



SPA DYNAMOMETERS  
CALIBRATION INSTRUCTIONS  
BTP-2000 IMPERIAL CRANK DYNO  
V6 SOFTWARE

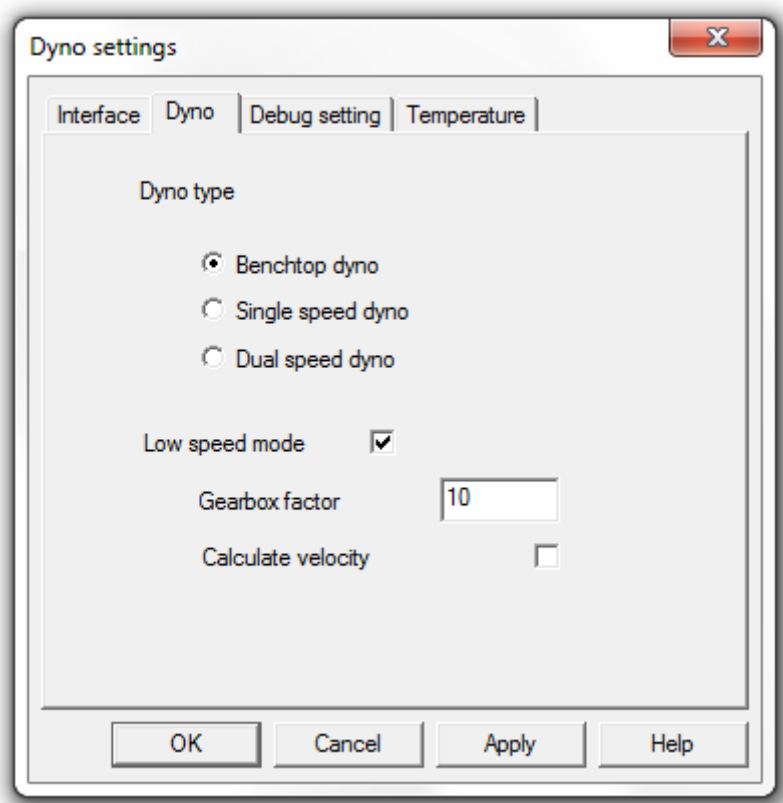
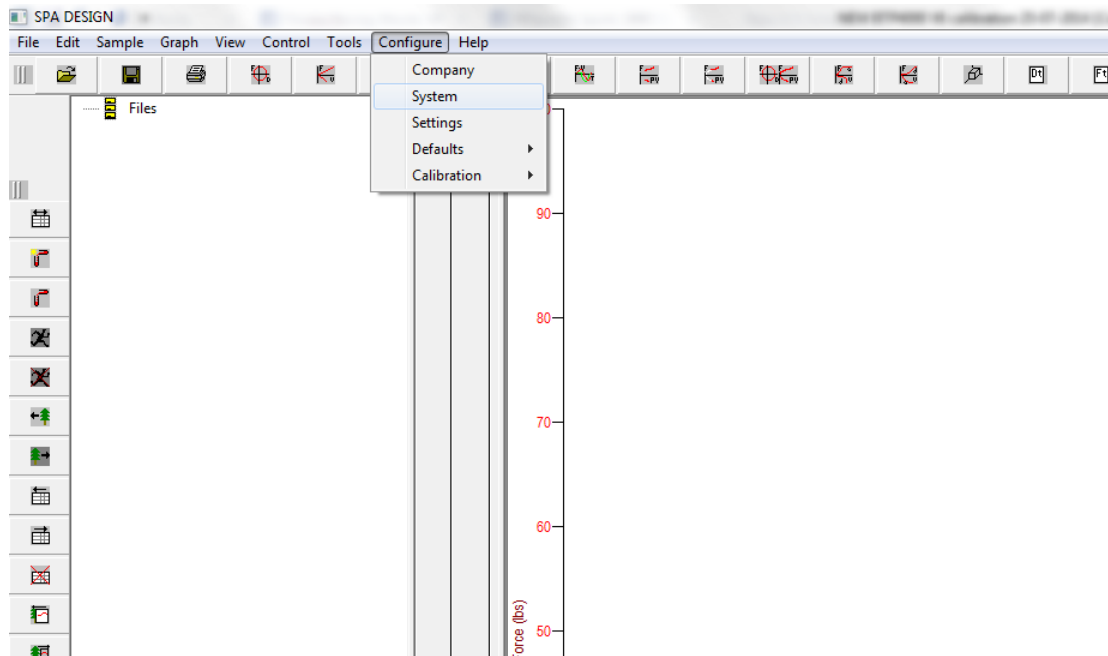


## Contents

1. Configuring the Dyno Type .....	1
2. Configure the Dyno Settings - Imperial .....	2
3. Calibrating the Motor Speed .....	3
4. Calibrating the x5 Velocity Gain – 0.5” Stroke .....	4
5. Calibrating the x0.25 Velocity Gain – 2.0” Stroke .....	8
6. Calibrating the x1 Position Gain – 2.0” Stroke .....	12
7. Calibrating the x1 Velocity Gain – 1.0” Stroke .....	16
8. Calibrating the Load Cell .....	20
9. Zeroing the Load Cell .....	21
10. Saving the Calibration.....	22

# 1. Configuring the Dyno Type

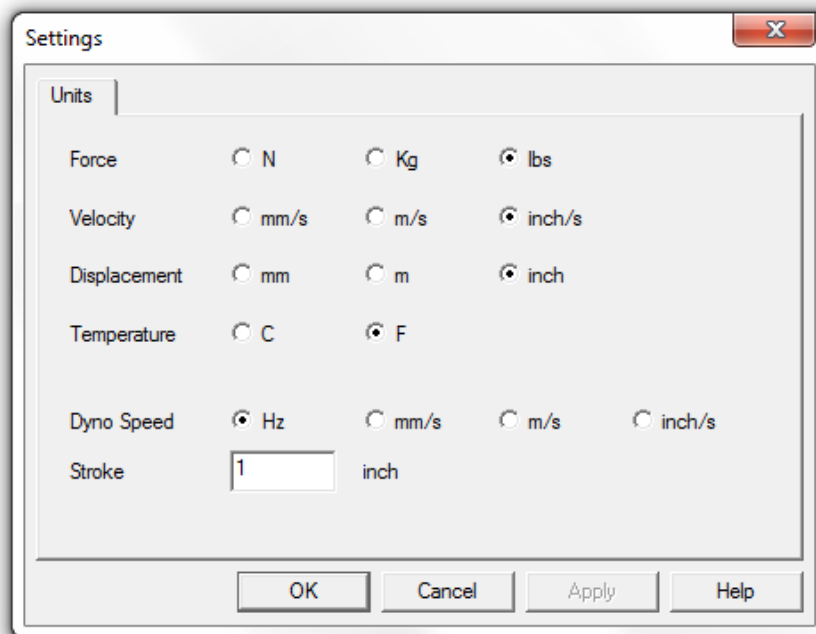
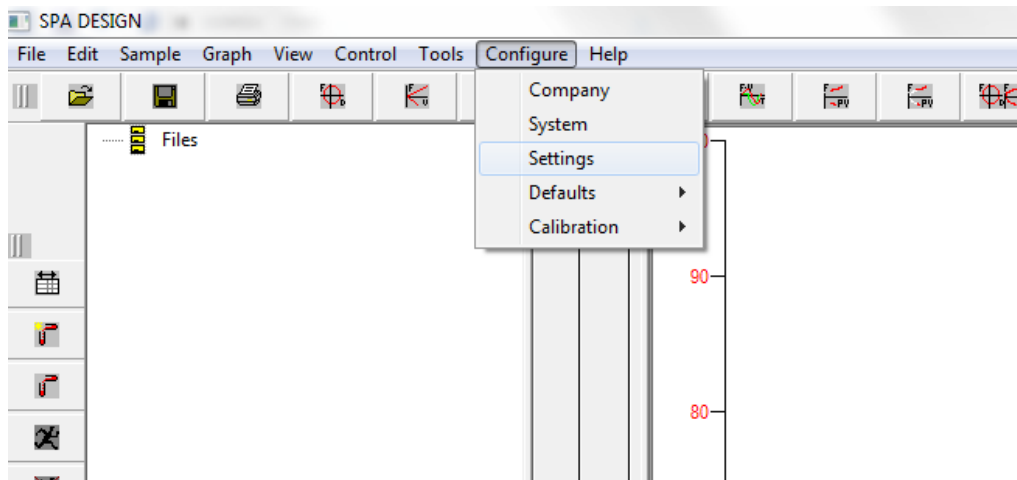
Select Configure>System and then click the 'Dyno' tab.



Select 'Benchtop Dyno'. Tick 'Low Speed mode' put the gearbox factor as '10.00'. When finished click 'OK'.

## 2. Configure the Dyno Settings - Imperial

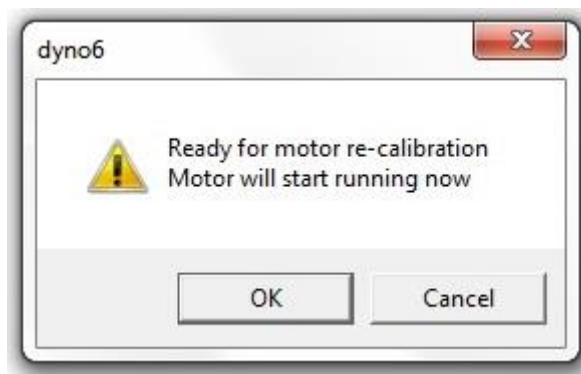
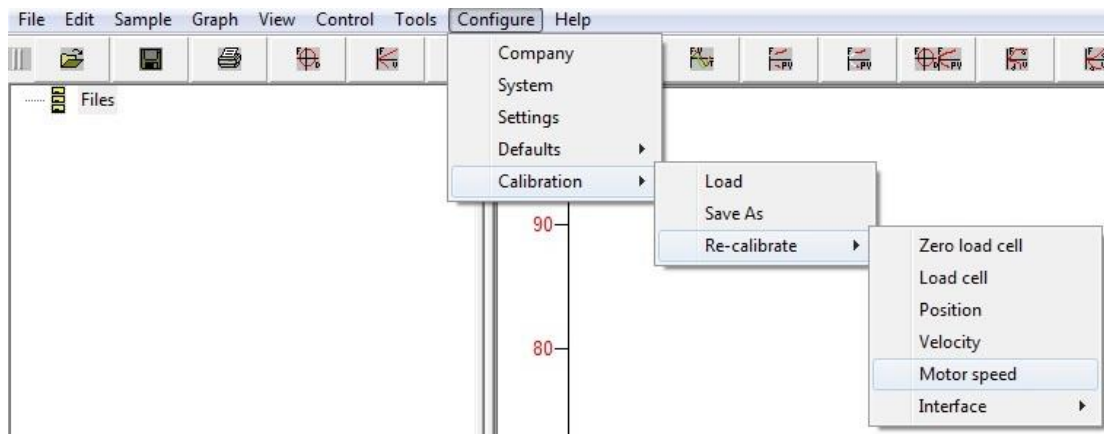
Click Configure>Settings



Configure the units when running the dyno calibration. The dyno should be calibrated in its base units i.e. an imperial crank dyno should be calibrated in imperial. Values can then be converted within the software if required. Leave the dyno speed set in 'Hz' and the stroke value can be left at the stroke value you normally run tests.

