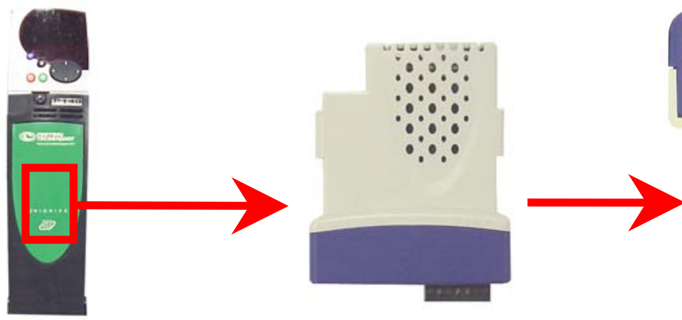
EMERSON
Industrial Automation

Troubleshooting Guide
CTTG #127

SP and SM-EZ Motion

This document pertains to all Unidrive SP models using an SM-EZMotion Module



Terminal #	Description
1	0 Volt
2	Digital IN 1
3	Digital IN 2
4	Digital IN 3
5	Digital IN 4
6	Digital OUT 1
7	Digital OUT 2

⚠WARNING

DO NOT ASSUME POWER IS OFF BECAUSE THE DRIVE DISPLAY APPEARS DEAD OR NO FANS ARE HEARD. THE VOLTAGE APPLIED TO THIS DRIVE CAN BE LETHAL IF TOUCHED !

When commissioning a drive it is advantageous to achieve stable rotation of the motor prior to advanced programming. This is important to ensure the drive, motor, and feed back device are working accordingly. Once advanced programming has been added to the drive and operation is not as you intended, it may prove more difficult to diagnose any problems that arise. Knowing the motor, drive, and feedback device are operating properly is a great advantage.

The purpose of this document is to give a basic set of steps to follow during the initial commissioning of a Unidrive SP with an SM-EZ Motion module installed to achieve a motion profile. This document will cover basic set up of the drive, tuning, phasing, and achieving a basic jog motion using Power Tools Pro to configure the drive and EZ Motion module. This document can also be used in the event a drive/motor are not operating properly after an SM-EZ Motion start up has already taken place. **If this is the case you must save all drive and module data before proceeding.**

You can be certain the Unidrive SP, Motor, Feedback device, and SM-EZ Motion Module are operational after completing the instructions in this guide.

Do not install the SM-EZ Motion module before the first power up. Your Unidrive SP comes out of the box with open loop factory defaults loaded. We will need to set the drive motor map to your motor specifications, run the autotune/phasing test, and then run the motor.

If you have decided SM-EZ Motion was the right choice for your application then you have also chosen an induction motor with a feedback device or a servo motor. Wire the SP drive, motor, and feedback device as per manufacturer specifications.

Do not enable the drive at this time (No connection to pin 31)

When the wiring has been completed then apply power and set the parameters below into the drive. You will need the information off the motor nameplate and feed back device to set the drive up properly. Be certain you follow the instructions for the type of motor you have. Either servo or induction.

Confirming Drive, Motor, and feedback Operation

Defaulting to Closed Loop Vector and preparing to program (See next page for Servo)

1. Set parameter 00.00 to 1244 (1233 for Europe)
2. Press the red reset key
3. Set parameter 00.49 to L2
4. If the drive trips "th" set #7.15 = Volt
5. Set parameter 00.00 to 1254 (1253 for Europe)
6. Set parameter 00.48 to CL Vect
7. Press the red reset key
8. Set parameter 00.00 to 1000
9. Press the red reset key

Basic Programming in Closed Loop Vector

Parameter	Description	Value
0.02	Max Reference	Motor Name PLate
0.05	Reference Select	Pad (4)
0.06	Current Limit	50.0
0.17	Current Demand Filter	2.0
0.27	Encoder PPR	Encoder Name Plate
0.42	Number of Motor Poles	Motor Name Plate
0.44	Motor Voltage	Motor Name Plate
0.45	Motor Rated FL Speed	Motor Name Plate
0.46	Motor FL Amps	Motor Name Plate
0.47	Motor Frequency	Motor Name Plate
3.36	Encoder Power Supply	Encoder Name Plate
3.38	Encoder Type	Encoder Name Plate

Perform a parameter save by setting #0.00 = 1000 and pressing the red reset key.

