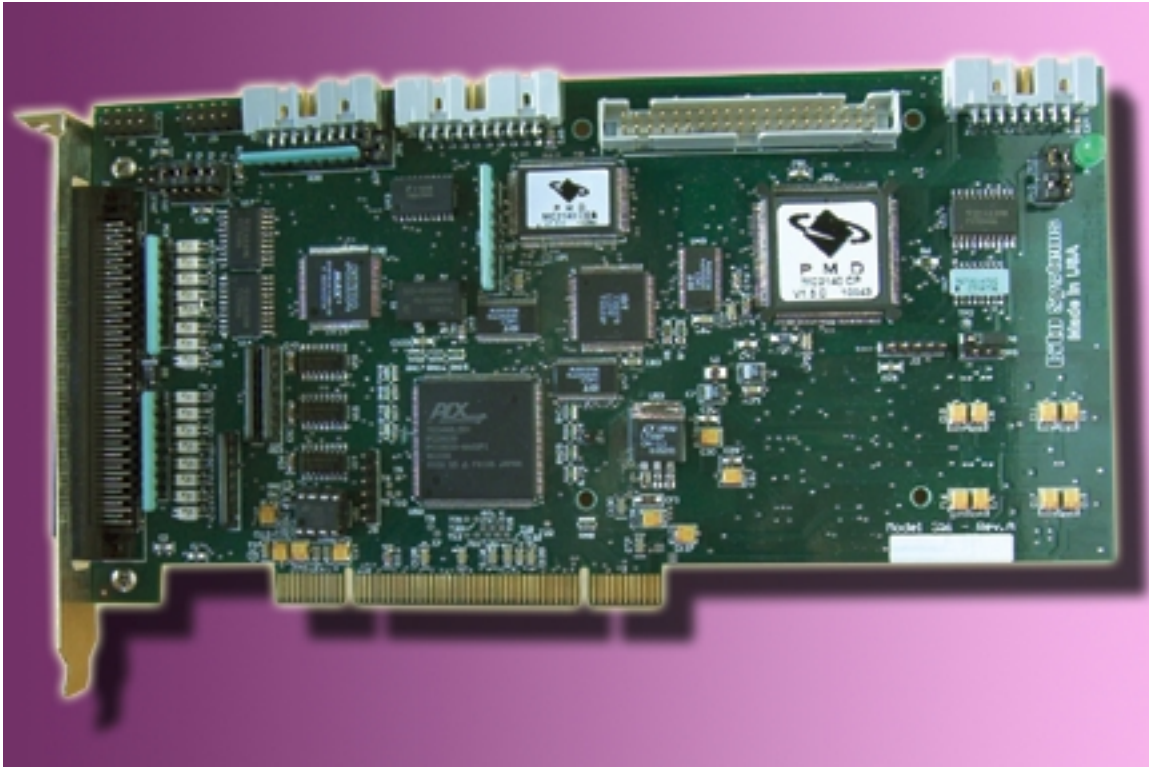


## 3mi-0x-S



### Product Description

The PCI-bus cards of the Millennium series are high performance feature-rich multi axis motion controllers. The 3mi-0x-S model implements the Navigator MC25xx series chipsets - dedicated motion processors from PMD to control stepper motors. These controllers harness the power of the Navigator high-speed DSP chip and incorporate ASIC and surface mount technologies. The Millennium controllers are available in configurations of 1, 2 or 4 axes.

The DSP unit provides S-curve, trapezoidal, velocity contouring and electronic gearing profiling modes for pulse and direction signal output. Onboard memory allows designers to capture on-the-fly motion data for analyzing system performance and diagnostic purposes. Motion trajectory segments can be blended into continuous motion path in the velocity mode.

The boards interface to external components via a 100

pin high density connector providing motor outputs and reading pulsed encoder (incremental or absolute) for on-the-fly motor stall detection, limit switches and home indicator input signals. They are capable of handling eight analog inputs and eight user-defined discrete inputs and outputs.

The card is supported by C-Motion™ - extensive C-language software library and Windows drivers, which allow development of any motion control application. EasyMotion™, a Windows application package with the industry's first ever MotionWizard, assists in a quick and easy way to set up even complex electro-mechanical systems.

The boards can be used in a variety of industries, such as robotic, machine tool, semiconductor, medical, food processing, textile and many others.

