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PCI-100 Scan Hardware

The PCI-100 hardware is an integral part of an ASSET system that bridges your hardware and ASSET software. The PCI-based scan hardware is available with all ASSET systems and provides a controller interface to test and/or program attached circuit boards. The PCI-100 hardware includes a PCI controller card, an optional pod, and several cable assemblies. The PCI-100 controller card can be installed into any PCI slot of an IBM-compatible personal computer.

- Physical characteristics
- Connecting the Controller Card
- Controller Card
- PCI-100 Pod
- Cables

Physical Characteristics

The PCI-100 controller card is the interface between your ASSET system and your Unit Under Test (UUT). It is a PCI/IEEE 1149.1 master controller card. This card controls a single IEEE 1149.1-compliant test bus.

The controller card may be used in standalone mode, via an attached cable, or in conjunction with an optional interface pod, which is attached via differential I/O buffers. The controller card also has the capability of controlling and monitoring discrete I/O signals.

A UUT cable is provided for attachment between your controller card and your UUT. The 4-foot UUT cable has a 36-pin connector on one end and a 14-pin connector on the other end of the cable.

When requiring a longer distance to attach the UUT or if your UUT requires logic levels other than 3.3V, you will use the optional pod and 5-foot Differential cable in conjunction with the UUT cable.

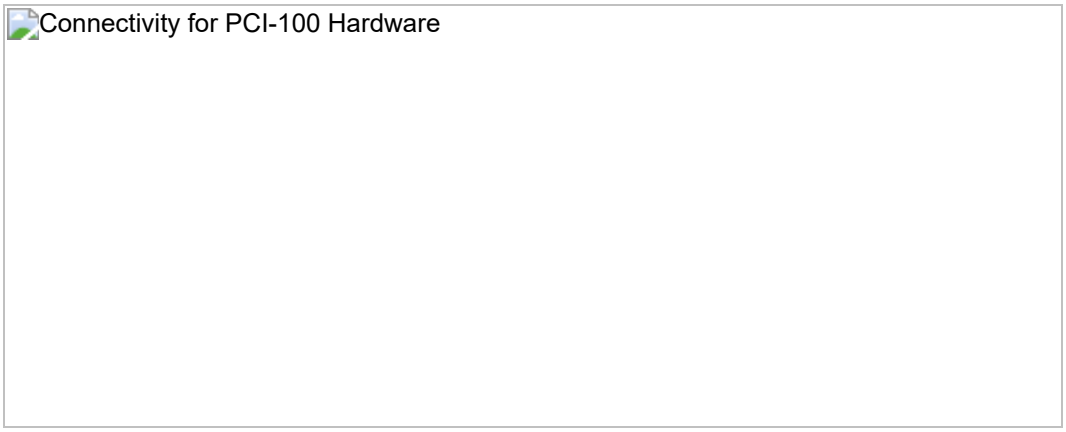
Should you require discrete I/O, a 26-pin cable assembly can be ordered separately. Contact your sales representative for specific ordering information.

Connecting the Controller Card

The controller card has a 36-pin connector and a 26-pin connector as a part of the card. The 36-pin connector allows connection between your UUT (using the UUT cable), or to the optional pod (using the Differential cable). The 26-pin connector is specifically used for connecting the Discrete I/O cable.

Connecting the Controller Card to a UUT

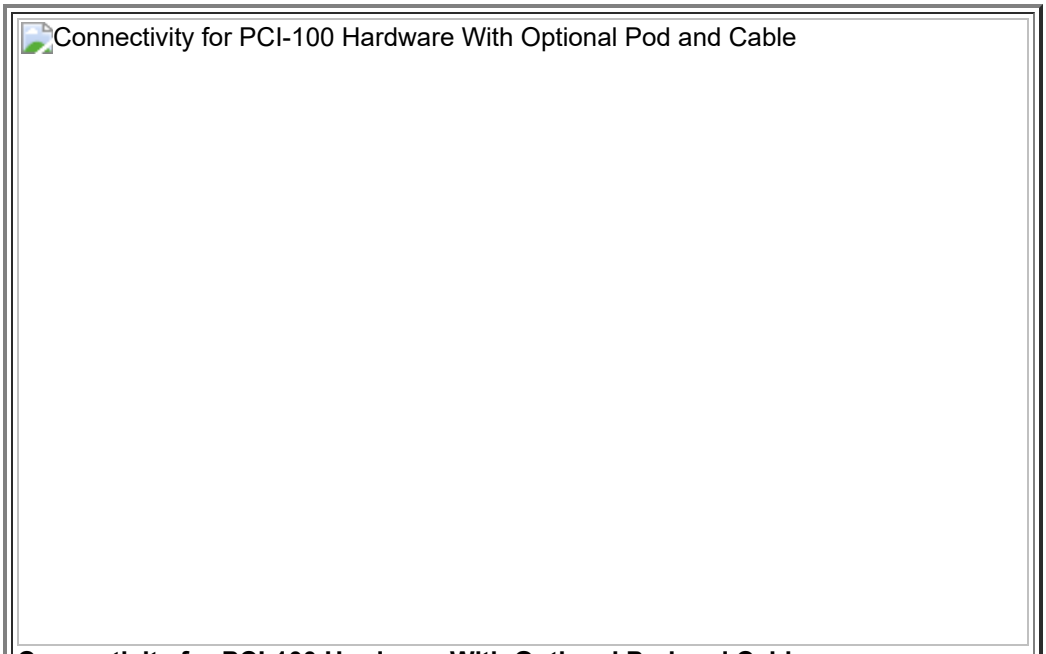
The following figure shows the overall connection to the controller card and a UUT.



