

MotionPod universal motion controller

The MotionPod is a flexible 1-4 axis motion controller with an internal power supply and either microstepping or servo motor control, all integrated in one efficient package. Based on proven, high-performance Galil motion control technology, the MotionPod is suited to multi-axis system and machine motion control, saving space and cabling. Available in either a panel mount enclosure or with a front panel as a standard 2U high 19" rack mount, the MotionPod accepts a supply voltage from 90 to 24 Volts, 50/60Hz.

A full range of Galil motion control commands allow many modes of both simple and complex control of stepping motors and brushed or brushless servo motors in a system. Both Ethernet10Base-T and RS232 communication is provided.

The MotionPod incorporates a 32-Bit microcomputer and provides such advanced features as PID compensation with velocity and acceleration feed-forward, programme memory with multitasking for simultaneously running up to 8 programmes and uncommitted I/O for synchronising motion with external events.

The hardware interface to motors, encoders, digital inputs and outputs and analogue inputs is provided through standard DSub connectors on the rear panel. Internally, emergency stop and braking functions, when required, are also catered for.

An optional MotionLink multi-axis joystick unit can also be connected.

The MotionPod is an economical and very capable multi-axis motion controller for almost any application where reliable and flexible control of motors is required.



Key

- Ethernet 10Base-T port; (1) RS232 port up to 19.2 kbaud
- Ethernet supports multiple masters and slaves. TCP/IP, UDP and ModBus TCP protocol for communication with I/O devices
- Up to 4 axes control
- User-configurable for stepper or servo motors on any combination of axes. Optional firmware for piezo-ceramic motors. Sinusoidal commutation for brushless servo motors
- Accepts up to 12MHz encoder frequencies for servos. Outputs up to 3MHz for steppers
- PID compensation with velocity and acceleration feedforward, integration limits, notch filter and low-pass filter
- Modes of motion include jogging, point-to-point positioning, contouring, linear and circular interpolation, electronic gearing and ECAM. Features ellipse scaling, slow down around corners, infinite segment feed and feedrate override
- Over 200 English-based commands executable by controller. Includes conditional statements and event triggers
- Non-volatile memory for programmes, variables and arrays. Concurrent execution of up to 8 programmes
- Dual encoders, home and limits for each axis
- 8 TTL uncommitted inputs and 8 outputs
- 8 analogue inputs
- High speed position latch and output compare for each axis
- Enclosure or 19" rack-mount option
- Communication drivers for Windows Linux and Labview
- Custom hardware and firmware options available



SPECIFICATIONS

Communication Interface

Ethernet 10Base-T. (1) RS232 port up to 19.2 kbaud

Modes Of Motion

Point-to-point positioning
Position Tracking
Jogging
2D Linear and Circular Interpolation with feed-rate override
Linear Interpolation
Tangential Following
Helical
Electronic Gearing with multiple masters
Gantry Mode
Electronic Cam
Contouring
Teach and Playback

Memory

Programme memory size - 1000 lines x 80 characters
510 variables
8000 array elements in up to 30 arrays

Filter

PID (Proportional-Integral-Derivative) with velocity and acceleration feedforward
Notch and low-pass filter
Velocity smoothing to minimise jerk
Integration limits
Torque limits
Offset adjustments
Option for piezo-ceramic motors

Kinematic Ranges

Position: 32 bit (± 2.15 billion counts per move, automatic rollover, no limit in jog or vector modes)
Velocity: up to 12 million counts/sec
Acceleration: up to 67 million counts/sec²

Uncommitted Digital I/O

8 buffered inputs for 1-4 axes
8 TTL outputs for 1-4 axes
8 analogue inputs

High Speed Position Latch

Uncommitted inputs 1-4 latch X,Y,Z,W
(latches within 0.1 microseconds)

Dedicated Inputs (per axis)

Main encoder inputs - Channel A, A-, B, B-, I, I- ($\pm 12V$ or TTL)
Auxiliary encoder inputs for each servo axis
Forward and reverse limit inputs - TTL
Home input - TTL
High speed position latch input

Dedicated Outputs (per axis)

Analogue motor command output with 16-bit DAC resolution
Pulse and direction output for stepper motors
Amplifier enable output
Error output
High speed position compare (1 output for 4 axes)

Minimum Servo Loop Update Rate

1-2 axes: 125 microseconds
3-4 axes: 250 microseconds

Maximum Encoder Feedback Rate

12 Mhz

Maximum Stepper Rate

3 Mhz (full, halfstep or microstep)

Power Requirements

90-240V @ 50/60 Hz

Environmental

Operating temperature: 0-70° C
Humidity: 20-95% RH, non-condensing

Mechanical

Construction: mild steel with powder coated exterior
Dimensions (mm, nominal):
Enclosure-mount version: 442w x 87h x 202d
19" rack-mount version: 482w x 88h x 230d (inc. handles)

CONNECTIONS

Motor 15 Way F	
PIN	FUNCTION
1	Motor 1
2	Motor 1
3	Motor 2
4	Motor 2
5	Motor 3
6	Motor 3
7	Motor 4
8	Motor 4
9	N/C or Brake +
10	N/C or Brake -
11	Hall 1
12	Hall 2
13	Hall 3
14	0 Volts
15	+ 5 Volts

Encoder 15 Way HD F	
PIN	FUNCTION
1	A+
2	B+
3	A-
4	B-
5	N/C
6	Forward Limit
7	Reverse Limit
8	Index +
9	Index -
10	Home
11	0 Volts
12	0 Volts
13	+ 5 Volts
14	N/C
15	N/C

I/O (when required) 37 Way F			
PIN	FUNCTION	PIN	FUNCTION
1	Digital Input 1	20	N/C
2	Digital Input 2	21	N/C
3	Digital Input 3	22	N/C
4	Digital Input 4	23	N/C
5	Digital Input 5	24	N/C
6	Digital Input 6	25	N/C
7	Digital Input 7	26	0 Volts
8	Digital Input 8	27	N/C
9	N/C	28	N/C
10	N/C	29	N/C
11	N/C	30	N/C
12	Digital Output 1	31	Analogue Input 1
13	Digital Output 2	32	Analogue Input 2
14	Digital Output 3	33	Analogue Input 3
15	Digital Output 4	34	Analogue Input 4
16	Digital Output 5	35	N/C
17	Digital Output 6	36	N/C
18	Digital Output 7	37	N/C
19	Digital Output 8		