

Personal488 User's Guide

For Windows[®] 95/98/Me/NT/2000/XP



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Personal488 User's Guide

For Windows 95/98/Me/NT/2000/XP

p/n 495-0940 Rev 1.0



This document is a guide for installing Personal488 software and hardware. After doing so you will need to refer to additional PDF documentation. See page v of this document for more information.

Warranty Information

Your IOtech warranty is as stated on the *product warranty card*. You may contact IOtech by phone, fax machine, or e-mail in regard to warranty-related issues.

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Warnings, Cautions, Notes, and Tips



Refer all service to qualified personnel. This caution symbol warns of possible personal injury or equipment damage under noted conditions. Follow all safety standards of professional practice and the recommendations in this manual. Using this equipment in ways other than described in this manual can present serious safety hazards or cause equipment damage.



This warning symbol is used in this manual or on the equipment to warn of possible injury or death from electrical shock under noted conditions.



This ESD caution symbol urges proper handling of equipment or components sensitive to damage from electrostatic discharge. Proper handling guidelines include the use of grounded anti-static mats and wrist straps, ESD-protective bags and cartons, and related procedures.



This symbol indicates the message is important, but is not of a Warning or Caution category. These notes can be of great benefit to the user, and should be read.



In this manual, the book symbol always precedes the words "Reference Note." This type of note identifies the location of additional information that may prove helpful. References may be made to other chapters or other documentation.



Tips provide advice that may save time during a procedure, or help to clarify an issue. Tips may include additional reference.

Specifications and Calibration

Specifications are subject to change without notice. Significant changes will be addressed in an addendum or revision to the manual. As applicable, IOtech calibrates its hardware to published specifications. Periodic hardware calibration is not covered under the warranty and must be performed by qualified personnel as specified in this manual. Improper calibration procedures may void the warranty.

Quality Notice



IOtech has maintained ISO 9001 certification since 1996. Prior to shipment, we thoroughly test our products and review our documentation to assure the highest quality in all aspects. In a spirit of continuous improvement, IOtech welcomes your suggestions.

Table of Contents

A Word about Personal488 Documentation	v
1 – Personal488 Overview	1-1
2 – CD-ROM, Driver 488 Software Packages	2-1
3 – Installation	3-1
<i>Windows 95 Users</i>	<i>3-2</i>
<i>Windows 98 Users</i>	<i>3-5</i>
<i>Windows Me</i>	<i>3-8</i>
<i>Windows NT Users</i>	<i>3-11</i>
<i>Windows 2000 & XP Users</i>	<i>3-13</i>
4 – Hardware Configuration Reference	4-1
<i>Configuration Overview</i>	<i>4-1</i>
<i>AT488 Configurations</i>	<i>4-3</i>
<i>GP488B Configurations</i>	<i>4-7</i>
<i>GP488B/MM Configurations</i>	<i>4-11</i>

Your order was carefully inspected prior to shipment. When you receive your product, carefully unpack all items from the shipping carton and check for physical signs of damage that may have occurred during shipment. Promptly report any damage to the shipping agent and your sales representative. Retain all shipping materials in case the unit needs to be returned to the factory.

A Word about Personal488 Documentation



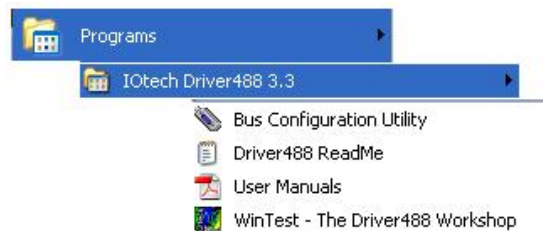
To ensure that your Personal488 device is properly installed and to get the most out of your device, it is important that you refer to the full-version user's manual PDF after using this installation guide.

Your Personal488 documentation exists in two formats:

- **Electronic** (an Adobe Acrobat PDF version of a full-version user's manual)
- **Hardcopy** (a printed user's guide, this manual)

The electronic document is included on your installation CD and will be installed on your PC's hard drive when the software is installed. The default location of the document is the Programs group. It can be navigated to from the Windows Desktop Start Menu as follows, providing that you did not choose an alternate location:

> Start
> Programs
> IOtech Driver 488.xx
> User Manuals



The electronic document is the *Personal488 User's Manual for Windows 95/98/Me/NT/2000/ and XP*, part number 495-0903. That document includes the material covered by this one, plus a great deal of additional material. The additional topics are provided on the following page.

The hardcopy document is this manual. It is designed to help you install software and hardware, regardless of your board type or type of Windows operating system.

After completing the installation you will need to review the contents of the larger manual for additional information, as needed. For example, you will need to read about the Bus Configuration Utility and WinTest.

A list of topics is provided on the following page.

Topics, which are Included in the Personal488 User's Manual*

Using IEEE488

IEEE488 Configuration Utility

WinTest – Driver488 WorkShop

Differences between 32-bit and 16-Bit Driver488 Software

Programming Language Support

Microsoft Visual C++

Borland C++

Microsoft Visual BASIC

Borland Delphi

Support for Other Languages

16-Bit Driver488/W95 Compatibility Layer

API Reference

API Error Codes

IEEE488 ASCII Code Map

Troubleshooting

The IEEE 488 Bus Standard

Analyzing the IEEE Bus

Common Problems and Solutions

New Standards Simplify Programming

Frequently Asked Personal 488 Questions

Specifications

PCI488 Specifications

AT488pnp Specifications

CARD488 Specifications

AT488 Specifications

GP488B Specifications

GP488B/MM Specifications

National Instruments - Compatible Drivers

Overview

Program Requirements

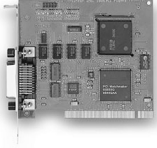
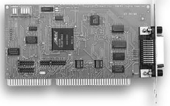


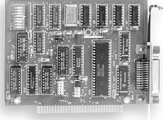

Installation

Upgrading from a Previous Version

Miscellaneous Hints and Tips

File Structure

* Refers to the full version manual, p/n 495-0903, which exists in Adobe Acrobat PDF format on your installation CD.

<i>Personal488 Hardware</i>	<i>Plug-and-Play</i>	<i>Bus Type and Transfer Rate</i>
<p><i>Personal488/PCI (with PCI488)</i></p> 	Yes	32-bit PCI Bus 1 Mbyte/s
<p><i>Personal488/ATpnp (with AT488pnp)</i></p> 	Yes	16-bit ISA Bus 1 Mbyte/s
<p><i>Personal488/CARD (with CARD488)</i></p> 	Yes	"hot swapping" PC Card (PCMCIA) 1 Mbyte/s
<p><i>Personal488/AT (with AT488)</i></p> 	No	16-bit ISA-bus 1 Mbyte/s
<p><i>Personal488 (with GP488B)*</i></p> 	No	8-bit ISA-bus 330 Kbyte/s
<p><i>Personal488/MM (with GP488B/MM)*</i></p> 	No	8-bit PC/104 330 Kbyte/s

* GP488 boards with serial numbers of 036731 or lower are not supported by Drivers for Windows 9x or WindowsNT.

Note: Items pictured are not shown to the same scale.

