

RadiSys ARTIC960 and ARTIC960 PCI Co-Processor Platform Guide to Operations Supplement

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Before using this information and the product it supports, be sure to read all the information in *Appendix A, Notices* .

Before installing or removing an adapter, be sure to study the Connect/Disconnect sequence diagram for cables in *Safety Information*. on page 14.

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About this Guide

This Supplement contains user information for the RadiSys 4-Port Multi-Interface Application Interface Board (AIB). This is an optional AIB that is used with the family of RadiSys ARTIC960 Co-Processor Platforms.

This Supplement contains the following:

- A RadiSys ARTIC960 4-Port AIB Startup/Option Diskette for PS/2 (for Micro Channel use only)
- Product description
- Installation requirements and instructions
- Testing using wrap plugs
- Connector information

ARTIC960 Diagnostic Programs

The 3.5-inch RadiSys ARTIC960 4-Port AIB Startup/Option Diskette for PS/2 provided with this Supplement contains diagnostic programs used to test the 4-Port Multi-Interface AIB on the Micro Channel bus only. These files must be installed onto either your Reference Diskette or your System Partition, depending upon your type of computer system. Specific instructions for installing these files are described in the *RadiSys ARTIC960 Co-Processor Platform Platform Guide to Operations*, and should be performed as part of the co-processor adapter hardware installation.

Diagnostic programs for testing the 4-Port Multi-Interface AIB in a RISC System/6000 computer with AIX Version 3.2.5 are contained on the RadiSys ARTIC960 Supplemental Diagnostic for RISC System/6000 diskette supplied with your RadiSys ARTIC960 Co-Processor Platform. Specific instructions for installing and running these diagnostic programs are described in the RadiSys ARTIC960 Co-Processor Platform *Guide to Operations*.

The *4-Port Multi-Interface AIB Hardware Maintenance Library Supplement* contains a procedure for installing and running the files on the RadiSys ARTIC960 Supplemental Diagnostic for RISC System/6000 diskette in the Standalone Mode.

RadiSys PCI Diagnostic Programs

The RadiSys ARTIC960 Platforms Operating System/2 Support Program diskettes contain diagnostic programs that are installed when you install the ARTIC960 PCI software.

The RadiSys ARTIC960 Platforms AIX Version 4 Support Program for RISC System/6000 diskette contains diagnostic programs that are installed when you install the RadiSys ARTIC960 PCI software. Instructions on how to run these diagnostic programs can be found in the *RadiSys ARTIC960 PCI Co-Processor Platform Guide to Operations*.

Guide Contents

The following lists the contents of this Guide.

Chapter	Description
1 Product Description	Describes the 4-Port Multi-Interface Application Interface Board (AIB), including specifications.
2 Installation Requirements and Instructions	Describes the installation requirements, installing the AIB cable, problem determination procedures.
3 Connector Information	Describes the cable assemblies and connector pin numbers and assignments.

Appendices

The appendices provide additional information about the product..

Appendix	Description
A Notices	Lists and describes safety information, telecommunication notices, and electronic emission and connectivity notices.

Notational conventions

This manual uses the following conventions:

- The term *ARTIC960 PCI adapter* refers to function supported only on the ARTIC960 PCI adapter (PCI bus). Throughout this manual, the RadiSys ARTIC960 Co-Processor Platform and the RadiSys ARTIC960 PCI Co-Processor Platform also are referred to jointly as the *co-processor platform* or as the *co-processor adapter*, interchangeably.
- Screen text and syntax strings appear in this font.
- All numbers are decimal unless otherwise stated.
- Bit 0 is the low-order bit. If a bit is set to 1, the associated description is true unless otherwise stated.



Notes indicate important information about the product.



Cautions indicate situations that may result in damage to data or the hardware.



Tips indicate alternate techniques or procedures that you can use to save time or better understand the product.



ESD cautions indicate situations that may cause damage to hardware via electrostatic discharge.



The globe indicates a World Wide Web address.



Warnings indicate situations that may result in physical harm to you or the hardware.

