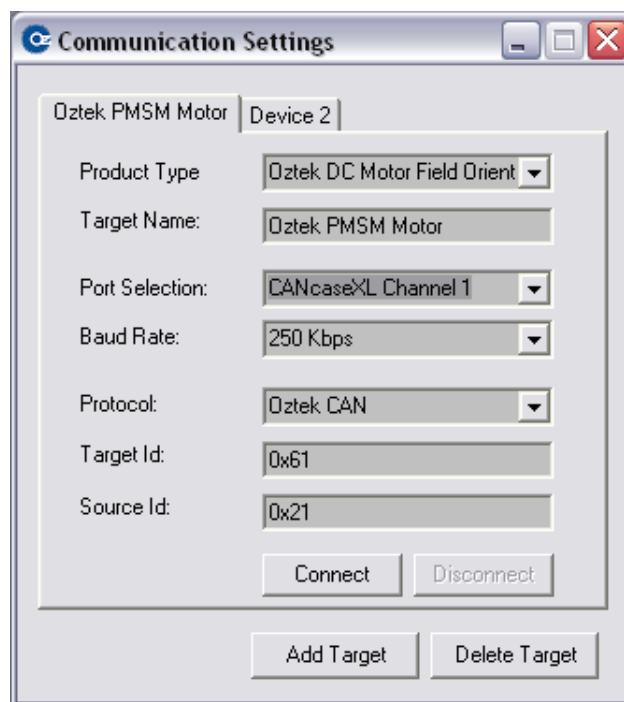


Figure 3 – Target Configure Window

3.3.1 Product Type

The product type allows the user to change what type of embedded Oztek product PCC is talking to. The available product types are set by Oztek and cannot be changed by the user. Changing the Product Type is similar to changing the Session file; other sub-windows will change to match the type of Product the user has selected. Additionally, the other fields on the Configure Window will change to match the Product type. Examples of product types are AFEs, Motor Controllers, or DC/DC converters.

3.3.2 Target Name

The user can rename the Target at any time by editing the text in this field. The name of the target is displayed as part of the title on all other sub-windows.

3.3.3 Port Selection

Port selection allows the user to choose which one of the PC's communication interfaces to use to communicate with the target. Each product type has a defined set of allowable busses, such as serial ports or USB-to-CAN devices that can be used. PCC automatically checks for all available busses on the PC and compares them against the list of allowable devices for a product type.

3.3.4 Baud Rate

Because many communications busses can have variable data rates, this drop-down box allows the user to configure the bus selected above for the correct bus speed. The actual options displayed changes as the user selects different Ports.

3.3.5 Protocol

Many Oztek embedded control products support more than one communications medium, as well as multiple protocol layers. This field allows the user to choose how the PCC will communicate with the target over the specified bus. Example protocols are ModBus, CANopen, OzCan, or other customer specific protocol layers.

3.3.6 Target Id / Source Id

Most multi-point protocol layers have an addressing scheme, assigning a unique identifier to each system on a communication bus. The Target Id and Source Id fields allow the user to specify the Oztek embedded target's unique identifier, as well as how the PCC(or source) should identify itself to the target.

3.3.7 Connect / Disconnect

The *Connect* and *Disconnect* buttons tell the PCC to start communicating with a target. When the *Connect* button is pressed, the buttons in other sub-windows, such as the Dashboard or

Target Config will become enabled. Any status messages that the PCC receives from the specified target will be displayed on the Dashboard (see Section 3.4). The *Disconnect* button will disable all user controls on the other sub-windows. Data on the Dashboard will not be updated, so the last received data will continue to be displayed.

3.3.8 Add Target

This button allows the user to add another target to the Session. After the user presses the *Add Target* button, a new tab will be added to the Configure window, named *Device N*, where *N* is the number of tabs open. The user then must configure all of the options discussed above to complete the *Add Target* process.

3.3.9 Delete Target

When the *Delete Target* button is pressed, a message box window will be displayed, shown in Figure 4. The “Choose Target” field will be blank, but the drop down list will be populated with all of the Targets loaded in the session. To delete a target, select it from the drop down box then select “OK”. Pressing “Cancel” or closing the message box will not delete a target. When deleting a target, any sub-windows related to it will be closed and removed from the main PCC window. Once a target is deleted, there is no tab for it in the Configure window, and it will not be saved in a session file.