Automatic Tuning in Closed Loop Vector

1. Set #00.40 to a 1
2. Enable the drive (terminal 31)
3. Give a RUN command (green button on the keypad)
4. If the drive completes the autotune with no errors continue

The following steps will cause the motor to rotate.
Ensure it is safe to do so.

5. Disable the drive (terminal 31)
6. Set #00.40 to a 2
7. Give a RUN command (green button on the keypad)
8. Wait for the motor to come to a stop and disable the drive
9. If the drive completes the second autotune with no errors then you can ramp the motor up and down using the keypad on the drive.

Defaulting to Servo and preparing to program

1. Set parameter 00.00 to 1244 (1233 for Europe)
2. Press the red reset key
3. Set parameter 00.49 to L2
4. If the drive trips with “th” set #7.15 = Volt
5. Set parameter 00.00 to 1254 (1253 for Europe)
6. Set parameter 00.48 to Servo
7. Press the red reset key
8. Set parameter 00.00 to 1000
9. Press the red reset key

Basic Programming in Servo Mode

Parameter	Description	Value
0.02	Max Reference	Motor Name PLate
0.03	Accel Rate	2.0
0.04	Decel Rate	2.0
0.05	Reference Select	Pad (4)
0.06	Current Limit	50.0
0.17	Current Demand Filter	2.0
0.27	Encoder PPR	Encoder Name Plate
0.42	Number of Motor Poles	Motor Name Plate
0.44	Motor Voltage	Motor Name Plate
0.46	Motor FL Amps	Motor Name Plate
3.36	Encoder Power Supply	Encoder Name Plate
3.38	Encoder Type	Encoder Name Plate
6.01	Stop Mode	rP
6.08	Hold Zero Speed	OFF

Perform a parameter save by setting #0.00 = 1000 and pressing the red reset key.

Automatic Phasing and Tuning in Servo Mode

**The following steps will cause the motor to rotate.
Ensure it is safe to do so.**

1. Set #00.40 to a 1
2. Enable the drive (terminal 31)
3. Give a RUN command (green button on the keypad)
4. If the drive completes the autotune with no errors continue
5. Disable the drive (terminal 31)
6. Set #00.40 to a 2
7. Give a RUN command (green button on the keypad)
8. Wait for the motor to come to a stop and disable the drive
9. If the drive completes the second autotune with no errors then you can ramp the motor up and down using the keypad on the drive.

If you have completed the steps above successfully then the wiring, drive, motor, and feedback device are working properly. You have ramped the motor up and down using the enable input and the drives keypad. We can now install the SM-EZMotion module and perform simple motion.

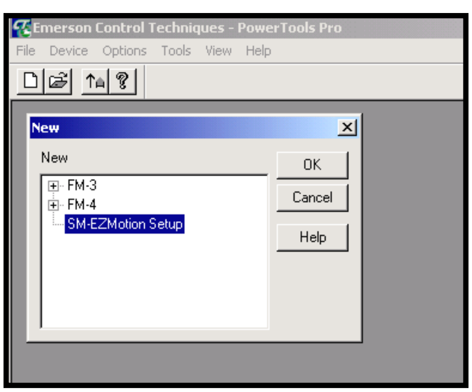
Comfirming EZ Motion Operation

Power down the drive. The manufacturer recommends 10 min. prior to seating a module in a drive slot. Insert the SM-EZ Motion module into the drive. If you do not have any other modules installed then slot three is recommended. It provides the most mounting support for the module. If you have multiple modules fill the drive slots starting with slot 3 and working towards slot 1. Power the drive back on and plug your serial communications cable between the RJ45 jack on the drive and the D-shell port on your computer. Open Power Tools Pro. The latest version can be downloaded from the link below.

