

Low-Cost Digital I/O – 24 TTL Lines

6503 Family (DIO-24)

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PCI-6503
DAQCard-DIO-24
PC-DIO-24

Digital I/O

24 (5V/TTL) lines in three 8-bit ports
Unidirectional and bidirectional I/O
2-wire handshake capability
User-defined power-up states
(PCI-6503, PC-DIO-24)

NI-DAQ Software

Windows NT/98/95
Mac OS*
(refer to page 200 for other
operating systems)
*Not for all hardware

Application Software

LabVIEW
BridgeVIEW
LabWindows/CVI
Lookout
ComponentWorks
VirtualBench

Solutions

BCD-compatible panel meters
and test equipment
Interface to parallel
digital I/O peripherals
Electromechanical and solid
state relays
Monitoring and control
of annunciators, fans, lights,
motors, and switches



Family	Digital I/O	Transfer Rate	Range	Handshaking	Pattern I/O	Triggers
6503	24	Static I/O	5 V/TTL	✓	–	–

Table 1. 6503 Family Specifications Overview (refer to page 331 for more detailed specifications)

Overview

The PCI-6503 is a PCI plug-in board. The DAQCard-DIO-24 is a Type II PC Card (PCMCIA) for notebooks and other computers with a PCMCIA slot. The PC-DIO-24 is an ISA plug-in board. Each of these products uses a 24-bit programmable peripheral interface (PPI) to achieve 24 channels of digital I/O. In addition, each is Plug and Play compatible and does not require a separate card manager for configuration. Each interface works with a variety of operating systems, so you can develop applications that work across multiple platforms.

Hardware PPI

These digital I/O cards use the 82C55 PPI. The PPI controls 24 bits of digital I/O and has three 8-bit ports (A, B, and C), which you can functionally program as either inputs or outputs. Ports A and B are always used for digital I/O, while port C can be configured for digital data I/O, control, status, or handshake signals. You can program the digital I/O card for unidirectional or bidirectional bus I/O and also for interrupt generation.

Digital I/O Power-Up State Selection

You can power the PCI-6503 and PC-DIO-24 digital I/O lines in a user-defined state – either up or down. Each line is connected

to a 100 k Ω resistor and can be pulled high or low. The DAQCard-DIO-24 has 100 k Ω resistors that always pull high.

PCI Bus Interface

The PCI-6503 uses the MITE™ custom ASIC to interface the board to the PCI bus. This ASIC fully implements the PCI Local Bus Specification Revision 2.0.

Digital I/O Connector

The PCI-6503 and PC-DIO-24 have an onboard 50-pin ribbon cable connector. The DAQCard-DIO-24 has a 27-pin PCMCIA connector. The pin assignments are compatible with standard 24-channel I/O module mounting racks, such as the National Instruments SSR Series and ER-8, ER-16 accessories. The eight bits in Port A of the DIO-24 products are at PA7 through PA0 on the digital I/O connector. Ports B and C are at PB7 through PB0 and PC7 through PC0, respectively. Each port is assigned as either an input or output by the PPI. Power from the ISA, PCI, or PCMCIA bus is also available on pin 49 of the digital I/O connector.

