



## **FIRMWARE UPDATES**

### **WaveSculptor Firmware Update Procedure**

TRI50.033 ver 3  
13 November 2008

# **WaveSculptor Firmware Update Procedure**

**13 November 2008**

©2008 Tritium Pty Ltd  
Brisbane, Australia  
<http://www.tritium.com.au>



## FIRMWARE UPDATES

### WaveSculptor Firmware Update Procedure

TRI50.033 ver 3  
13 November 2008

#### **1 REQUIRED TOOLS**

- WaveSculptor motor controller to be updated
- Firmware Loader program (WSloader.exe)
- Firmware update file (\*.tsf)
- Driver Controls / Config program (WSDrvCtrls.exe)
- CAN – USB converter
- M12 – DB9 adapter
- M12 CAN cable
- Paper clip, small hex key, screwdriver or other fine point tool that can be used to push the WaveSculptor reset button

#### **2 FIRMWARE UPDATE PROCEDURE**

The WaveSculptor firmware loader is used for writing new DSP and FPGA firmware on the control board of the motor controller. The following instructions relate to the 'DSP Firmware' section of the firmware update program (the left side of the program window). It is not necessary to update the FPGA firmware.

1. Connect the WaveSculptor Controller through the M12 – DB9 adapter and CAN – USB converter to a PC running the WaveSculptor firmware loader. Power the WaveSculptor through the M12 – DB9 adapter. No other device should be present on the CAN bus while running this procedure. Please note that the WaveSculptor firmware loader will not start without connecting to the USB converter, so make sure that no other software is using the USB converter before attempting to start the WaveSculptor firmware loader
2. While holding the reset button, start the WaveSculptor firmware loader. Once started, the WaveSculptor firmware loader will have “Waiting” written in the top left box. Release the reset button and the box with “Waiting” written in it will turn green and say “Bootloader Found”
3. Click the browse button and choose the latest \*.tsf file that you downloaded from the Tritium website
4. Click the “Read code file” button, there should be about 22k words of firmware
5. If everything is correct so far, click the “Erase/Prog” button to begin the firmware upload
6. A successful upload will be reported below the “Words to program” progress bar. If anything other than “Programming completed successfully” is reported, do not use your controller, note the error and report it to Tritium
7. Shut down the firmware update program and reset the controller



## FIRMWARE UPDATES

### WaveSculptor Firmware Update Procedure

TRI50.033 ver 3  
13 November 2008

A yellow light on the front panel of the controller may illuminate at this point to indicate a config error. This is because the new firmware expects some new config values and it knows that it doesn't have them. To fix this, continue with the following steps

1. Using the latest Driver Controls / Config software, connect to the controller
2. Go to the config screen (View → Configuration)
3. Download the config from the controller (Transfer → Download)
4. Upload the config to the controller (Transfer → Upload). This will update the config to the latest version while keeping your custom values and also filling in the new values with sensible defaults. It will report "Config update from v1.01 to v1.03" or similar

At this point check that the config has not been accidentally over-written at some point previously. This has been easy to do in the past but is fixed in the latest version of the Windows software. Operating the controller with overwritten calibration values will result in potentially inefficient operation and a greater chance of errors and shutdowns. To check this:

1. Using the latest Driver Controls / Config software, connect to the controller
2. Go to the config screen (View → Configuration)
3. Download the config from the controller (Transfer → Download)
4. Check that the controller serial number (upper right-hand corner of the window) matches that which is laser etched onto the top panel of the motor controller. Overwritten config values will report a serial of 0
5. If your config has been overwritten, contact James Kennedy at Tritium (james@tritium.com.au) to request the factory config file for your controller serial number
6. Still in the Configuration screen, load the factory config file (File → Open)
7. Upload the new file to the motor controller (Transfer → Upload)
8. Shut down the Driver Controls program and reset the motor controller
9. Open the Driver Controls / Config software, run the Phasorsense and Parameter Extraction routines for your motor, and adjust any config limit values that are specific to your vehicle such as voltage limits, wheel diameter, and the mass of the vehicle
10. After uploading the changes to the motor controller, save a copy of the config for backup purposes (File → Save)

### **3** **REVISION RECORD**

REV	DATE	CHANGE
1	11 May 2007	Document creation (DAF) Edits & clarification (JMK)
2	27 September 2007	Generalisation of documentation for any firmware version (DAF)
3	13 November 2008	Added additional config version and mismatch fix steps (JMK)