Free **Power Tools Pro**

http://www.emersonct.com/download_usa/software/SMEZMotion/PowerTools Pro 3_0e.exe

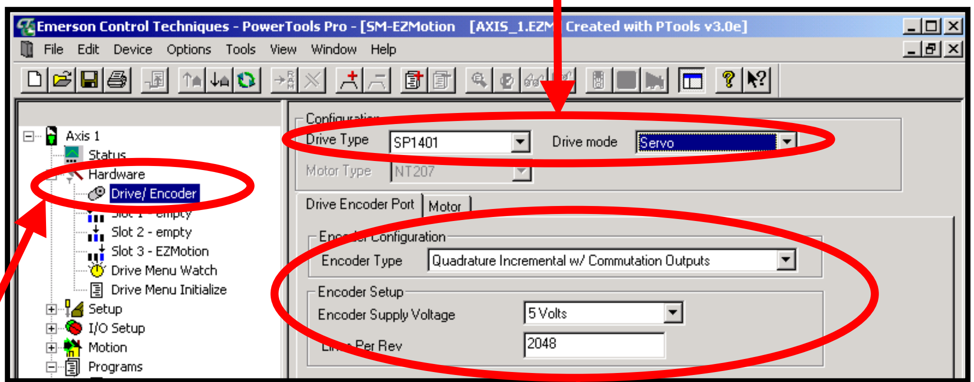
Starting a new test file



Open Power Tools Pro then click New File and select SM EZMotion Setup

Motor and Drive Set Up for Testing

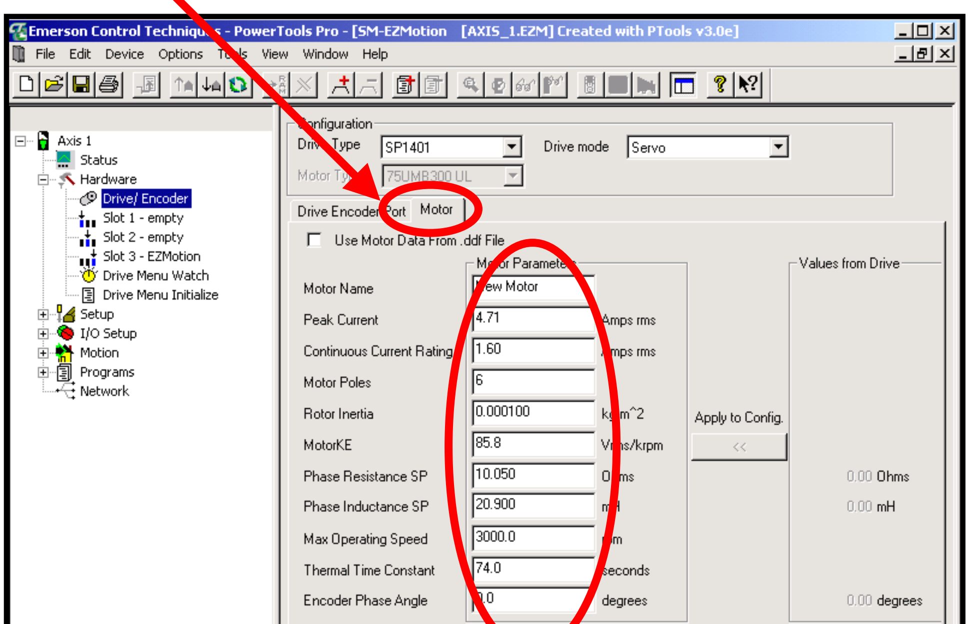
Choose the drive model and operating mode



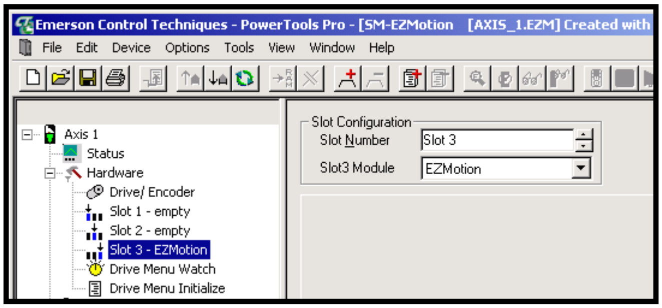
Expand Hardware and click on Drive/Encoder

Set the encoder options to match the encoder on your motor. If you are not sure of any values refer to the name-plate or data sheets for your encoder.

