

COMPLETE CALIBRATION

Replacement TS100 Drive Module

Before You Begin

When replacing or configuring a controller, the machine configuration and calibration must be established before the machine is returned to operation. There are two methods available:

Option A — Clone an Existing Controller

Use the EZcal **CLONE SAVE / CLONE RESTORE** function to transfer the configuration and calibration data from a properly operating machine of the **same model and controller type**. This method allows existing machine configuration and calibration data to be copied to the replacement controller.

Option B — Calibrate the Machine

If a compatible, properly operating machine is not available for cloning, configure and calibrate the machine using the instructions below.

IMPORTANT: Clone data should only be transferred between machines of the same model and controller type. **TS100 and TS100XE boards cannot be cloned to each other.** TS100 data may only be transferred to a TS100 board, and TS100XE data may only be transferred to a TS100XE board.

Complete Calibration Overview

When installing a new TS100 module into a Pro Series or Zero Turn lift, a complete calibration will be necessary if it is not possible to clone the original controller.

CAUTION: MAKE SURE YOU HAVE SUFFICIENT OVERHEAD CLEARANCE TO FULLY RAISE THE PLATFORM.

There are three steps to the calibration:

1. **Tilt** — Sets the Tilt Sensor to Zero
2. **Height** — Establishes a Range for the Angle Sensors
3. **Load** — Establishes the Range for the Pressure Transducer

1. TILT CALIBRATION

Sets the Tilt Sensor to Zero

1. Place unit on level ground.
 2. Confirm platform is fully down.
 3. Plug EZCal into TS-100 four pin port.
 4. Turn the key switch to ground mode.
 5. When EZCal powers on, display will show: **"TS-100 Menu -- Help: Press Enter"**
 6. Press right arrow key until display shows **"Access Level 3"** and then press **ENTER**.
 7. Enter code **2222 (Access level 2)** and press **ENTER**.
 8. Press right arrow key until **"Setups"** is displayed and press **ENTER**.
 9. Press right arrow key until **"Tilt Setups"** is displayed and press **ENTER**.
 10. When display shows **"Calibrate Level,"** press **ENTER** twice to complete level calibration.
 11. Press **ESC** twice to display **"Tilt Setups"**.
-

2. HEIGHT CALIBRATION

Establishes a Range for the Angle Sensors

1. Press right arrow key to display **"Height Setups"**.
2. Press **ENTER** and then right arrow key to display **"Calibrate Height"** and then press **ENTER**.
3. When display shows **"Platform Down?"** press **ENTER**.
4. When prompted to lift, press and hold the EZCal up arrow.

Do not release it until the platform is fully raised — the pump will strain noticeably at the top.

5. When prompted to lower, press and hold down at the lower control panel.

Do not release the down switch until the unit is fully stowed.

6. If an error code is displayed during the height calibration, repeat the above steps.

7. If calibration is successful, you will be prompted to enter a calibration date. If the date is not entered, the calibration is not complete.
-

3. LOAD CALIBRATION

Establishes the Range for the Pressure Transducer

3-Step Calibration

The TS100 control module must be calibrated before it can determine platform load.

The calibration records the lift cylinder pressure at various platform heights, as determined by the angle sensors, both fully loaded and empty.

During the calibration procedure, the platform is fully raised and lowered three times:

DYNAMIC Calibration

Fully loaded platform raised & lowered in one continuous movement.

Model	Weight Added to Platform
--------------	---------------------------------

PS-1930	674 lbs
---------	---------

PS-1430	774 lbs
---------	---------

ZT-1630	715 lbs
---------	---------

ZT-1230	715 lbs
---------	---------

LOADED Calibration

Fully loaded platform raised & lowered with stops to take measurements.

Model	Weight Added to Platform
--------------	---------------------------------

PS-1930	674 lbs
---------	---------

PS-1430	774 lbs
---------	---------

ZT-1630	715 lbs
---------	---------

ZT-1230	715 lbs
---------	---------

EMPTY Calibration

Unloaded platform raised & lowered with stops to take measurements.

ALL MODELS: 0 lbs — Remove all added weight from platform.

IMPORTANT

If changes are made to the machine mechanics or hydraulics, the calibration should be performed to accurately establish the platform's load.

The following procedure must be followed **COMPLETELY** to calibrate the TS100. Throughout the procedure various checks are made, so if any problems are detected the procedure stops and displays a **FLASHING** failure message.

CAUTION: If the calibration procedure is interrupted, completed phases need not be repeated. A **“REDO”** prompt will appear — answer **“NO”** if there is no reason to repeat the phase, or **“YES”** if the phase must be repeated (for example because a significant mechanical or hydraulic change has been made).

DYNAMIC CALIBRATION

1. Park the lift on level ground, with sufficient clearance above to allow for the platform to fully lift.
2. If you are calibrating a ZT, set the key switch to upper control and the Upper Control Box to lift.
3. Connect an EZCal controller to the TS100. **HELP: PRESS ENTER** is displayed. Press the right arrow twice, so **ACCESS LEVEL 3** is displayed. Press **ENTER**.
4. With the **UP** and **RIGHT** arrows change the code to **2222**. Press **ENTER**, to enable adjustments and calibrations.
5. With the Right Arrow go to **SETUPS** and press **ENTER**.
6. Right Arrow to **LOAD SETUPS** press **ENTER** then right arrow to **“CALIBRATE LOAD”** press **ENTER**.
7. The display will show **“REDO DYNAMIC? YES”** if this is the first time doing the dynamic calibration, or **“REDO DYNAMIC? NO”** if the dynamic calibration has previously been performed.
8. Make sure the display shows **“REDO DYNAMIC? YES”** by using the EZCal UP arrow, then press the **ENTER** button to confirm that dynamic calibration is needed.

