

PCI-1780U

8-ch Counter/Timer Card Startup Manual

Packing List

Before installation, please ensure that the following items have been included in your shipment:

1. PCI-1780U card
2. Quick Start User Manual

If anything is missing or damaged, contact your distributor or sales representative immediately.

Overview

The PCI-1780U is a general-purpose, multi-channel counter/timer card for the PCI bus. It implements counter/timer functions using an FPGA. It provides eight 32-bit counter channels, eight digital outputs, and eight digital inputs. The powerful, Advantech-designed counter functions meet your industrial or laboratory application needs.

Declaration of Conformity

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the user manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user is required to correct interference at his own expense.

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from Advantech. Please contact your local supplier for ordering information.

Specifications

Programmable Counter

Channel	8 (independent)	
Resolution	32-bit	
Programmable Clock Source	8 independent	
Programmable Counter Modes	6	
Max. Frequency	10 MHz	
Interrupt source	8 counter outputs	

Digital Input Output

Input Channel	8	
Input Voltage	Low	0.8 V max.
	High	2.0 V min.
Interrupt source	All channels	
Output Channels	8	
Output Voltage	Low	0.4 V max. @ 2 mA (sink)
	High	4.0 V min. @ 2 mA (source)

For more information on this and other Advantech products, please visit our website at:

<http://www.advantech.com>

For technical support services, please visit our support website at:

<http://www.advantech.com/support/>

This manual is for PCI-1780U.

Part No. 2003178021

Edition 2
Feburary 2025

Specifications (Cont.)

General

I/O Connector Type	68-pin SCSI-II female	
Dimensions	175 mm x 100 mm (6.9" x 3.9")	
Power Consumption	Typical	+5 V @ 200 mA
	Max.	+5 V @ 400 mA
Temperature	Operation	0 ~ 60°C (32 ~ 140°F) (refer to IEC 68-2-1,2)
	Storage	-20 ~ 70°C (-4 ~ 158°F)
Relative Humidity	Up to 95% RH non-condensing (refer to IEC 68-2-3)	
Certification	CE certified	

Installation

Software Installation

1. The XNavi could be found on Advantech Support Portal (<https://www.advantech.com/support>).
2. Search for XNavi and download it.
3. Execute the installer, then you can choose the device and software components you'd like to install in the system.
4. Click on "start" to begin the installation.

Hardware Installation

1. Turn off your computer and unplug the power cord and cables. TURN OFF your computer before installing or removing any components on the computer.
2. Remove the cover of your computer.
3. Remove the slot cover on the back panel of your computer.
4. Touch the metal part on the surface of your computer to neutralize the static electricity that might be on your body.
5. Insert the PCI-1780U card into a PCI slot. Hold the card only by its edges and carefully align it with the slot. Insert the card firmly into place. Use of excessive force must be avoided, otherwise the card might be damaged.
6. Fasten the bracket of the PCI card on the back panel rail of the computer with screws.
7. Connect appropriate accessories (68-pin, wiring terminals, etc. if necessary) to the PCI card.
8. Replace the cover of your computer chassis. Reconnect the cables you removed in step 2.
9. Plug in the power cord and turn on the computer.

Pin Assignment

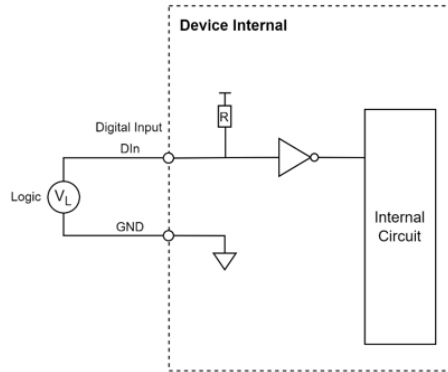
GND	68	34	FOUT3
GND	67	33	FOUT2
GND	66	32	FOUT1
GND	65	31	FOUT0
GND	64	30	OUT7
GND	63	29	OUT6
GND	62	28	OUT5
GND	61	27	OUT4
GND	60	26	OUT3
GND	59	25	OUT2
GND	58	24	OUT1
GND	57	23	OUT0
DO7	56	22	DO6
DO5	55	21	DO4
DO3	54	20	DO2
DO1	53	19	DO0
+5V	52	18	+5V
DI7	51	17	DI6
DI5	50	16	DI4
DI3	49	15	DI2
DI1	48	14	DI0
GND	47	13	NC
GATE7	46	12	GATE6
GATE5	45	11	GATE4
GATE3	44	10	GATE2
GATE1	43	9	GATE0
GND	42	8	CLK7
GND	41	7	CLK6
GND	40	6	CLK5
GND	39	5	CLK4
GND	38	4	CLK3
GND	37	3	CLK2
GND	36	2	CLK1
GND	35	1	CLK0

Signal name	Reference	Direction	Description
GND	-	-	DC ground
+5V	GND	Output	+5 V _{DC} source
FOUT<0..3>	GND	Output	Frequency output channels
OUT<0..7>	GND	Output	Counter output channels
DO<0..7>	GND	Output	Digital output channels
NC	GND	Input	Not connected
CLK<0..7>	GND	Input	Input Clock input channels
GATE<0..7>	GND	Input	Input Gate control channels
DI<0..7>	GND	Input	Input Digital input channels