Figure 4 – Delete Target Message Box

3.4 Dashboard Windows

Every target has a Dashboard window that can be used to control the target and display its status. The Dashboard displays fault and instrumentation status. It can be used to send commands to the target as well. An example of a Dashboard for an Oztek Motor Controller is shown in Figure 5.

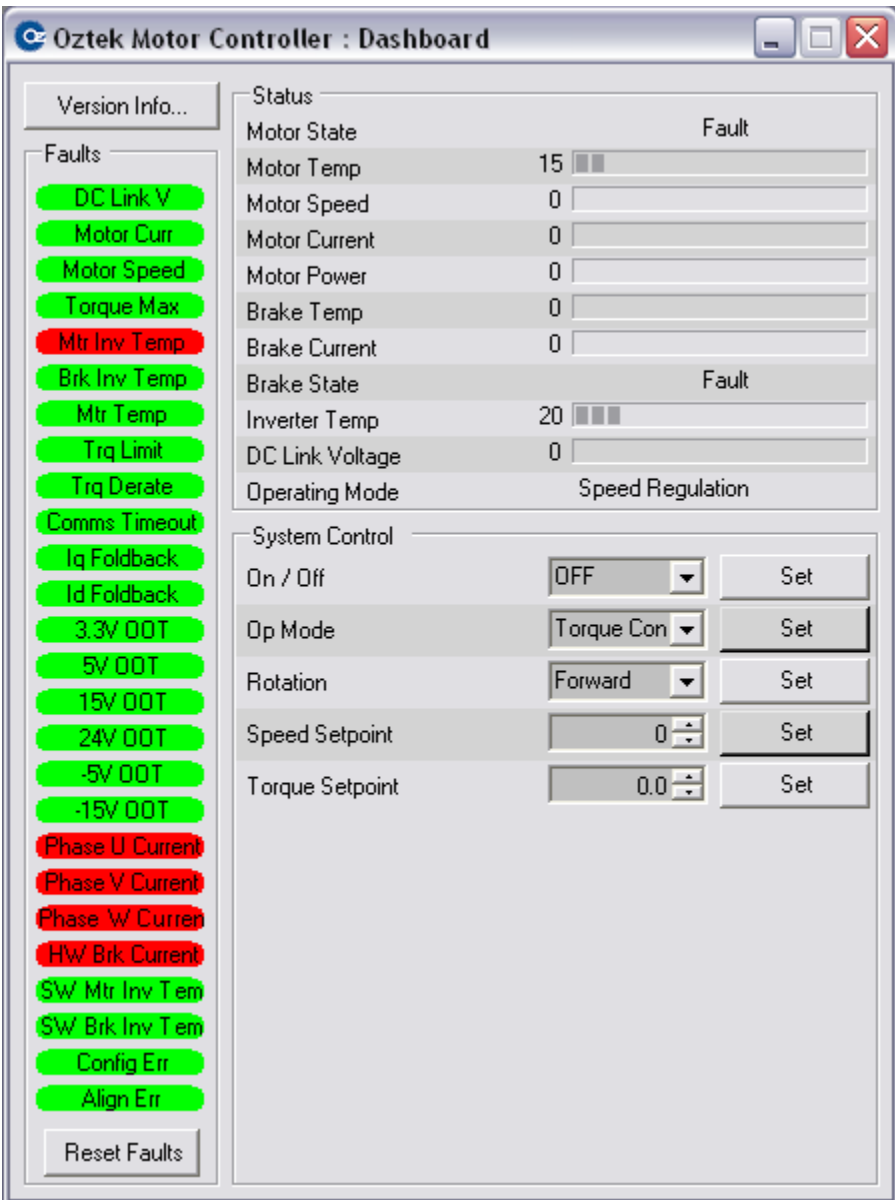


Figure 5 – Oztek Motor Controller Dashboard

3.4.1 Faults

The Fault panel on each Dashboard displays the various fault conditions that exist for a target. When no fault condition exists, the fault is displayed with a green background. When a warning condition exists, a yellow background is used for that item. A red background is used to indicate that a fault condition exists. The warning / fault status is retrieved from the target via the Protocol defined on the Configure Window.

The user can attempt to reset the target’s faults by pressing the “Reset Faults” button. This will generate the appropriate protocol command necessary to reset the target’s faults. This button

does not reset the faults on the window. Only if the fault condition is cleared by the target will it be reflected on the Dashboard.

3.4.2 Status

The Status panel on each Dashboard displays any instrumentation data available via the Communication protocol for a particular target. PCC supports displaying enumerated types as text, as shown in Figure 5 by the *Motor State*, *Brake State*, and *Operating Mode* data.

