



## EZcalPro

Advanced hand-held device, configures and diagnoses controllers

### General features

- Diagnosis and configuration of PG Trionic controllers
- "Quick HELP" gives instant access to diagnostic help from any menu
- Built-in USB storage for file transfer between controllers and PCs
- SAVE and LOAD functions allow controller settings to be saved for documentation, and loaded to another controller for easy repeating of machine configuration
- "PGFLASH" function for easy controller software updates
- Advanced features include "GETCURVE" and "QUICKLOG"





## 1.1 Description

The EZcalPro is a hand-held device used to diagnose and configure machine controllers from PG Trionic Inc. The device has a two line x 16 character backlit display, a 7 button keypad, RS232 / power connection, and USB connection.

When connected to a PG Trionic Inc controller, the buttons and display are used to access, view and alter controller diagnostics and adjustments.

When connected to a PC via USB, files can be written to or read from the EZcalPro; subsequently the EZcalPro can use the files to enable field diagnosis and update of controllers without needing a PC.

## 1.2 EZcal functionality

The EzcalPro can be used instead of an EZcal, for diagnosing and configuring a controller – simply use the supplied four pin connector cable between the EZcalPro and the controller.



When the EZcalPro is connected, the display lights up and shows the initial controller menu, typically like:

The LEFT (◀) and RIGHT (▶) arrow keys can be used to select different controller menus, while the ENTER key opens the menu and the ESC key escapes back out of an opened menu:



The UP (▲) and DOWN (▼) arrow keys can adjust some controller values.



All normal controller menu functions are available, including DIAGNOSTICS, ADJUSTMENTS, and SETUPS menus.

### 1.3 EZcal “?” Quick HELP

The EZcalPro “?” button instantly shows the controllers current HELP message, while viewing any controller menu (there is no need to exit the current menu and navigate to the HELP menu).



The current HELP message is displayed while the “?” button is pressed; the EZcalPro immediately reverts to the original menu display, once the button is released:

### 1.4 Accessing EZcalPro functions

The EZcalPro incorporates a number of “computer like” features so that a PC is not needed for many controller configuration tasks, such as updating the controller software or copying settings & adjustments from one controller to another.

The EZcalPro functions are accessed from a set of menus separate to those of the connected controller; access to the EZcalPro menus is possible:

- 1) Press and hold the ESC key while connecting the EZcalPro to the controller, or
- 2) Press and hold the ESC key for about 5 seconds, if the EZcalPro is already connected to the controller
- 3) Press the ESC key while pressing the “?” button (avoids the 5 second delay)

In each case, the EZcalPro menus will show, with the initial SETUP option:



The LEFT (◀) and RIGHT (▶) arrow keys can be used to select different EZcalPro menus, while the ENTER key opens the menu and the ESC key escapes back out of an opened menu. EZcalPro menus include:



SETUP, SAVE, SAVEquick, LOADquick, PGFLASH, QUICKLOG, GETCURVE, ABOUT

NOTE: Press the “?” button at the menu, to immediately see the EZcalPro version.

## 2.1 EZcalPro SAVE menu

The EZcalPro SAVE menu enables all data in the connected controller to be saved to USB storage in the EZcalPro; subsequently the file can be accessed from a PC, or used to load the same data to another controller (ie: copying from one controller to another).

The SAVE function saves all controller information including ADJUSTMENTS, SETUPS, DIAGNOSTICS, etc; an eight character filename can be specified to identify the data, and the file has a “.PGT” extension – example:

```
[DIAGNOSTICS]
"SYSTEMdriveENABLE","NO","0",6
"SYSTEMboomENABLE","NO","0",7
"SYSTEM B+SUPPLY","10.9V","13039",8
...
[ADJUSTMENTS]
"DRIVE FWD MIN","36%","36",292
"DRIVE FWD MAX","55%","55",293
...
```

To SAVE all controller data to a USB storage file:

- Access the EZcalPro menus and select the SAVE menu
- Enter an appropriate filename; press UP/DOWN to set each character, and LEFT/RIGHT to move between characters; press ENTER when the filename is correct
- The EZcalPro will prompt for confirmation, displaying “:NO” after the filename; to confirm the filename and begin the SAVE, press UP/DOWN to show “:YES” then press ENTER
- The EZcalPro will now create the filename in USB storage, read all data from the controller, and write it to file; this will take a long time (30s or longer)
- The display will show the data being written as the EZcalPro works: DIAGNOSTICS, ADJUSTMENTS, SETUPS, etc. When complete the display will show “OK”; press ESC to exit the SAVE menu

## 2.2 EZcalPro SAVEquick menu

The EZcalPro SAVEquick menu is very similar to the SAVE menu, however only ADJUSTMENTS and SETUPS are saved – diagnostic data is omitted so that the SAVEquick function takes less time.

