# INTRODUCTION

Trio Motion Technology's range of *Motion* Coordinator products are designed to enable the control of industrial machines with a minimum of external components. The products may be combined to build a control system capable of driving a multi-axis machine and its auxiliary equipment. The *Motion* Coordinator PCI 208 card allows you to control up to 8 servo or stepper motors, digital and analog I/O and additional equipment via 2 CAN ports. Multiple PCI 208 cards can be put in a PC to increase capacity. The controller is programmed via an Active X component from PC based programming languages and in addition can execute programs internally using the *Trio* BASIC programming language.
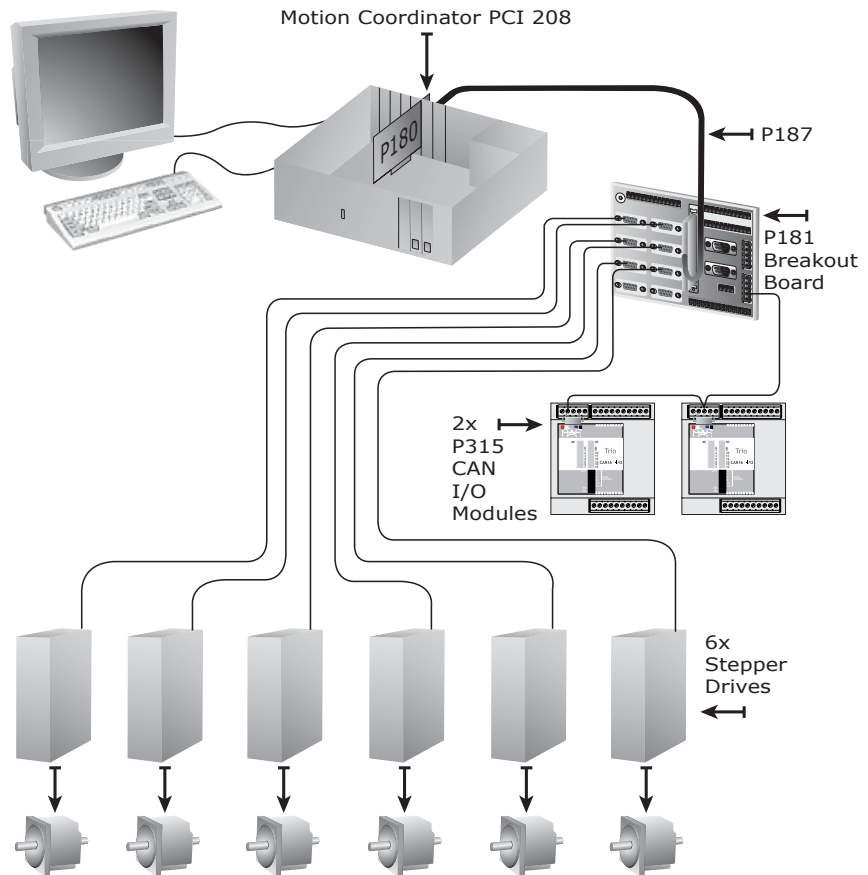
Typical System Configuration

Setup and Programming

The PCI 208 is inserted into a free PCI slot within the PC running Windows 2000 or Windows XP. Trio's *Motion* Perfect application development tool can be used to view the status of the axes, IO and other facilities of the PCI 208. *Motion* Perfect can be run alongside the users application running via the Active X link into the PCI 208.
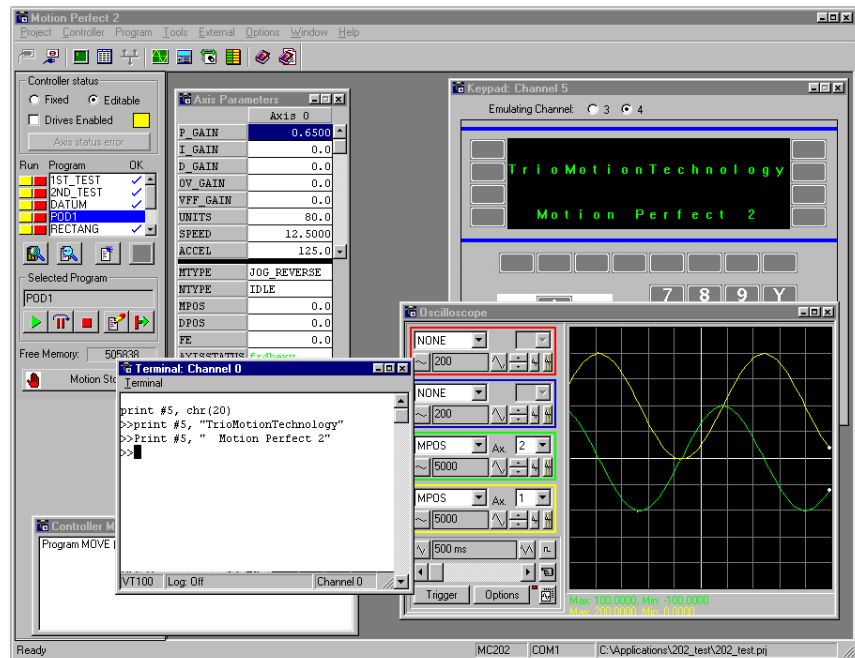
Motion **Perfect**

Users programs are usually constructed on the PC in languages such as, Visual BASIC, Delphi or Visual C. The programs use the Trio PC Active X component to access the PCI 208 card functions via the dual port ram. *Motion* Perfect can be used if required to help debug the users application program. In addition *Motion* Perfect provides an easy, rapid way to develop control programs. All the standard program constructs are provided; variables, loops, input/output, maths and conditions. Extensions to this basic instruction set exist to permit a wide variety of motion control facilities, such as single axis moves, synchronized multi axis moves and unsynchronised multi axis moves as well as the control of the digital I/O.