9. The display will show “**PLATFORM DOWN?**”, asking for confirmation that the platform is fully lowered.
10. Check that the platform is fully lowered then press the **ENTER** button to confirm.
11. The display will show “**PLATFORM LOADED?**”, asking for confirmation that the platform is loaded.
12. Load the platform with the calibration load specified for your model (WEIGHT ADDED PER MODEL REFERENCED ABOVE), then press the **ENTER** button to confirm.
13. The display will show “**PLEASE LIFT ...**”, press and hold the EZCal **UP** arrow until the platform has reached full height. At full height the pump will strain noticeably.
14. **IMPORTANT:** If the UP switch is released early, the calibration will have to be aborted and repeated from the beginning!
15. When the system detects the UP switch activated, the display will show “**LIFTING**” with an increasing count. The system will monitor changing height as the platform is lifted, until the UP switch is released.
16. When the UP switch is released, the TS100 records the maximum height of the platform.
17. The display now shows “**PLEASE LOWER ...**”
18. Activate the **DOWN** switch and **KEEP IT ACTIVATED** until the platform is fully lowered.
19. **CAUTION:** If the DOWN switch is released early, the calibration will have to be aborted and repeated from the beginning!
20. When the system detects the DOWN switch activated, the display will show “**LOWERING**”.
21. The system will wait for the DOWN switch to be released once the platform is fully lowered.

The DYNAMIC phase is now complete.

LOADED CALIBRATION

1. The display will show “**REDO LOADED? YES**” if this is the first time performing the loaded calibration, or “**REDO DYNAMIC? NO**” if the loaded calibration has previously been performed.
2. Make sure the display shows “**REDO LOADED? YES**” by using the EZCal UP arrow, then press the **ENTER** button to confirm that loaded calibration is needed.
3. The display will show “**PLATFORM LOADED?**”, asking for confirmation that the platform is loaded.
4. Press the **ENTER** button to confirm.
5. The display will show “**PLEASE LIFT ...**”, waiting for the UP arrow on the EZCal (Up switch on ZT) to be activated to begin raising the platform.
6. Press the **UP** switch and hold it until the platform has reached full height.
7. When the system detects the UP switch activated, the display will show “**LIFT LOADED**” with the current height (from 0% to 100%).
8. After a delay, the system will stop the platform lift and take height & pressure measurements; the display will show “**MEASURING #xx**”.
9. When the measurements have been taken, the platform will resume lifting.
10. The lifting ... stopping ... measuring ... lifting process will continue until the platform reaches full height.
11. When the platform reaches full height (and height 100% is displayed), release the UP switch.
12. The display shows “**TOTAL DATA: xx**” to indicate the number of measurements taken, then shows “**PLEASE LOWER ...**”
13. Activate the **DOWN** switch and keep it activated until the platform is fully lowered. When the system detects the DOWN switch activated, the display will show “**LOWER LOADED**” with the current height (from 100% to 0%).
14. After a delay, the system will stop the platform lower and take height & pressure measurements; the display will show “**MEASURING #xx**”.
15. When the measurements have been taken, the platform will resume lowering.
16. The lowering ... stopping ... measuring ... lowering process will continue until the platform is fully lowered.

17. When the platform is fully lowered (and height 0% is displayed), release the DOWN switch; the display shows **“TOTAL DATA: xx”** to indicate the number of measurements taken.

LOADED calibration is now complete.

EMPTY CALIBRATION

1. The display will show **“REDO EMPTY? YES”** if this is the first time performing the empty calibration, or **“REDO EMPTY? NO”** if the empty calibration has previously been performed.
2. Make sure the display shows **“REDO EMPTY? YES”** by using the EZCal UP arrow, then press the **ENTER** button to confirm that empty calibration is needed.
3. The display will show **“PLATFORM EMPTY?”**, asking for confirmation that the platform is empty.
4. **REMOVE ALL ADDED WEIGHT** from the platform, then press the **ENTER** button to confirm.
5. The display will show **“PLEASE LIFT ...”**, waiting for the UP switch to be activated to begin raising the platform.
6. Activate the **UP** switch and keep it activated until the platform has reached full height.
7. When the system detects the UP switch activated, the display will show **“LIFT EMPTY”** with the current height (from 0% to 100%).
8. The lifting ... stopping ... measuring ... lifting process will continue until the platform reaches full height, then the UP switch can be released.
9. The display shows **“TOTAL DATA: xx”** to indicate the number of measurements taken.
10. The display will show **“PLEASE LOWER ...”**
11. Close the **DOWN** switch and keep it activated until the platform is fully lowered.
12. The lowering ... stopping ... measuring ... lowering process will continue until the platform is fully lowered, then the DOWN switch can be released.

13. The display shows **“TOTAL DATA: xx”** to indicate the number of measurements taken.

EMPTY calibration is now complete.

Completing the Calibration

The collected data is checked to ensure that there were no problems with the recorded pressure; checks include making sure that the loaded pressures are higher than the empty pressures, with sufficient difference to enable load estimates to be calculated.

The display will show **“CALDATE: mm/dd/yy”** with the **“mm”** value flashing.

A Cal Date must be entered for the calibration to be saved.

Enter the current date to provide easy tracking of the date of last calibration. The date can be seen in the **“LOG”** menu available in the **“DIAGNOSTICS”** menu.

Use arrow keys to set the month, then press **ENTER** to move to the date; set the date and then the year.

Press **ENTER** to complete date entry. The system will store it.

The display will show:

“FINISHED!”

IMPORTANT — FINAL STEP

Press the **ESC** button to exit the **“CALIBRATE LOAD”** option.

It is not possible to use the machine if you do not do this.

The TS100 is now fully calibrated.