### 3. Calibrating the Motor Speed

Click Configure>Calibration>Re-calibrate>Motor speed.



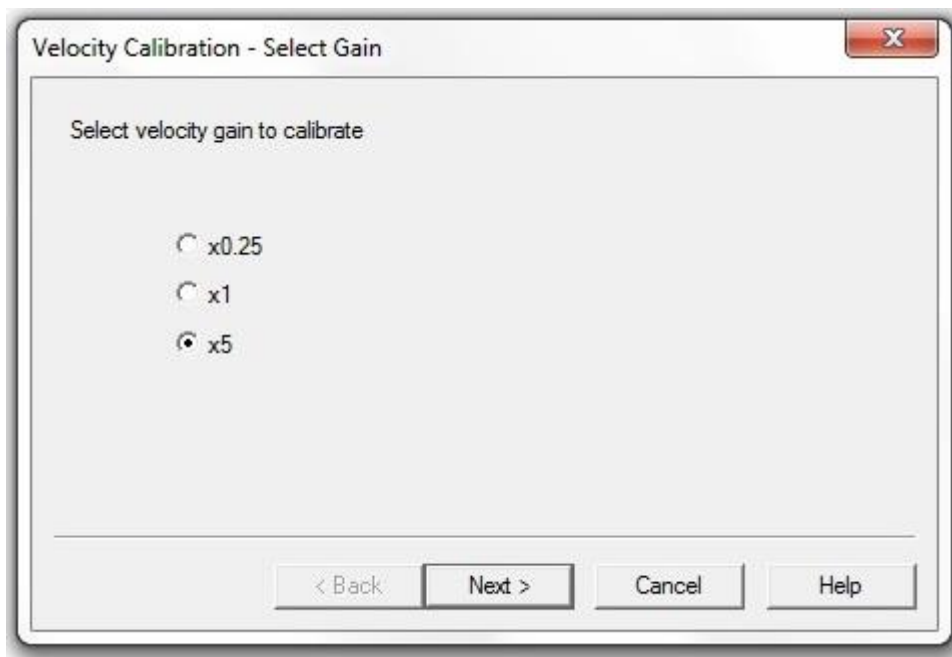
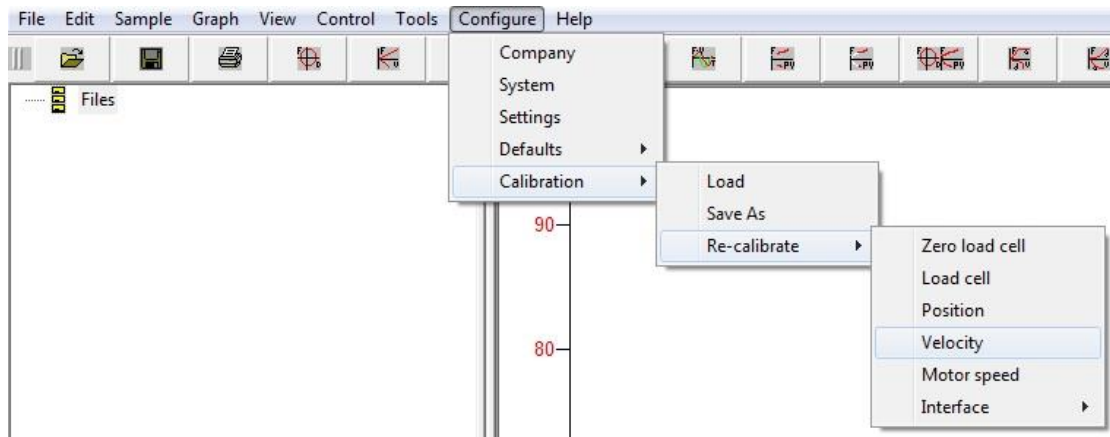
A warning window will open telling you that the motor is going to run. Click 'OK' and the motor speed calibration will start. When the calibration is complete the window will close.



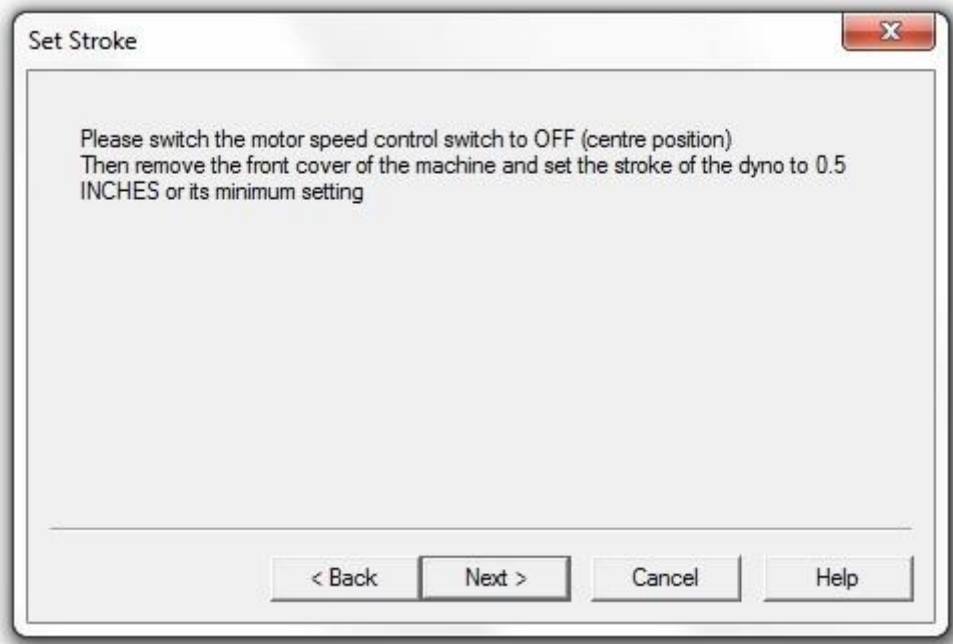
Calibrating the Motor Speed automatically updates the gearbox factor under Configure>System>Dyno.

## 4. Calibrating the x5 Velocity Gain – 0.5” Stroke

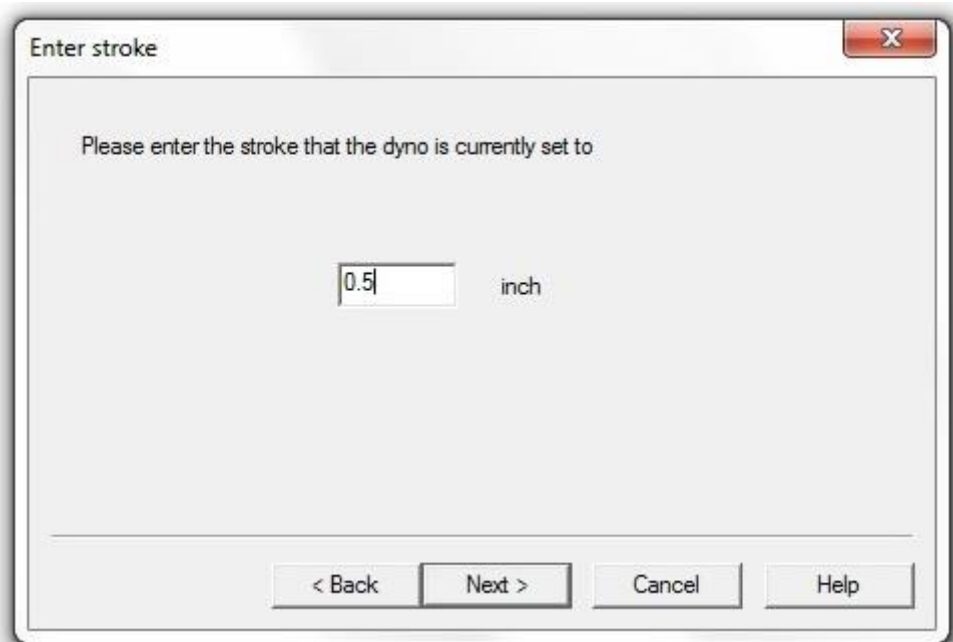
Click Configure>Calibration>Re-calibrate>Velocity.



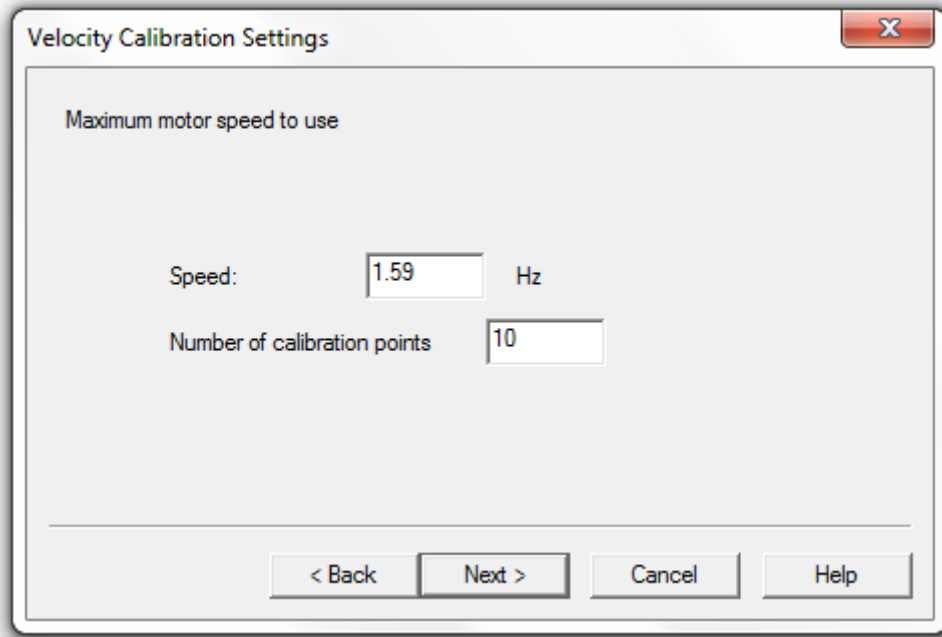
To calibrate the velocity on a 0.5” stroke select the x5 velocity gain and click ‘Next’.