Hardware Products

The family of Personal488 PC/IEEE 488 controller interfaces includes the six (6) interfaces which are discussed in this manual. All of them are IEEE 488.2 compatible and are supported by 32-bit Driver488 software for Windows 95, 98, Me, 2000 and NT. These interfaces are discussed in the following Personal488 packages:

Hardware Configurations

<u>Plug-and-Play Devices</u>	<u>"Non plug-and-play" Devices</u>
<ul style="list-style-type: none">• Personal488/PCI (PCI488)• Personal488/ATpnp (AT488pnp)• Personal488/Card (Card488)	<ul style="list-style-type: none">• Personal488/AT (AT488)• Personal488 (GP488B)• Personal488/MM



Reference Notes:

- Refer to Chapter 4, *Hardware Configuration Reference* for information concerning jumpers and switches.
- For hardware specifications, please refer to Appendix D of the Personal488 User's Manual (p/n 495-0903). A PDF version of the manual is included on the installation CD and on our website.

Software Installation

The installation process consists of running an installation setup program, and for non plug-and-play products running the Add New Hardware program found in the Windows Control Panel. The installation setup program will automatically determine the version of Windows (e.g. Windows 95, 98, Me, NT, 2000, or XP) and copy all the necessary drivers and support files to the appropriate destinations. Note that on Windows systems with AutoPlay *enabled*, the setup program will automatically start upon insertion of the CD.



Install the software before installing the hardware. Since the installation setup program installs driver and INF files, plug-and-play boards will be automatically configured upon first startup, thus eliminating the need to insert the CD and browse for support files. For non plug-and-play devices all that is required to complete the installation is to run "Add New Hardware." This will notify Windows that a new device exists.



Acrobat: For installing Adobe Acrobat Reader. Documentation that has been included on the CD in the Adobe pdf format can be viewed and printed with use of the Adobe Reader.

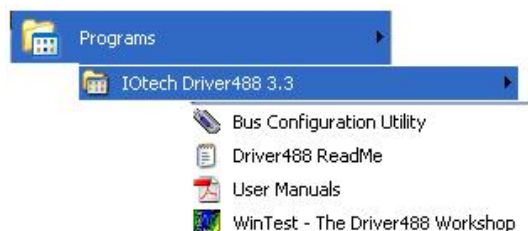
Driver488/DRV

Driver488/NI Includes drivers for DOS and Windows 3.1

Driver488/SUB

The **Win9x_WinNT** folder includes a W9X Driver Disk folder for Windows 95 and 98; and a Win2K Driver Disk folder for Me, NT, 2000, and XP.

After the software has been installed you can access the full version user's manual PDF from the Windows Desktop by navigating as follows: Start>Programs>IOtech Driver488.xx>User Manuals.



Note: The CD structure is subject to change without notice.

Iotech, Inc. IEEE 488.2 Software Products

Personal488/PCI – 1 Mbyte/s PCI/IEEE 488.2 Board with Plug & Play, Digital I/O, & Software for PCs

Personal488/Atpnp – 1 Mbyte/s PCI/IEEE 488.2 Board with Plug & Play, Digital I/O, & Software for PCs

Personal488/AT – 1 Mbyte/s IEEE 488.2 Board & Software for PC/Ats

Personal488 – IEEE 488.2 Board & Software for PCs

Personal488/CARD – IEEE 488.2 PC-Card Interface, Cable, & Software for Notebook & Desktop PCs

This CD contains several driver software packages for DOS and Windows. The following table shows which Driver488 packages can be used with each IEEE 488 Controllers product type.

Folder (In CD Root Directory) →	Win9x_WinNT		W31	DRV	SUB	NI (*)
	2000, XP, Me, and 9x	NT	3x	DOS	DOS	
Personal488 (ISA)	✓	✓	✓	✓	✓	✓
Personal488AT (ISA)	✓	✓	✓	✓	✓	✓
Personal488/Atpnp (ISA pnp)	✓	No	No	No	No	✓
Personal488PCI (PCI)	✓	✓	No	No	No	✓
Personal488CARD (PC-CARD)	✓	No	✓	✓	✓	✓
Personal 488MM (PC104)	✓	✓	✓	✓	✓	✓



(*) Reference Note:

Information pertaining to National Instruments (NI) is provided in Appendix E of the full version PDF manual (p/n 495-0903). If needed, see page v in regard to accessing the PDF manual.

The CD contains all of the Driver488 packages available for current IEEE 488 Controller products. The various driver packages are organized according to the directory tree structure as indicated on page 1-2.



Before running any of the installation programs, please look for a read-me file in the same directory as the install program. When present, it may contain important installation instructions.

Driver488 Packages

Driver488/DRV

IEEE 488.2 DOS Device Driver Software.

- Supports IOtech's AT488, GP488B, CARD488, NB488, GP488B/MM, MP488, MP488CT series boards.
- Includes "ON SRQ" program vectoring for Basic, C, Pascal.
- Compatible with all popular programming languages and spreadsheets.
- Automatically loads into high memory when available.

Driver488/SUB

IEEE 488.2 DOS Subroutine Driver.

- Supports IOtech's AT488, GP488B, CARD488, NB488, GP488B/MM, MP488, MP488CT series boards.
- Includes "ON SRQ" program vectoring for Basic, C, Pascal.
- Compatible with popular programming languages and spreadsheets such as C, Pascal and QuickBasic.

Driver488/W31

IEEE 488.2 Microsoft Windows Dynamic Link Library

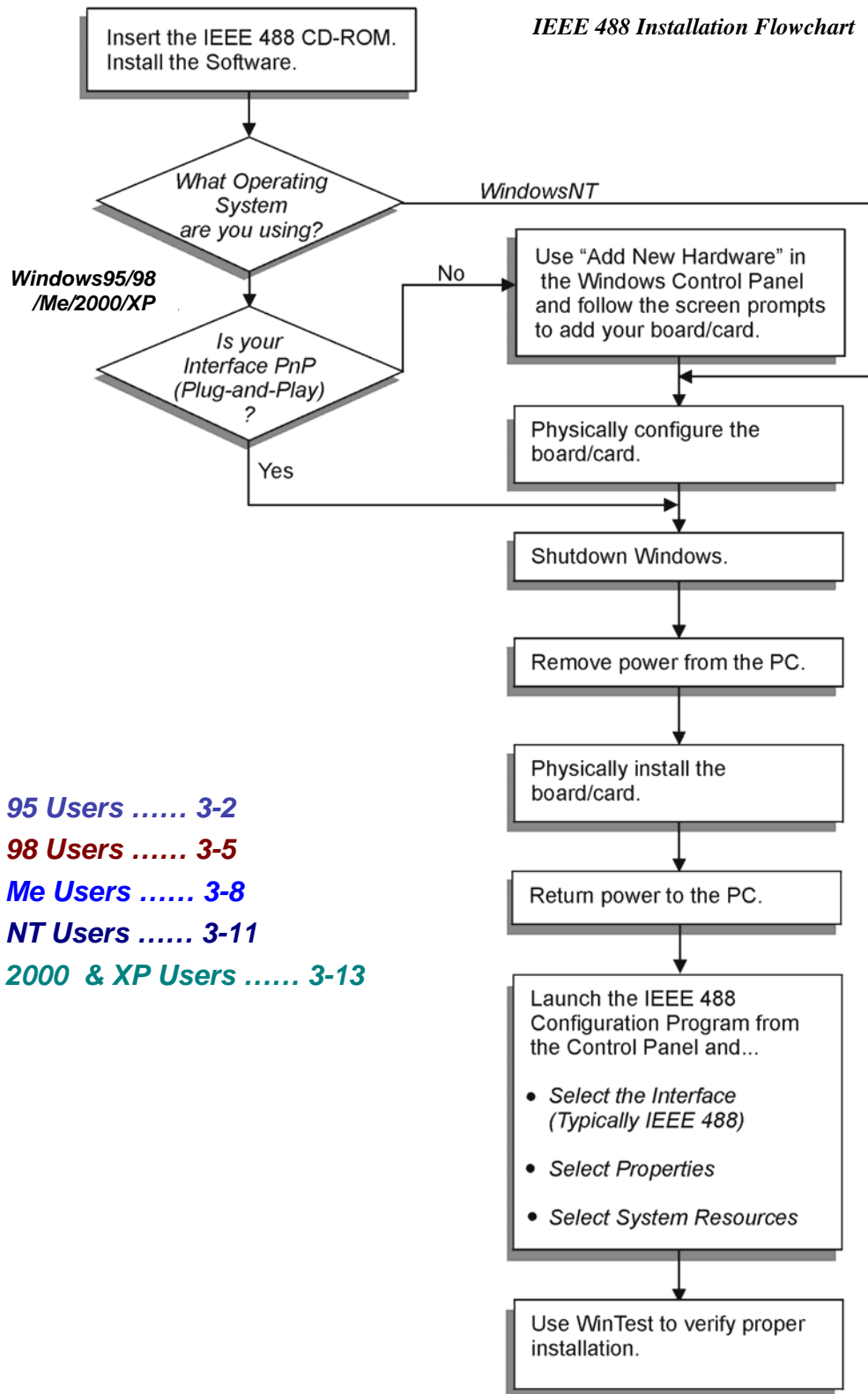
- Supports IOtech's AT488, GP488B, CARD488, NB488, GP488B/MM, MP488, MP488CT series boards.
- Offers HP-style commands for high & low-level control.
- Designed for Windows' message passing, multi-tasking architecture.
- Includes language interfaces for Microsoft C, Visual C++, Visual Basic, Turbo C, Borland C++.
- Includes an interactive control application for exercising instruments and generating code.
- On-Line Help provides complete command reference as well as examples.