Where to get more information

You can find out more about the product from these sources:

- **World Wide Web:** RadiSys maintains an active site on the World Wide Web. The site contains current information about the company and locations of sales offices, new

and existing products, contacts for sales, service, and technical support information. You can also send e-mail to RadiSys using the web site.



When sending e-mail for technical support, please include information about both the hardware and software, plus a detailed description of the problem, including how to reproduce it.



To access the RadiSys web site, enter this URL in your web browser:
<http://www.radisys.com>

Requests for sales, service, and technical support information receive prompt response.

- **Other:** If you purchased your RadiSys product from a third-party vendor, you can contact that vendor for service and support.

Required Publications

This Supplement should be used in conjunction with the *Guide to Operations* books for the RadiSys ARTIC960 Co-Processor Platform and the RadiSys ARTIC960 PCI Co-Processor Platform, and the documentation for the computer system in which they are installed.

Refer to the appropriate *Guide to Operations* for a complete list of related publications.

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Product Description

The 4-Port Multi-Interface Application Interface Board (AIB) is used with the family of RadiSys ARTIC960 Co-Processor Platforms. This AIB provides up to four ports operating concurrently on any one of the following interface standards:

- EIA-232
- EIA-530 (RS-422)
- ISO 4902 (V.36/V.35 compatible)
- ISO 4903 (X.21).

This AIB connects to the co-processor adapter by a 140-pin connector. Interface signals exit the AIB through the 100-pin connector at the rear of this board. The co-processor adapter and the attached AIB occupy just one 32-bit expansion slot in IBM Personal System/2 (PS/2) computers, IBM Industrial Computers, and RISC System/6000 computers that are Micro Channel or PCI compliant.

When clocks are supplied by an external device (all interfaces except EIA-232) the 4-Port Multi-Interface AIB supports four ports running simultaneously at a maximum data rate of 2.048M bits per second (bps), full duplex, and synchronous. The maximum speed supported for each electrical interface is:

Electrical Interface	Maximum Speed (per port)
EIA-232 (asynchronous only)	38.4K bps (U.S. only) 19.2K bps (EMEA only)
EIA-530	2.048M bps (U.S. only)
ISO 4902 (V.36)	2.048M bps (U.S. only) 64K bps (EMEA only)
ISO 4903 (X.21)	2.048M bps

When clocks are supplied by a Dual Universal Serial Communications Controller (DUSCC) on the AIB, the 4-Port Multi-Interface Application Interface Board provides synchronous data rates up to 230.4K bps, full duplex. Additionally, an on-card clock generator can provide data rates of either a 1.544M bps or 2.048M bps for each port. Selection of the clock frequency is programmable.

Specifications

Dimensions

Characteristic	Value
Length	205 mm (8.12 inches)
Depth	80 mm (3.15 inches)

Environment

Characteristic	State	Value
Air temperature	Operating	0°C through 60°C (32°F through 140°F)
	Non-operating	0°C through 60°C (32°F through 140°F)
Humidity	Operating	5% through 95%
	Wet bulb temperature	29.4°C (85°F)

Electrical

No Load on Outputs, Normal Operating Mode

Characteristic	Value
Power requirements	+5 Vdc, 0.9 A (maximum)
	+12 Vdc, 25 mA (maximum)
	-12 Vdc, 25 mA (maximum)
Power dissipation	(Typically) 2.8 Watts

Installation Requirements and Instructions

2

This chapter lists the contents of the 4-Port Multi-Interface Application Interface Board (AIB) package and provides instructions for installing the AIB Cable.

The 4-Port Multi-Interface AIB package contains the following:

- 4-Port Multi-Interface AIB
- *Supplement to the Guide to Operations for the RadiSys ARTIC960 Co-Processor Platform RadiSys ARTIC960 PCI Co-Processor Platform*, which contains:
 - RadiSys ARTIC960 4-Port AIB Startup/Option Diskette for PS/2 (for use with Micro Channel only)
 - Warranty Statement
 - Notice to United Kingdom Users
- I/O Bracket Hardware Kit

Installation Requirements

The installation requirements for the 4-Port Multi-Interface AIB are described in the following:

- *RadiSys ARTIC960 Co-Processor Platform Guide to Operations*
- *RadiSys ARTIC960 PCI Co-Processor Platform Guide to Operations*.



