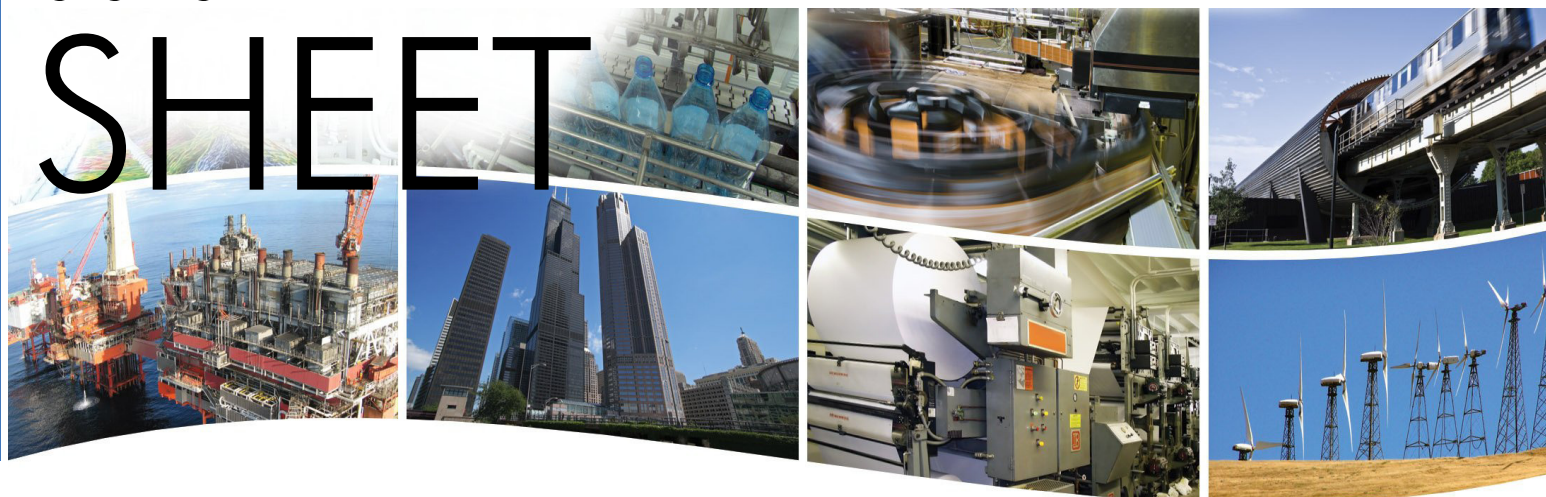# data SHEET

PCI20U Series — Universal ARCNET® Card

The PCI standard requires that plug-in boards use a +3.3 V power source provided by the PC's motherboard, making the +5 V power source obsolete. In response to this development, Contemporary Controls introduced a universal-voltage PCI ARCNET Network Interface Module (NIM) which is compatible with both +3.3 Volt and older, 5-Volt computers.

The PCI20U product is a drop-in replacement for the PCI20 +5 V PCI card which removes work needed by the user to migrate to +3.3 V PCI or PCI-X slot motherboards. This demonstrates the company's commitment to ARCNET technology and to their customer's requirements for legacy installations.

PCI-X is an enhancement to the original PCI Local Bus Specification enabling devices to operate at speeds up to 133 MHz. If a PCI20U is installed into a bus capable of PCI-X operation, the clock remains at the 33 MHz frequency — restricting all other devices on that bus to the conventional PCI protocol.

This device incorporates the COM20022 ARCNET controller chip. New features include command chaining, sequential access to internal LAN, and duplicate node ID detection. Bus contention problems are minimized since the module's interrupt level and I/O base address are assigned through Plug-and-Play (PnP) operation. There is no requirement for wait-state arbitration.

The PCI20U Series exploits the new features of the COM20022 such as 10 Mbps communications for EIA-485 transceivers — DC-coupled and AC-coupled (transformer) variants. Conventional 2.5 Mbps dipulse signalling is also supported.

The PCI20U module has two LEDs on the board for monitoring network operation and PCI bus access to the module. It is equipped with an 8-position, general-purpose DIP switch which could be used to reassign the ARCNET node address without removing the module. Ultimately, the node address is configured via software so the DIP switch can be used for user-defined functions.