Win9x_WinNT Folder

This folder includes IEEE 488.2 drivers for the following operating systems: Windows 9x, Windows Me, Windows 2000, Windows XP, and Windows NT.

The setup program automatically detects the operating system and installs the correct drivers.

- In regard to Windows 9x, Windows Me, Windows 2000, and Windows XP, the drivers support IOtech's AT488, GP488B, GP488B/MM, PCI488 series boards.
- Integrate IEEE 488.2 control into Microsoft Windows applications.
- Provide true multi-tasking device locking.
- Were specifically designed for the 32-bit Windows environment.



Software Installation



- For best results, install the interface after the software installation.
- Due to differences in Windows 95 “Add New Hardware” panels, the following description may vary slightly.
- If installing a second non plug-and-play interface, skip step 1.
- If installing a second plug-and-play interface, go to “Hardware Installation.”

Step 1

Insert the IEEE488 Software CD. The CD has an auto-run program that will automatically start the setup program when the CD is inserted into the CD ROM driver. If auto-run is disabled, use Explorer to launch the Setup.exe found in the root directory of the CD. Follow the screen prompts to install the software. If non plug-and-play hardware is being installed, proceed to step 2; otherwise proceed to “Hardware Installation” on page 3-4.

Step 2

Use the “Add New Hardware” program found in the Control Panel to notify Windows 95 that you are installing new hardware. Refer to the following steps that demonstrate the typical Windows panels encountered during the “Add New Hardware” program execution:

Start ⇒ Settings ⇒ Control Panel ⇒ Add New Hardware

Add New Hardware Procedure (*non plug-and-play users only*):



It is only necessary for users of “non plug-and-play” boards to follow the Add New Hardware Procedure. If your device is a “plug-and-play device,” skip this procedure.

1. The “Add New Hardware Wizard” displays an introductory message and prompts you to click *Next*.
2. Windows 95 will automatically search for hardware. Click *Next*.



3. Click *'No, the device isn't in the list'*



4. Select the option:
“No, I want to select the hardware from a list,” then click *Next*.

Choose **IEEE488.2 Controllers** from the list of hardware types and click *Next*.

5. Windows will now display a list of devices to install.

Select your specific Personal488 interface product. Example Personal488/AT

After making the selection, click *Next*.

Windows will now display the default resource settings for your interface.



6. Make note of the displayed settings, as you must configure the jumpers and switch settings before installing an AT488 or GP488B

7. Click **Finish**.

Click **Yes**, proceed with Windows 95 Hardware Installation.

Hardware Installation for Windows 95 Users

Plug-and-Play Devices

Personal488/PCI
Personal488/ATpnp
Personal488/Card

1. If you have not already done so, shutdown Windows 95 after the IEEE 488 software has been successfully installed.
2. Remove power from the PC.
3. Physically install your interface. As a quick reference,
Personal488/PCI installs into a 32-bit PCI expansion slot,
Personal488/ATpnp installs into a 16-bit ISA expansion slot, and
Personal488/Card installs into a PC card slot.
4. Return power to the PC. After the computer powers up, Windows will detect your new hardware.

At this point refer to the full-version PDF. See page v for location.

“Non plug-and-play” Devices

Personal488/AT (AT488)
Personal488 (GP488Bplus)
Personal488/MM

1. Verify that Windows 95 has properly shutdown.
2. Remove power from the PC.
3. Physically configure the device’s jumpers and switches to match the resource settings Windows reported during the driver installation.



Non plug-and-play board users: physically configure your board’s jumpers and switches to match the resource settings Windows reported. If these settings conflict with other hardware, change the jumpers, switches, and Windows Resource settings to available resources.



Reference Note:
Refer to Chapter 4, *Hardware Configuration Reference* for further information concerning jumpers and switches.

4. Physically install your interface.
5. Return power to the PC.

At this point refer to the full-version PDF. See page v for location.

Windows 98 Users

Software Installation



- For best results, install the interface after the software installation.
- If installing a second *non plug-and-play* interface, skip step 1.
- If installing a second *plug-and-play* interface, go to *Hardware Installation*, page 3-7.

Step 1

Insert the IEEE488 Software CD. The CD has an auto-run program that will automatically start the setup program when the CD is inserted into the CD ROM driver. If auto-run is disabled, use Explorer to launch the Setup.exe found in the root directory of the CD. Follow the screen prompts to install the software. Then, if non plug-and-play hardware is being installed, proceed to step 2; otherwise proceed to hardware installation on page 3-7.

Step 2

Use the “Add New Hardware” program found in the Control Panel to notify Windows 98 that you are installing new hardware. Refer to the following steps that demonstrate the typical Windows panels encountered during the “Add New Hardware” program execution:

Start ⇒ Settings ⇒ Control Panel ⇒ Add New Hardware

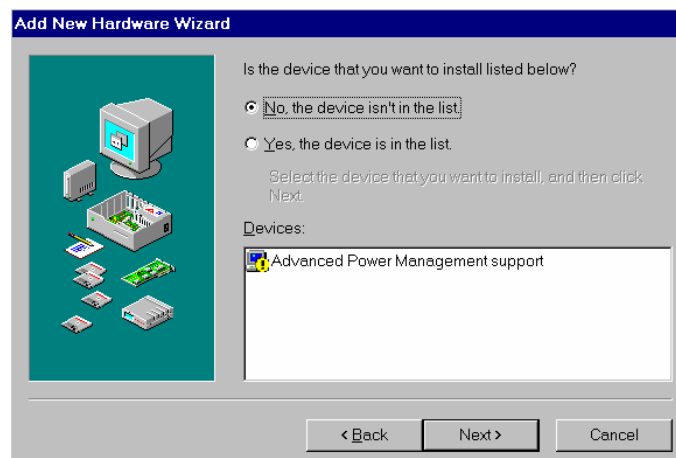
Add New Hardware Procedure (*non plug-and-play users only*):



It is only necessary for users of “non plug-and-play” boards to follow the Add New Hardware Procedure. If your device is a “plug-and-play device,” skip this procedure.