For some RISC System/6000 Computer installations, the Packet Memory Module, the Co-Processor Platform, and the AIB are supplied already assembled as one unit.

Step-by-step hardware instructions are described in the appropriate Co-Processor Platform's *Guide to Operations* for the following tasks:

- Installing the Optional Packet Memory Module
- Configuring the AIB bracket and stiffener
- Installing the AIB onto the Co-Processor Platform
- Installing the Co-Processor Platform and Attached AIB into the System Unit
- Configuring and Testing the System Unit¹
- Verifying the Installed Co-Processor Platforms²
- Installing and Running the Diagnostics³
- Copying the Startup/Option Diskette(s) for PS/2⁴

- To execute diagnostics on an AIB installed on an ARTIC960 PCI adapter, refer to Appendix A in the *RadiSys ARTIC960 PCI Co-Processor Platform Guide to Operations*.

- 1 This task applies only to Personal System/2 and IBM Industrial Computers.
- 2 This task applies only to RISC System/6000 computers and is performed after Installing the AIX Support Program.
- 3 This task applies only to RISC System/6000 computers and is performed after Verifying the Installed Co-Processor Platforms.
- 4 This task applies only to the ARTIC960 Co-Processor Platform card for PS/2 Micro Channel only.

These tasks should be performed as part of the co-processor adapter installation. The installation of this AIB is completed by connecting the AIB cable as described in Connect the AIB Cable.

Connect the AIB Cable

Four optional cables are available for use with the 4-Port Multi-Interface AIB. Each optional cable provides access to four ports for a single electrical interface. The supported interfaces are: EIA-232-D, EIA-530, ISO 4902 (V.36), or ISO 4903 (X.21).

The individual cables are 1.8 meters (6 feet) long and have a 100-pin, male, D-shell connector on the end that attaches to the AIB. The 100-pin end of each cable branches into four individual cables, each of which is terminated with a male D-shell connector. The type of connector provided on the multiconnector end of each AIB cable conforms with the electrical interface in the following table.

Electrical Interface	Connector Type
EIA-232-D	25-pin D-shell
EIA-530	25-pin D-shell
ISO 4902 (V.36)	37-pin D-shell
ISO 4903 (X.21)	15-pin D-shell

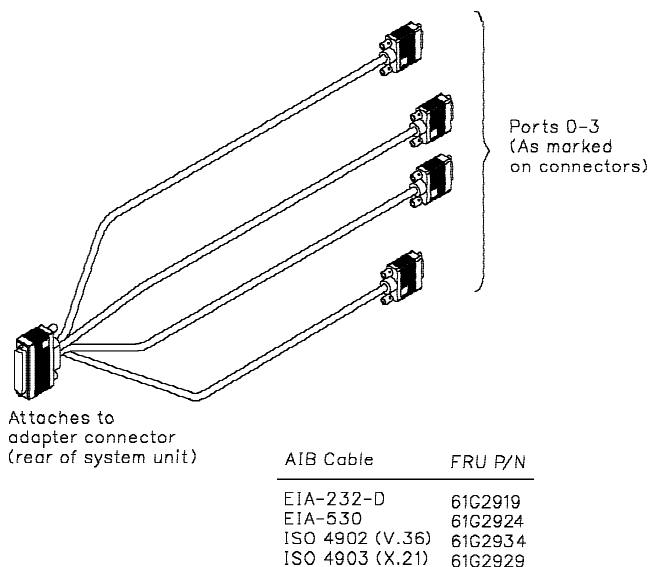


Figure 2-1. AIB Cables



Lightning protection

In the following steps, do not connect or handle the cable during a lightning storm.

1. Align the connector of the AIB Cable with the co-processor adapter connector at the rear of the system unit.
2. Firmly press the AIB Cable onto the co-processor adapter connector.
3. Insert and tighten the thumbscrew at each side of the connector on the AIB Cable.
4. Connect your device to the AIB Cable. Tighten the thumbscrew on each side of the AIB Cable. (The connectors are marked with the AIB Cable port assignments.)