The SAVEquick menu is useful when it is desired to transfer controller data to another controller – use the SAVEquick menu to save the original controller data, then use the LOADquick menu on the new controller.

To SAVEquick controller data to a USB file:

- Proceed the same way as for the SAVE menu (but the process will be quicker)



## 2.3 EZcalPro LOADquick menu

The EZcalPro LOADquick menu enables ADJUSTMENTS and SETUPS that have been saved from a controller, to be loaded to another controller – once done, both controllers will be identically configured.

To LOAD controller data from a previously saved USB file:

- Access the EZcalPro menus and select the LOADquick menu
- All available filenames (with “.PGT” extension) are displayed, one by one, followed by the “:NO” confirmation prompt
- If the filename displayed is not the correct one, press ENTER with “:NO” to reject that filename and display the next
- When the correct filename is displayed, press UP/DOWN to show “:YES” then press ENTER to confirm that filename
- The EZcalPro will display “WORKING” while the data in the file is compared with that in the controller
- The EZcalPro will display “LOADCOUNT=”, indicating how much data needs to be changed in the controller, followed by a percent complete while the changes are made
- The EZcalPro will display “OK” when all data in the controller matches that in the file; press ESC to exit the LOADquick menu

**IMPORTANT:** Ensure that data is only transferred between identical controllers running the same software – loading data for one controller to a different type of controller will have unexpected and possibly dangerous effects on the vehicle!

The EZcalPro will detect an attempt to load data for the wrong controller type, and will display a warning like “MACHINE CODE CHANGED” or “MODEL CHANGED” – this is a warning to cancel the LOAD operation.



## 2.4 EZcalPro PGFLASH menu

The EZcalPro PGFLASH menu allows the software of a connected controller to be updated, perhaps to provide new vehicle functionality. Controller software files have a “.REC” extension, and are provided by PG Trionic Inc according to customer needs. File contents are a meaningless sequence of letters and numbers, and should never be altered!

```
S113F60050475420444953504C41592056312E31CF  
S113F6100032303039205047205472696F6E69636C
```

```
...  
S105FFFEF628DF  
S903F60006
```

A supplied controller software “.REC” file must first be transferred to USB storage in the EZcalPro, then the EZcalPro can be connected to the controller to update it.

To PGFLASH new controller software:

- Access the EZcalPro menus and select the PGFLASH menu
- All available filenames (with “.REC” extension) are displayed, one by one, followed by the “:NO” confirmation prompt
- If the filename displayed is not the correct one, press ENTER with “:NO” to reject that filename and display the next
- When the correct filename is displayed, press UP/DOWN to show “:YES” then press ENTER to confirm that filename
- The EZcalPro will proceed with updating the controller software, displaying various messages while working:  
ACCESSING BOOT  
CHECKING BOOT  
ERASING  
PROGRAMMING
- A percent complete shows progress (the PGFLASH process can take up to a few minutes to complete); when complete an OK/FINISHED message is displayed (the new controller software version is also displayed)
- If there are any errors, be sure to confirm that the correct software file was chosen, matching the connected controller – if necessary the ABOUT menu can provide additional help with problems

NOTE: Normally the PGFLASH routine communicates with the controller at HIGHSPEED (as fast as possible); in rare circumstances this may cause erratic failures. If this is suspected, the EZcalPro SETUP menu can be used to disable HIGHSPEED – the PGFLASH routine will then proceed more slowly.