For instrumentation data with numerical values, a bar graph is displayed. The bar graph indicates the percent of the maximum value that is being reported. This is a useful indicator of how close a value is to reaching a warning or fault value.

3.4.3 System Control

The System Control panel allows the user to interact with a Target. These commands can be used to change the runtime operating mode or control parameters of a target. In Figure 5, the On / Off command is the same command that would be used if the Emergency Stop (see Section 3.1.2.1) button were pressed.

The PCC is capable of multiple control types, either an Enumerated type such as “OFF” and “ON”; integer values, shown for Speed Setpoint; or decimal values shown for Torque Setpoint. The actual limitations are defined by the communication protocol in use for the target.

3.4.4 Version Info

Pressing the “Version Info...” button will display a message box, shown in Figure 6. The message box displays version information provided by the target. Note that not all Targets will report all of the data in the message box; instead an “n/a” will be displayed.



Figure 6 – Version Message Box

3.5 Target Configuration Windows

The Target Config windows allow the user access to a Target's non-volatile memory. Non-volatile memory is used to store configuration data for the target, such as fault thresholds, or default operating modes. For more details on a particular target's non-volatile configuration data, consult that Product's User's Manual or Functional Specification.

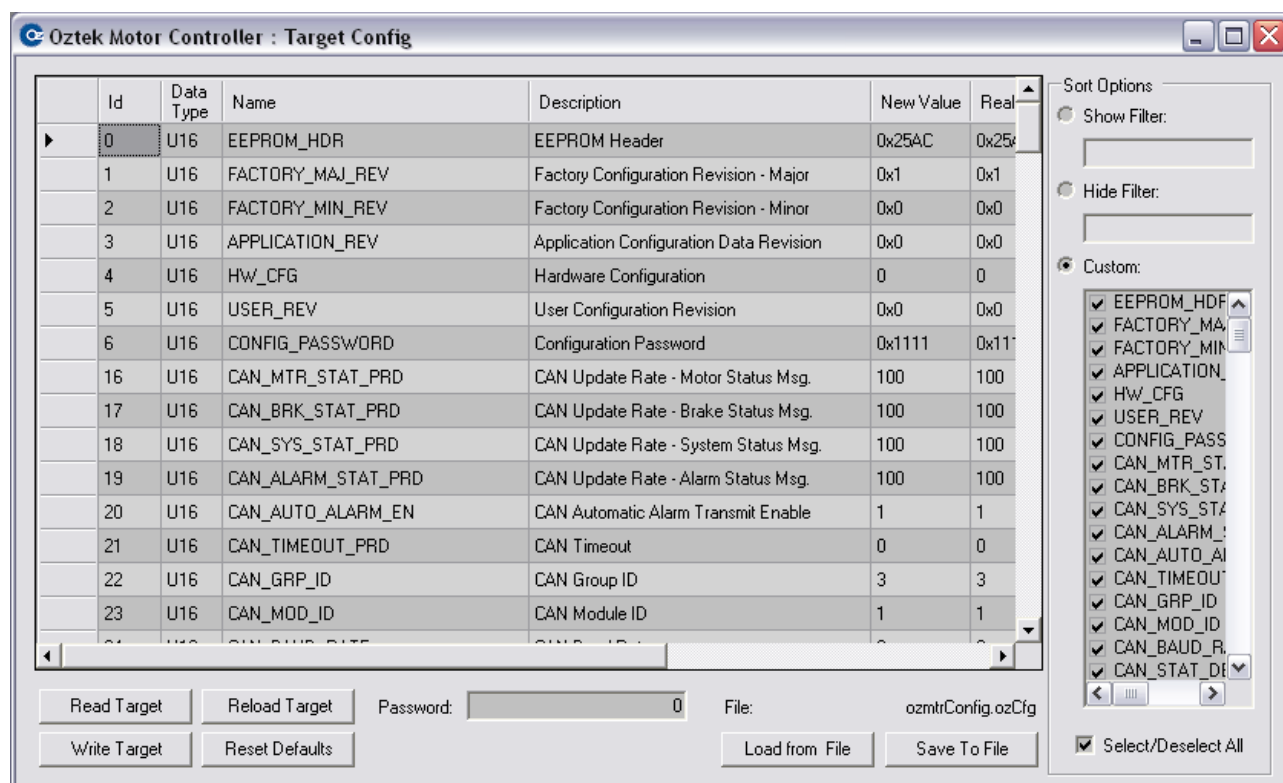


Figure 7 – Target Config Window

3.5.1 Config Files

Each Oztek Product type has a default Oztek Config, .ozCfg file associated with it. However, it is possible to change the file by using the “Load From File” button. The “Load From File” button only displays the configuration data in the Target Config window, it does not actually load any data into the target.