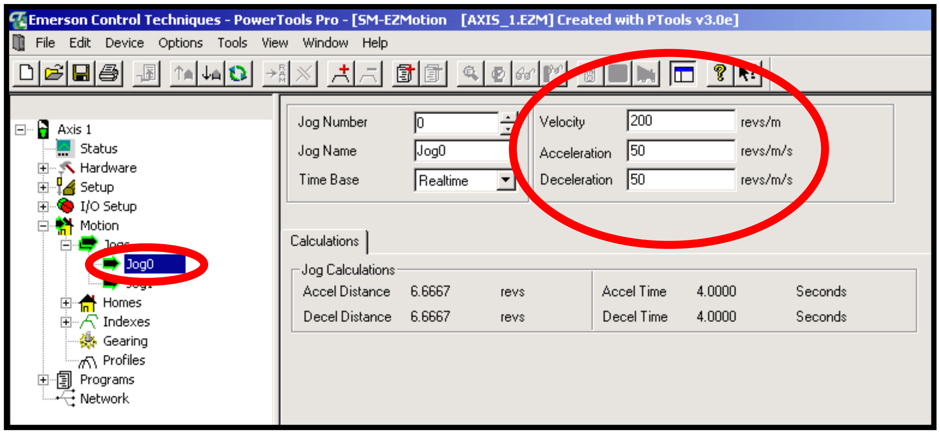
Click on the Motor tab shown below



Enter motor data here. If you are unsure of the values to enter see the motor nameplate, refer to the data sheet or contact the motor manufacturer.



Choose the Slot with your EZMotion module and configure the Slot Number and Slot Module accordingly. Set up any other modules at this time.



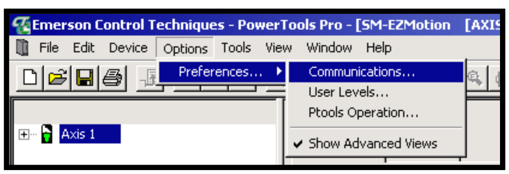
Select Jog0 from the menu tree and set the following:

Enter 200 for Velocity

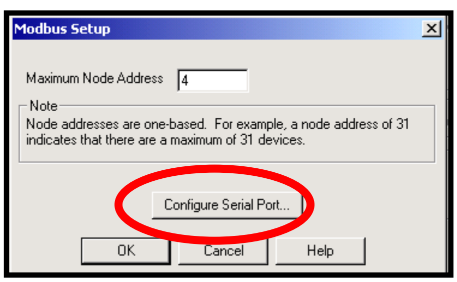
Enter 50 for Acceleration

Enter 50 for Deceleration

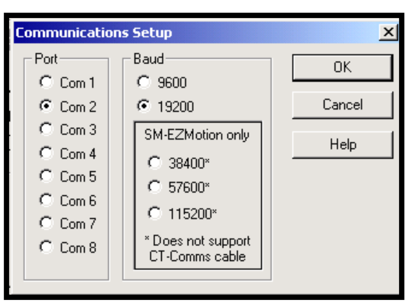
Confirming Communication Settings



Click on options and then choose the Communications option

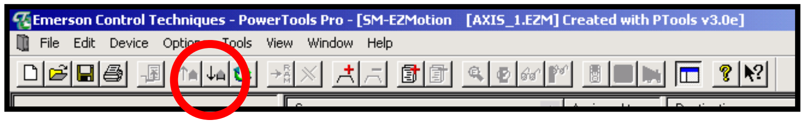


Choose Configure Serial Port

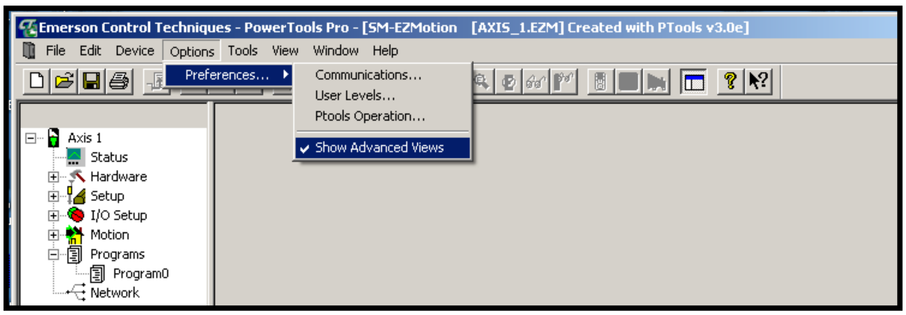


Confirm the settings coincide with the drive and your PC.

Download the Set Up to the Drive

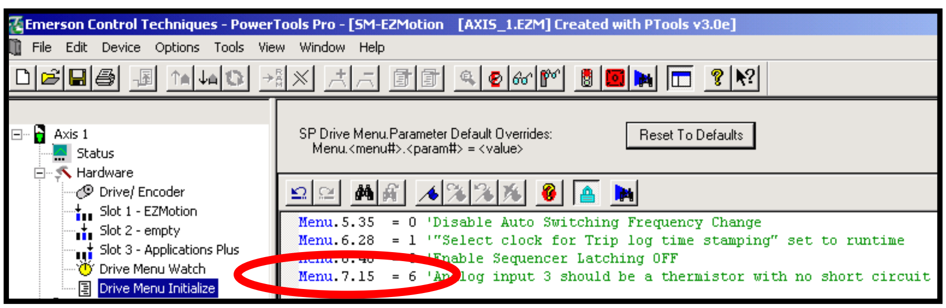


Press the button shown above to download you Power Tools Pro configuration to the module in the drive.



Click on **Options**, **Preferences**, then **Show Advanced Views**

This will allow you to select the Drive Menu initialize.



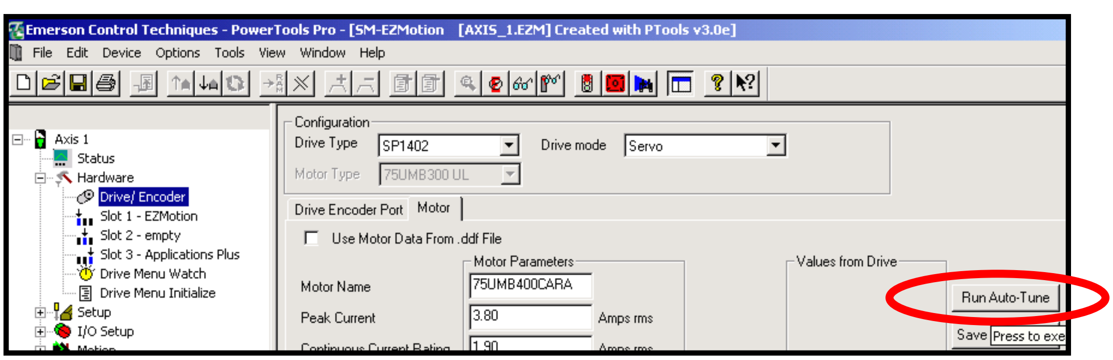
If the drive trips "th" after the SM-EZ Motion download set