## 2.5 EZcalPro GETCURVE menu

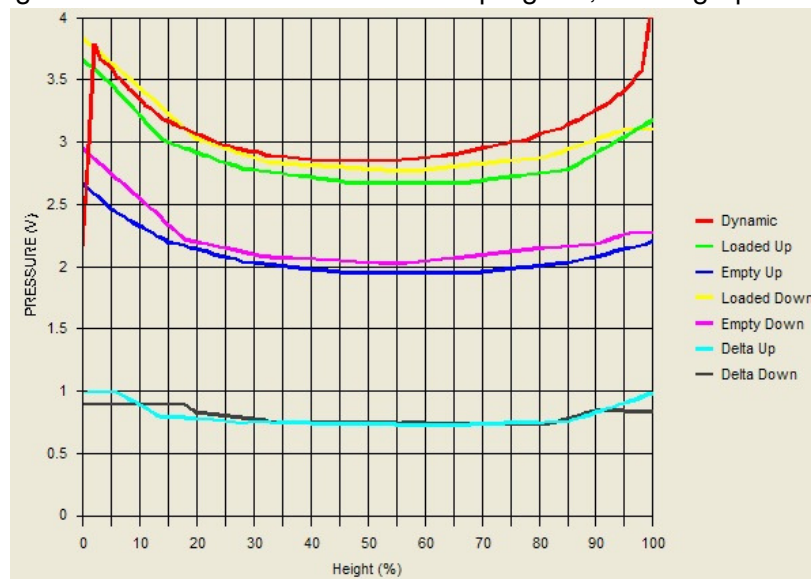
The EZcalPro GETCURVE menu saves the platform overload calibration curve data in the connected controller to be saved to USB storage in the EZcalPro; subsequently the file can be accessed from a PC.

This function is only useful for controllers which implement curve-based platform overload.

To store platform overload curve data to a USB file:

- Access the EZcalPro menus and select the GETCURVE menu
- Enter an appropriate filename; press UP/DOWN to set each character, and LEFT/RIGHT to move between characters; press ENTER when the filename is correct
- The EZcalPro will prompt for confirmation, displaying “:NO” after the filename; to confirm the filename and begin storing the curve data, press UP/DOWN to show “:YES” then press ENTER
- The EZcalPro will now create the filename in USB storage, read the platform overload data from the controller, and write it to file; this will take a long time (30s or longer)
- The display will show various messages as the EZcalPro works; when complete FINISHED is displayed

NOTE: The file created by GETCURVE may have a “.CRV” or “.LOG” extension, depending on the controller type; in either case the file can be viewed on a PC with using the PG Trionic Inc GETCURVEW program, which graphically shows the curves:



## 2.6 EZcalPro QUICKLOG menu

The EZcalPro QUICKLOG menu can store selected controller values to a file in USB storage, while the machine is being tested (for example to record motor voltage / current). Please see “EZcalPro Advanced Instructions” for more information.



## 2.7 EZcalPro SETUP menu

The EZcalPro has a number of special setup options, accessible in this menu; generally the setup options are needed only rarely:

- EZCAL MODE (legacy, smart); please see “EZcalPro Advanced Instructions” for more information
- DEBUG (no, yes); assists with resolving EZcalPro communications issues
- HIGHSPEED (yes, no); disables highspeed PGFLASH updating if problems occur
- FORMAT (no, yes); formats the USB storage in the EZcalPro, wiping all data
- QUICKLOGrate; please see “EZcalPro Advanced Instructions” for more information
- TRANSLATE (no files, yes, no); please see “EZcalPro Advanced Instructions” for more information

To select the EZCAL MODE of the EZcalPro:

- Access the EZcalPro menus and select the SETUP menu
- Access the EZCAL MODE sub-menu; press UP or DOWN to choose LEGACY or SMART, then ENTER to exit the EZcalPro menus and return to EZcal mode showing controller menus, using the selected mode
- NOTE: The selected mode is remembered until it is changed again

To use the DEBUG function of the EZcalPro:

- Access the EZcalPro menus and select the SETUP menu
- Access the DEBUG sub-menu; press UP/DOWN to choose “:YES” to enable debug
- Now all RS232 communications with the controller will be logged; proceed to carry out the problem activity
- Once the problem activity has been completed, return to this DEBUG sub-menu in the EZcalPro SETUP menu, and press UP/DOWN to choose “:NO” to stop debug – this is critical, so that the created debug file is available for access in USB storage
- Finally, connect the EZcalPro to a PC and copy the file DEBUG.TXT from USB storage – this file can be provided to PG Trionic Inc engineers to assist with resolving the communications problem

