



# WaveSculptor Motor Controllers

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Release Notes

TRI74.049

Version 6

4 July 2019

## 1 Release – 4<sup>th</sup> July 2019

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### 1.1 Released:

- WS22 firmware image v1.14

### 1.2 Fixes:

- Removal of “Low Speed PWM” mode internally in WaveSculptor22, improving low-RPM, high-torque performance of controller
- Enables smoother transition between SixStep and Sinusoidal control, and potential ability to reduce Engage/Disengage frequencies (for Hall-Effect controlled motors)

## 2 Release – 31<sup>st</sup> August 2015

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### 2.1 Released:

- WS22 and WS200 firmware images v1.12
- wsConfig 1.14
- triFwLoader 1.06
- User's Manual WS22.v4 and WS200.v5
- Config software users manual v4
- WS200 Datasheet v4

### 2.2 Fixes:

- Firmware: fixed (resolver / encoder) motor position processing and switching the rotation direction defined as “forwards”
- Firmware: added Tritium version reporting system
- Firmware: added support for new Tritium CAN Bootloader
- wsConfig: updated to detect new device IDs and GUI cosmetic improvements
- triFwLoader: updated to support new Tritium CAN Bootloader for more reliable firmware updates

### 2.3 Notes:

- The latest wsConfig *must* be used with the latest DSP firmware, the WaveSculptors device IDs have been updated and older software will not detect the devices
- Devices shipped after July 2014 have a new bootloader installed. Older devices must use the firmware file designated by “\_oldBL” in the filename

## **3 Release – 24<sup>th</sup> SEPTEMBER 2013**

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### **3.1 Released:**

- WS22 and WS200 firmware images v1.11
- wsConfig 1.13

### **3.2 Fixes:**

- Firmware: fixed fault with “ACTMOT” CAN command causing configuration corruption when used
- Firmware: improved motor position sensing at very low speeds
- Firmware: fixed overly aggressive minimum bus voltage control loop
- Firmware: updated stream bulk data transfer protocol
- wsConfig: updated stream bulk data transfer protocol

### **3.3 Notes:**

- The latest wsConfig *must* be used with the latest DSP firmware, or a stream protocol error will be reported when uploading or downloading configurations

## **4 Release – 26<sup>th</sup> JULY 2013**

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### **4.1 Released:**

- WS22 and WS200 firmware images v1.10
- wsConfig 1.12
- triFwLoader 1.05
- WS22 user's manual v3

### **4.2 Fixes:**

- Firmware: improved motor temperature reporting reliability
- Firmware: removed field weakening (overspeed) operation for BLDC type (permanent magnet) motors. This eliminates reported issues with high-speed velocity control and motor efficiency in solarcars.
- wsConfig: remembers window screen positions correctly
- WS22 user's manual: updated M6 bolt torque to match datasheet value

### **4.3 Notes:**

- There is also updated CanBridgeConfig and CanLogger programs associated with the CAN-Ethernet bridge, improving operation on some network types

## **5 Release – 18<sup>th</sup> April 2012**

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### **5.1 Released:**

- WS22 and WS200 firmware images v1.08
- wsConfig 1.11
- triFwLoader 1.04
- User's Manual v4
- Config software users manual v3

### **5.2 Additions:**

- WS configuration transfers now utilise an end-to-end stream protocol in order to increase transfer reliability over Ethernet and CAN
- Improved induction motor control, particularly in the overspeed region
- Further cleaned up User Interface for Firmware Loader utility
- Clarified motor setup procedures and error descriptions in software user's manual
- Improved noise immunity and response rate when using a resolver for motor position feedback

### **5.3 Fixes:**

- Improved motor interface serial communications reliability in WS

### **5.4 Notes:**

- The new 1.08 WS firmware requires the updated Windows software 1.11 which in turn requires CAN-Ethernet bridge firmware v1.04 or later
- A full update of all Windows programs and device firmware is highly recommended

## **6 Release – 8<sup>th</sup> October 2011**

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### **6.1 Released:**

- WS22 and WS200 firmware images v1.07
- wsConfig 1.10
- triFwLoader 1.03

### **6.2 Additions:**

- All Windows executables are digitally signed
- Improved handling of noisy/glitchy hall signal inputs, which may previously have triggered HALL or SWOC errors
- Improved handling of noisy Sin/Cos resolver position data
- Improved calibration accuracy on later production controllers (S/N 6900+)
- User Interface change regarding config upload/download
- Improved reliability of config upload/download
- Config no longer downloads at wsConfig startup, only when required
- Added ability to load Factory Default files without having to read existing config, which may be corrupted
- Cleaned up User Interface for Firmware Loader utility

### **6.3 Fixes:**

- Set active motor CAN packet ("ACTMOT") no longer corrupts config

### **6.4 Notes:**

- Windows software requires CanBridgeConfig v1.06 or later
- Also suggest upgrading to CAN-Ethernet bridge firmware v1.03 or later