

Using the SOC MC433/MC433G

4 Axis Unipolar Stepper Motor Controller

With ArtSoft's Mach3 CNC Controller

www.soc-robotics.com

Introduction

The MC433 4 Axis Stepper Motor Controller is configured to accept step and direction pulses through its DB25 Parallel Port connector. However, the MC433G has its own on-board G-Code processor which must be disabled so that step and direction pulses can be accepted from Mach3. This is accomplished by powering the MC433G and typing “cm” at the dash prompt.

CM - Set Monitor Mode (MC433G only)

Set Control Monitor mode – the G Code Processor releases all step/direction and Aux IO lines and allows external signals at the parallel port to take control. The Control Monitor mode can be used if step/direction control signals are sent to the MC433G via the parallel port from an external pulsing engine, such as Mach3.

Mach3 Settings using the MC433.xml configuration file

Before making changes to settings in Mach3 manually, an MC433 configuration file for Mach3 is available on the SOC Robotics Download Page (MC433.xml). This should make most of the settings you will need. The file will configure Mach3 to use the MC433 set to Full-Step, with 200 steps-per-rev stepper motors, turning #1/4-20 leadscrews on all axes.

Download the file and copy it to the Mach3 main directory. Use the Mach3 Loader utility to start Mach3 with the MC433 configuration. This file will configure Mach3 to send step and direction pulses to the correct pins of the MC433 Parallel Port connector. If Limit Switches and an E-Stop button are attached to the MC433, the Port will also be configured correctly for these.

Custom Settings for your machine

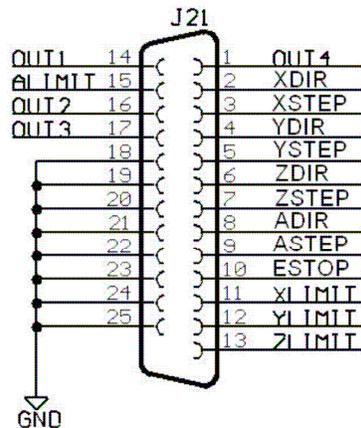
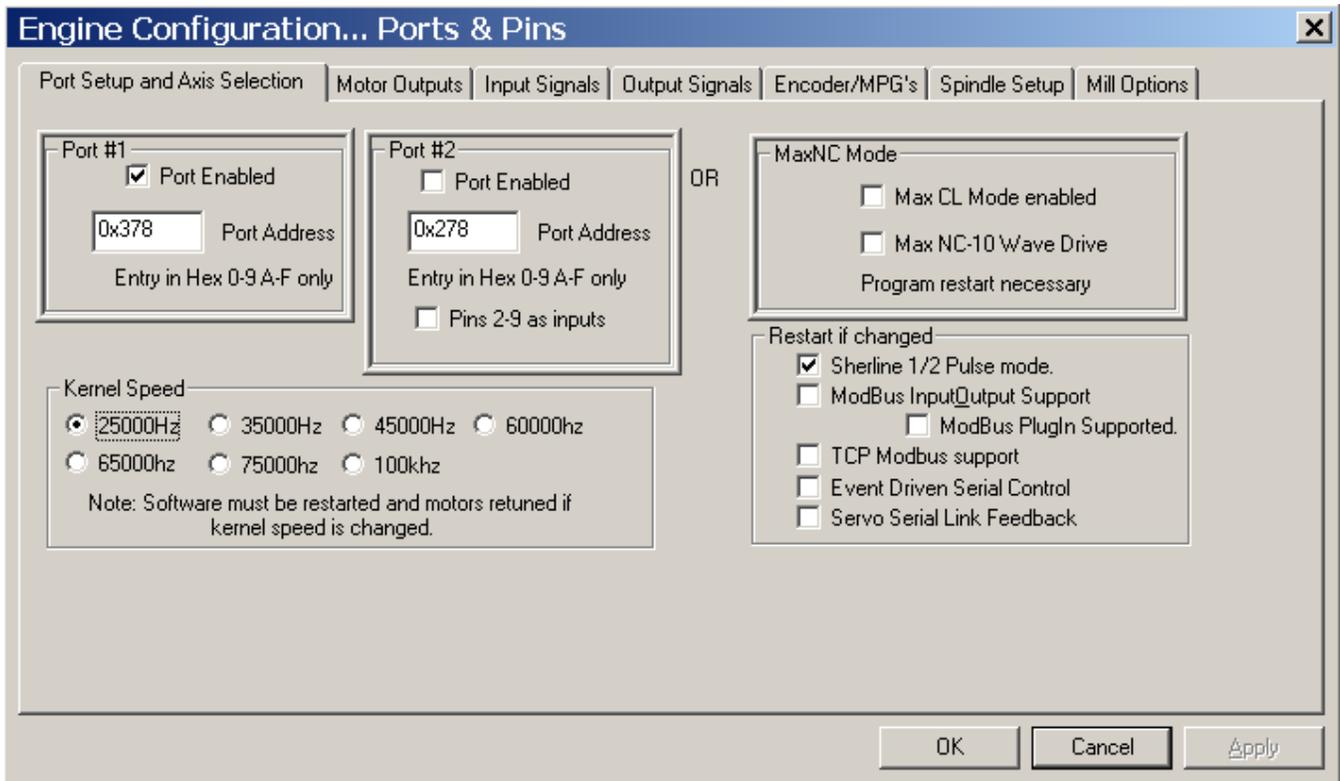
The only other changes you might need to make will be specific to your machine and setup, such as Port Pin settings for output control signals (spindle, coolant pump, etc.). The Motor Tuning Dialog, in the Config Menu of Mach3, allows you to specify the number of pulses Mach3 must generate to move an axis one inch or one millimeter (Steps Per). This number depends on the units you are using (“Select Native Units” Dialog in the Config Menu), on the number of steps the motor makes in one revolution and on the number of motor revolutions required to move one unit (leadscrew threads per inch or threads per millimeter).

