Low-Cost Stepper Motion Controllers

NI 7330 Series

- Up to 4 axes of stepper motion
- 3D linear interpolation
- PXI (cPCI) and PCI versions available

Models
- NI PCI-7334
- NI PXI-7334

Operating Systems
- Windows 2000/NT/XP

Recommended Software
- LabVIEW
- NI Motion Assistant
- LabWindows/CVI
- Measurement Studio
- Motion Control Module for Measurement Studio

Other Compatible Software
- Visual Basic
- C/C++

Driver Software (included)
- NI-Motion

Overview and Applications

NI 7330 series devices are low-cost stepper motion controllers for point-to-point applications. These low-cost motion controllers provide new solutions for machine builders who need simple, straightforward motion control without a lot of extra features.

Unlike other low-cost motion controllers, NI 7330 controllers still have a variety of powerful features including:

- Linear interpolation for coordinating multiple axes.
- Real-time system integration for directly communicating with data acquisition or image acquisition boards
- High-performance stepper generation for ensuring smooth motion at high velocities.

NI-Motion Driver Software

NI 7330 devices use the NI-Motion driver. The advantage of this is that if your application needs change in the future, you can easily upgrade your hardware without having to change your code. You can also take advantage of any firmware updates with the field-upgradable firmware.

Integration Capabilities

Like other NI Motion controllers, NI 7330 controllers offer powerful integration capabilities with both data acquisition and machine vision. One of the most powerful is the RTSI bus or PXI trigger bus capability that you can use to communicate directly with other devices without extra wiring and without consuming bandwidth on the host bus. An NI 7330 is ideal when using stepper motors for applications where only simple motion is required.

Feature	NI 7330 Series
Maximum number of axes	4 axes
Closed loop stepper control	✓
Linear interpolation	✓
Configurable auxiliary DIO	✓
RTSI	✓
S-curve	✓
Configurable move complete criteria	✓
Software limits	✓
High-speed capture	✓
Blending	✓
Upgradeable firmware	✓
NI Motion software API	✓
Number of axes per 62.5 microsecond PID rate	1
Static PWM outputs	2
DIO	32 bits
Analog-to-digital converter	12-bit A/D
Stepper output rate	4 MHz maximum
Encoder rate	20 MHz maximum
PCI	✓
PXI	✓

Figure 1. NI 7330 Series Features

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Technical Support for Motion Software

As a complement to your motion software product, consider:

Technical Support – FREE through applications engineers worldwide, Web resources, and Premier Support – ***ni.com/support***

Motion Control Fundamentals Training – Instructor-led courses – ***ni.com/training***

Professional Services – Feasibility, consulting, and integration through our Alliance Program members – ***ni.com/alliance***

For more information on NI services and support, visit ni.com/services

Ordering Information

NI PCI-7334 (4-axis stepper) 778417-01
NI PXI-7334 (4-axis stepper) 778444-01
Includes hardware and NI-Motion software, libraries, and examples

Accessories

NI Motion Assistant.....778553-01
Universal Motion Interfaces.....see page 640
Drives.....see page 642
Cables.....see page 645

BUY ONLINE!

Visit ni.com/info and enter pxi7334, pci7334.

Specifications

Trajectory update rate range..... 62.5 to 500 µs/sample
Maximum update rate..... 62.5 µs/axis
4-axis update rate ..... 250 µs total
Multi-axis synchronization..... < 1 update sample
Trajectory parameters
Position range..... $\pm 2^{31}$ steps
Maximum relative move size ..... $\pm 2^{31}$ steps
Velocity range..... 1 to 4,000,000 steps/s
Acceleration/deceleration..... 61 to 128,000,000 steps/s2

System Safety

Watchdog timer function ..... Resets board to startup state
Shutdown input ..... Disable all axes and command outputs

Motion I/O

Stepper outputs
Maximum pulse rate ..... 4 MHz (full, half, and microstep)
Step output mode..... Step and direction or CW/CCW
Encoder inputs..... Quadrature, incremental, single-ended
Maximum count rate ..... 20 MHz
Forward, reverse, and home inputs
Number of inputs..... 3 per axis
Control ..... Individual enable/disable, stop on input, prevent motion, find home
Trigger inputs..... 1 per axis
Maximum repetitive capture rate ..... 150 Hz
Breakpoint outputs
Number of outputs ..... 1 per axis, programmable polarity
Inhibit/enable output
Number of outputs ..... 1 per axis, programmable polarity
Analog inputs ..... 12-bit resolution, ±10 V range, 50 µs scan rate

Digital I/O

Ports..... 4, 8-bit TTL ports, bit configurable, sink or source 24 mA
Open-loop PWM outputs
Number of PWM outputs 2
Clock sources..... Internal or external

Power Requirements

+5 VDC (±3%)..... 1 A
+12 VDC (±3%)..... 30 mA
-12 VDC (±3%)..... 30 mA
Power consumption..... 5.7 W, maximum

Physical

PCI ..... 17.5 by 9.9 cm (6.9 by 3.9 in.)
PXI ..... 16 by 10 cm (6.3 by 3.9 in)
Connectors
Motion I/O connector..... 68-pin female high-density VHDCI type
Digital I/O connector..... 68-pin female high-density VHDCI type

Environment

Operating temperature..... 0 to 55 °C
Storage temperature..... -20 to 70 °C
Relative humidity range ..... 10 to 90% (noncondensing)