The “Add New Hardware Wizard” displays an introductory message and prompts you to click *Next*.

1. Click *Next*.



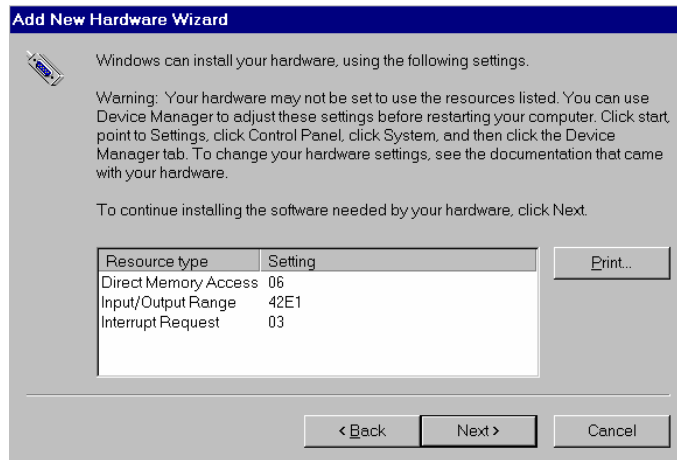
2. Select '*No, the device isn't in the list*' and click *Next*.



3. Select '*No, I want to select the hardware from a list*' and click *Next*.

4. Select '*IEEE 488.2 Controllers*' and click *Next*.
5. Windows will now display a list of devices to install. **Select your specific Personal488 interface product. Example Personal488/AT**
6. After making the selection, click *Next*.

Windows will now display the default resource settings for your interface.



7. Make note of the displayed settings, as you must configure the jumpers and switch settings before installing an AT488 or GP488B.

8. Click *Finish*.
9. Click '*Yes*' and shut down the computer; then proceed to the next step.

Hardware Installation for Windows 98 Users

Plug-and-Play Devices

Personal488/PCI
Personal488/ATpnp
Personal488/Card

1. If you have not already done so, shutdown Windows 98 after the IEEE 488 software has been successfully installed.
2. Remove power from the PC.
3. Physically install your interface. As a quick reference,
 - Personal488/PCI** installs into a 32-bit PCI expansion slot,
 - Personal488/ATpnp** installs into a 16-bit ISA expansion slot, and
 - Personal488/Card** installs into a PC card slot.
4. Return power to the PC. Windows will detect your new hardware when the computer powers up.

At this point refer to the full-version PDF. See page v for location.

“Non plug-and-play” Devices

Personal488/AT (AT488)
Personal488 (GP488B)
Personal488/MM

1. If you have not already done so, shutdown Windows 98 after the IEEE 488 software has been successfully installed.
2. Remove power from the PC.
3. Physically configure the device's jumpers and switches to match the resource settings Windows reported during the driver installation.



Non plug-and-play board users: physically configure your board's jumpers and switches to match the resource settings Windows reported. If these settings conflict with other hardware change the jumpers, switches, and Windows Resource settings to available resources.



Reference Note:

Refer to Chapter 4, *Hardware Configuration Reference* for further information concerning jumpers and switches.

4. Return power to the PC.

At this point refer to the full-version PDF. See page v for location.

Windows Me Users

Software Installation



- For best results, install the interface after the software installation.
- If installing a second non plug-and-play interface, skip step 1.
- If installing a second plug-and-play interface, go to “Hardware Installation.”

Step 1

Insert the IEEE488 Software CD. The CD has an auto-run program that will automatically start the setup program when the CD is inserted into the CD ROM driver. If auto-run is disabled, use Explorer to launch the Setup.exe found in the root directory of the CD. Follow the screen prompts to install the software. Then if non plug-and-play hardware is being installed, proceed to step 2; otherwise proceed to *Hardware Installation for Windows Me Users* on page 3-10.

Step 2

Use the “Add New Hardware” program found in the Control Panel to notify Windows Me that you are installing new hardware. Refer to the following steps that demonstrate the typical Windows panels encountered during the “Add New Hardware” program execution:

Start ⇒ Settings ⇒ Control Panel ⇒ Add New Hardware

Add New Hardware Procedure (*non plug-and-play users only*):



It is only necessary for users of “non plug-and-play” boards to follow the Add New Hardware Procedure. If your device is a “plug-and-play device,” skip this procedure.

The “Add New Hardware Wizard” displays an introductory message and prompts you to click *Next*.

1. Click *Next*.



2. Select '*No, the device isn't in the list*' and click *Next*.

3. Select '*No, I want to select the hardware from a list*' and click *Next*.



4. Select '*IEEE 488.2 Controllers*' and click *Next*.
5. Windows will now display a list of devices to install. **Select your specific Personal488 interface product. Example Personal488/AT**
6. After making the selection, click *Next*.

Windows will now display the default resource settings for your interface.



7. Make note of the displayed settings, as you must configure the jumpers and switch settings before installing an AT488 or GP488B.

8. Click *Finish*.
9. Click 'Yes' and shut down the computer.

At this point, proceed to the next section, *Hardware Installation for Windows Me Users*.

Hardware Installation for Windows Me Users

Plug-and-Play Devices

Personal488/PCI
Personal488/ATpnp
Personal488/Card

1. If you have not already done so, shutdown Windows Me after the IEEE 488 software has been successfully installed.
2. Remove power from the PC.
3. Physically install your interface. As a quick reference,
Personal488/PCI installs into a 32-bit PCI expansion slot,
Personal488/ATpnp installs into a 16-bit ISA expansion slot, and
Personal488/Card installs into a PC card slot.
4. Return power to the PC. After the computer powers up, Windows Me will detect your new hardware.

At this point refer to the full-version PDF. See page v for location.

“Non plug-and-play” Devices

Personal488/AT (AT488)
Personal488 (GP488B)
Personal488/MM

1. If you have not already done so, shutdown Windows Me after the IEEE 488 software has been successfully installed.
2. Remove power from the PC.
3. Physically configure the device's jumpers and switches to match the resource settings Windows Me reported during the driver installation.



Non plug-and-play board users: physically configure your board's jumpers and switches to match the resource settings Windows reported. If these settings conflict with other hardware change the jumpers, switches, and Windows Resource settings to available resources.



Reference Note:

Refer to Chapter 4, *Hardware Configuration Reference* for further information concerning jumpers and switches.

4. Return power to the PC.

At this point refer to the full-version PDF. See page v for location.

Windows NT Users

Software Installation

Step 1

Insert the IEEE488 Software CD. The CD has an auto-run program that will automatically start the setup program when the CD is inserted into the CD ROM driver. If auto-run is disabled, use Explorer to launch the Setup.exe found in the root directory of the CD.

Step 2

Follow the screen prompts to install the software, then proceed to hardware installation.