## Features:

- Uses DSP and ASIC high speed dedicated motion processors in 1, 2 or 4 axes configuration
- Independent or synchronous axes programming
- Open loop or stall detection with encoder feedback operating modes
- Choice of S-curve, trapezoidal, velocity contouring or electronic gearing motion profiles
- Asymmetric acceleration and deceleration to custom program a trapezoidal motion profile
- Velocity and acceleration changes on-the-fly for trapezoidal and velocity contouring profiles
- Position range from -2,147,483,648 to +2,147,483,647 counts
- Velocity range from -32,768 to +32,767 counts/sample with a resolution of 1/65,536 counts/sample
- Acceleration and deceleration range from -32,768 to 32,767 counts/sample<sup>2</sup> with a resolution of 1/65,536 counts/sample<sup>2</sup>
- Jerk range from 0 to 1/2 counts/sample<sup>3</sup> with a resolution of 1/4,294,967,296 counts/sample<sup>3</sup>
- Electronic gear ratio range from -32,768 to 32,767 (negative and positive direction)
- Programmable sample rate from 100  $\mu$ sec to 3355 msec per axis
- Single-ended or differential incremental encoder maximum rate up to 5.0 Mcounts/sec
- Maximum parallel encoder rate up to 160.0 Mcounts/sec
- Parallel encoder word size: 16 bits
- Parallel encoder read rate: 20kHz (every 50  $\mu$ sec)
- Pulse and direction motor output up to 4.98 M-pulses/sec
- On-board 64 kByte dual-port memory buffer for data and parameters storage
- PCI-bus communication interface
- Opto-isolated dedicated inputs for two-directional travel limit switches, home indicator and fault signal operating at +5V, +12V, +24V or +48V
- 8 general purpose discrete TTL level input lines
- 8 uncommitted discrete output lines operating at TTL level, expandable to 128 outputs or opto-isolated capable of sinking or sourcing maximum 350 mA at 50V
- 8 general purpose 10-bit analog inputs in range of 0 to 5.0 V dc
- Automatic motor shutdown on motion error
- Programmable host interrupts
- Trace capabilities for system performance testing and diagnostic purposes
- Software functions support coordinated linear and circular interpolation, point-to-point positioning and contouring, backlash compensation, jogging, homing, etc.
- Status reporting for position, speed and errors
- Infinite number of linear and arc segments for smooth motion
- Programmable event triggers for monitoring elapsed time, motion complete, position, motion error, limit switches and position wrap-around

## Axes Control Signals Connector (J4)

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
01	QuadA1+	26	QuadA2+	51	QuadA3+	76	QuadA4+
02	QuadA1-	27	QuadA2-	52	QuadA3-	77	QuadA4-
03	QuadB1+	28	QuadB2+	53	QuadB3+	78	QuadB4+
04	QuadB1-	29	QuadB2-	54	QuadB3-	79	QuadB4-
05	Index1+	30	Index2+	55	Index3+	80	Index4+
06	Index1-	31	Index2-	56	Index3-	81	Index4-
07	Vcc (encoder)	32	Vcc (encoder)	57	Vcc (encoder)	82	Vcc (encoder)
08	GND (encoder)	33	GND (encoder)	58	GND (encoder)	83	GND (encoder)
09	N.C.	34	N.C.	59	N.C.	84	N.C.
10	N.C.	35	N.C.	60	N.C.	85	N.C.
11	N.C.	36	N.C.	61	N.C.	86	N.C.
12	GND	37	GND	62	GND	87	GND
13	PosLim1	38	PosLim2	63	PosLim3	88	PosLim4
14	NegLim1	39	NegLim2	64	NegLim3	89	NegLim4
15	Home1	40	Home2	65	Home3	90	Home4
16	AxisIn1	41	AxisIn2	66	AxisIn3	91	AxisIn4
17	AxisOut1	42	AxisOut2	67	AxisOut3	92	AxisOut4
18	Pulse1	43	Pulse2	68	Pulse3	93	Pulse4
19	N.C.	44	N.C.	69	N.C.	94	N.C.
20	N.C.	45	N.C.	70	N.C.	95	N.C.
21	Direction1	46	Direction2	71	Direction3	99	Direction4
22	N.C.	47	N.C.	72	N.C.	97	N.C.
23	N.C.	48	N.C.	73	N.C.	98	N.C.
24	GND	49	GND	74	GND	99	GND
25	Opto GND	50	Opto GND	75	Opto GND	100	Opto GND

## User-defined Digital I/O Connector (J5)

Pin	Signal Name	Pin	Signal Name
01	PrIn0	11	PrIn5
02	PrOut0	12	PrOut5
03	PrIn1	13	PrIn6
04	PrOut1	14	PrOut6
05	PrIn2	15	PrIn7
06	PrOut2	16	PrOut7
07	PrIn3	17	GND
08	PrOut3	18	Vcc
09	PrIn4	19	GND
10	PrOut4	20	Vcc

## Serial Channel Connector (J2)

Pin	Signal Name
01	SrIXmt
02	SrIRcv
03	Synch
04	GND
05	Vcc

## Analog Input Connector (J1)

Pin	Signal Name	Pin	Signal Name
01	Analog1	09	AnalogRefHigh
02	Analog2	10	AnalogRefLow
03	Analog3	11	AnalogVcc
04	Analog4	12	AnalogGND
05	Analog5	13	Vcc
06	Analog6	14	GND
07	Analog7	15	Synch
08	Analog8	16	~HostIntrpt

## High Power I/O Connector (J7)

Pin	Signal Name	Pin	Signal Name
01	High PrOut0	09	High PrOut4
02	+VS	10	Pwr GND
03	High PrOut1	11	High PrOut5
04	+VS	12	Pwr GND
05	High PrOut2	13	High PrOut6
06	+VS	14	Pwr GND
07	High PrOut3	15	High PrOut7
08	+VS	16	Pwr GND

## Environmental and Electrical Ratings

Dimensions	4.00" x 8.25"
Storage Temperature	-40 °C to 125 °C
Operating Temperature	0 °C to 70 °C (an industrial version with an operating range of -40 °C to 85 °C is also available)
Power Consumption	1A @ 5V
Supply Voltage Limits	-0.3V to +7.0V
Supply Voltage Operating Range	4.75V to 5.25V
Analog Input Range	0.0V to 5.0V

## Ordering information

3mi - 0  - S

1 - 1 axis controller

2 - 2 axis controller

4 - 4 axis controller