Hardware Installation Guide

Avanstar Xi

Avanstar Xm

Avanstar Xe

Avanstar Xp

90600200C

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Electronic Emission Notices

Federal Communications Commission (FCC) Statement

Radio Frequency Interference (RFI)   **(FCC 15.105)**

This equipment has been tested and found to comply with the limits for Class B digital devices pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

Labeling Requirements   **(FCC 15.19)**

This device complies with Part 15 of 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.

Modifications   **(FCC 15.21)**

Changes or modifications to this equipment not expressly approved by the manufacturer may void the user's authority to operate this equipment.

Cables   **(FCC 15.27)**

Shielded cables *must* be used to remain within the Class B limitations.

Declaration Of Conformity

(in accordance with FCC Dockets 96-208 and 95-19)

Manufacturer's Name: Digi International

Corporate Headquarters: 11001 Bren Road East
Minnetonka, MN 55343

Digi International declares that the products:

Product Names:	Avanstar 8i	Avanstar 16i
	Avanstar 8m	Avanstar 16m
	Avanstar 8e	Avanstar 16e
	Avanstar 8p	Avanstar 16p

Model Numbers:	50600041
	700170B
	700125A
	50600050

to which this declaration relates meets the requirements specified by the Federal Communications Commission as detailed in the following specifications:

Part 15, Subpart B, for Class B equipment
FCC Docket 96-208 as it applies to Class B personal computers and peripherals

The product listed above has been tested at an External Test Laboratory certified per FCC rules and has been found to meet the FCC Part 15, Class B, Emission Limits. Documentation is on file and available from the Digi International Homologation Department.

Avanstar Family

FC

Tested To Comply

With FCC Standards

FOR HOME OR OFFICE USE

Industry Canada Compliance Statement

This Class B digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union EMC Directive

This product has been tested and found to comply with the following European Union EMC standards:

- EN 55022 Class B

- EN 50082-2

Safety Compliance

UL-1950

CSA 22.2 No. 950

EN-60950

Introduction

General Description

The Avanstar^{TM} Xe, the Avanstar Xm, the Avanstar Xi, and the Avanstar Xp from Digi International Inc. are intelligent expansion I/O controllers. The "X" in a product name denotes the number of serial ports (either 8 or 16) that are on the external panel connected to the controller, while the lower-case letter indicates the bus architecture that the controller is designed for (e = EISA, m = Micro Channel, i = ISA, p = PCI). Digi device drivers will support up to four Avanstar family controllers in a host computer.

The external panel is connected to the board by a cable. There are two types of external panels available:

- An 8-port, EIA-232/422 configurable external panel which is provided with the Avanstar 8i, the Avanstar 8m, the Avanstar 8e, and the Avanstar 8p.

- A 16-port, EIA-232/422 configurable external panel which is provided with the Avanstar 16i, the Avanstar 16m, the Avanstar 16e, and the Avanstar 16p.

Each of the ports on these panels can be set up as either EIA-232 or EIA-422 through software control.

Physical Description

The Avanstar controller package consists of six or seven items which are listed roughly in order of unpacking:

- **The** *Avanstar Family Hardware Installation Guide*
  For future reference, you may want to place this guide in the "Guide to Operations" binder supplied with the computer.

- **Device Driver Software Installation Guide**
  This manual describes how to install and use the device driver software.

- **Avanstar family driver diskette**
  This diskette contains the device driver and support files for the Avanstar controller.

- **The Option Configuration diskette will be packed with the Avanstar Xm and the Avanstar Xe.**
  This diskette contains the Adapter Description File (.ADF) used by the MCA setup utility and the Configuration File (.CFG) used by the EISA Configuration Utility.

- **Avanstar Xi, Avanstar Xm, Avanstar Xe, or Avanstar Xp board**

- **8-port or 16-port external panel**

- **Cable to connect board to external panel**

Installation

Installation Precautions

Important!

- Before handling an Avanstar board, touch a grounded object to discharge any static electricity that has built up on your body.

- Never insert or remove the board while power is applied to the computer. Once the computer power switch is shut off, wait at least 10 seconds for the power supply to discharge before inserting or removing the board.

- Never insert or remove the board-to-external panel cable while power is applied to the computer.

- Hold the board only by its edges.

- Before you install the board, make sure all other users are logged off your computer system.