Movement of the computer system (with the AIB Cable attached) may result in the dislodgement of the co-processor adapter. Should the co-processor adapter (or any other adapter) become dislodged while power is applied to the system, proceed as follows.

1. Turn off power to your computer system.
2. Remove the system unit cover.
3. Loosen the expansion-slot screw of the dislodged adapter. Press down on the top edge of the adapter to reseal it. Then, retighten the expansion-slot screw.
4. Reinstall the system unit cover.
5. Turn on power to your computer system..



If you also have installed a new co-processor adapter, you must install and load the RadiSys ARTIC960 Co-Processor Platform Operating System Support Program. Refer to the appropriate Co-Processor Platform's *Guide to Operations* for program installation and loading information.

Problem Determination Procedures

The problem determination procedures for the 4-Port Multi-Interface Application Interface Board are the same as described in the appropriate Co-Processor Platform's *Guide to Operations*.

For information on wrap tests, proceed to Testing Using Wrap Plugs.

Testing Using Wrap Plugs

Wrap tests can be performed at the AIB interface connector or at a selected port of an AIB Cable. Menu prompts permit the user to select either location for wrap testing. Table 2-1 lists the wrap plug part numbers to use during wrap testing.

Table 2-1. Wrap Plugs for the 4-Port Multi-Interface AIB

Location of Wrap Plug	Wrap Connector FRU/Part Number
100-Pin AIB Connector	53G0632
25-Pin Wrap Plug (EIA-232-D Cable, Ports 0–3)	33F8985
25-Pin Wrap Plug (EIA-530 Cable, Ports 0–3)	53G0639
37-Pin Wrap Plug (ISO-4902 (V.36) Cable, Ports 0–3)	53G0641
15-Pin Wrap Plug (ISO-4903 (X.21) Cable, Ports 0–3)	53G0638

For example, during diagnostic testing of the 4-Port Multi-Interface AIB, the diagnostic program initially prompts you to make a wrap test selection, either at the 100-pin connector of the AIB, or at one of the ports of an AIB cable.

If you want to wrap test the 100-pin connector, you must connect a wrap plug (part number 53G0632) to the 100-pin connector of the 4-Port Multi-Interface AIB. After making this wrap plug connection, respond **yes** to the test prompt for this interface, and the testing will proceed automatically.

If you want to wrap test one port of the EIA-232-D Cable, you must connect wrap plug (part number 33F8985) to the desired port (0, 1, 2, or 3) of the EIA-232-D Cable. After making this wrap plug connection, respond **yes** to the test prompt for this interface, and the testing will proceed automatically.

Operating System Support Code

Information describing the operating system support code provided with the RadiSys ARTIC960 Co-Processor Platform and RadiSys ARTIC960 PCI Co-Processor Platform is contained in the appropriate *Guide to Operations*.

Connector Information

This chapter provides the connector pin numbers and assignments.

This product has the optional connectors listed in the table below.

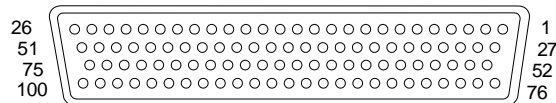
Connector	Page
EI A-232 Connector	8
EIA-530/RS-422 Connector	9
ISO 4902 Connector	10
X.21 Connector	11

Connector Pin Numbers and Assignments

This section provides pin numbering and signal assignments for each of the cables. For each cable, a table shows the pin assignments for the 100-pin connector. Each signal is identified as input (I) or output (O).

100-Pin Connector

The following shows a 100-pin female, D-shell connector on the 4-Port Multi-Interface AIB.



The following shows a 100-pin male, D-shell connector on the AIB Cable.

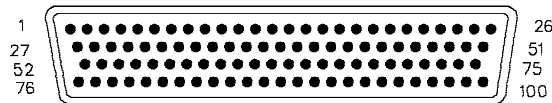


Table 3-1, Table 3-2 and Table 3-3 list the pin assignments for the 100-pin connector on the 4-Port Multi-Interface AIB and the corresponding connectors on the AIB Cables. These tables also identify the direction (I for input and O for output) that the signal is driven with respect to the AIB.