Hardware Installation

All Devices

Personal488/AT (AT488)
Personal488 (GP488Bplus)
Personal488/MM
Personal488/PCI

1. Access the Windows Control Panel and launch the *IEEE488* configuration program.
2. Highlight your interface (typically IEEE0) and select **Properties** as shown below:

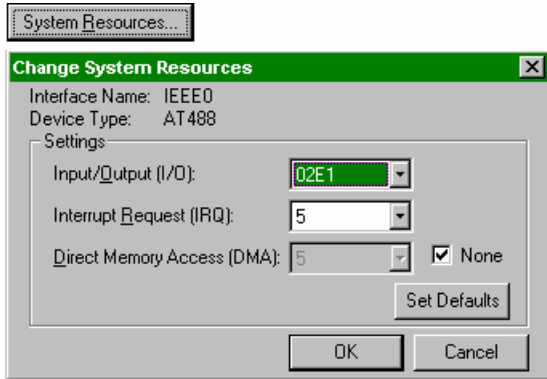


Selecting “Properties” and “System Resources”

3. Click the **Systems Resources** button.



If Personal488/PCI is selected, then the System Resources button is not available. Windows NT is not a plug-and-play operating system, and thus changing resources on a Plug-and-Play interface is not possible.



4. Physically configure the device's jumpers and switches to match the resource settings Windows is reporting during the driver installation. If these settings conflict with other hardware, change the jumpers, switches, and Windows Resource settings to available resources.



Reference Note:

Refer to Chapter 4, *Hardware Configuration Reference*, for more information regarding jumpers and switches.

5. Shutdown Windows and remove power from your PC.
6. Insert the interface board, securing it appropriately.
7. Return power to the PC.

At this point refer to the full-version PDF. See page v for location.

Windows 2000 and Windows XP Users

Note: Although Windows 2000 is mentioned in the following text, users of XP should be able to easily follow these same instructions, with minor, but obvious exceptions. This is due to the fact that the procedure for Windows XP is very close to that of Windows 2000.

Software Installation



- For best results, install the interface after the software installation.
- If installing a second *non plug-and-play* interface, skip step 1.
- If installing a second *plug-and-play* interface, go to *Hardware Installation*, page 3-16.

Step 1

Insert the IEEE488 Software CD. The CD has an auto-run program that will automatically start the setup program when the CD is inserted into the CD ROM driver. If auto-run is disabled, use Explorer to launch the Setup.exe found in the root directory of the CD. Follow the screen prompts to install the software. Then, if non plug-and-play hardware is being installed, proceed to step 2; otherwise proceed to hardware installation on page 3-16.

Step 2

Use the “Add New Hardware” program found in the Control Panel to notify Windows 2000 that you are installing new hardware. Refer to the following steps that demonstrate the typical Windows panels encountered during the “Add New Hardware” program execution:

Start ⇒ Settings ⇒ Control Panel ⇒ Add New Hardware

Add New Hardware Procedure (*non plug-and-play users only*):



It is only necessary for users of “non plug-and-play” boards to follow the Add New Hardware Procedure. If your device is a “plug-and-play device,” skip this procedure.

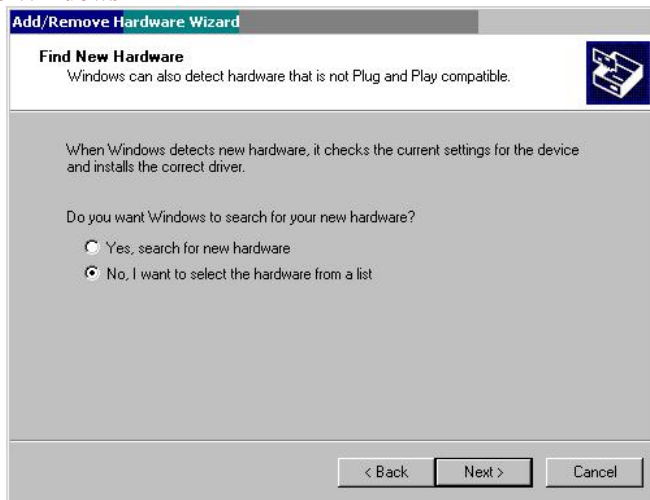
1. After the Add/Remove Hardware Wizard appears, click *Next*.
2. Select **Add/Troubleshoot a device.**
3. Click *Next*.

The *Add/Remove Hardware Wizard* searches for new plug-and-play hardware.

After new hardware is located a screen, similar to that at the left, appears.

4. Select **Add a new device.**
5. Click *Next*.

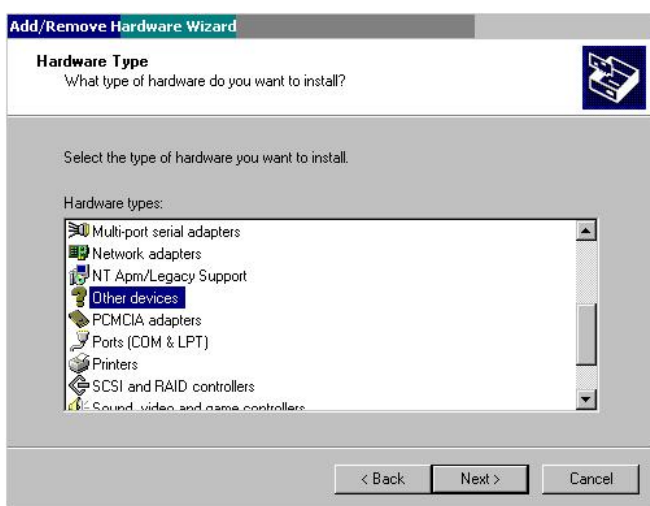
Windows 2000 & Windows XP



6. When prompted by the question, "Do you want Windows to search for your new hardware?"

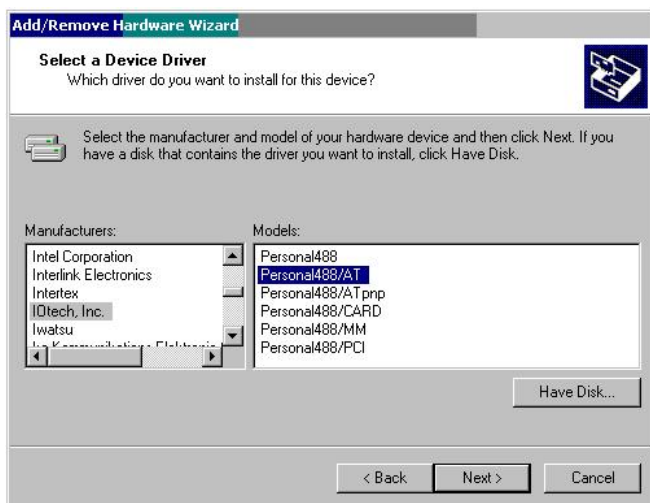
Select *'No, I want to select the hardware from a list.'*

7. Click *Next*.



8. When asked what type of hardware you want to install, select **Other devices**.

9. Click *Next*.

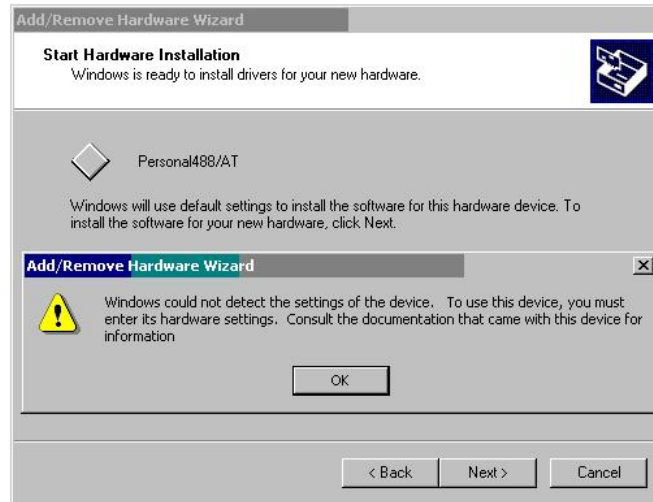


Windows will display a list of manufacturers and device models.