Avanstar Configuration

- If you have an Avanstar Xi, you may need to set the SW1 DIP switches to select an I/O address before you install the board in the computer. If you have an Avanstar Xi, go now to the section titled "Avanstar Xi Configuration" on page 5 for instructions.

- The Avanstar Xm, the Avanstar Xe, and the Avanstar Xp do not have any configuration switches that need to be set.

    ◊   You configure an Avanstar Xm or an Avanstar Xe through software after the board has been installed in the computer.

    ◊   The Avanstar Xp is configured automatically, although (depending on your system) some PCI-specific parameters can be manually assigned through the BIOS setup. The section titled "Avanstar Xp Configuration" on page 19 describes the Avanstar Xp's resource requirements.

    If you have an Avanstar Xm, an Avanstar Xe, or an Avanstar Xp, go now to the section titled "Avanstar Board Installation" on page 6 for installation instructions.

Avanstar Xi Configuration

Figure 1 shows the SW1 switches 1 through 4 in the default ON position. These switch positions set the I/O address to 200h.

Figure 1   Default SW1 DIP Switch Settings for I/O Address 200h
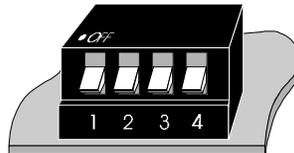
Table 1 shows the I/O address selections available and the corresponding switch positions.

Table 1   Available I/O Addresses and Switch Settings

I/O Address	Switch 1	Switch 2	Switch 3	Switch 4
200h	ON*	ON*	ON*	ON*
208h	OFF	ON	ON	ON
300h	ON	OFF	ON	ON
308h	OFF	OFF	ON	ON
600h	ON	ON	OFF	ON
608h	OFF	ON	OFF	ON
700h	ON	OFF	OFF	ON
708h	OFF	OFF	OFF	ON
Reserved	all other settings			

*   Default setting

Note: When setting the I/O addresses of multiple Avanstar Xi boards that are to be installed in one system, make sure that each board's I/O address is unique.

After the I/O address has been selected for your Avanstar Xi, go to "Avanstar Board Installation" on page 6 for instructions on installing the board.

Avanstar Board Installation

- An Avanstar Xe board may be installed into any computer with an EISA bus or compatible architecture.

- An Avanstar Xm board may be installed into any computer with a Micro Channel bus or compatible architecture.

- After an Avanstar Xi board has been configured by setting its DIP switches, the board may be installed into any ISA-bus compatible computer.

- An Avanstar Xp board may be installed into any computer with a PCI bus architecture.

Follow these steps to install an Avanstar board:

1. Place the computer, monitor and all peripheral device POWER switches in the OFF position.

2. Unplug the computer, monitor and all peripheral device line cords from their outlets.

3. Follow the instructions in the *Guide to Operations* manual supplied with the computer to remove the cover and install a board.

4. After installing the board, follow the instructions in the *Guide to Operations* manual to replace the cover.

Connecting the External Panel

Use the supplied cable to connect the external panel to the Avanstar board. Follow these steps:

1. Make sure the host PC power is OFF before plugging or unplugging the cable.

2. Plug either end of the cable into the 62-pin receptacle on the external panel.

3. Plug the other end of the cable into the receptacle on the Avanstar board.

Note:

- The receptacles for both the board and the external panel have 62 pins. Since the board-to-external panel cable is a straight-through cable, it connects corresponding pins on each of its ends.

- Make sure that the external panel and the cable are properly connected to the board prior to applying power to the system. If the external panel is not attached, the on-board program software will detect a non-functional panel and will report an error during download.

Configurable External Panel

Each port on the 8-port and the 16-port configurable external panels is a 25-pin female receptacle. Although the ports on the configurable external panels default to EIA-232, you can change the interface of any or all ports to EIA-422 through software control. See the driver manual for a description of the utility to do this. See the *Avanstar Family Technical Reference Manual* for the programming details to change the interface type directly.

There are two LEDs adjacent to each port on the external panel to indicate which interface is active. (See Figures 2 and 3). A lit green LED indicates that the EIA-232 interface is active for that port; a lit yellow LED indicates that the EIA-422 interface is active for that port. Only one LED at a time is lit for each port.