Data Acquisition

Low-Cost Digital I/O – 24 TTL Lines

6503 Family (DIO-24)

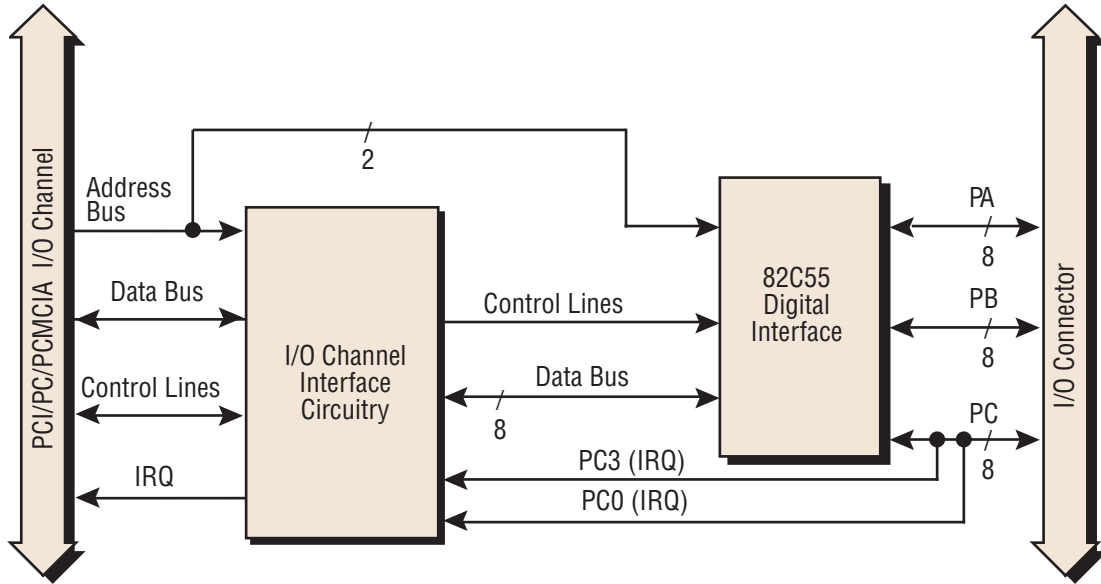


Figure 2. 6503 Family Hardware Block Diagram

PC7	1	2	GND
PC6	3	4	GND
PC5	5	6	GND
PC4	7	8	GND
PC3	9	10	GND
PC2	11	12	GND
PC1	13	14	GND
PC0	15	16	GND
PB7	17	18	GND
PB6	19	20	GND
PB5	21	22	GND
PB4	23	24	GND
PB3	25	26	GND
PB2	27	28	GND
PB1	29	30	GND
PB0	31	32	GND
PA7	33	34	GND
PA6	35	36	GND
PA5	37	38	GND
PA4	39	40	GND
PA3	41	42	GND
PA2	43	44	GND
PA1	45	46	GND
PA0	47	48	GND
+5 VDC	49	50	GND

Figure 1. 6503 Family I/O Connector



For detailed product specifications, refer to page 331.

Data Acquisition

Ordering Information

6503 Family

PCI-6503777690-01

DAQCard-DIO-24 for

Windows NT/98/95776912-01

Mac OS776912-02

PC-DIO-24 (PnP)777368-01

PC-DIO-24

(with jumpers; includes DOS drivers)777367-01

Includes NI-DAQ for Windows NT/98/95 on CD unless otherwise noted.

See page 228 for more details.

Example Configurations

Family	DAQ Board	Cable (page 305-309)	Accessory (page 295-304)
6503	PCI-6503	NB1 (180524-10)	CB-50LP (777101-01)
	DAQCard-DIO-24	PSH27-50F-D1 (776989-01)	CB-50LP (777101-01)
	PC-DIO-24	NB1 (180524-10)	CB-50LP (777101-01)

Refer to page 205 for more detailed cable and accessory options.

Specifications

Static Digital I/O (650x Families)

Digital I/O

Number of channels	
6503	24
6507/8	96
Compatibility	5V/TTL
Power-on state	Input
Digital Logic Levels	

Level	Minimum	Maximum
Input low voltage	-0.3 V	0.8 V
Input high voltage	2.2 V	5.3 V
Output low voltage ($I_{out} = 2.5$ mA)	-	0.4 V
Output high voltage ($I_{out} = 2.5$ mA)	3.7 V	-

Transfer rate ³ (1 word = 8 bits)	
Maximum with NI-DAQ software	50 kwords/s
Constant sustainable rate	1 to 10 kwords/s, typical
Handshaking	2-wire
Data transfers	Interrupts, programmed I/O

Bus interface

PCI, Pxi, DAQCard, DAQPad, AT

Power Requirements

Board	+5 VDC (±5%)	Power available at I/O connector
6507/8 and PCI-6503	400 mA	+4.65 to +5.25 VDC, 1 A fused
DAQCard-DIO-24	15 mA	+4.65 to +5.25 VDC, 500 mA
PG-DIO-24	160 mA	+4.65 to +5.25 VDC, 1 A fused

Board	+9 to +30 VDC	Power available at I/O connector
DAQPad-6507/8	150 mA at 12 VDC typical; 1 A max	+4.65 to +5.25 VDC, 1 A fused

Physical

Dimensions	
PCI-6503	12.2 by 9.5 cm (4.8 by 3.7 in.)
DAQCard-DIO-24	Type II PC Card
PC-DIO-24	11.7 by 10.6 cm (4.6 by 4.2 in.)
PC-DIO-96	13.7 by 10.7 cm (5.4 by 4.2 in.)
PXI-6508	10 by 16 cm (3.9 by 6.3 in.)
PC-DIO-96	16.5 by 9.9 cm (6.3 by 3.9 in.)
DAQPad-6507/8	14.6 by 21.3 by 3.8 cm (5.8 by 8.4 by 1.5 in.)

I/O connector

6503, except DAQCard	50-pin male
DAQCard-DIO-24	25-pin female PCMCIA
6507/8, except PC-DIO-96	100-pin female 0.050 series D-type
PC-DIO-96	100-pin male ribbon cable

Environment

Operating temperature	0 to 55 °C, DAQCard should not exceed 55 °C while in PCMCIA slot
Storage temperature	-20 to 70 °C
Relative humidity	10% to 90% noncondensing

For information on static digital I/O in the VXI form factor refer to the VXI Catalogue.