To change the HIGHSPEED mode of the EZcalPro:

- Access the EZcalPro menus and select the SETUP menu
- Access the HIGHSPEED sub-menu; press UP/DOWN to choose “:YES” to enable highspeed, or “:NO” to disable
- When HIGHSPEED is enabled, the PGFLASH update of controller software occurs at maximum speed; when disabled, the update occurs at standard speed
- Normally using the HIGHSPEED mode is recommended (so choose “:YES”)
- NOTE: The selected mode is remembered until it is changed again

To FORMAT the USB storage in the EZcalPro:

- Access the EZcalPro menus and select the SETUP menu
- Access the FORMAT sub-menu; press UP or DOWN to choose YES, then ENTER to begin wiping all USB storage in the EZcalPro
- The message “WORKING” will be displayed, followed by “OK”

The FORMAT sub-menu wipes the USB storage in the EZcalPro, erasing all files; this should be used in preference to using the format command on a computer, to ensure that the storage is prepared so that the EZcalPro can access it.



## 2.8 EZcalPro ABOUT menu

The EZcalPro ABOUT menu displays various information about the EZcalPro, as well as information about the latest PGFLASH (in case there was a problem).

To view the ABOUT menu of the EZcalPro:

- Access the EZcalPro menus and select the ABOUT menu
- Press LEFT or RIGHT to move through the different ABOUT information displays; press ESC to exit
- Information displays in the ABOUT menu include:
  - Copyright information
  - EZcalPro version build information
  - USB storage information (including file count)
  - MACHINE information (model/version for connected controller)
  - RS232 code/tx/rx information (details last RS232 message to/from controller)
  - BOOT/FLASH/CODE information (details last PGFLASH activity)
  - DCODE information (details any unsupported SMART EZcal menu)
  - DEV ID/DEVREV information (internal identification data)
  - V/T information (supply voltage, internal temperature data)

**IMPORTANT:** When the ABOUT menu is entered, the file EZCALPRO.TXT is created in USB storage, with all information – there is no need to copy the displayed information, as this file can be accessed instead:

```
©2009 PG Trionic Inc
V3.05 Mar 4 2010
FILE SYSTEM OK (11)
MACHINE=439/V1.6
CODE=$10,TX=$02,RX=$82,ADDR=$076C,LEN=$04,ERR=$20
BOOT=160, FLASH=12, CODE=0
DCODE=0,ADDR=0,MSG=$0000
DEV ID=$1009, DEVREV=$0001
V=10.4, T=172
```

## 2.9 EZcalPro BACK TO EZCAL menu

This menu provides a return to displaying EZcal controller menus (in LEGACY or SMART mode); simply select the BACK TO EZCAL menu and press ENTER.



## 3.1 EZcalPro USB connection

The EZcalPro provides an industry standard “mini USB” connector which both powers the EZcalPro and allows for stored files to be accessed by a PC. Files created on the EZcalPro (by SAVE, GETCURVE, etc) can be read by the PC; new files can also be stored in the EZcalPro from the PC (for later access by PGFLASH, LOAD, etc)

**IMPORTANT:** When changing files on the EZcalPro, do not disconnect until the change is complete; the EZcalPro will flash the display illumination when files are being changed by a PC connected via USB.

Be sure to properly “eject” the EZcalPro before disconnecting it; some computers do not properly finish writing files until the device is ejected.

The EZcalPro USB file storage can display filenames of more than 8 characters; however, files created on the EZcalPro (by SAVE, GETCURVE, etc) are limited to no more than 8 characters.

The EZcalPro can act as a USB serial device, enabling communication with a PG Trionic Inc controller from a PC running certain programs.

To use this feature:

- Connect the EZcalPro to the controller in the normal way
- Now also connect USB between the EZcalPro and the USB
- Wait for the EZcalPro to be fully connected (the USB storage drive window will display)
- Run the supported PG Trionic Inc program, go to the File menu and check the “Connect via EZcalPro” option

**NOTE:** Only a limited set of PG Trionic Inc programs can use the EZcalPro as a USB serial device.

Do not leave the EZcalPro connected via USB to a PC which goes to sleep (extra current drawn by the EZcalPro may drain batteries and cause the PC to switch off).