Figure 2   **Eight Port Configurable External Panel**
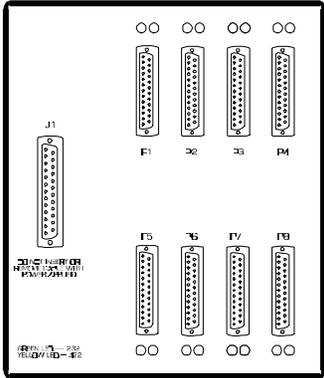
Figure 3   **Sixteen Port Configurable External Panel**
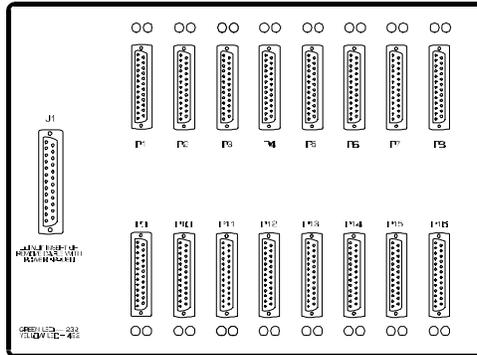
Pin assignments for EIA-232 DTE compliance are identified in Table 2. If a particular peripheral device doesn't require the modem handshake signals, only pins 2, 3 and 7 need be used. We recommend connecting only the necessary signals in the EIA-232 interface cable.

Table 2   **EIA-232 Serial Port Data Connections**

Pin #	Signal	Description	Input/Output
1	GND	Chassis Ground	N/A
2	TxD	Transmitted Data	Output
3	RxD	Received Data	Input
4	RTS	Request to Send	Output
5	CTS	Clear to Send	Input
6	DSR	Data Set Ready	Input
7	SG	Signal Ground	*reference*
8	DCD	Data Carrier Detect	Input
20	DTR	Data Terminal Ready	Output
22	RI	Ring Indicator	Input

Pin assignments for EIA-422 compliance are identified in Table 3. No connections should be made to pins not listed.

Table 3   **EIA-422 Serial Port Data Connections**

Pin #	Signal	Description
11	TxD+	Transmit Data High
13	RxD+	Receive Data High
14	TxD-	Transmit Data Low
16	RxD-	Receive Data Low

Connecting Peripherals

Software Handshaking (XON/XOFF) for Terminals and Printers

In most cases, serial terminals and printers need only a "three-wire" connection. (See Figure 4). All Avanstar device driver software supports XON/XOFF (software) handshaking, so the only signal lines necessary are Transmitted Data (TxD), Received Data (RxD) and Signal Ground (SG).

Figure 4   **Simple Terminal/Printer Cable**

Signal	Pin		Pin	Signal
GND	Shell		1	GND
TxD	2		2	TxD
RxD	3		3	RxD
RTS	4		4	RTS
CTS	5		5	CTS
DSR	6		6	DSR
SG	7		7	SG
DCD	8		8	DCD
DTR	20		20	DTR
RI	22		22	RI

DB-25 Male — DB-25 Male

Cable Shield
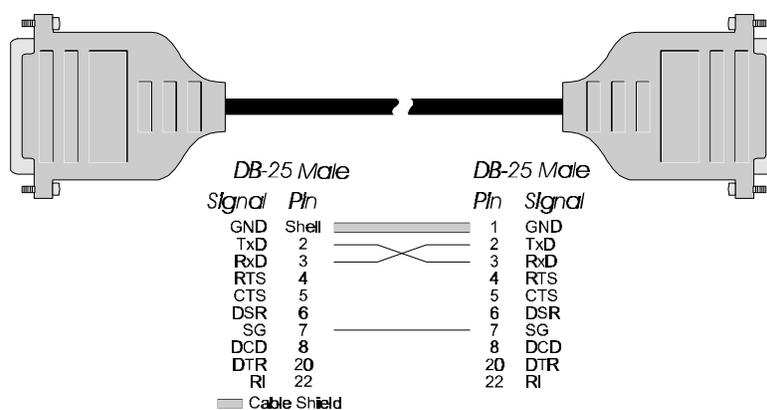
Hardware Handshaking (Ready/Busy) for Terminals and Printers

Most terminals and printers use Data Terminal Ready (DTR) for Ready/Busy hardware handshaking. The cable shown in Figure 5 supports this method.

