Trio Motion Technology
BREATHING LIFE INTO MACHINES

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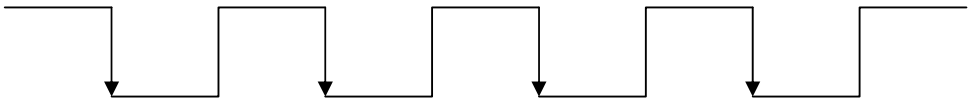
Technical Bulletin

1. Background:

Nearly a decade of development in the field of Stepper Motors and Drives has gone by since Trio first developed the Stepper Daughter Board for the MC1 Motion Coordinator. In that time the electronic components used in stepper drives have got faster and microstepping drives are now much more common. The MC206 Motion Coordinator has a new logic scheme to generate the step pulses that addresses some of these changes.

2. P230, P240 & P280 stepper daughter boards:

The original scheme used on the daughter boards produces a square wave at the step output. This changes frequency as the step rate changes and the drive is assumed to turn the motor by one step on each falling edge of the waveform.



Some drives step the motor on the rising edge of the incoming pulse, so to allow for this there is an INVERT_STEP axis parameter. Set this ON for drives that clock on the rising edge.

3. MC206 stepper output

The step output of the MC206 is a string of short pulses that have a varying mark-space ratio. Unlike the daughter board output, the MC206 pulses always return to zero and so there is NO requirement to set up the active edge with INVERT_STEP.

The output pulse width is much shorter at low step rates than the width of the square-wave produced by the daughter board. This may make the MC206 unsuitable for controlling older drives with slower opto-isolated step inputs. The output pulse widths are given in the following table.

Step Rate Band	Output Pulse Width (nominal*)
0 kHz to 31 kHz	16.0 μs
32 kHz to 62 kHz	8.0 μs
63 kHz to 499 kHz	1.0 μs
500 kHz to 999 kHz	0.5 μs
1 MHz to 2 MHz	0.25 μs

TABLE 1: MC206 step output pulse width

* Note: Pulse width jitter occurs and the value may be less than the figure shown.

4. Stepper axis parameters

Some axis parameters have a new function on the MC206. The table below shows stepper parameters and their function.

Parameter Name	MC202/204/216	MC206
INVERT_STEP	Changes the active step edge.	Inverts step output.
MICROSTEP	OFF: smooth running at low step rates. Max output = 62.5 kHz. ON: Max output = 500 kHz.	OFF: Step + Dir output. ON: A + B Quadrature output.
VERIFY	OFF: Encoder counts Step + Dir either internally (P240) or via encoder input connector. (MC202) ON: Encoder counts A + B quadrature input.	OFF: Encoder input counts Step + Dir. ON: Encoder input counts A + B quadrature.

TABLE 2: Stepper axis parameters

Notes:
1) MC206 uses x16 multiplier for all internal stepper axes over the entire frequency range.
2) All Motion Coordinators apart from MC206 use x16 with MICROSTEP set to OFF and x2 when MICROSTEP=ON.
3) When used as Stepper axes, the MC206 can count its own step pulses for registration purposes.