Calculate this number as follows:

$$\begin{array}{r} \text{\# of motor steps per rev} \\ \text{X} \quad \text{number of revs per unit} \\ \hline = \quad \text{“Steps Per” setting} \end{array}$$

Other machine-specific settings, such as Backlash and Homing/Limits, must be determined at the machine location and set by the user.

Screen Shots of Mach3 Settings for the MC433



Pin Designations for
MC433 / MC433G
Parallel Port Connector (DB25)
(See next page for Mach3 Port Pin settings)

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Step Pin#	Dir Pin#	Dir LowAc...	Step Low ...	Step Port	Dir Port
X Axis		3	2			1	1
Y Axis		5	4			1	1
Z Axis		7	6			1	1
A Axis		8	9			1	1
B Axis		0	0			0	0
C Axis		0	0			0	0
Spindle		0	0			0	0

OK Cancel Apply

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
X Home		1	11			0
Y ++		1	0			0
Y --		1	0			0
Y Home		1	12			0
Z ++		1	0			0
Z --		1	0			0
Z Home		1	13			0
A ++		1	0			0

Pins 10-13 and 15 are inputs. Only these 5 pin numbers may be used on this screen

Automated Setup of Inputs

OK Cancel Apply

Motor Tuning and Setup

X - AXIS MOTOR MOVEMENT PROFILE

Velocity inches per Minute

Time in Seconds

Axis Selection

X Axis

Y Axis

Z Axis

A Axis

B Axis

C Axis

Spindle

Accel

Steps per: Velocity In's or mm's per min.: Acceleration in's or mm's/sec/sec: G's: Step Pulse 1 - 5 us: Dir Pulse 0 - 5:

Motor Home/SoftLimits

Entries are in setup units.

Axis	Revers...	Soft Max	Soft Min	Slow Z...	Home ...	Home ...	Auto Z...	Speed %
X	✔	8.00	0.00	1.00	0.0000	✘	✔	20
Y	✘	4.00	0.00	1.00	0.0000	✘	✔	20
Z	✘	0.00	-4.00	-1.00	0.0000	✘	✔	20
A	✘	100.00	-100.00	1.00	0.0000	✘	✔	20
B	✘	100.00	-100.00	1.00	0.0000	✘	✔	20
C	✘	100.00	-100.00	1.00	0.0000	✘	✔	20

G28 home location coordinates

X A

Y B

Z C