Figure 5 **Terminal/Printer Cable with DTR Handshaking**

DB-25 Male　　　　　　DB-25 Male

Signal	Pin		Pin	Signal
GND	Shell		1	GND
TxD	2		2	TxD
RxD	3		3	RxD
RTS	4		4	RTS
CTS	5		5	CTS
DSR	6		6	DSR
SG	7		7	SG
DCD	8		8	DCD
DTR	20		20	DTR
RI	22		22	RI

Cable Shield
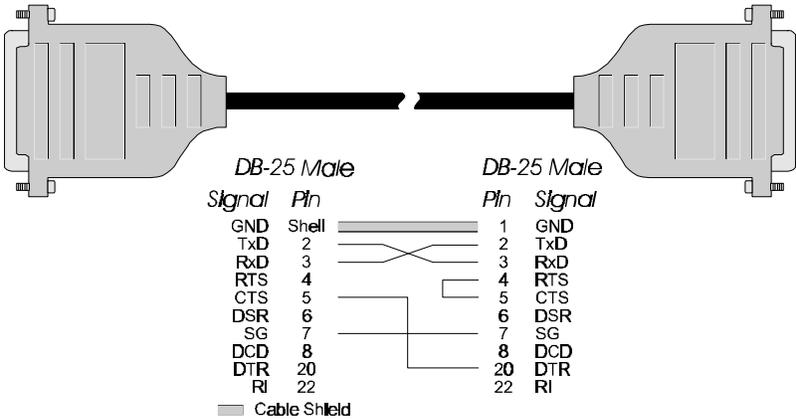
Modems

Use a standard "straight-through" cable to connect a modem to a DTE-wired DB-25 connector on the external panel. (See Figure 6).

```
                        DB-25 Male              DB-25 Male
                      Signal   Pin            Pin   Signal
                       GND    Shell ━━━━━━━━━━  1    GND
                       TxD      2  ──────────   2    TxD
                       RxD      3  ──────────   3    RxD
                       RTS      4  ──────────   4    RTS
                       CTS      5  ──────────   5    CTS
                       DSR      6  ──────────   6    DSR
                       SG       7  ──────────   7    SG
                       DCD      8  ──────────   8    DCD
                       DTR     20  ──────────  20    DTR
                       RI      22  ──────────  22    RI
                       ▭ Cable Shield
```
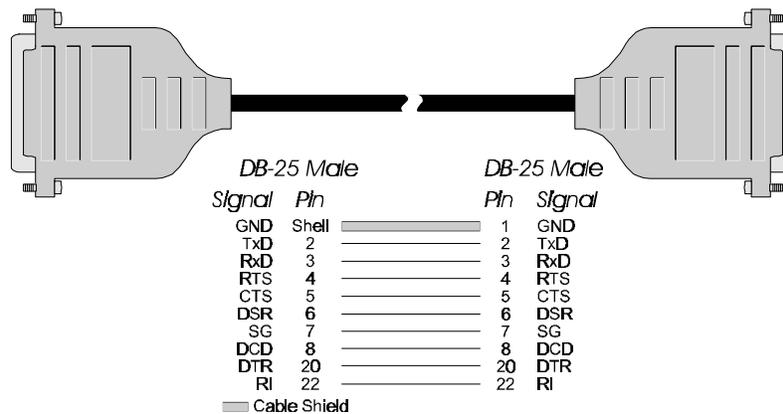
Device Driver Installation

- If you have an Avanstar Xi, you are now ready to load the device driver software by following the instructions in the device driver software installation guide.

- If you have an Avanstar Xe, an Avanstar Xm, or an Avanstar Xp, you must first follow the instructions in "Configuring the Avanstar Xe, Avanstar Xm, and Avanstar Xp" on page 14 of this manual.

Configuring the Avanstar Xe, Avanstar Xm, and Avanstar Xp

System Configuration

After the Avanstar Xe, Avanstar Xm, or the Avanstar Xp is installed in the computer, the computer must be configured to recognize and initialize the board.

Avanstar Xe Configuration

The EISA configuration utility supplied with the computer must be run. See the documentation supplied with the computer for instructions on using the EISA configuration utility.

Although every EISA configuration utility is different, the following general instructions can be used.

1. Enter the executable command to activate the EISA configuration utility.

2. Select the "Configure" option in the menu.

3. When you are asked for the configuration file, insert the Digi-supplied Option Configuration diskette into the floppy disk drive of your computer. The Option Configuration diskette contains the following file:

    !SGT0101.CFG

This configuration file lists the dual port memory addresses and IRQs which may be assigned to the Avanstar Xe.