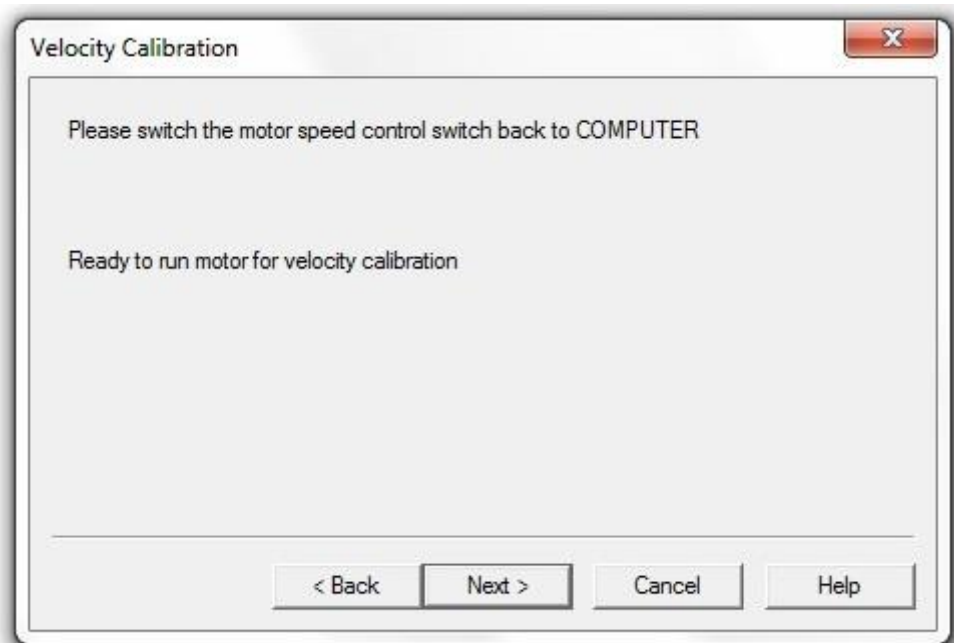
On the control panel on the dyno set the motor speed control switch to the OFF position (centre position). Remove the front cover of the dyno and then change the stroke to 0.5". Replace the front cover and then click 'Next'.



Enter the current stroke setting and then click 'Next'.

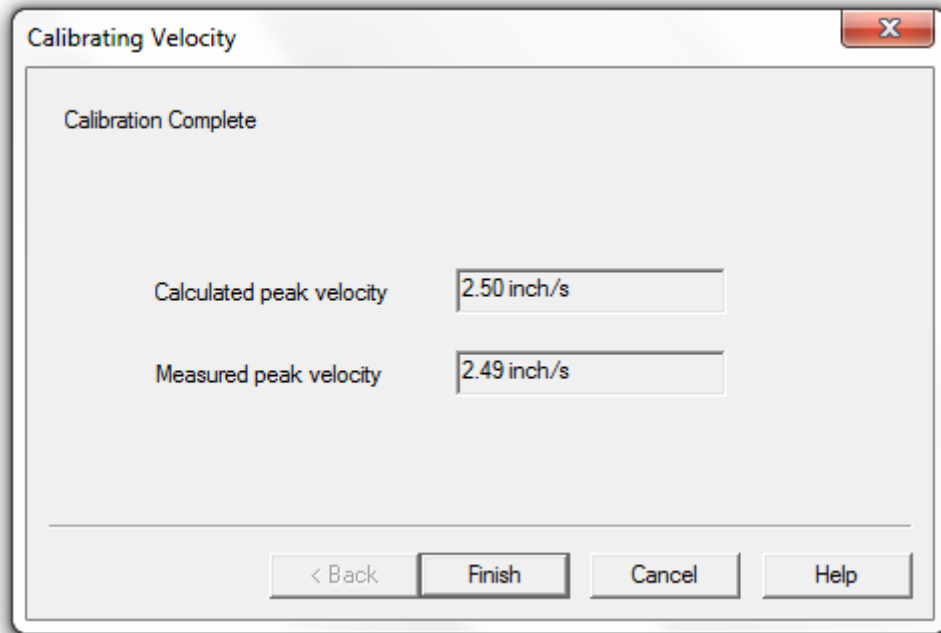


The x5 velocity gain calibrates the sensor in the 0-2.5in/s velocity range. Enter a value of 1.59Hz to give a maximum velocity of 2.5in/s. Enter '10' for the number of calibration points and then click 'Next'.



On the dyno control panel switch the motor speed control switch to the COMPUTER position and then click 'Next'.



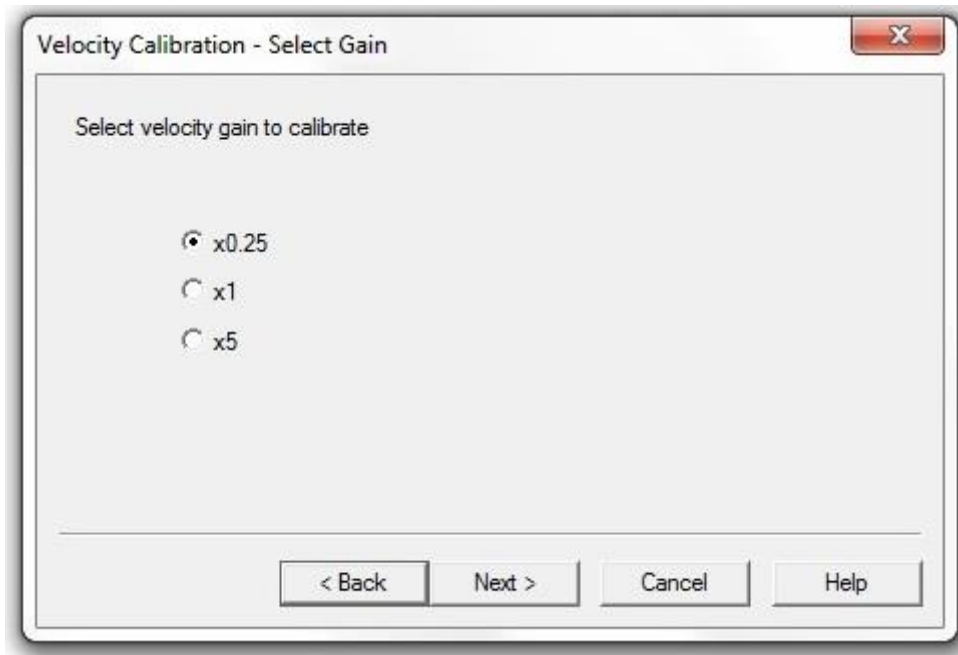
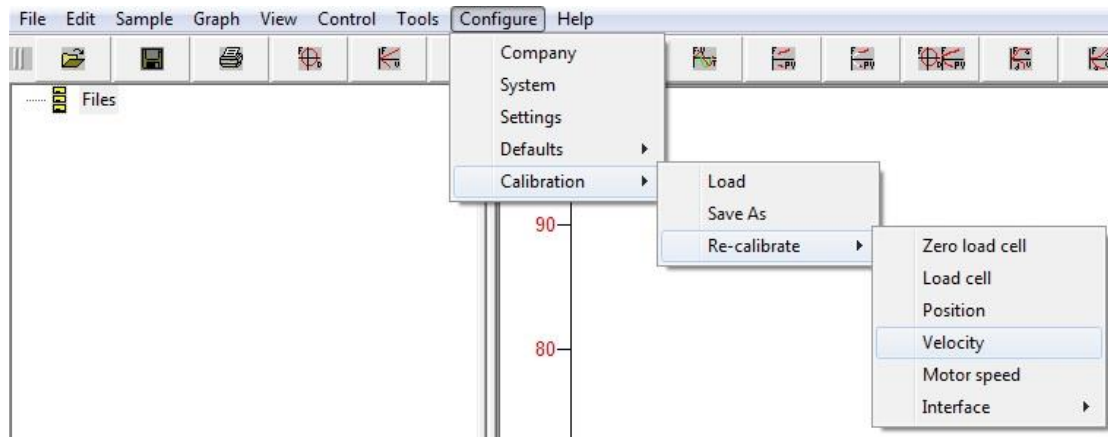


The dyno will now run through the 10 calibration points up to the maximum speed entered. Once this is completed click 'Finish'.

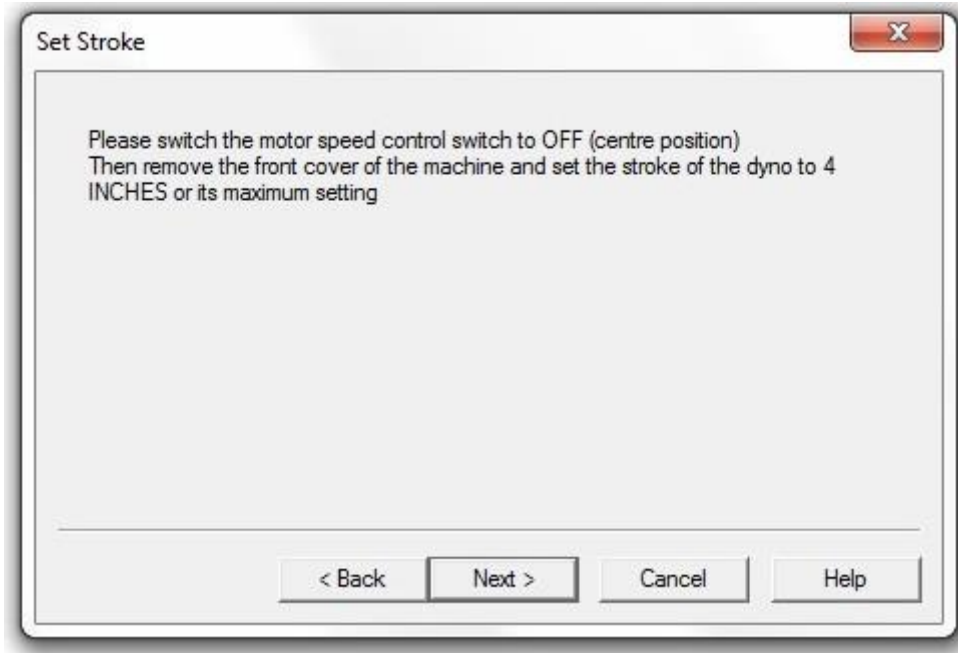
The x5 Velocity gain has now been calibrated on 0.5" stroke.