10. Select **IOtech Inc**.
11. Select your specific Personal488 interface product.
12. Click *Next*.

Windows 2000 & Windows XP

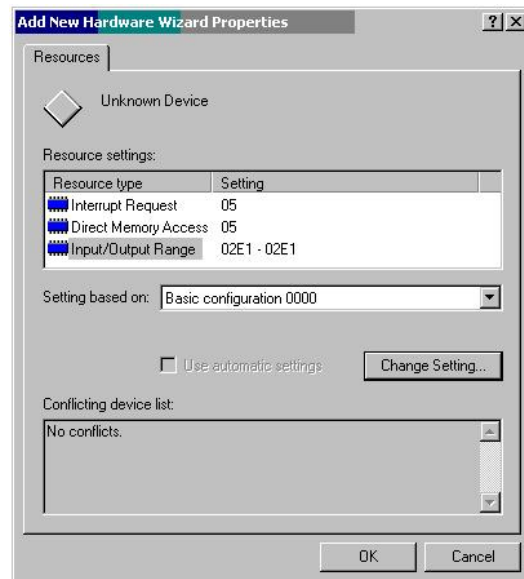
13. Click *Next*.
Windows 2000 will install software for the device.



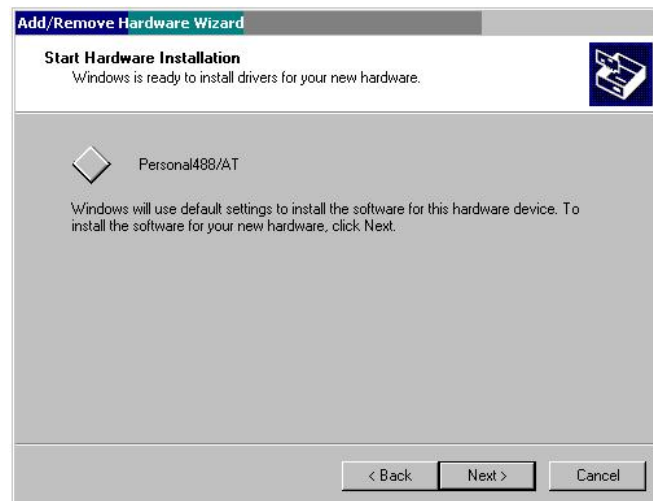
If Windows could not detect any hardware settings for the device, a message box informs you that hardware settings must be entered (see the following figure).

14. If Windows could not detect any hardware settings, as indicated by the message in step 14, enter the settings.

Refer to *Hardware Configuration Reference* (chapter 4) for setting information.



15. When prompted that “Windows is ready to install drivers for your new hardware,” click *Next*.



Windows will inform you that the hardware was installed.

16. Click **Finish**.

Now proceed to the next section, *Hardware Installation for Windows 2000 and Windows XP Users*.

Hardware Installation for Windows 2000 & Windows XP Users

Note: Although Windows 2000 is mentioned in the following text, users of Windows XP should be able to easily follow these same instructions, with minor, but obvious exceptions. This is due to the fact that the procedure for Windows XP is very close to that of Windows 2000.

Plug-and-Play Devices

Personal488/PCI
Personal488/ATpnp
Personal488/Card

1. If you have not already done so, shutdown Windows 2000 after the IEEE 488 software has been successfully installed.
2. Remove power from the PC.
3. Physically install your interface. As a quick reference,
Personal488/PCI installs into a 32-bit PCI expansion slot,
Personal488/ATpnp installs into a 16-bit ISA expansion slot, and
Personal488/Card installs into a PC card slot.
4. Return power to the PC. After the computer powers up, Windows 2000 will detect your new hardware.

At this point refer to the full-version PDF. See page v for location.

“Non plug-and-play” Devices

Personal488/AT (AT488)
Personal488 (GP488B)
Personal488/MM

1. If you have not already done so, shutdown Windows 2000 after the IEEE 488 software has been successfully installed.
2. Remove power from the PC.
3. Physically configure the device’s jumpers and switches to match the resource settings Windows 2000 reported during the driver installation.



Non plug-and-play board users: physically configure your board’s jumpers and switches to match the resource settings Windows reported. If these settings conflict with other hardware change the jumpers, switches, and Windows Resource settings to available resources.



Reference Note:

Refer to Chapter 4, *Hardware Configuration Reference* for further information concerning jumpers and switches.

4. Return power to the PC.

At this point refer to the full-version PDF. See page v for location.

[Configuration Overview 4-1](#)
[AT488 Configurations 4-3](#)
[GP488B Configurations 4-7](#)
[GP488B/MM Configurations 4-11](#)

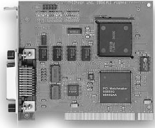

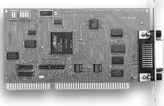
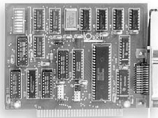


Configuration Overview

Plug-and-Play Devices

Plug-and-play devices require no physical configuration of hardware. After installing your software and hardware [as described in Chapters 2 and 3] the configuration is performed automatically. Note that the *plug-and-play* devices are listed in the following table as a product reference only. This chapter contains no useful information concerning *plug-and-play* devices.

Non Plug-and-Play Devices

The I/O base address, IRQ, and DMA settings of *non plug-and-play* devices are determined by the physical settings of jumpers and DIP switches. This chapter provides the information necessary to configure these devices.

Plug-and-Play Devices	Non Plug-and-Play Devices
<p>PCI488</p>  <p>Automatic Configuration.</p>	<p>AT488</p>  <p>See page 4-3.</p>
<p>AT488pnp</p>  <p>Automatic Configuration.</p>	<p>GP488B</p>  <p>See page 4-7.</p>
<p>CARD488</p>  <p>Automatic Configuration.</p>	<p>GP488B/MM</p>  <p>See page 4-11.</p>

Note: The device images are not shown to the same scale.



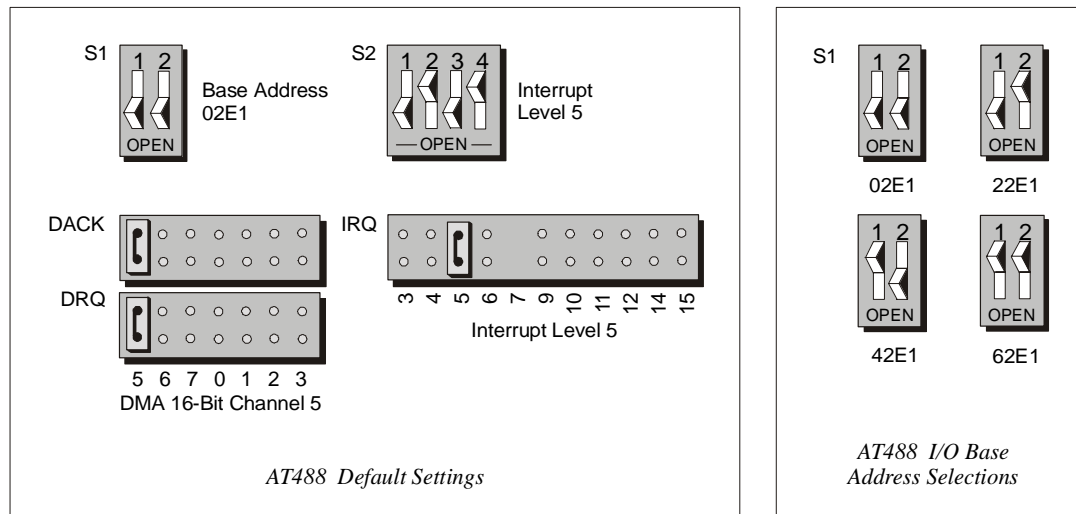
AT488 Configurations



The I/O base address, IRQ, and DMA settings are switch/jumper selectable via the following locations on the AT488 interface board: One 2-microswitch DIP switch labeled S1, one 4-microswitch DIP switch labeled S2, two 14-pin headers labeled DACK and DRQ, and one 22-pin header labeled IRQ. The DIP switch settings, and the arrangement of the jumpers on the headers set the hardware configuration.