Features

- Interfaces ARCNET with PCI and PCI-X bus computers
- Automatic configuration of I/O and interrupt
- High-speed I/O access to its ARCNET controller
- Supports coaxial and twisted-pair cabling including EIA-485
- CE Mark
- RoHS compliant
- Enhanced software capabilities over earlier generation ARCNET controllers
- Suitable with all Contemporary Controls MOD HUB and AI Series active hubs
- Variable data rates up to 10 Mbps utilising the various EIA-485 transceiver options

CONTEMPORARY CONTROLS®
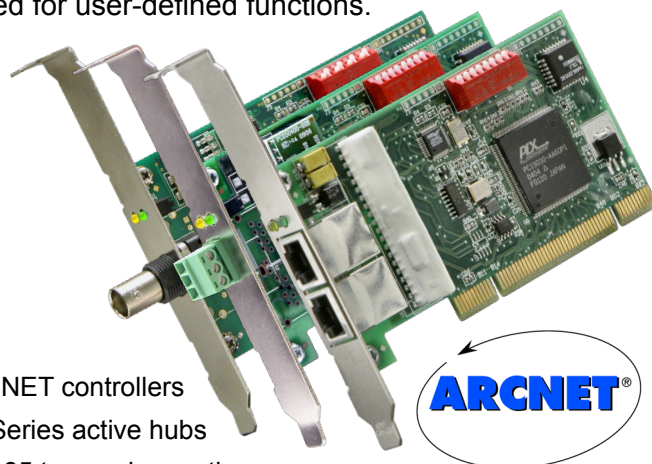
Transceiver Options

Dipulse (Analogue) Signals

Coaxial Bus Topology   (PCI20U-CXB)

Cards with *-CXB* transceivers accept RG-62/u cable via BNC Tee connectors. Each node is a high-impedance in both powered and unpowered states. BNC-style 93Ω terminators must be applied to both ends of a bus segment. The maximum segment length is 305 metres and up to 8 devices can share the segment.

Coaxial Star Topology   (PCI20U-CXS)

In a *-CXS* coaxial star system, devices connect in a point-to-point fashion with RG-62/u coaxial cabling not exceeding 610 metres. If more than two cards share the cabling, a hub is needed — because a *-CXS* card provides the 93Ω of termination *internally*.

Twisted-Pair Bus Topology   (PCI20U-TB5)

Using dual RJ-45 jacks, a *-TB5* dipulse transceiver supports up to 8 devices and 122 metres of shielded or unshielded twisted-pair. RJ-45 style 93Ω terminators must be applied at each end of the bus.
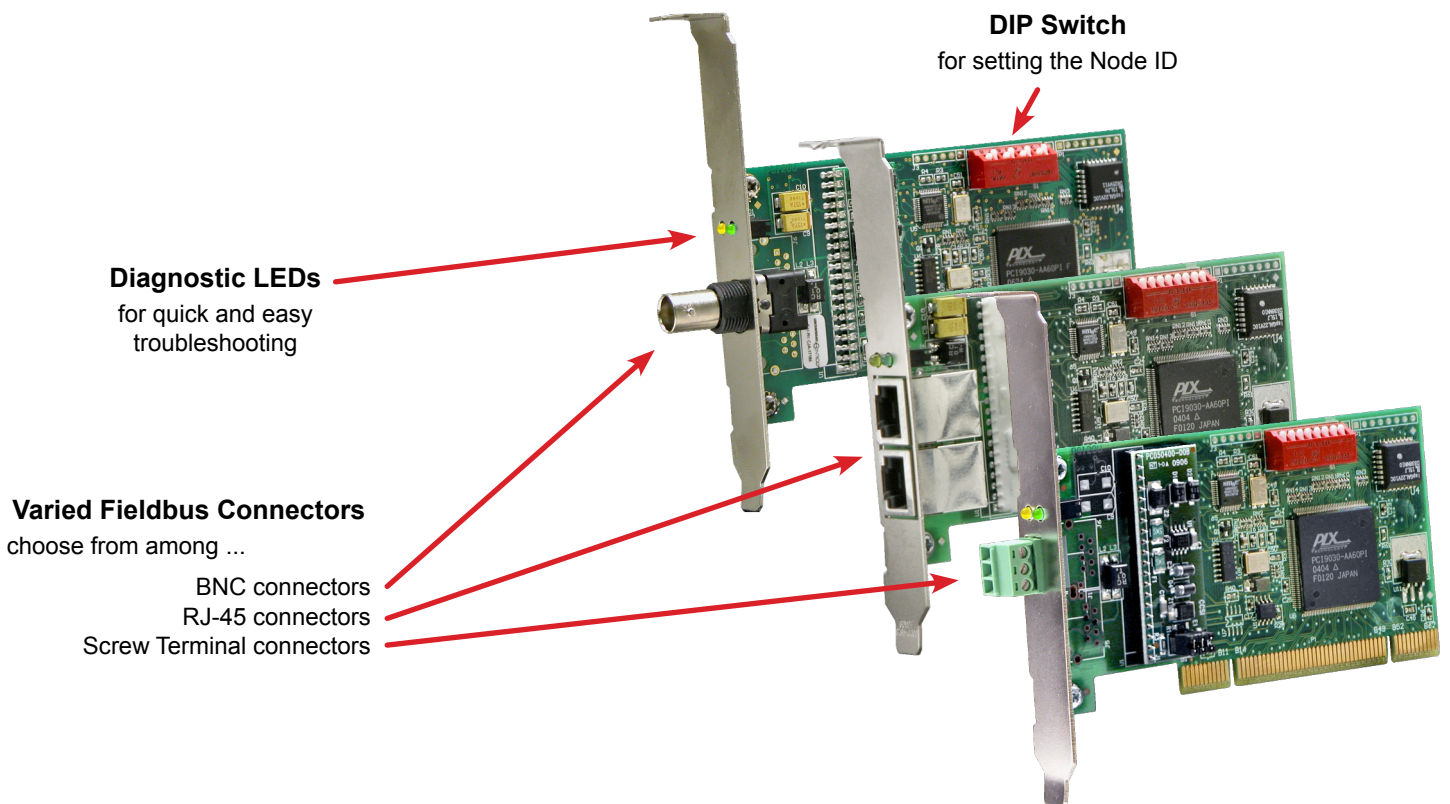
EIA-485 (Digital) Signals