## 5. Calibrating the x0.25 Velocity Gain – 2.0” Stroke

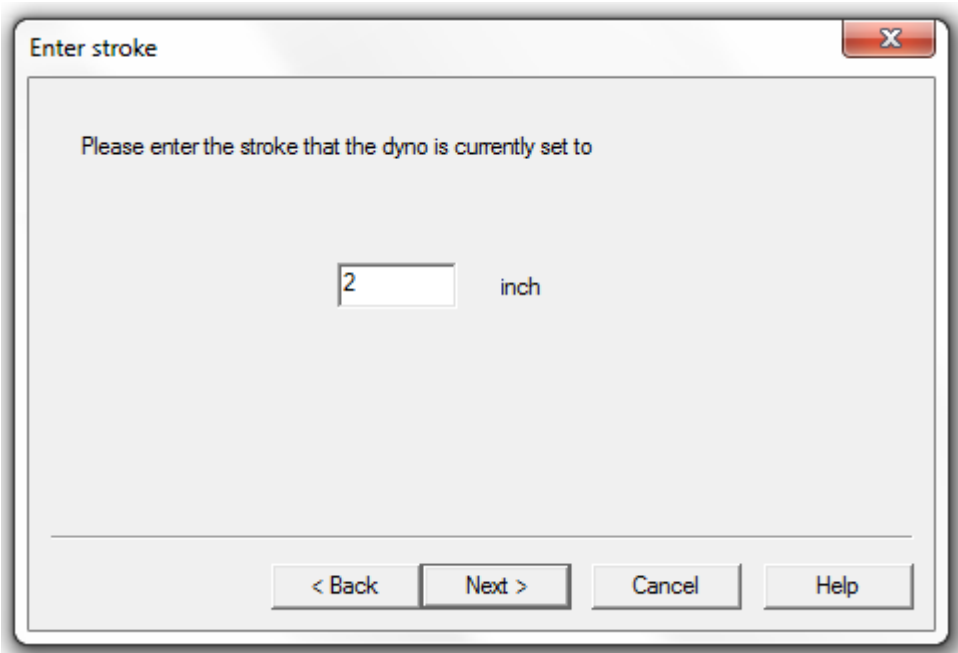
Click Configure>Calibration>Re-calibrate>Velocity.



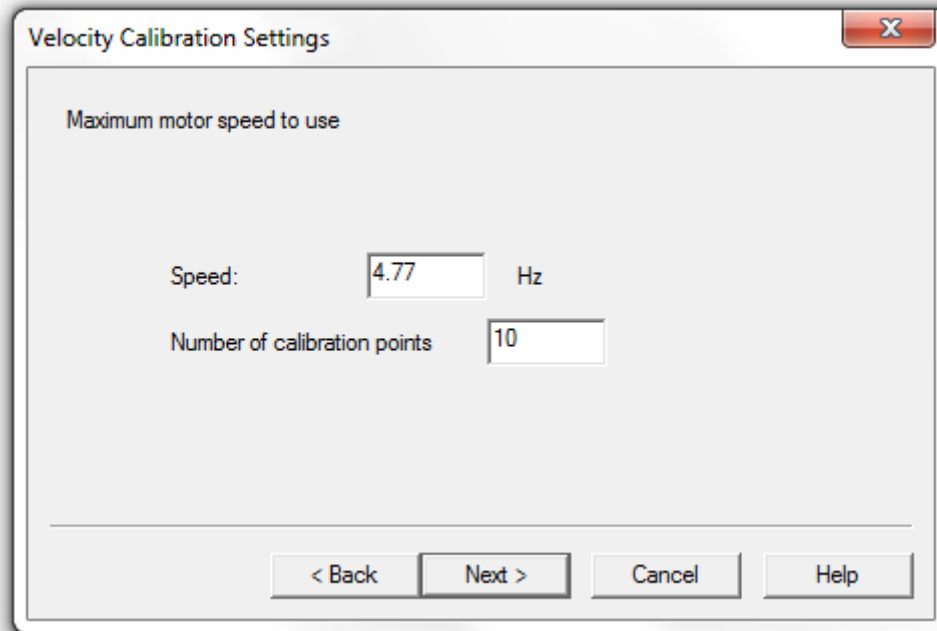
To calibrate the velocity on a 2.0” stroke select the x0.25 velocity gain and click 'Next'.



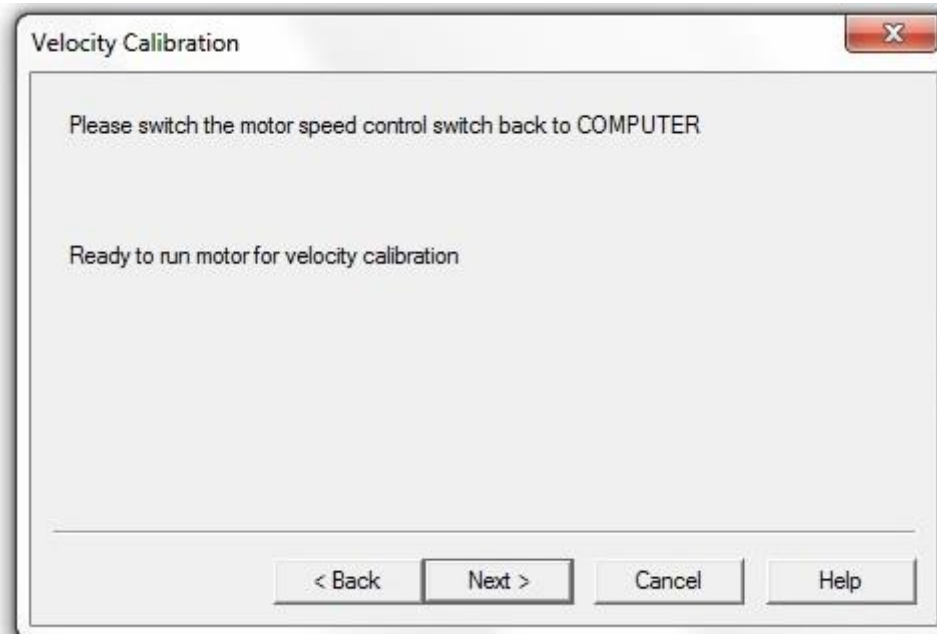
On the control panel on the dyno set the motor speed control switch to the OFF position (centre position). Remove the front cover of the dyno and then change the stroke to 2.0". Replace the front cover and then click 'Next'.



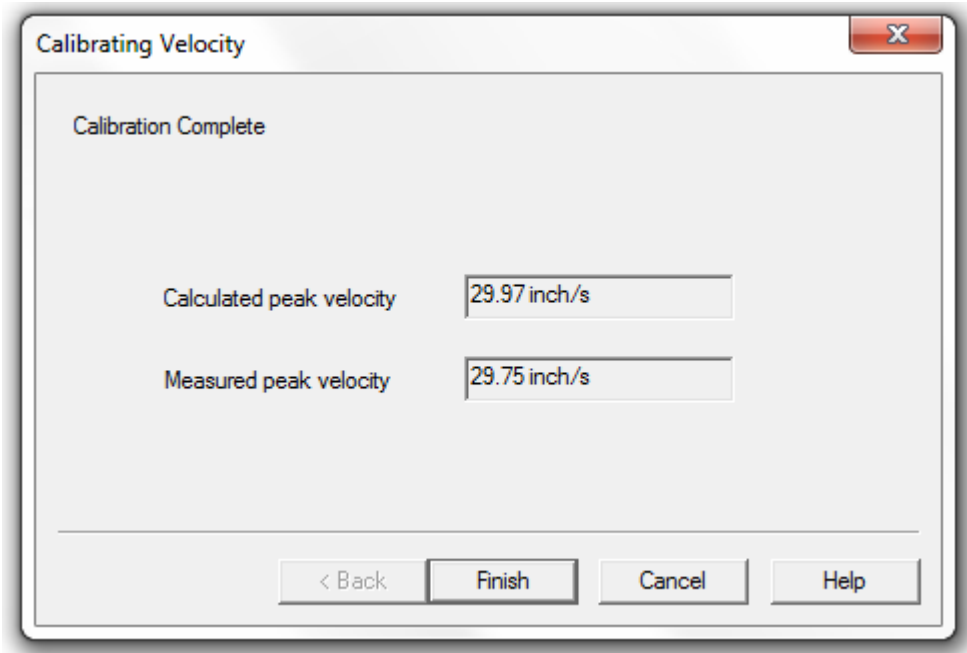
Enter the current stroke setting and then click 'Next'.



The x0.25 velocity gain calibrates the sensor in the 0-30in/s velocity range. Enter a value of 4.77Hz to give a maximum velocity of 30in/s. Enter '10' for the number of calibration points and then click 'Next'.



On the dyno control panel switch the motor speed control switch to the COMPUTER position and then click 'Next'.