The user may modify the Oztek Config and save the file under a different name. This allows the user to create and save a custom configuration for later use. Oztek will always provide a default Config file for each Product Type that PCC supports. The default Oztek Config file is automatically saved to the session file associated with the user's selected target(s).

3.5.2 Sorting Target Data

Because there can be a large number of configuration parameters, there are several methods available to help the user select which data is displayed in the window.

3.5.2.1 Show Filter

The user can select this filter method by clicking on the radio button labeled “Show Filter”. The text box will now be enabled. Only configuration parameters that contain the text typed into this box will be shown in the window. If no text is entered, all configuration parameters will be displayed.

3.5.2.2 Hide Filter

The user can select this filter method by clicking on the radio button labeled “Hide Filter”. The text box will now be enabled. Only configuration parameters that do not contain the text typed into this box will be shown in the window. If no text is entered, all configuration parameters will be displayed.

3.5.2.3 Custom Filter

The user can select this filter by clicking on the radio button labeled “Custom”. The list box will now be enabled. Only configuration parameters that are checked will be displayed in the window. If no boxes are checked, no parameters will be shown in the window. A “Select/Deselect All” option is available to aid in creating custom filters.

3.5.3 Reading Target Data

When the “Read Target” button is pressed, POC will automatically retrieve the Target’s values for all configuration parameters displayed in the window. The actual value stored in the target will be displayed in the column “Real Data”.

Some configuration parameters may require a password to read them. Before pressing the “Read Target” button, enter in the required 4-digit hexadecimal value in the text box labeled “Password”. The text box will only accept entry of 4 digits.

If there is an error during the Read process (such as a parameter is not readable, or incorrect password), a red error indicator will be displayed to the left of the corresponding parameter ID (PID). Moving the mouse over the error will display a Tool Tip that indicates what the error was.

3.5.4 Writing Target Data

The user can enter new values for a configuration parameter by editing the field labeled “New Value”. This input supports entry as hexadecimal data, integer data, or decimal data, depending on the parameter’s data type. If a parameter is not a writable, the user will not be able to edit this field. The access permission (Read-only or Writable) is displayed in the last column of the data table.

Some configuration parameters may require a password in order to write them. Before pressing the “Write Target” button, enter in the required 4-digit hexadecimal value in the text box labeled “Password”. The text box will only accept entry of 4 digits.

When the “Write Target” button is pressed, PCC will attempt to write all of the parameters displayed in the window with their new values. If the write is not a success, a red indicator will be displayed to the left of the corresponding PID. Moving the mouse over the error will display a Tool Tip that indicates what the error was.

After a successful write, any attempts to read the parameters will display the new value in the “Real Value” column. However, the data is not loaded into the Target’s RAM (i.e. it has only been updated in the non-volatile configuration memory). The embedded application will reload its run-time configuration variables stored in RAM from the non-volatile memory if the “Reload Target” button is pressed. It is then recommended that the user use the “Read Target” button to update the “Real Value” columns for all parameters after performing a Reload operation.

3.5.5 Resetting Target Data

If the user wishes to reset the Target’s non-volatile configuration data to the factory defaults, the user must enter in the correct password to the Password text box, and then press the “Reset Defaults” button. It is then recommended that the user use the “Read Target” button to update the “Real Value” columns for all parameters. Note that any configuration parameters that were previously changed from the factory default values will be overwritten, so care should be taken to save any custom configuration data to a file prior to resetting the target data.

3.6 Monitor Windows

Note: this feature is in development and is not supported by the current release of PCC.

Monitor windows are intended to let the user watch values over time, similar to the Status Panel of a Dashboard. In addition to displaying the current value, it is possible to graph the values over time.

3.7 Programming Window

Note: this feature is in development and is not supported by the current release of PCC.

Some targets support in-field reprogramming. If a target supports the reprogramming function, it will be specified in the Target’s default Session File. This feature of PCC allows a user to update the Oztek Control board’s programmable images, such as the embedded controller’s firmware, an embedded programmable logic device (FPGA / CPLD), or other embedded non-volatile memory device.

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

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

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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.