

## Feature

- Four , configurable, axes position control for servo or stepper
- Supports real-time RTX driver (option)
- Most advanced encoder interface features
- On board Linear DDA for fine interpolation
- Output Interface can be analog or pulse train commands
- 250ns P position controls loop with offset compensation
- Four 32 bits encoder channels
- Four 16 bits D/A channels (*PCI-8504 only*)
- Encoder resolution multipliers: x1, x2 or x4 rates
- 18 on board system I/O points
- Further DI/O expansion up to 128 remote I/Os thru its I/O daughter board
- Watchdog timer and on board programmable timer
- Supports Windows 98/NT/2000/XP and LabView 6.0/7.0 driver
- Complete sample programs in VB, VC, BCB, Delphi

## Introduction

The PCI-8504 is a PCI-based, four-axis motion control board. It's designed to control both servo and stepper motor. The PCI-8504 thus has two modes: The first one is to work with an analog interfaced, velocity mode servo drive. The PCI-8504 compares the segmental movement commands from Host PC and encoder feedback from servo motor, close the position loop once every 250ns and send the analog output velocity command to the velocity mode servo drive. The second mode is to convert the segmental movement command into well behaved pulse trains to either a position mode servo or a stepper drive. In addition to a Windows kernel soft driver, we also support the RTX (VenturCom) driver for applications requiring higher level of hard real time.

### Higher Level of Hard Real Time Control: RTX Driver

Depending on the level of CPU in your system, normally the "Block Processing Time" of a RTX motion application in Windows XP/2000 with the PCI-8504 can easily reach to a 500us level deterministically in a Pentium IV system while the CPU still has abundant power to perform Soft Logic and HMI.

### Most Advanced Encoder Interface ASIC

- Up to 1MHz A, B, Z phase
- Index, probing, and general digital input interrupt with position latches
- On board system I/O for each axis
- Position comparison with interrupt
- Optional subcount for low speed feedback

## Specifications

Data bus: 16-bit  
Interrupt source: 83  
Control axes: 4  
DDA cycle: 25 $\mu$ s-3.35 ms  
D/A resolution: 16-bit  
Pulse command output: Pulse/Direction, CW/CCW, A/B phase  
Encoder feedback signal: Pulse/Direction, CW/CCW, A/B phase  
DAC: 4 D/A, 16 bits, position loop output (*PCI-8504 only*)  
Error counter: 16-bit  
Absolute position recorder: 24-bit  
Compensator: P, PI mode  
Local system I/O channels: 18  
Local I/O type: general purpose, interrupt I/O  
Remote I/O channels: up to 128 DI/O  
Remote I/O type: Output sink type (open collector) input source type  
Interval timer channel: 1  
Timer interrupt: 0.5 $\mu$ s-33ms  
Watchdog timer: 16-bit

### General Environment

Connector type: 100-pin SCSI-II pin type female  
Power consumption: +5V @0.9A max.  
Operation temperature: 0 ~ 60°C  
Storage temperature: -20 ~ 70°C  
Humidity: 0 ~ 90% non-condensing  
Dimensions: 185mm x 122mm

### Pin Assignment

100-Pin SCSI-II Pin Type Female Connector for  
PCI-8504/ 8504L (J1)

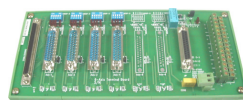
Description	Pin		Pin	Description
AGND	1		51	AGND
DAC/D1	2		52	DAC/D4
DAC/D2	3		53	DAC/D5
DAC/D3	4		54	DAC/D6
VCC_OUT(+5V)	5		55	COM-
COM+	6		56	COM-
COM	7		57	E_STOP
COM	8		58	P_RDY
HOME_I1	9		59	HOME_I2
OT+ I1	10		60	OT+ I2
OT- I1	11		61	OT- I2
INH_O1	12		62	INH_O2
HOME_I3	13		63	HOME_I4
OT+ I3	14		64	OT+ I4
OT- I3	15		65	OT- I4
INH_O3	16		66	INH_O4
HOME_I5	17		67	HOME_I6
OT+ I5	18		68	OT+ I6
OT- I5	19		69	OT- I6
INH_O5	20		70	INH_O6
XENC_INA1	21		71	XENC_INA2
~XENC_INA1	22		72	~XENC_INA2
XENC_INB1	23		73	XENC_INB2
~XENC_INB1	24		74	~XENC_INB2
XENC_INC1	25		75	XENC_INC2
~XENC_INC1	26		76	~XENC_INC2
XENC_INA3	27		77	XENC_INA4
~XENC_INA3	28		78	~XENC_INA4
XENC_INB3	29		79	XENC_INB4
~XENC_INB3	30		80	~XENC_INB4
XENC_INC3	31		81	XENC_INC4
~XENC_INC3	32		82	~XENC_INC4
XENC_INA5	33		83	XENC_INA6
~XENC_INA5	34		84	~XENC_INA6
XENC_INB5	35		85	XENC_INB6
~XENC_INB5	36		86	~XENC_INB6
XENC_INC5	37		87	XENC_INC6
~XENC_INC5	39		88	~XENC_INC6
XDDA_OUTA1	38		89	XDDA_OUTA2
~XDDA_OUTA1	40		90	~XDDA_OUTA2
XDDA_OUTB1	41		91	XDDA_OUTB2
~XDDA_OUTB1	42		92	~XDDA_OUTB2
XDDA_OUTA3	43		93	XDDA_OUTA4
~XDDA_OUTA3	44		94	~XDDA_OUTA4
XDDA_OUTB3	45		95	XDDA_OUTB4
~XDDA_OUTB3	46		96	~XDDA_OUTB4
XDDA_OUTA5	47		97	XDDA_OUTA6
~XDDA_OUTA5	48		98	~XDDA_OUTA6
XDDA_OUTB5	49		99	XDDA_OUTB6
~XDDA_OUTB5	50		100	~XDDA_OUTB6

### Ordering Information

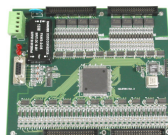
#### PCI-bus Board

- PCI-8504** 4-Axis Motion Control Board
- PCI-8504L** PCI-8504 without D/A on Board

#### Daughter Board



- DB-87040**  
4-Axis Motion Control  
Daughter Board for DIN-Rail  
Mounting



- DB-87064**  
64 D/I and 64 D/O Daughter  
Board



- DB-87063**  
64 Remote Isolated DI/O  
Module

#### Cable



- CB-89200-2**  
100-Pin SCSI-II Pin Type  
Male to Male 2M Cable
- CB-89200-5**  
100-Pin SCSI-II Pin Type  
Male to Male 5M Cable



- CB-89009-2**  
9-Pin D-Sub Male to Male  
2M Cable
- CB-89009-5**  
9-Pin D-Sub Male to Male  
5M Cable



- CB-89410-0.2**  
2 Sets 10-Pin Flat Female to  
2 Sets 9-Pin D-Sub Female  
Cable