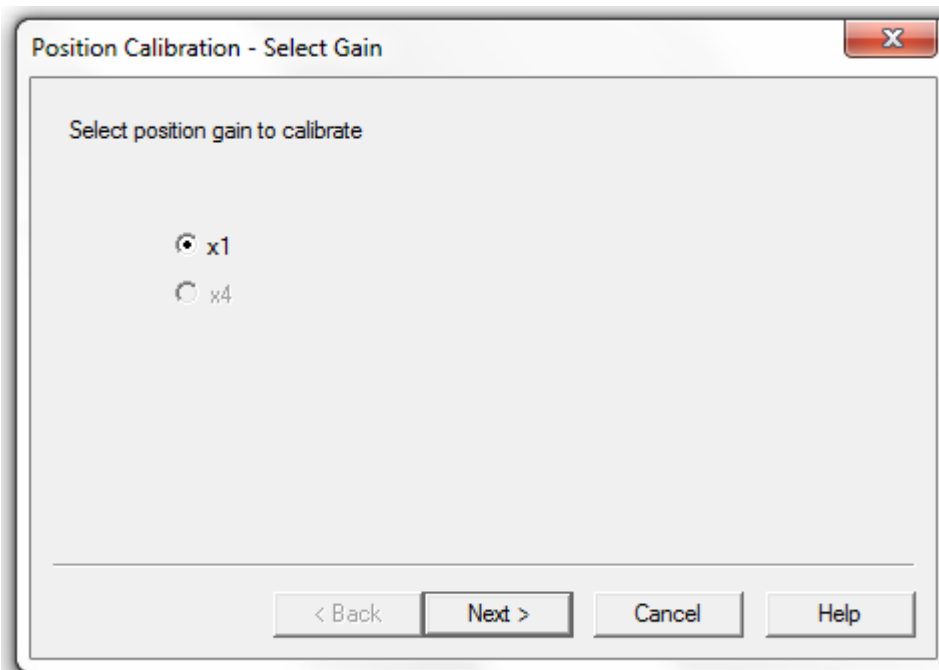
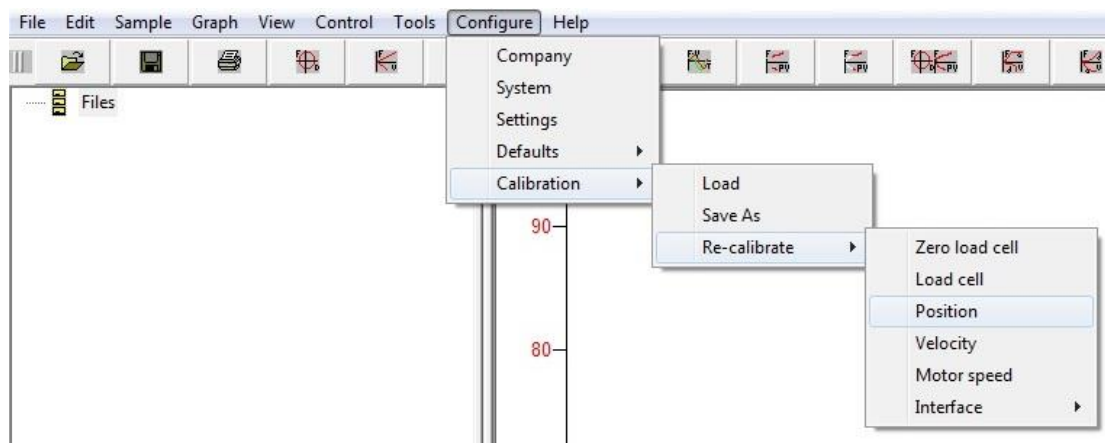
The dyno will now run through the 10 calibration points up to the maximum speed entered. Once this is completed click 'Finish'.

The x0.25 velocity gain has now been calibrated on a 2.0" stroke.

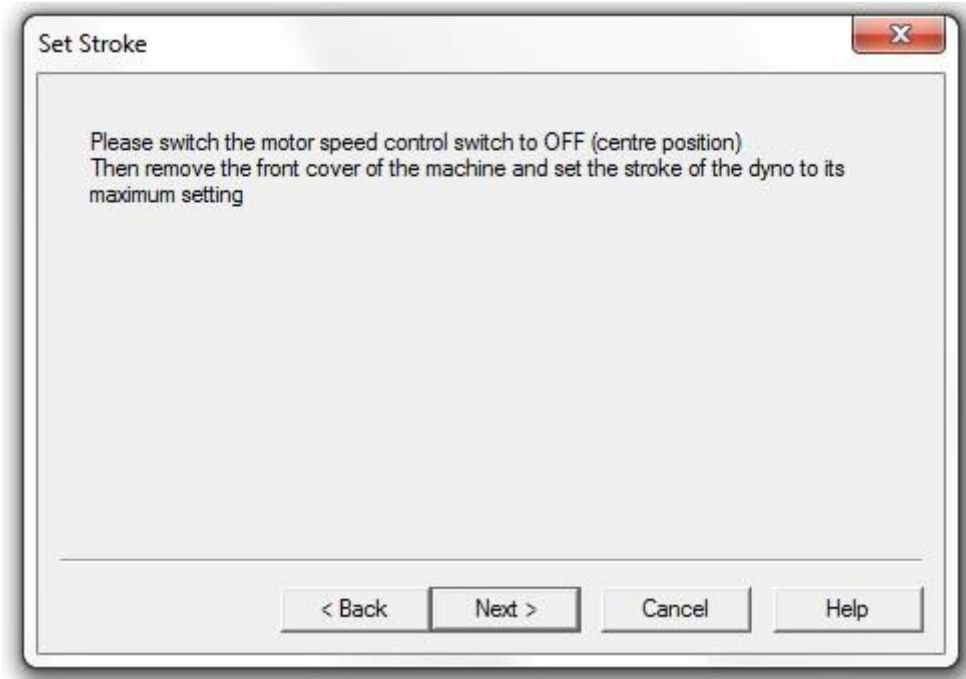
Whilst the dyno is set on a 2.0" stroke the software will recommend calibrating the position whilst the machine is set on a 2.0" Stroke – click 'OK' and then proceed to calibrate the position.

## 6. Calibrating the x1 Position Gain – 2.0” Stroke

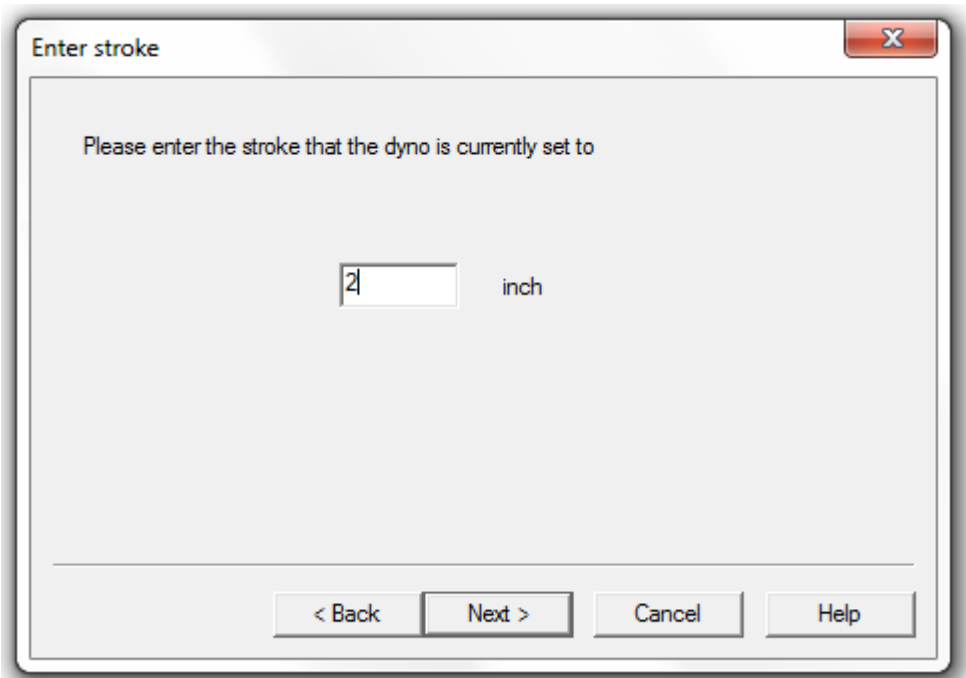
Click Configure>Calibration>Re-calibrate>Position.



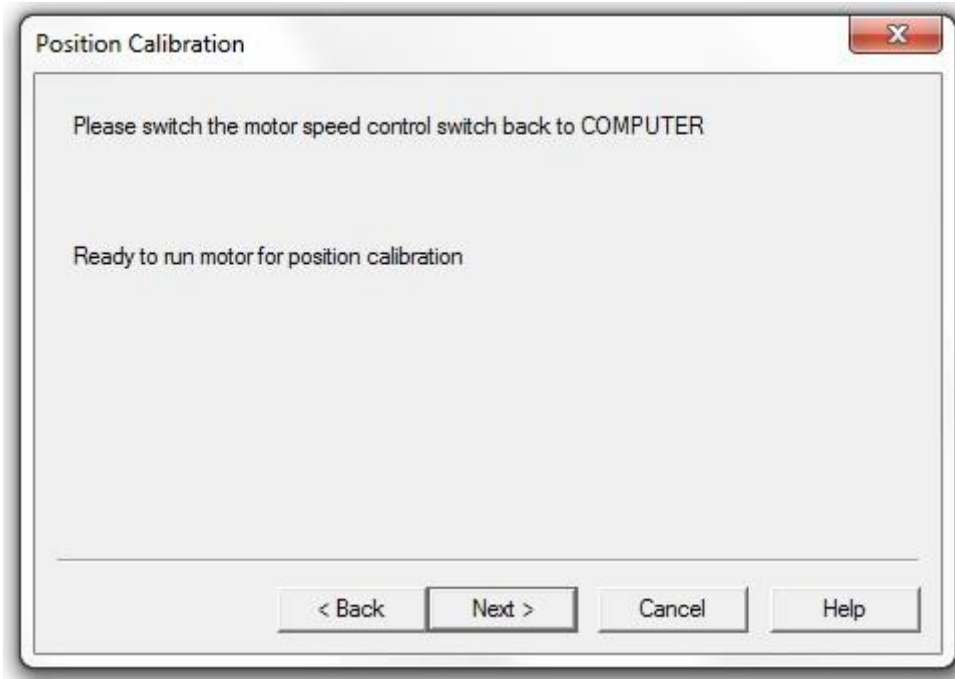
Select x1 position gain to calibrate the position on a 2.0” stroke.