For the next steps, make sure that the I/O address, IRQ, and DMA set on the interface board are different from any existing ports in your system. A conflict results when two I/O addresses, IRQs, or DMAs are the same. (As the exception, additional AT488 interfaces may share the same IRQ and DMA values.) If there is a conflict, reconfigure the switch/jumper settings. Refer to the following figures as needed.

Configuring the AT488 Interface I/O Base Address



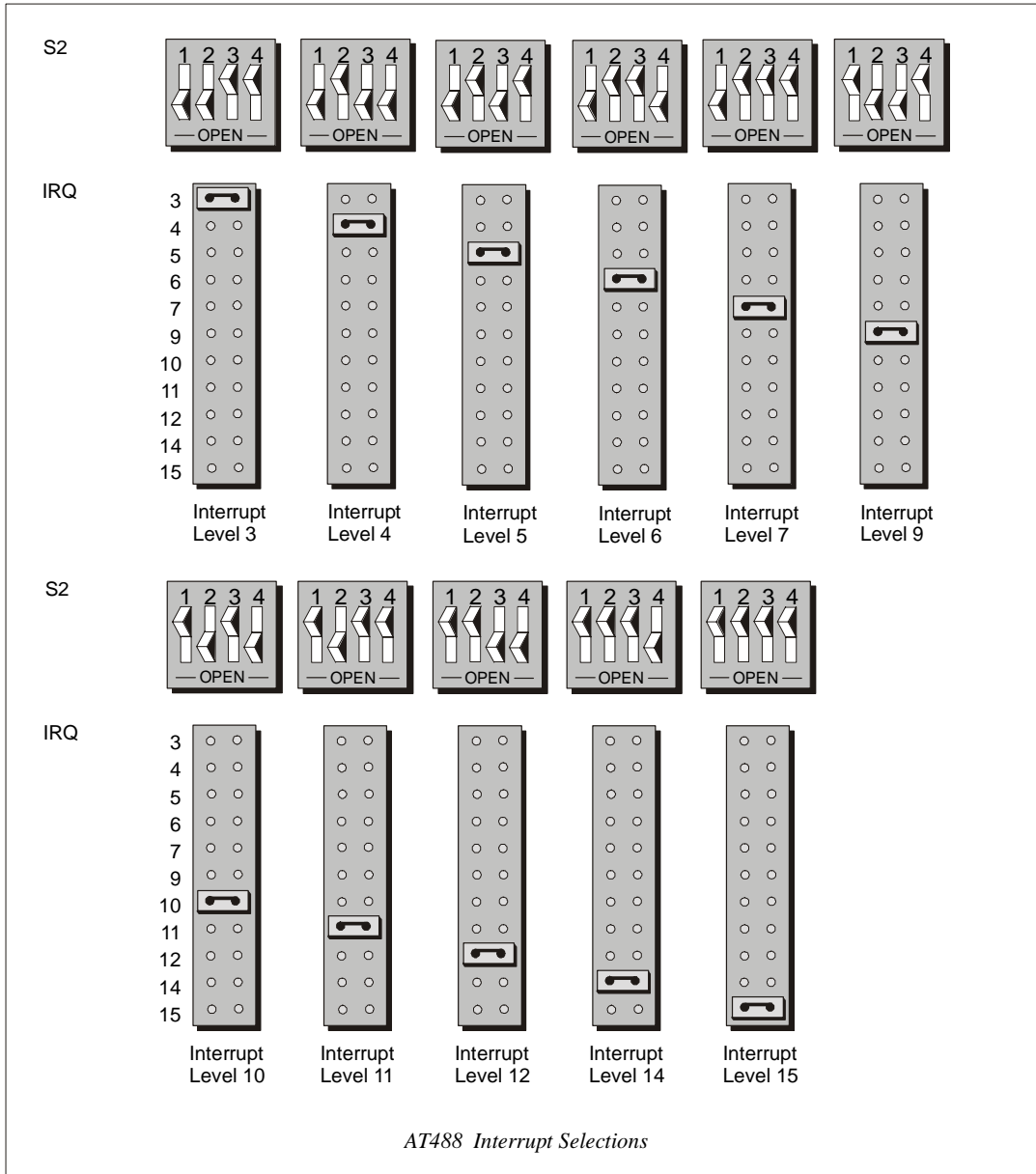
The factory default I/O base address is **02E1**. If this creates a conflict, reset switch S1 according to the figure and following table. The register addresses will be automatically relocated at fixed offsets from the base address. If reset, record the new Input/Output (I/O) address being used.

Selected I/O Base				Register	
Address					
02E1	22E1	42E1	62E1		
Automatic Offset Addresses				Read Register	Write Register
02E1	22E1	42E1	62E1	Data In	Data Out
06E1	26E1	46E1	66E1	Interrupt Status 1	Interrupt Mask 1
0AE1	2AE1	4AE1	6AE1	Interrupt Status 2	Interrupt Mask 2
0EE1	2EE1	4EE1	6EE1	Serial Poll Status	Serial Poll Mode
12E1	32E1	52E1	72E1	Address Status	Address Mode
16E1	36E1	56E1	76E1	CMD Pass Through	Auxiliary Mode
1AE1	3AE1	5AE1	7AE1	Address 0	Address 0/1
1EE1	3EE1	5EE1	7EE1	Address 1	End of String

The I/O base address sets the addresses used by the computer to communicate with the IEEE 488 interface hardware on the board. The address is normally specified in hexadecimal and can be **02E1**, **22E1**, **42E1**, or **62E1**. The registers of the IOT7210 IEEE 488 controller chip and other auxiliary registers are then located at fixed offsets from the base address.

Most versions of Driver488 are capable of managing as many as four IEEE 488 interfaces. To do so, the interface configurations must be arranged to avoid conflict amongst themselves. No two boards may have the same I/O address; but they may, and usually should, have the same DMA channel and interrupt level.