EIA-232 Connector

The following shows a 25-pin, male, D-shell connector. Table 3-1 lists the pin assignments for the EIA-232 electrical interface.

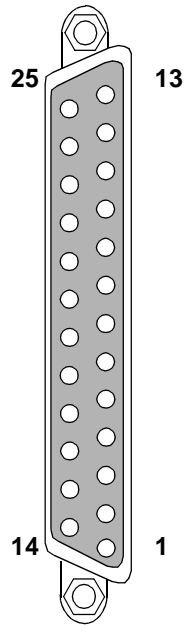


Table 3-1. EIA-232-D Pin Assignments

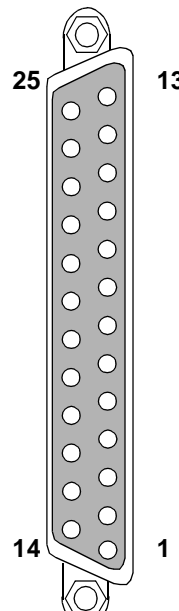
Signal Name	I/O	100-Pin Connector (Ports 0–3)				25-Pin Connector
		0				
TXD _x	O	05	12	18	24	02
RXD _x	I	80	86	92	99	03
RTS _x	O	31	37	68	74	04
CTS _x	I	32	39	45	51	05
CD _x	I	81	62	94	100	08
DTR _x	O	07	13	19	26	20
DSR _x	I	57	63	69	50	06
GND	—	06	38	44	25	07
Shield	—	Housing				01/Housing

- Where “x” is the port number (0, 1, 2, or 3).
- The EIA-232-D Cable ID is 2.

EIA-530/RS-422 Connector

The following illustration shows a 25-pin, male, D-shell connector. Table 3-2 lists the pin assignments for the EIA-530 (RS-422) electrical interface.

Table 3-2. EIA-530/RS-422 Connector Pin Assignments



		120-Pin Connector					25-Pin Connectors
Signal Name	I/O	0	1	2	3		
TXDxA	O	01	09	15	21	02	
TXDxB	O	27	34	41	47	14	
RTSxA	O	03	11	17	23	04	
RTSxB	O	29	36	43	49	19	
RXDxA	I	52	58	64	95	03	
RXDxB	I	76	82	88	70	16	
CTSxA	I	30	61	67	98	05	
CTSxB	I	04	85	91	73	13	
CDxA	I	55	33	40	20	08	
CDxB	I	79	08	14	46	10	
RCLKIxA	I	54	60	66	97	17	
RCLKIxB	I	78	84	90	72	09	
TCLKOxA	O	02	10	16	22	24	
TCLKOxB	O	28	35	42	48	11	
TCLKIxA	I	53	59	65	96	15	
TCLKIxB	I	77	83	89	71	12	
GND	—	06	38	44	25	07	
Shield	—	Housing				01/Housing	

- Where “x” is the port number (0, 1, 2, or 3).
- The EIA-530 Cable ID is 3.

ISO 4902 Connector

The following illustration shows a 37-pin, D-shell connector. Table 3-3 lists pin assignments for the ISO 4902 (V.36) electrical interface.