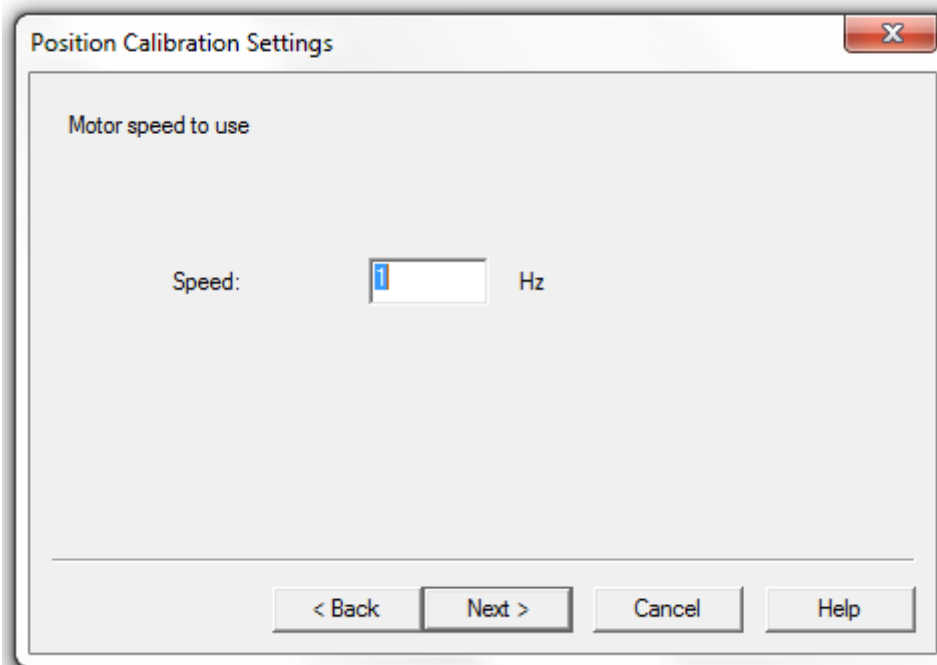
On the control panel on the dyno set the motor speed control switch to the OFF position (centre position). Remove the front cover of the dyno and then change the stroke to 2.0" if it is not set already. Replace the front cover and then click 'Next'.



Enter the current stroke setting and then click 'Next'.

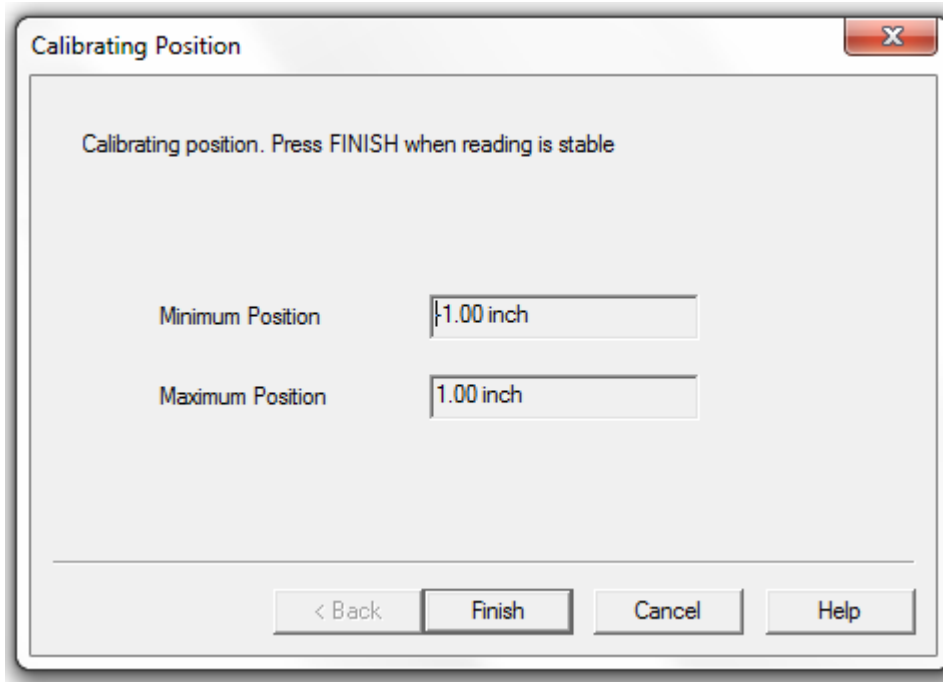


On the dyno control panel switch the motor speed control switch to the COMPUTER position and then click 'Next'.



Set the motor speed to 1.0Hz and then click 'Next'.





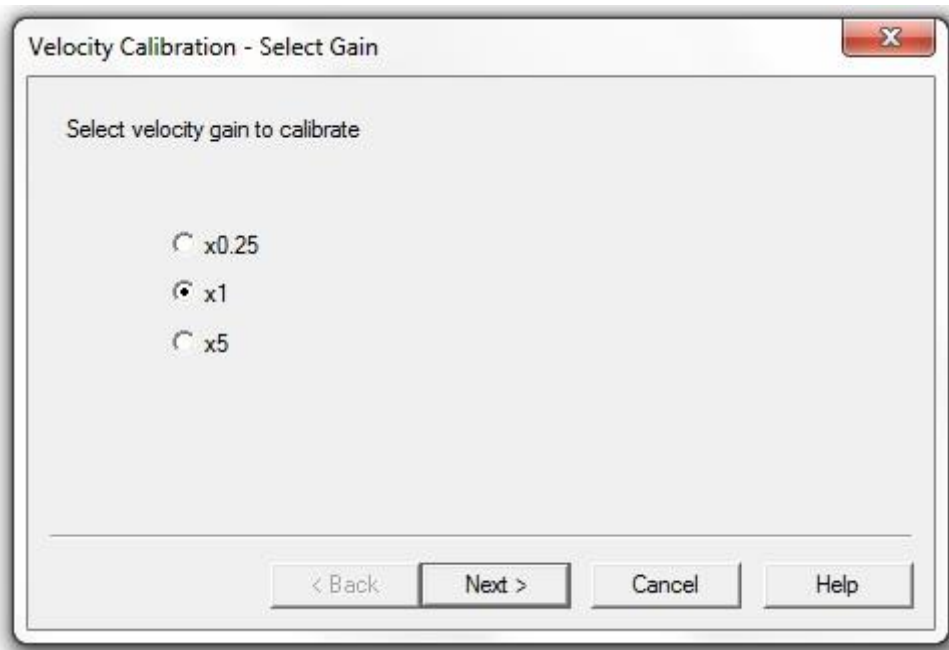
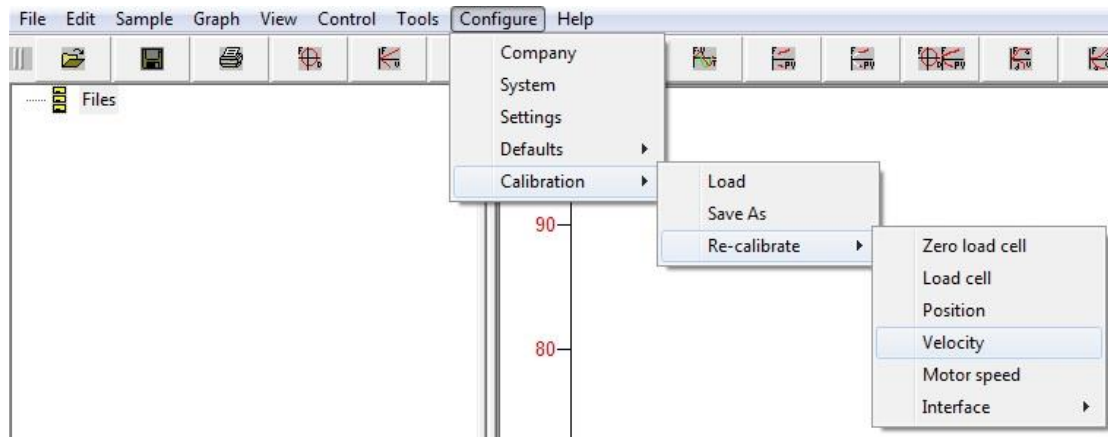
The dyno will now run at 1.0Hz to calibrate the position sensor. Once the maximum and minimum readings stabilise click 'Finish'.

The x1 position gain has now been calibrated on 2.0" stroke.

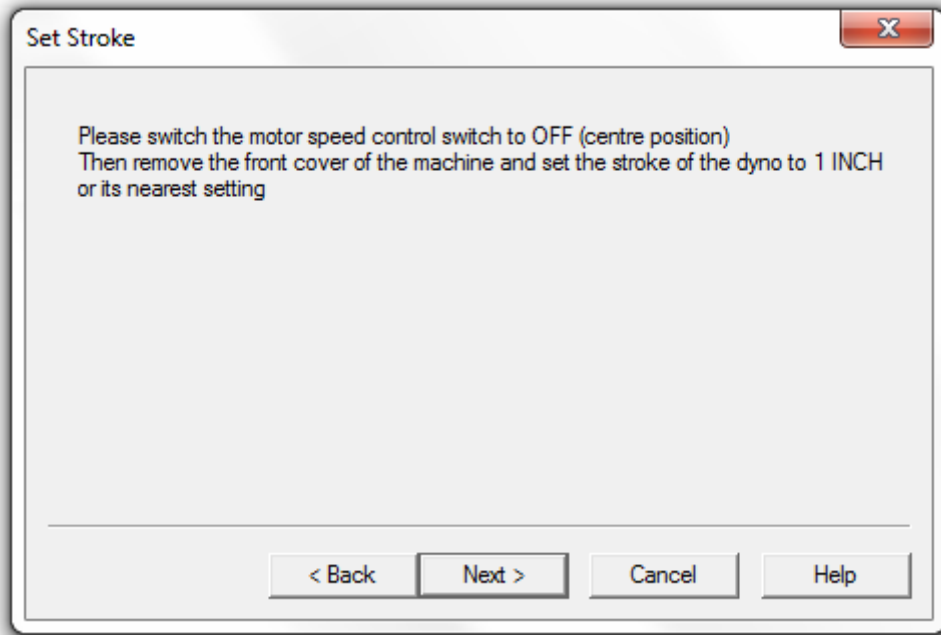
The software will then recommend calibrating the x0.25 velocity gain whilst the machine is set to 2.0" stroke. Click 'OK' and proceed as required. If the x0.25 velocity gain has already been calibrated ignore this message.