Connectivity for PCI-100 Hardware

Connecting the Optional Pod to a UUT

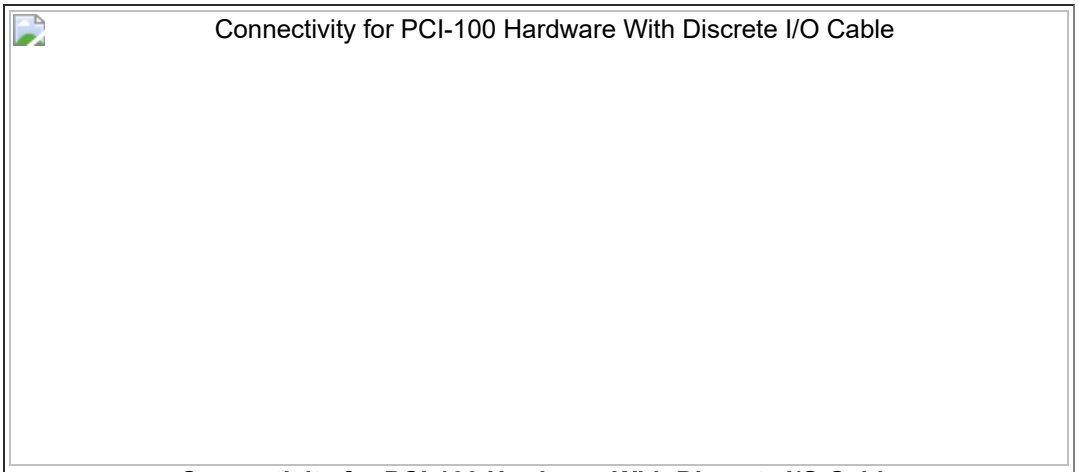
The following figure shows the overall connection between the controller card, the pod, and the UUT.



Connectivity for PCI-100 Hardware With Optional Pod and Cable

Connecting the Controller Card Using the Discrete I/O Cable

The following figure shows the connection between the controller card, the pod, and the UUT, specifically using the Discrete I/O cable. The Discrete I/O may be used with the previous two cabling configurations.



Connectivity for PCI-100 Hardware With Discrete I/O Cable

PCI-100 Controller Card

- Features
- IEEE 1149.1 Signaling
- Discrete I/O
- Electrical Characteristics
- 36-Pin IEEE-1149.1 Connector Pinout
- 26-Pin Discrete I/O Connector

Features

Features of the controller card include:

- Programmable TCK up to 16.67 MHz
- Flexible TAP control (free-running or gated TCK)
- Discrete I/O
- Industry-proven SN74LVT8980
- Interface to optional pod for increased distance and voltage conditioning

IEEE 1149.1 Signaling

The PCI-100 controller card provides both single-ended and differentially driven IEEE 1149.1 type signals. The single-ended signals are used to communicate directly between the controller and your UUT's IEEE 1149.1 interface. The differential signals are used to communicate between the controller and the optional pod or a user-designed test fixture. The optional pod converts the differential signals to single-ended signals, which are used to communicate between the pod and your UUT.

Discrete I/O

The PCI-100 controller card provides 16 individually controllable, digital I/O lines. The I/O signals are individually selectable for use as inputs or as outputs and are non-boundary-scan signals that should be used at your discretion. Of these 16 signals, 8 are designed as high-drive signals and 8 are configured for low load. See the Electrical Characteristics for specific information about these signals.

Electrical Characteristics

- Discrete I/O
- IEEE 1149.1 Signals

Discrete I/O

The discrete I/O signal outputs are driven by NPN-type darlington transistor arrays. Eight signals are terminated to provide a high-drive capability and eight are terminated to present a low load to the UUT. The inputs are monitored by an LVTH-family component. All signals are

provided with transient protection diode arrays to provide a level of protection from environmental hazards. The following table defines the electrical characteristics of the discrete I/O signals.

Parameter	8 high drive signals (8-15)		8 low load signals (0-7)		Unit
	Min	Max	Min	Max	
Vi		5.5		5.5	VDC
Vih	2.0		2.0		VDC
Vil		0.8		0.8	VDC
Iih		12		4	mA
Iil		-24		-8	mA
Voh	2.0		2.0		VDC
Vol		0.8		0.8	VDC
Ioh		-12		-4	mA
Iol		12		4	mA

IEEE 1149.1 Signals

The IEEE 1149.1 signals are provided as either single-ended signals or differential signals. The single-ended signals are driven by the Texas Instruments' SN74LVT8980 eTBC with 50 ohms series termination for noise immunity. The single-ended inputs (TDO and TCK_RET) are connected to a single LVT input. All single-ended signals are provided with transient protection diode arrays to provide a level of protection from environmental hazards. The following table defines the electrical characteristics of the single-ended signals.