4. Follow the on-screen messages and select the Avanstar Xe board for configuration.

5. Select a dual port address that does not conflict with other hardware in the system. The same dual port address can be shared by all Avanstar Xe boards installed in the system. The following addresses are valid locations for the dual port. These addresses are all on 32K-byte boundaries within the first megabyte of the address space.

A0000	A8000
B0000	B8000
C0000	C8000
D0000	D8000
E0000	

   The configuration utility will inform you of dual port address conflicts.

6. Select the IRQs for the boards. An Avanstar Xe board can share an IRQ only with other Avanstar Xe boards. The IRQs that can be selected are 3, 4, 5, 9, 10, 11, 12, and 15. The configuration utility also allows interrupts to be disabled. See the device driver manual for specific instructions regarding interrupt enabling/disabling and selection.

7. Save the configuration.

8. Exit from the EISA configuration utility.

9. Reboot the computer.

After you successfully complete this procedure, load the device driver by following the instructions in the software installation guide.

Avanstar Xm Configuration

The Avanstar Xm must be configured with the Reference diskette included with a Micro Channel computer. Follow these steps:

1. Use the DOS DISKCOPY command to make a backup copy of the Reference diskette supplied with the computer. Store the original diskette in a safe place and use the backup copy as your working diskette.

2. Insert the backup copy of the Reference diskette into drive A and turn on the computer.

3. The display will announce that a self-test has found a new controller installed, and it will ask you to run "automatic configuration." Disregard the suggestion and go to the Main Menu instead by typing **n**.

     Automatic configuration will not work properly until you add files from the Digi-supplied Avanstar Option Configuration diskette.

4. From the Main Menu, select:

    Copy an option diskette

5. Follow the on-screen instructions to copy the Adapter Description File (the file with an extension of .ADF) from the Option Configuration diskette onto the Reference Diskette. This file lists the dual port memory boundary addresses which may be assigned to the Avanstar Xm. At power-up, the MCA configuration utility chooses an address from this list. This file also contains a list of supported IRQ levels and a selection to disable interrupts to the host PC.

6. Return to the Main Menu.

---

7. Check your software driver manual and decide on the following.

    - Select a dual port memory boundary address at an available
      location in the computer's address space. The dual port memory
      boundary address must be on a 16K-byte (4000H) boundary, and it
      must not conflict with the address of any other controllers residing
      in the computer. See the *Guide to Operations* manual supplied
      with the computer for more information.

    - Interrupt level (IRQ) or no IRQ

    - You may or may not be required to select an I/O address.

Table 4   **Avanstar Xm Configuration Choices**

(Defaults are shown in bold.)
dual port address: **0D0000**, 0D4000, 0D8000, 0DC000
(hex)   0C0000, 0C4000, 0C8000, 0CC000
I/O address (hex):   **0800**, 0C00, 1000, 1400, 1800, 1C00, 2000
IRQ: **3**, 4, 5, 7, 9, 10, 11, 12, No IRQ

8. At the Main Menu select:

    Set configuration

9. If you are happy with the defaults, select:

    Run automatic configuration

Then go to to Step 12.

If you want to select other values, select:

    Change configuration

10. Scroll to the entry for the Avanstar Xm controller. It shows the default
    values which have been loaded.

11. Make your selections with the help of the on-screen instructions and save
    them.

12. Follow the on-screen instructions to leave the configuration menu and
    restart the computer.

After you successfully complete this procedure, load the device driver by
following the instructions in the software installation guide.

Avanstar Xp Configuration

The Avanstar Xp's resources are configured automatically by the system's PCI BIOS. When an Avanstar Xp is installed in the bus, this feature can sometimes cause previously installed adapters to be assigned different device numbers and resources than what they were originally assigned. This may also result in different port names because the driver may initialize the adapters in a different order. Depending on your system, some resources can be manually assigned through the BIOS setup. Refer to your system user manual for more information on how to configure the adapter in your system.

The Avanstar Xp requires the following resources to be assigned by the BIOS:

- 128 bytes I/O space (4 GB range)
- 128 bytes memory space (4 GB range)
- 128 KB memory space (4 GB range)
- One IRQ (3-15)

The Avanstar Xp uses PCI INTA. This line is routed on the motherboard to a BIOS-selected IRQ. On some systems, the IRQ can be manually selected through the BIOS setup.

Digi Support Services

The Digi Bulletin Board System

Digi provides an electronic bulletin board service (BBS) for our customers. This bulletin board provides general and technical information about Digi's products.