## 7. Calibrating the x1 Velocity Gain – 1.0” Stroke

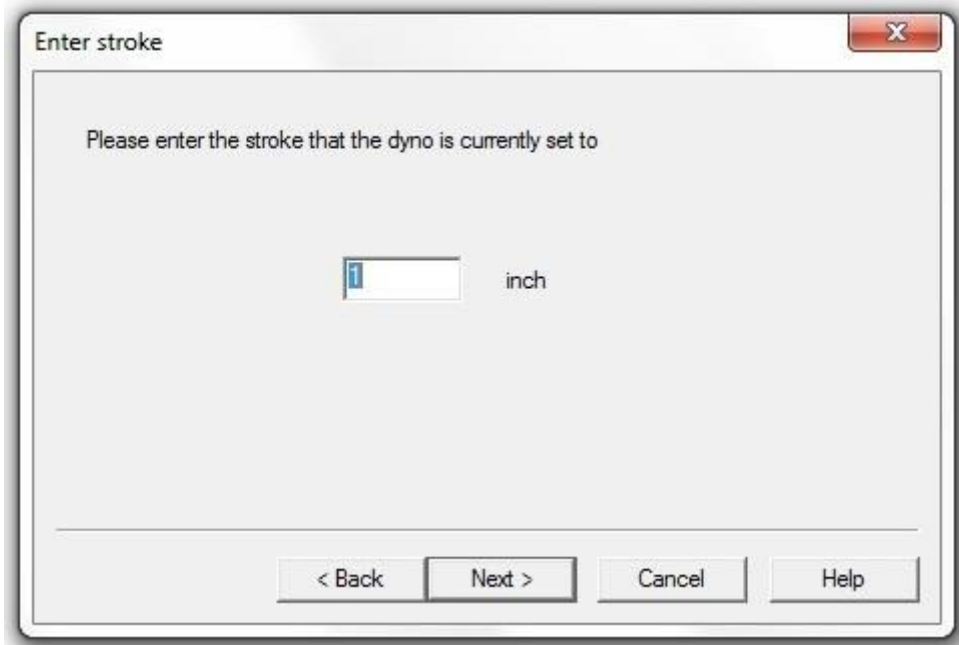
Click Configure>Calibration>Re-calibrate>Velocity.



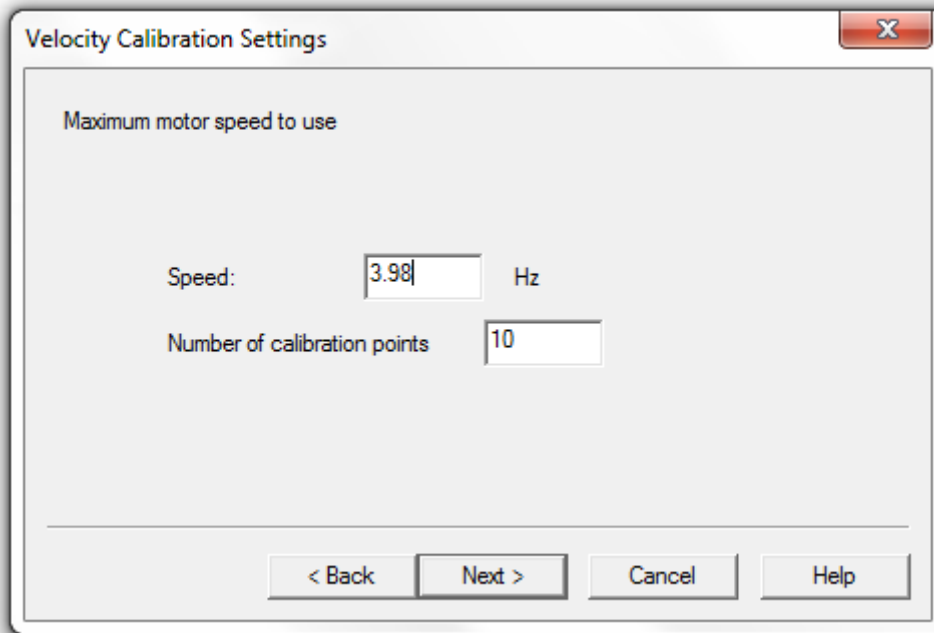
To calibrate the velocity on a 1” stroke select the x1 velocity gain and click ‘Next’.



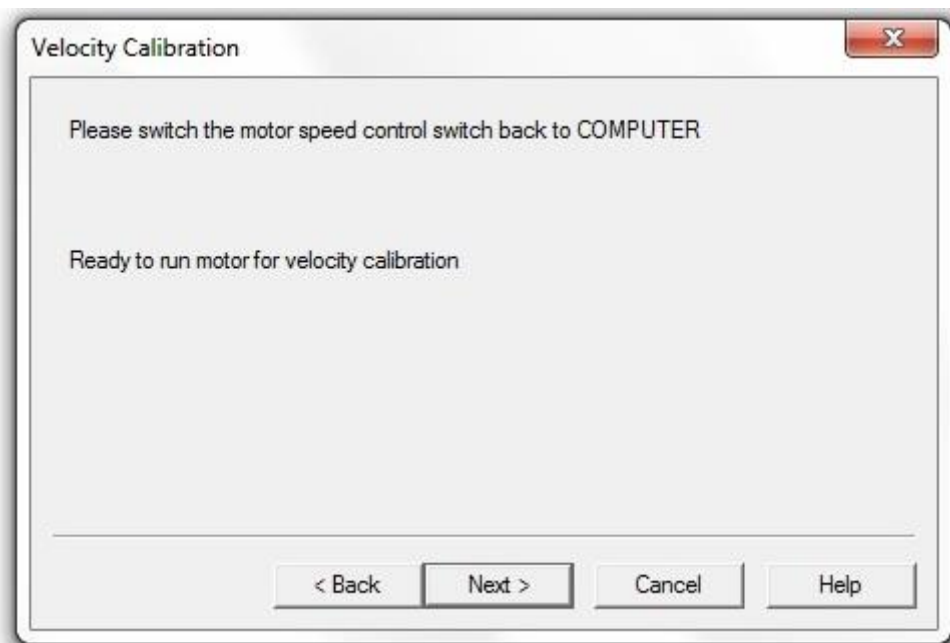
On the control panel on the dyno set the motor speed control switch to the OFF position (centre position). Remove the front cover of the dyno and then change the stroke to 1.0". Replace the front cover and then click 'Next'.



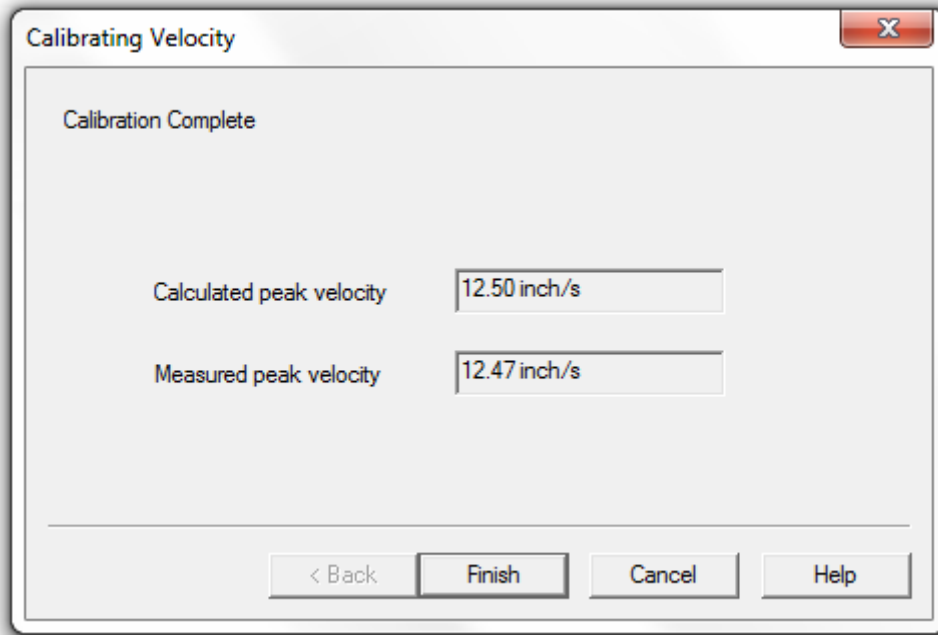
Enter the current stroke setting and then click 'Next'.



The x1 velocity gain calibrates the sensor in the 0-12.5in/s velocity range. Enter a value of 3.98Hz to give a maximum velocity of 12.5in/s. Enter '10' for the number of calibration points and then click 'Next'.



On the dyno control panel switch the motor speed control switch to the COMPUTER position and then click 'Next'.

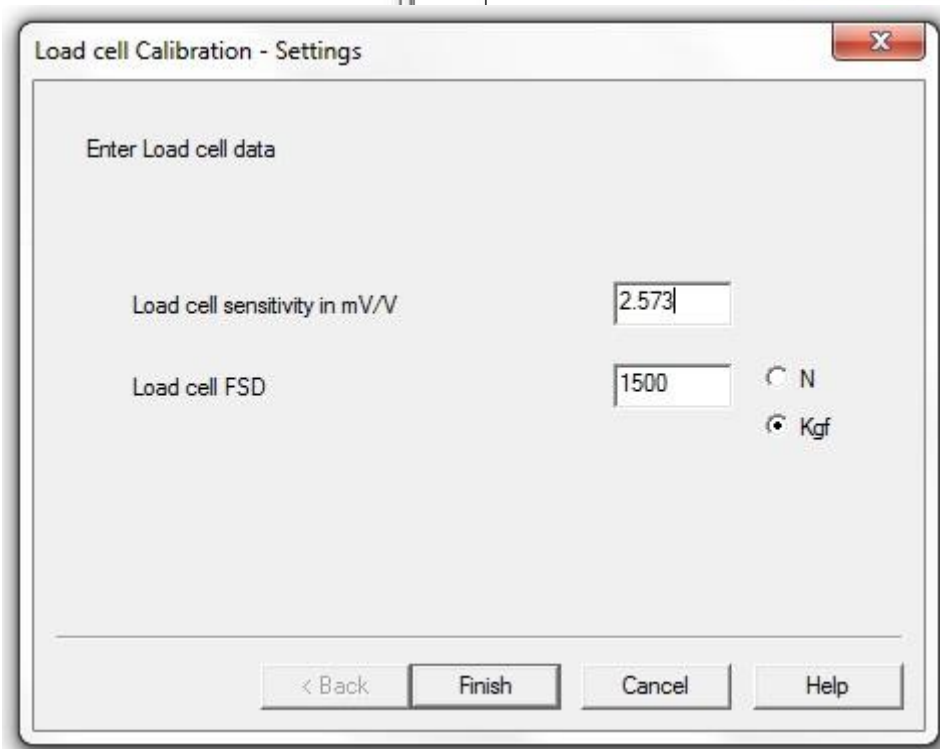
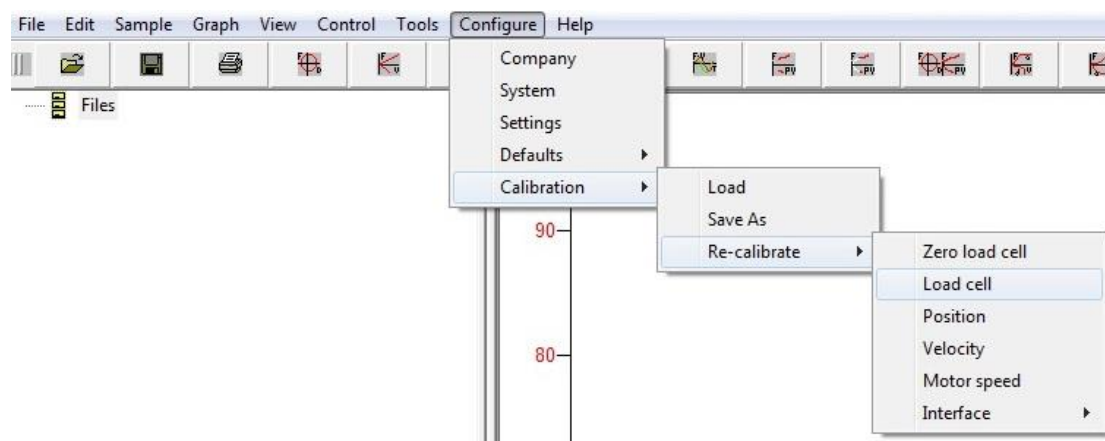