Products

This manual covers the *Motion* Coordinator PCI 208 and its option modules:

Motion Coordinator PCI 208 and Options:

| Product Code	Name	Description
P180	**PCI 208**	PCI card Servo/stepper *Motion* Coordinator for up to 8 axes. 20 opto-isolated inputs and 10 opto-isolated outputs are built in. Multi-tasking *Trio* BASIC. 2 CAN channels for I/O expansion.
P181	**Breakout Board**	DIN rail mounting PCB to allow easy connection to all the PCI 208 functions in prototype and low volume applications.
P182	**Additional Stepper Axis**	The standard PCI 208 has 2 stepper/servo axes. Additional stepper axes (up to a total of 8) can be activated by purchasing P182 options. The P182 is supplied as a "Feature Enable Code". This is a code word to enable this feature of the P180.
P183	**Additional Servo Axis**	The standard PCI 208 has 2 stepper/servo axes. Additional servo axes (up to a total of 8) can be activated by purchasing P183 options. *Analog voltage output servo axes will in addition require a P184 or P185 module.*
P184	**4 Axis DAC Module**	Provides 4 x +/-10 volt outputs for analog servo drive control. The outputs are opto-isolated and have 16 bit resolution. The P184 in addition provides 2 x 0-10 volt analog inputs.
P185	**8 Axis DAC Module**	Provides 8 x +/-10 volt outputs for analog servo drive control. The outputs are opto-isolated and have 16 bit resolution.
P187	**2.5m 100 Way Cable**	Cable to connect PCI 208 to breakout board.
P315	**CAN 16 I/O Module**	DIN Rail mounted 24v I/O expander module provides 16 opto-isolated channels each of which may be used as an Input or an Output. Up to 16 P315 modules can be connected to the PCI 208 to expand the I/O.
P325	**CAN Analog Input Module**	8 x +/-10 volt input channels. Up to 4 P325 modules can be connected to the PCI 208 to expand the analog input capacity.

I/O Expansion options

P315 - CAN-16 I/O

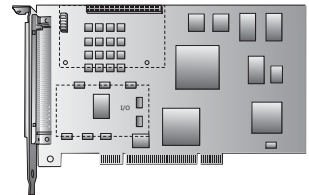P325 - CAN-8 Analog Inputs

System Examples

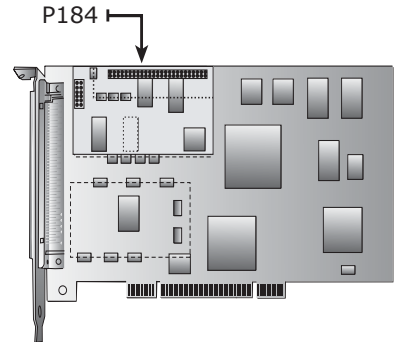**Example 1 Simplest Possible System - 2 Axis Stepper System**
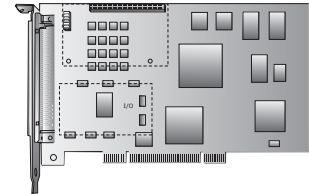
- 1 x P180

Example 2 8 Axis Stepper System

- 1 x P180   PCI 208 *Motion* Coordinator
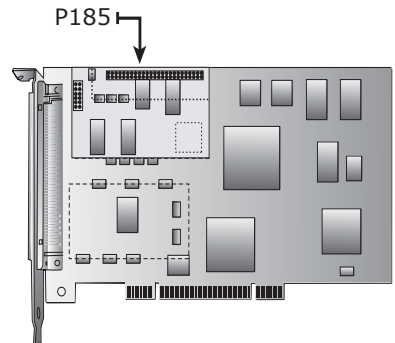- 6 x P182   Additional stepper axis