The Digi BBS allows users to download software drivers as soon as they become available. There is also a feature to allow users with problems or questions about Digi products to leave messages to Digi Technical Support.

Using the Digi BBS is easy. Simply dial **(612) 912-4800**. In Europe, dial **+49 221 9205211**; in Asia, dial **+65 735 2460**. The bulletin board accepts calls at 1200, 2400, 9600 and 14.4K baud. V.32, HST 14.4, V.42 and V.42*bis* standards are supported, with full MNP class 1-5 error correction and data compression.

The recommended modem communications parameters are 8 bits, no parity and one stop bit (**8 N 1**). Other settings may also work.

Download protocols include Zmodem, Xmodem, Ymodem, Kermit and others.

Internet FTP Server

Digi has set up an Anonymous FTP server for those with access to the Internet network. The address is **ftp.dgii.com**. Log in as anonymous, and enter your E-mail address when asked for a password. Drivers and installation tips are located in the **/drivers** directory. A text file, **download.doc**, gives information on uncompressing the files after downloading. Tip: Be sure to enter "**bin**" before downloading, to ensure binary transfer of files.

World Wide Web Server

Product information, manuals, new product announcements, programs, application stories and more can be obtained through the World Wide Web. Our address is http://www.dgii.com.

DigiFACTs FaxBack Server

Manuals and technical information can also be obtained by FAX. To use the FaxBack server, simply call (612) 912-4990 on a touch tone phone.

Information About Your System

Serial number of your Digi product: _____

Make, model and clock speed of your computer: _____

_____

How much RAM does your computer have? _____

Hard disk controller: Type: _____ Memory addressed at: _____

I/O port used: _____ IRQ: _____

LAN card: Type: _____ Memory addressed at: _____

I/O port used: _____ IRQ: _____

Other: Type: _____ Memory addressed at: _____

I/O port used: _____ IRQ: _____

Operating system: _____ Version: _____

Digi device driver version: _____

Technical Support

At Digi, we are proud of our products, and support them. Our dealers and distributors are fully trained on our product line, so that they can help you on a technical level should assistance be needed.

Your first level of support is your Digi dealer, the place where you purchased your Digi product. Your dealer has the training to help you with any installation questions or difficulties you might have.

If you still experience difficulties (after contacting your first level of support), Digi has a staff of Technical Support Specialists that can assist you. They can be reached at **(612) 912-3456**. In Europe, call **+49 221 920520**, and in Asia, call **+65 732 1318**. FAX numbers are: (612) 912-4958 (USA), +49 221 9205210 (Europe) and +65 732 1312 (Asia).

When you call Digi Technical Support, please call from a position where you can operate your system. Also, please fill out the form on the previous page before calling, so your Technical Support representative can have a clear picture of your system and any potential conflicts between devices.

Digi Technical Support can also be reached via Internet E-mail. Please send correspondence to **support@dgii.com**, and include your voice and FAX phone numbers.

Customer Service

Digi also has a staff of Customer Service representatives to help you with software and documentation update requests, as well as Returned Merchandise Authorizations (RMAs) in case you need to return your Digi product for repair. (See page 24.) They can be reached at **(612) 912-3456**. Digi Customer Service can be contacted by FAX at (612) 912-4959.

Digi Customer Service can also be reached via Internet E-mail. Please send correspondences to **cust_serv@dgii.com**, and include your voice and FAX phone numbers.

Return Procedures

All Digi products have a five-year parts and labor warranty, and we are ultimately responsible for any defective parts, according to the limits specified in the warranty. However, many of the reported problems are due to factors other than defects in the product itself. To save you time and possibly additional cost, Digi asks that you *first* try to resolve any difficulties by contacting our Technical Support representatives at **(612) 912-3456.**

Note: Be sure to have the serial number of your Digi product at hand before calling Technical Support.

Returns should be directed to the dealer or distributor from whom you purchased the product. If you need to return your Digi product for repair, it is first necessary to obtain an RMA (Returned Merchandise Authorization) number from Digi, by speaking to a Digi Customer Service representative. Authorized returns should be shipped to Digi International, 10000 West 76th Street, Eden Prairie, MN 55344. The RMA number should appear on the shipping carton, on or near the address label.

Note: Products received without an RMA number clearly marked on the outside of the package will be returned, unopened, to the sender

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