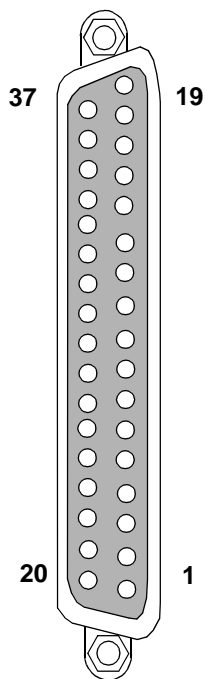


Table 3-3. ISO 4902 (V.36) Connector Pin Assignments

		120-Pin Connector					25-Pin Connectors
Signal Name	I/O	0	1	2	3		
TXDxA	O	01	09	15	21	02	
TXDxB	O	27	34	41	47	14	
RTSx	O	03	11	17	23	04	
RTSxA	I	29	36	43	49	19	
RTSxB	I	52	58	64	95	03	
CTSx	I	76	82	88	70	16	
DSRx	I	30	61	67	98	05	
DTRx	O	04	85	91	73	13	
CDx	I	55	33	40	20	08	
RCLKIxA	I	79	08	14	46	10	
RCLKIxB	I	54	60	66	97	17	
TCLKOxA	O	78	84	90	72	09	
TCLKOxB	O	02	10	16	22	24	
TCLKIxA	I	28	35	42	48	11	
TCLKIxB	I	53	59	65	96	15	
GND	—	77	83	89	71	12	
Shield	—	06	38	44	25	07	
Housing						01/Housing	

- Where “x” is the port number (0, 1, 2, or 3).
- The ISO 4902 Cable ID is 4.

X.21 Connector

The following illustration shows a 15-pin, male, D-shell connector. Table 3-3 lists the pin assignments for the X.21 (ISO 4903) electrical interface..

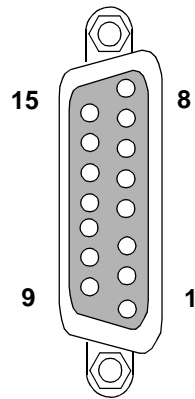


Table 3-4. X.21 (ISO 4903) Connector Pin Assignments

Signal Name	I/O	120-Pin Connector				15-Pin Connector
		0	1	2	3	
TXDxA	O	01	09	15	21	02
TXDxB	O	27	34	41	47	09
RTSxA	O	03	11	17	23	03
RTSxB	O	29	36	43	49	10
RXDxA	I	52	58	64	95	04
RXDxB	I	76	82	88	70	11
CTSxA	I	30	61	67	98	05
CTSxB	I	04	85	91	73	12
RCLKIxA	I	54	60	66	97	06
RCLKIxB	I	78	84	90	72	13
TCLKOxA	O	02	10	16	22	07
TCLKOxB	O	28	35	42	48	14
GND	—	06	38	44	25	08
Shield	—	Housing				01/Housing

- Where “x” is the port number (0, 1, 2, or 3).
- The ISO 4903 Cable ID is 1.

Notices



This appendix includes the notices listed in the table below.

When reading this file online, you can immediately view any notice by placing the mouse cursor over a notice name and clicking.

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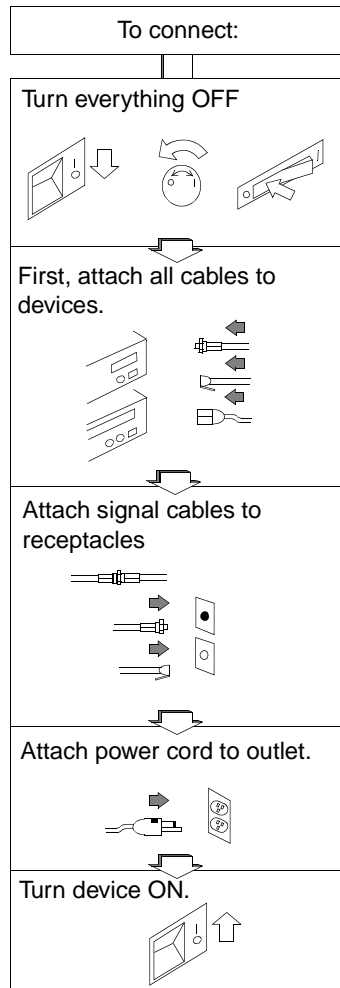
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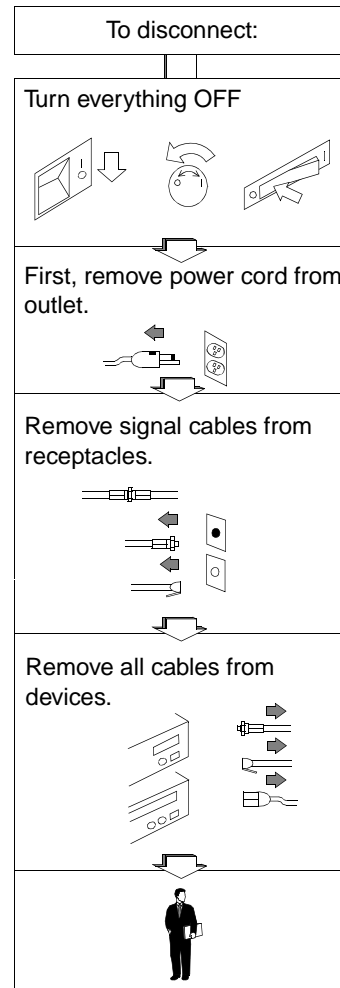
Safety Information.