Example 3 4 Axis Servo System

- 1 x P180   PCI 208 *Motion* Coordinator
- 2 x P183   Additional servo axis
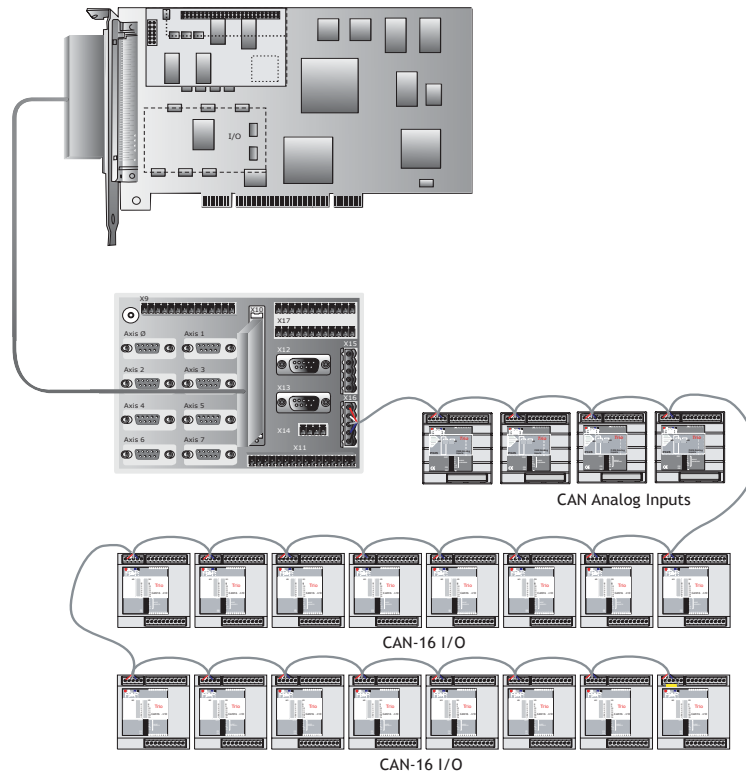- 1 x P184   4 axis DAC module

P184

Example 4 6 Axis Servo + 2 Axis Stepper System

- 1 x P180   PCI 208 *Motion* Coordinator
- 4 x P183   Additional servo axis
- 2 x P182   Additional stepper axis
- 1 x P185   8 Axis DAC module

P185

Example 5 8 Axis Servo System with 256 expansion I/O and 32 analog inputs

CAN Analog Inputs

CAN-16 I/O

CAN-16 I/O

- 1 x P180   PCI 208 *Motion* Coordinator
- 1 x P181   Breakout board
- 1 x P187   2.5 metre breakout board cable
- 1 x P185   8 Axis DAC module
- 6 x P183   Additional servo axis
- 16 x P315   16 I/O module
- 4 x P325   8 Analog input module

Features and Typical Applications

The PCI 208 software contains accurate motion control functions for the generation of complex movements of various types, including:

- Linear interpolation of up to 8 axes
- Circular and helical interpolation
- Variable speed and acceleration profiles
- Electronic gearboxes
- Electronic cam profiles
- Linked motion
- Axis superimposition
- Imaginary axes
- Hardware registration

The operator interface is normally achieved using the PC user interface.

The system is able to control a wide range of mechanisms and equipment including:

- Brushless servo motors
- Stepper motors
- Brushed DC servo motors
- Hydraulic servo valves
- Hydraulic proportional valves
- Pneumatic/hydraulic solenoids
- Relays/contactors
- Switches / Thumbwheels
- Status lamps

Typical applications:

• Cut to length	• Coil winding	• Automotive welding
• Flying shears	• Laser guidance	• Spark erosion
• Glue laying	• Electronic assembly	• Drilling
• Web control	• Printing	• Milling
• Tension control	• Collating	
• Pick & Place	• Packaging	• YOUR application

The Trio Motion Technology Website

The Trio website contains up to the minute news, information and support for the whole *Motion* Coordinator product range.
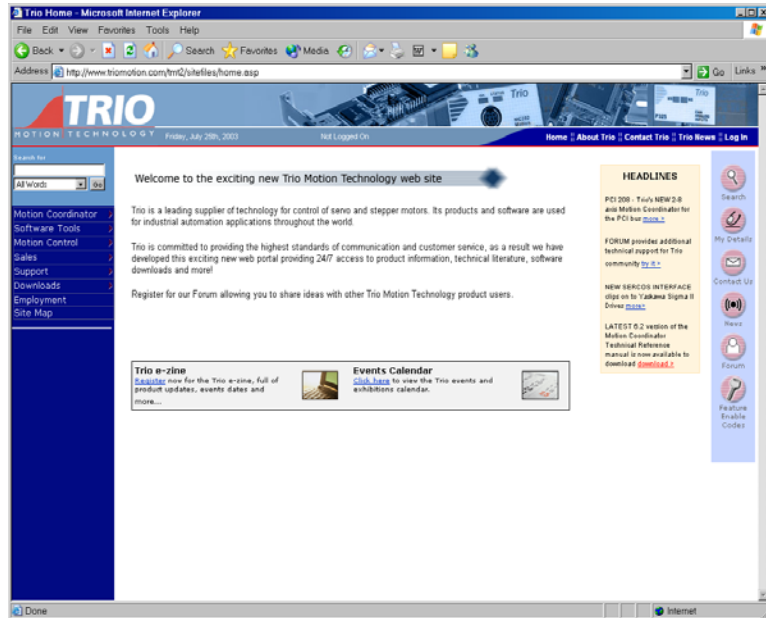
Website Features

- Latest News
- Product Information
- Manuals
- Support Software
- System Software Updates
- Technical Support
- User's Forum
- Application Examples
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