Connections

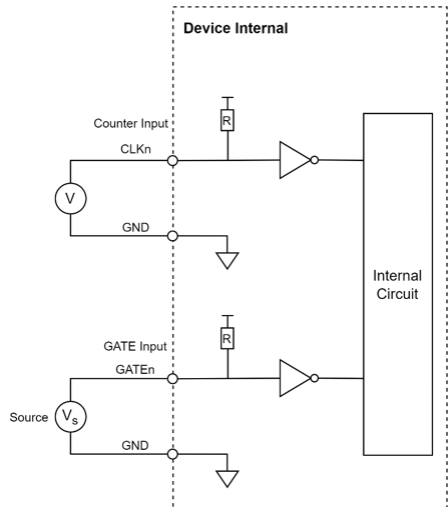
Digital Input

When performing digital input measurement, the voltage logic level between the digital input (DI) terminal and the digital ground (GND) terminal is measured.



Event Counting

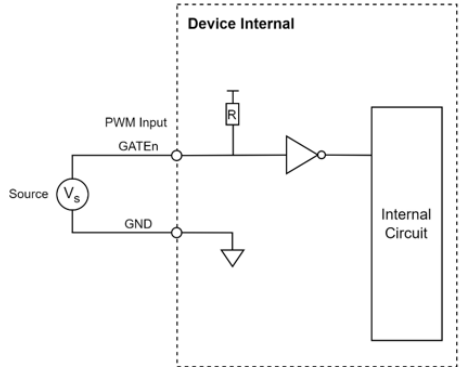
In event counting mode, the counter counts the number of edges the counter clock signal generates.



Connections (Cont.)

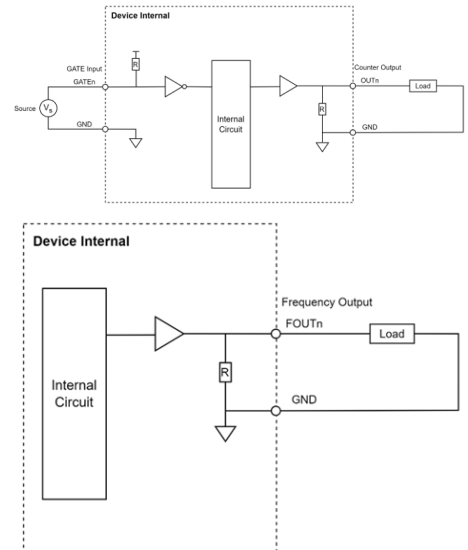
Pulse Width Measurement

In pulse width measurement mode, both the high period and the low period of the counter clock signal are measured.



Timer/Pulse

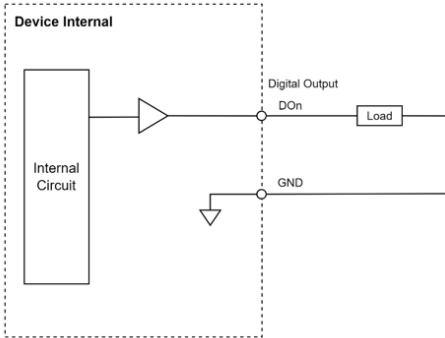
In timer/pulse mode, continuous pulses with specified frequency are generated at counter output terminal.



Connections (Cont.)

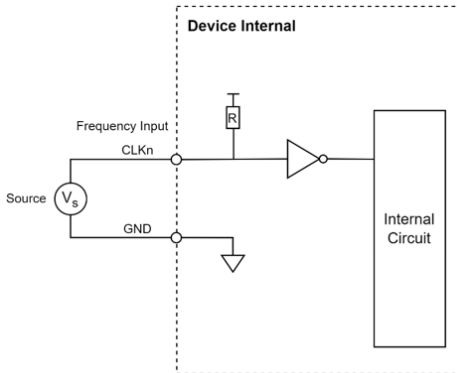
Digital Output

When performing digital output generation, a voltage logic level is generated between the digital output (DO) terminal and the digital ground (GND) terminal.



Frequency Measurement

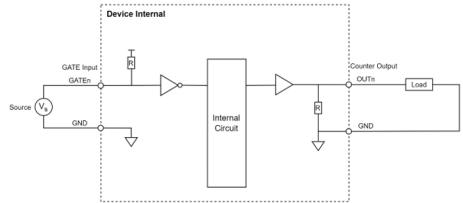
In frequency measurement mode, the frequency of the counter clock signal is measured by one of the two measuring methods: Period inversion or counting number of pulses in fixed duration.



Connections (Cont.)

One-shot

In one-shot mode, when an active edge of gate signal is detected, a pulse will be generated after the specified number of source clock counts.



Pulse Width Modulation

In pulse width modulation (PWM) output mode, a pulse waveform with specified high period and low period is output at counter output terminal.