The dyno will now run through the 10 calibration points up to the maximum speed entered. Once this is completed click 'Finish'.

The x1 velocity gain has now been calibrated on a 1.0" stroke.

## 8. Calibrating the Load Cell

Click Configure>Calibration>Re-calibrate>Load-cell.



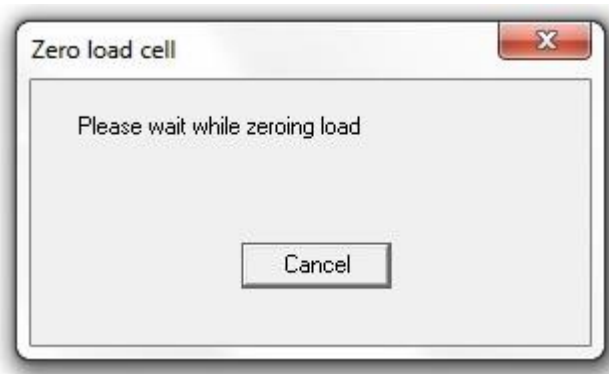
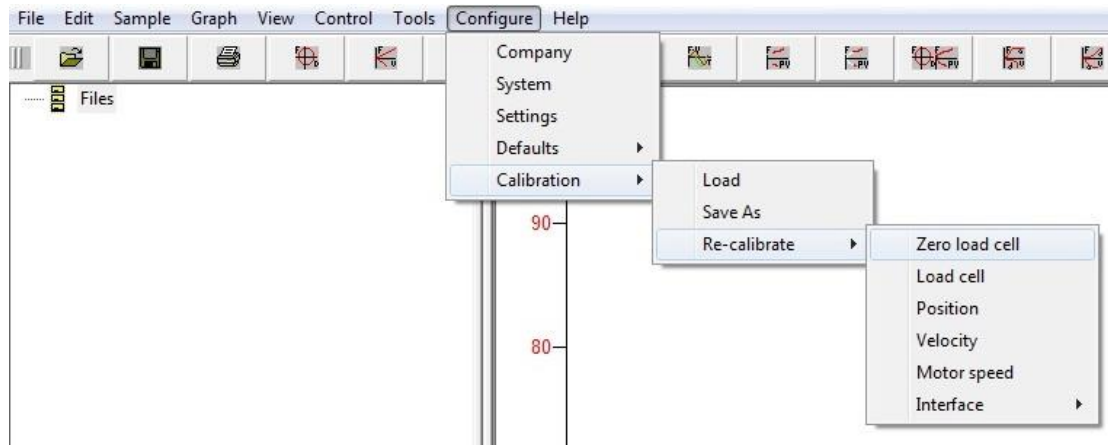
Enter the load cell sensitivity value in mV/V – this value can be found in the folder supplied with the dyno or on a sticker on the load cell. Then enter the load cell FSD – this is the load cell rating which is usually 1500 Kgf for standard load cells. Once the data has been entered click 'Finish'.

The load cell has now been calibrated.

## 9. Zeroing the Load Cell

To fully zero the load cell first remove the clevis/attachments so there is no weight acting on the load cell.

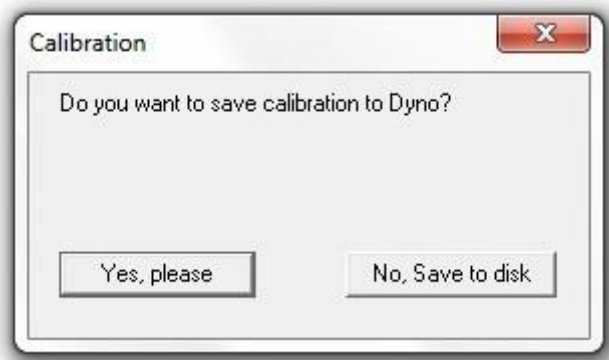
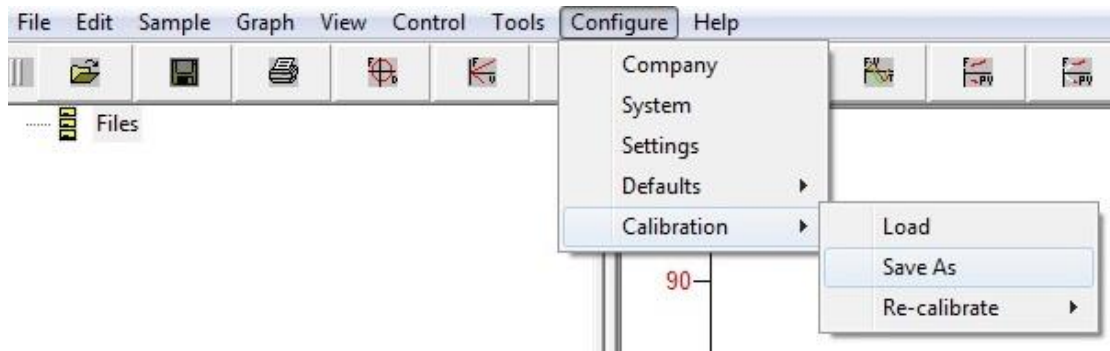
Click Configure,>Calibration>Re-calibrate>Zero load-cell. The load-cell will now zero.



The load cell has now been zeroed.

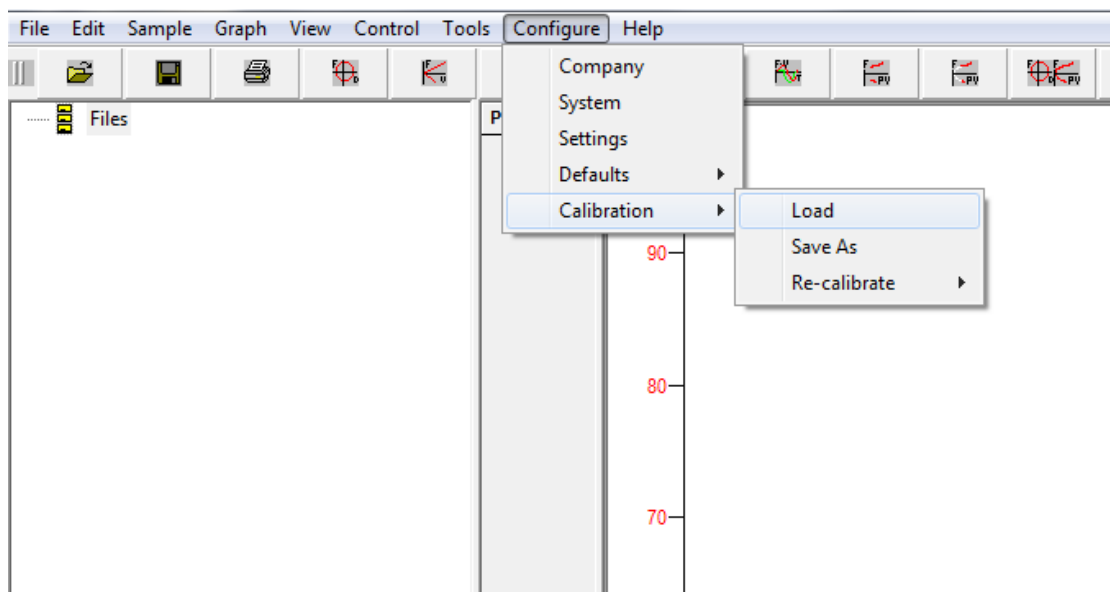
## 10. Saving the Calibration

Click Configure>Calibration>Save As.

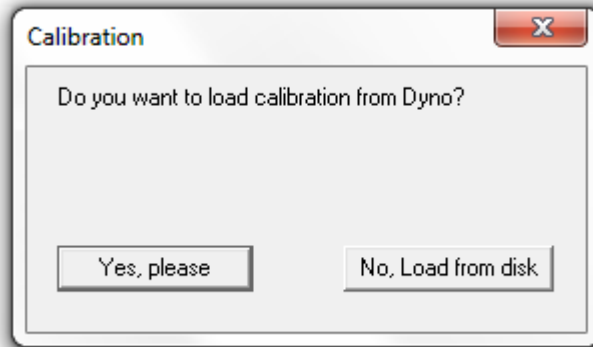


You can save the calibration directly to the dyno interface memory or save it to the PC. We recommend saving it to the dyno and keeping a copy on the PC.

To Load a saved calibration file Click Configure>Calibration>Load







You will now have the option to load the stored calibration from the dyno or alternatively load a saved calibration file from the PC.

Once you have saved the calibration the dyno is ready to use!