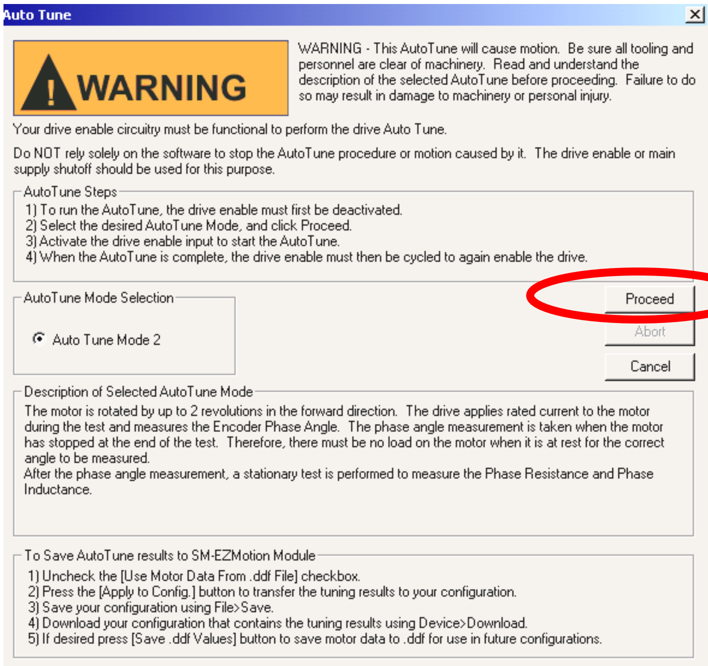
Menu.7.15 = 6

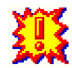
In the Drive Menu Initialize file and repeat the download.

EZ Motion Autotune

An autotune can be performed after a successful download has taken place and the SM-EZ Motion software is online with the drive. Go back to the motor tab under Drive/Encoder and click on the Run Auto-Tune button.







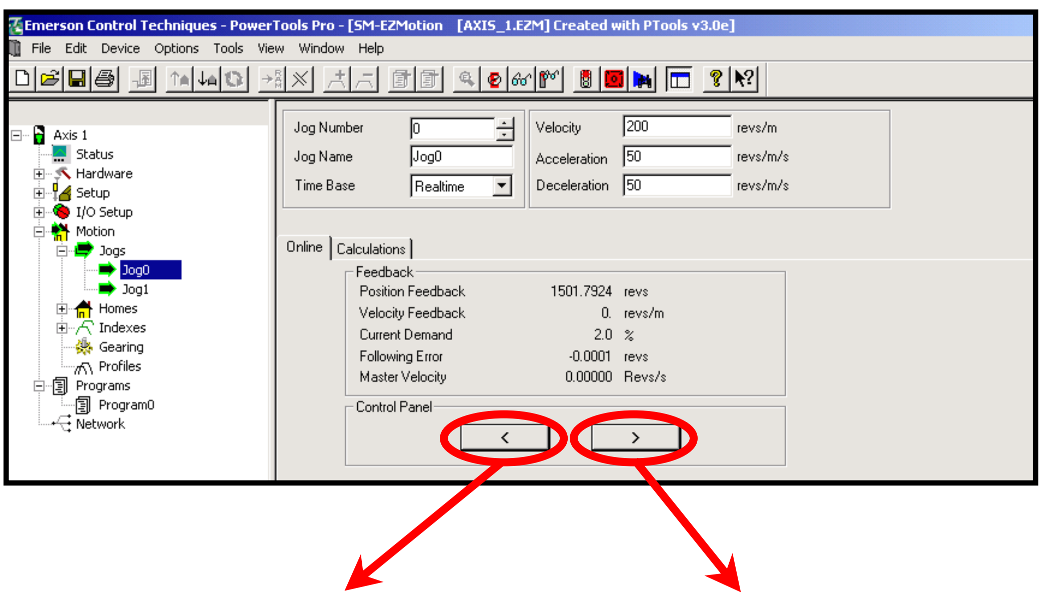
Ensure it is safe for the motor to rotate

Click Proceed shown to the left.

Click OK shown above

Disable then enable the drive. The drive should now perform the autotune.

Testing the Jog0 Profile



Jog Reverse

Jog Forward

Go back to the Jog0 in the menu tree. If you are still online with the drive an Online tab will appear. You can click on the arrow button to jog forward or jog reverse. Test this function.

You have completed the testing of the motor, drive, feedback device, and SM-EZ Motion module. You can now move on to advanced programming of the drive.

Questions ?? Ask the Author:

Author: **Jeff Wilcox** **e-mail :** jeff.wilcox@emersonct.com
(716)-774-0093