DC-coupled EIA-485   (PCI20U-485 or PCI20U-485D)

EIA-485 backplane mode is invoked in the *-485* card via user software and in the *-485D* card via the card's own hardware. Either card uses a 3-terminal screw connector* for twisted-pair up to 274 metres in length and up to 17 nodes. Use proper cable and maintain wiring phase integrity among all nodes. Use 120Ω termination and proper bias at each end of the bus.

AC-coupled EIA-485   (PCI20U-4000 or PCI20U-485X)

EIA-485 backplane mode is invoked in the *-4000* card via user software for segments up to 80 meteres in length and up to 8 nodes. Backplane mode is invoked by the hardware in the *-485X* card which supports up to 13 devices and a segment length of 213 metres. The -4000 card uses dual RJ-45 jacks. The -485X card uses a 3-terminal screw connector*. Apply 120Ω termination at each end of the bus.

* Dual RJ-45 sockets replace the 3-pin connector if the */J* model is specified (see Ordering Information).

DIP Switch
for setting the Node ID

Diagnostic LEDs
for quick and easy troubleshooting

Varied Fieldbus Connectors
choose from among ...
BNC connectors
RJ-45 connectors
Screw Terminal connectors

CONTEMPORARY CONTROLS

Specifications

Environmental/Mechanical

Operating temperature	0°C to 60°C
Storage temperature	−40°C to +85°C
Relative humidity	10–95%, non-condensing
Protection	IP30

Functionality

Data rate

PCI20U-CXB, -CXS, -TB5	2.5 Mbps
PCI20U-485, -485D	10 Mbps, 5 Mbps, 2.5 Mbps, 1.25 Mbps, 625 kbps, 312.5 kbps, 156.25 kbps
PCI20U-485X, -4000	10 Mbps, 5 Mbps, 2.5 Mbps, 1.25 Mbps
I/O mapping	Requires 16 bytes of I/O space for COM20022 controller
Interrupts	Supports PCI INTA
Compliance	ATA 878.1-1999

LED indicators

Green — flashes when the unit transmits to the ARCNET network

Yellow — flashes when the unit is communicating with its host computer

Dimensions

64 mm x 95 mm   (2.50" x 4.72")

Shipping Weight

0.45 kg   (1 lb.)

