

## Model 2205 Stepping Motor Control Module

### Fully Programmable Performance Characteristics



The model 2205 Stepping Motor Control Module is an intelligent module allowing stepping motors to be easily tuned – and their performance modified – under program control. An independent microprocessor on the model 2205 handles all aspects of stepping motor control, allowing you to run multiple axes of stepping motors simultaneously without burdening the controller's main processor.

#### Flexible Performance Characteristics

All significant aspects of motion control, including base speed, maximum speed, acceleration rate, deceleration rate and stepping mode (i.e., full step or half step) may be modified under program control using the "profile motor" command. These parameters may be derived from thumbwheel arrays, numeric registers, or any other controller data resource; this flexibility allows:

- motor tuning in minutes, using Quickstep™ with its register monitoring and modification capabilities.
- operator controls based on thumbwheels, potentiometers, keypad entry, etc., or automatic adjustment based on any condition the controller can sense.
- data table storage of motion parameters, allowing sets of motion characteristics to be preprogrammed and selected based on the specific process being run that day.

#### Absolute and Relative Positioning

The model 2205 supports both simple "relative" turn commands (e.g., "turn motor#1 ccw 1500 steps") and more powerful "absolute" turn commands, where all motions are to coordinates based on a preset zero position. This latter technique allows x-y motions, and similar functions, to be programmed quickly and easily

#### On-board Drivers for Smaller Motors

For Control Tech stepping motors up to 100 oz-in, on-board drivers on the model 2205 may be used with the addition of the appropriate external resistor packs. For larger motors, the model 2205 supplies pulse and direction signals which may be used to control an external drive. Drives, motors and related cabling may be obtained directly from Control Tech, pre-engineered for plug-compatibility.

In addition, the model 2205 provides six auxiliary inputs which perform such commonly-used functions as jogging (cw or ccw, slow or fast), home sensing and hard or soft limit. Indicators are provided for each of these inputs.



The model 2205 Stepping Motor Control Module may be used in any Control Tech controller with a type 2200 bus.

Commands for the model 2205 may derive their parameters from any of the controller's numeric resources. The following commands are supported by the model 2205:

profile – establishes the stepping mode and motion profile for one or more subsequent motions:

profile motor#1 (half) basespeed = reg#501  
maxspeed = reg#502  
accel = reg#503  
decel = reg#504

turn – both relative and absolute turn commands are supported:

turn motor#1 ccw 5000 steps  
turn motor#1 to reg#100

search and zero – turns motor slowly in specified direction until "home" is sensed, then sets zero position:

search ccw and zero motor#1

zero – sets zero position without turning:  
zero motor#1

stop – stops motor stepping instantaneously (note, however, that absolute position may be lost due to overrun):  
stop motor#1

### For More Information

Further detailed information about Control Tech. products and the Quickstep™ language may be obtained from our staff of Systems Specialists — call the number below for further information.

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Absolute Maximum Ratings	Min	Typ	Max	
Applied Input Voltage (Note 1)			27.0	VDC
Driver Outputs				
Maximum output voltage (Note 2)			55.0	VDC
Maximum sink current (per winding)			2.0	Amps
Signal Outputs				
Maximum output voltage			5.5	VDC
Ambient Temperature	0		50	°C

Specifications	Min	Typ	Max	
Auxiliary Inputs				
Off Voltage (Ii = 0 mA) - Note 3		24.0	26.4	VDC
On Current (Vi = 0 V)		5.9	6.7	mA
Threshold Current		2.0	3.0	mA
Pulse and Direction Output Signals				
Output Voltage - low (Io = 40 mA)			0.7	VDC
Output Voltage - high (Io = 0 mA)		5.0	5.25	VDC
Output Current - low (Vo <= 0.8 V)			17.0	mA
Output Current - high (Vo >= 2.4 V)			9.5	mA
Driver Outputs				
On Voltage (I = 2.0 A)		.98	2.0	VDC
Off Leakage (V = 55 V)		0.01	1.0	mA

Performance Specifications	Min	Typ	Max	
Base Speed Setting50 (Max Speed)				Steps/sec
Maximum Velocity Setting (Base Speed) + 8			17,000	Steps/sec
Absolute Position Range	0		65,535	Steps
Relative Motion Command Range	0		65,535	Steps

Power Requirements (from controller)	Min	Typ	Max	
Logic Supply (5 V)	260	320		mA
Auxiliary Supply (24 V)		20	65	mA

### Notes:

1. Under normal operation, no external voltages are applied to the inputs – actuation is accomplished by sinking the input to the auxiliary supply's common.
2. Output voltage may not exceed the voltage applied to the cathodes of the on-board protection diodes.
3. Input off voltage is a function of the controller's auxiliary supply voltage.
4. Specifications shown above are at 25° C., unless otherwise noted.