Electrical current from power, telephone, and communications cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving, or opening the covers of this product or attached devices.



In the UK, by law, the telephone cable must be connected *after* the power cord.



In the UK, by law, the power cord must be disconnected *after* the telephone line cable.

Required Electronic Emission and Connectivity Notices

Class A Federal Communications Commission Statement

Federal Communications Commission (FCC) Statement

Note: 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. RadiSys is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Compliance Statement

This Class A digital apparatus complies with the Canadian ICES-003.

Cet appareil numérique de la classe A conform à la norme NMB-003 du Canada.

United Kingdom

Notice to United Kingdom Users

This apparatus is approved under General Approval number NS/G/1234/J/100003 for indirect connection to public telecommunications systems in the United Kingdom.

European Union (EU) Electromagnetic Compatibility Directive

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

RadiSys cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-RadiSys option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits

for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

If the Ethernet port is connected, 100 ohm category 5 shielded twisted-pair Ethernet cable must be used to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment.

RadiSys cannot accept responsibility for any interference caused by other-than-recommended cables and connectors.

Germany

Zulassungsbescheinigung laut Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Der Aussteller der Konformitätserklärung ist die:

ARTIC Hardware Development
5445 NE Dawson Creek Drive
Hillsboro, OR 97124

Informationen in Hinsicht EMVG Paragraph 3, Abs. 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

EN 55022 Klasse A Geräte bedürfen folgender Hinweise:

Nach dem EMVG:

“Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministeriums für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.” (Auszug aus dem EMVG, Paragraph 3, Abs. 4)

Dieses Genehmigungsverfahren ist nach Paragraph 9 EMVG in Verbindung mit der entsprechenden Kostenverordnung (Amtsblatt 14/93) kostenpflichtig.

Nach der EN 55022:

“Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.”

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen, sind die Geräte wie in den Handbüchern angegeben zu installieren und zu betreiben.

Japanese Voluntary Control Council for Interference (VCCI) Statement

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Korean Communications Statement

Please note that this device has been approved for business purpose with regard to electromagnetic interference. If you find this is not suitable for your use, you may exchange it for a non-business one.

Notice to United Kingdom Users

Application Interface Board

This Application Interface Board (AIB) must be used in conjunction with an RadiSys ARTIC960 Co-Processor Platform or RadiSys ARTIC960 PCI Co-Processor Platform.

The electrical interface between this AIB and the Host apparatus uses Safety Extra Low Voltages (SELV).

It is a condition of approval that the current drawn by the total of all adaptor cards installed within the Host environment, together with any auxiliary apparatus, does not exceed the power specification as stated in the Technical Reference Material of the Host apparatus. Other usage will invalidate the approval of this AIB if as a result it ceases to comply with safety requirements.

The maximum power requirements for this IBM Application Interface Board and the bass co-processor adapter card are as follows:

Power Supply Voltage ($\pm 5\%$)	Base Card	4-Port Multi-Interface AIB
+5 Vdc	2.5 A	1.2 A
+12 Vdc	30 mA	100 mA
-12 Vdc	6 mA	75 mA

To maintain the independent approval of this AIB, you must ensure that minimum creepage and clearance distances of 5.00 mm are maintained between the installed AIB and any optional cards or other components that use mains or other excessive voltages. An excessive voltage is one which exceeds 42.4V peak ac or 60 Vdc. If you have any doubt, seek advice from a competent engineer before installing any other adaptor into the Host apparatus.