Parameter	Min	Max	Unit
Vi		5.5	VDC
Vih	2.0		VDC
Vil		0.8	VDC
Iih		100	uA
Iil		100	uA
Voh	2.0		VDC
Vol		0.8	VDC
Ioh		-8	mA
Iol		8	mA

The IEEE 1149.1 differential signals are Low-Voltage Differential Signals (LVDS) based on TIA/EIA-644 and IEEE 1596.3 standards. The following table defines the electrical characteristics of the differential signals.

Parameter	Min	Max	Unit
Vod (Differential output voltage)	250	450	mV (into 100 ohm load)
Vth (Differential input high threshold)		100	mV
Vtl (Differential input low threshold)		-100	mV

36-Pin IEEE-1149.1 Connector Pinout

Using the 36-pin IEEE 1149.1 connector, you can connect the controller card to your UUT using the UUT cable. If you have purchased the optional pod assembly, you use this connector to attach the pod assembly via the Differential cable.

The connector from the controller card is a 3M #N10236-5212VC 36-pin receptacle. A suitable mating plug is the 3M #10136-6000EC, or equivalent.The following table shows the pinouts for the 36-pin connector on the controller card. The same 36-pin connector is on the pod, if you have purchased it.

Pin	Name	Direction	Description
1	GND		Digital Ground
2	TMS	Out	Test Mode Select
3	GND		Digital Ground
4	TCK	Out	Test Clock
5	GND		Digital Ground
6	TCK_RET	In	Return Test Clock
7	RSVD		Reserved
8	RSVD		Reserved
9	TMS+	Out	Differential Test Mode Select +
10	TMS-	Out	Differential Test Mode Select -
11	NC		No connection (reserved for TVCC on pod)
12	DIFF_SEL	In	Differential I/O Select (Ground to select Differential I/O)
13	TCK+	Out	Differential Test Clock +
14	TCK-	Out	Differential Test Clock -
15	+12V	Out	+12V supply for pod
16	+12V	Out	+12V supply for pod
17	TCK_RET+	In	Differential Return Test Clock +
17	TCK_RET-	In	Differential Return Test Clock -
19	GND		Digial Ground
20	TRST#	Out	Test Reset
21	GND		Digial Ground
22	TDI	Out	Test Data to UUT (from controller)
23	GND		Digial Ground
24	TDO	In	Test Data from UUT (to contoller)
25	RSVD		Reserved
26	RSVD		Reserved
27	TRST+	Out	Differential Test Reset +
28	TRST-	Out	Differential Test Reset -
29	+12V	Out	+12V supply for pod
30	+12V	Out	+12V supply for pod
31	TDI+	Out	Differential Test Data to UUT + (from controller)
32	TDI-	Out	Differential Test Data to UUT -
33	+12V	Out	+12V supply for pod
34	+12V	Out	+12V supply for pod
35	TDO+	In	Differential Test Data from UUT + (to controller)
36	TDO-	In	Differential Test Data from UUT - (to controller)

26-Pin Discrete I/O Connector

Using the 26-pin Discrete I/O connector, you can connect the controller card to an optional Discrete I/O cable.

The connector from the controller card is a 3M #10226-5212VC 26-pin receptacle. A suitable mating plug is the 3M #10126-6000EC, or equivalent. The following table shows the pinouts for the 26-pin connector on the controller card. The UUT end of the Discrete I/O cable is not terminated, allowing you to easily customize the interface to a test fixture or UUT.

Pin	Name	Direction	Description
1	GND		Ground reference (from PC)
2	IO0	In/Out	Input/Output #0 Low Load
3	IO1	In/Out	Input/Output #1 Low Load
4	IO2	In/Out	Input/Output #2 Low Load
5	IO3	In/Out	Input/Output #3 Low Load
6	GND		Ground
7	IO4	In/Out	Input/Output #4 Low Load
8	IO5	In/Out	Input/Output #5 Low Load
9	IO6	In/Out	Input/Output #6 Low Load
10	IO7	In/Out	Input/Output #7 Low Load
11	GND		Ground
12	IO8	In/Out	Input/Output #8 High Drive
13	IO9	In/Out	Input/Output #9 High Drive
14	IO10	In/Out	Input/Output #10 High Drive
15	IO11	In/Out	Input/Output #11 High Drive
16	GND		Ground
17	IO12	In/Out	Input/Output #12 High Drive
18	IO13	In/Out	Input/Output #13 High Drive
19	IO14	In/Out	Input/Output #14 High Drive
20	IO15	In/Out	Input/Output #15 High Drive
21	RSVD		Reserved
22	RSVD		Reserved
23	RSVD		Reserved
24	RSVD		Reserved
25	+5V	Out	+5V for auxiliary equipment (fused at 375 mA)
26	+5V	Out	+5V for auxiliary equipment (fused with pin 25)

- PCI-100 Pod
- Cables

See also:
ASSET hardware options

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