Regulatory Compliance

CE Mark

RoHS

CFR 47, Part 15 Class A

Power Requirements

Model	+5 V	+3.3 V	VIO
PCI20U-CXB	350 mA	30 mA	20 mA
PCI20U-CXS	350 mA	30 mA	20 mA
PCI20U-TB5	350 mA	30 mA	20 mA
PCI20U-485	350 mA	30 mA	20 mA
PCI20U-485D	350 mA	30 mA	20 mA
PCI20U-485X	350 mA	30 mA	20 mA
PCI20U-4000	350 mA	30 mA	20 mA

Fieldbus Connectors and Cabling

Connector	Cable	Segment Length		Max Nodes per Segment
		Min[1]	Max	
BNC	RG-62/u	2m (6ft)	305m (1000ft)	8
BNC	RG-62/u	0	610m (2000ft)	2
Dual RJ-45	T-P[2]	2m (6ft)	122m (400ft)	8
3-pin[3]	T-P[2]	0	274m (900ft)	17
3-pin[3]	T-P[2]	0	274m (900ft)	17
3-pin[3]	T-P[2]	0	213m (700ft)	13
Dual RJ-45	T-P[2]	0.5m (1.6ft)	80m (262ft)	8

[1] Minimum distance between any two network devices.

[2] T-P = Twisted-pair, IBM Type 3

[3] Dual RJ-45 jacks if the characters "*/J*" are added to the model number .

Mounting Brackets

Each NIM (network interface module) is pre-attached to a traditional sized mounting bracket for the PCI bus.

A half-height mounting bracket is included in the event that the NIM must be installed in a miniature desktop PC. Unfasten the two screws which secure the traditional height bracket to the NIM, and fasten the smaller bracket to the NIM with the same screws.
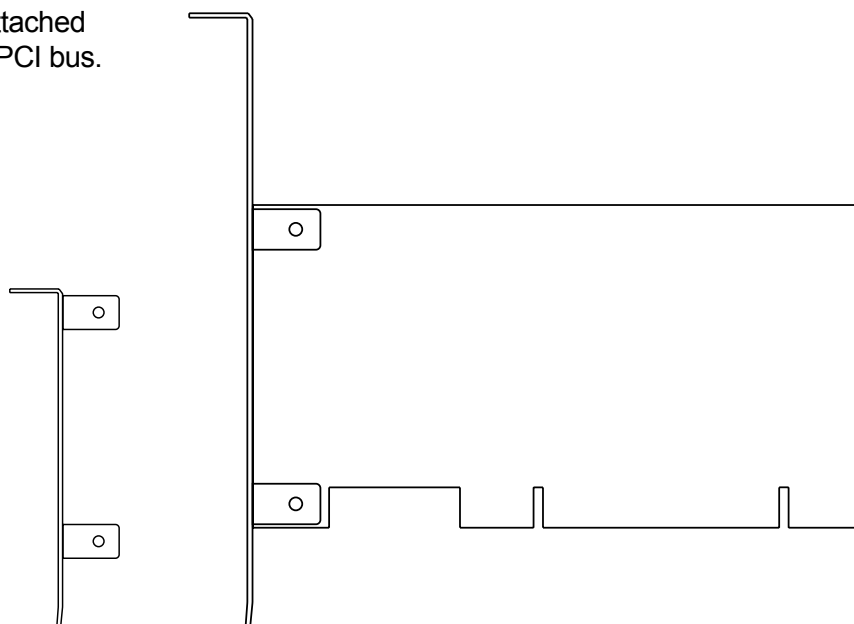
Ordering Information

Model	Description	Fieldbus Connector
PCI20U-CXB	20022 coaxial bus NIM*	BNC
PCI20U-CXS	20022 coaxial star NIM	BNC
PCI20U-TB5	20022 twisted-pair bus NIM	Dual RJ-45
PCI20U-485	20022 DC-coupled EIA-485 NIM (backplane invoked by software)	3-pin screw terminal
PCI20U-485/J	20022 DC-coupled EIA-485 NIM (backplane invoked by software)	Dual RJ-45
PCI20U-485D	20022 DC-coupled EIA-485 NIM (backplane invoked by hardware)	3-pin screw terminal
PCI20U-485D/J	20022 DC-coupled EIA-485 NIM (backplane invoked by hardware)	Dual RJ-45
PCI20U-485X	20022 AC-coupled EIA-485 NIM (backplane invoked by hardware)	3-pin screw terminal
PCI20U-485X/J	20022 AC-coupled EIA-485 NIM (backplane invoked by hardware)	Dual RJ-45
PCI20U-4000	20022 AC-coupled EIA-485 NIM (backplane invoked by software)	Dual RJ-45

* NIM is an abbreviation for *network interface module*