Configuring the AT488 Interface Interrupt (IRQ)

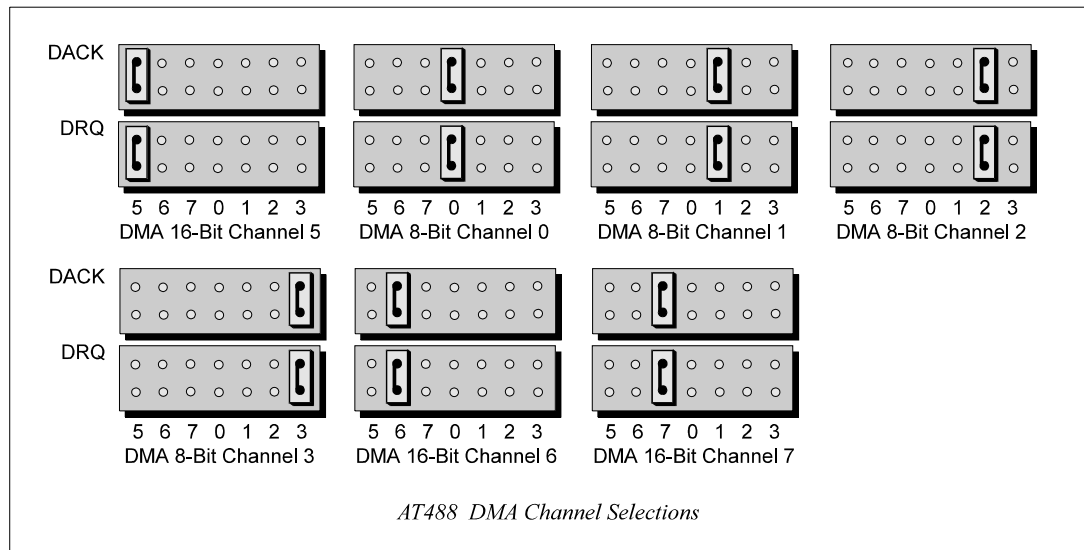


The factory default Interrupt (IRQ) is 5. If this creates a conflict, reset switch S2 and jumper IRQ according to the figure. The switch and jumper settings must both indicate the same interrupt level for correct operation with interrupts. If reset, record the new Interrupt (IRQ) being used.

The AT488 interface board may be set to interrupt the PC on the occurrence of certain hardware conditions. The main board interrupt may be set to IRQ level 3 through 7, 9 through 12, 14, or 15. Interrupts 10 through 15 are only available in a 16-bit slot on an AT-class machine. Interrupt 9 becomes synonymous with Interrupt 2 when used in a PC/XT bus.

The selected interrupt may be shared among several AT488s in the same PC/AT chassis. The AT488 adheres to the "AT-style" interrupt sharing conventions. When the AT488 requires service, the IRQ jumper determines which PC interrupt level is triggered. When an interrupt occurs, the interrupting device must be reset by writing to an I/O address which is different for each interrupt level. The switch settings determine the I/O address to which the board's interrupt rearm circuitry responds.

Configuring the AT488 Interface DMA Channel

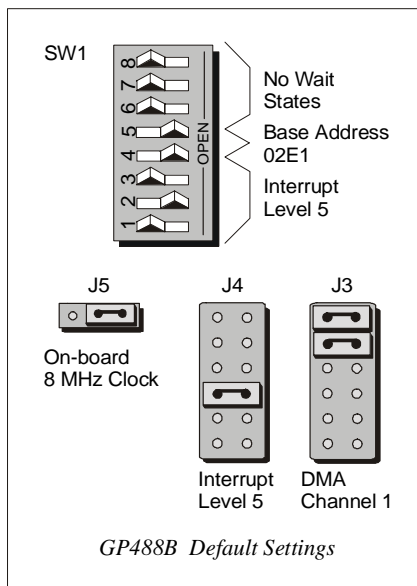
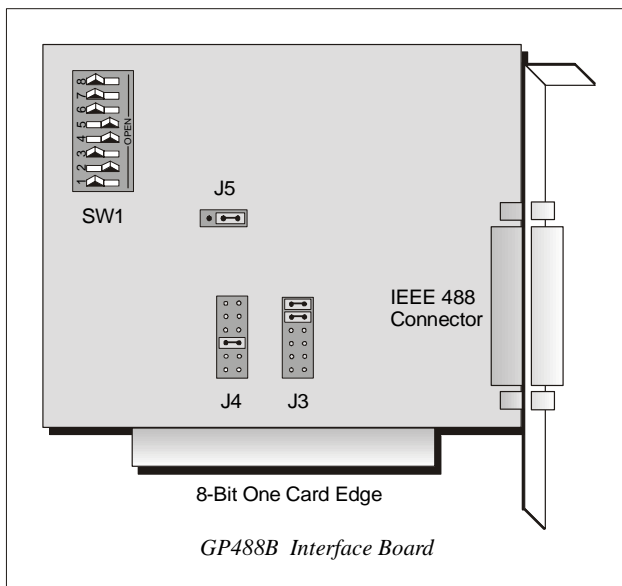
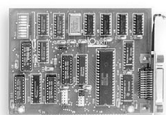


The factory default DMA channel is 5. If this creates a conflict, reset jumpers DACK and DRQ according to the figure. Both the DRQ and DACK jumpers must be set to the desired DMA channel for proper operation. If reset, record the new DMA channel being used.

Direct Memory Access (DMA) is a high-speed method of transferring data from or to a peripheral, such as a digitizing oscilloscope, to or from the PC's memory. The AT class machine has seven DMA channels. Channels 0 to 3 (8-bit), 5, 6, and 7 (16-bit) are available only in a 16-bit slot on a PC/AT-class machine. Channel 2 is usually used by the floppy disk controller, and is unavailable. Channel 3 is often used by the hard disk controller in PCs, XT's, and the PS/2 with the ISA bus, but is usually not used in AT's. Channels 5 to 7 are 16-bit DMA channels and offer the highest throughput (up to 1 Megabyte per second). Channels 0 to 3 are 8-bit DMA channels and although slower, they offer compatibility with existing GP488B and GP488B/MM applications that only made use of 8-bit DMA channels. Under some rare conditions, it is possible for high-speed transfers on DMA Channel 1 to demand so much of the available bus bandwidth that simultaneous access of a floppy controller will be starved for data due to the relative priorities of the two channels.



GP488B Configurations

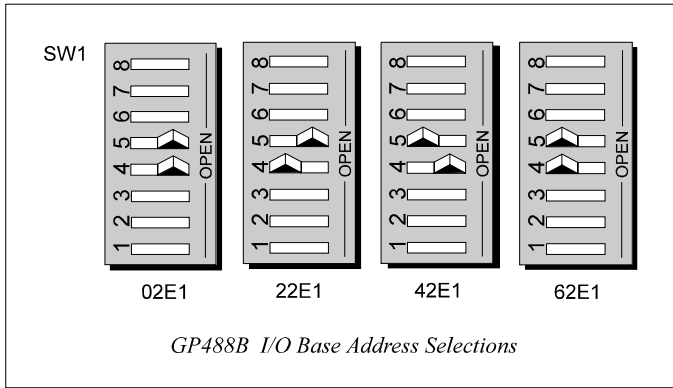


The I/O base address, IRQ, and DMA settings are switch/jumper selectable via the following locations on the GP488B interface board: One 8-microswitch DIP switch labeled SW1, two 12-pin headers labeled J3 and J4, and one 3-pin header labeled J5. The DIP switch settings, and the arrangement of the jumpers on the headers set the hardware configuration.

For the next steps, make sure that the I/O address, IRQ, and DMA, set on the interface board are different from any existing ports in your system. A conflict results when two I/O addresses, IRQs, or DMAs are the same. (As the exception, additional GP488B interfaces may share the same IRQ and DMA values). If there is a conflict, reconfigure the switch/jumper settings. Refer to the following figures as needed.

Selected I/O Base				Register	
Address					
02E1	22E1	42E1	62E1		
Automatic Offset Addresses				Read Register	Write Register
02E1	22E1	42E1	62E1	Data In	Data Out
06E1	26E1	46E1	66E1	Interrupt Status 1	Interrupt Mask 1
0AE1	2AE1	4AE1	6AE1	Interrupt Status 2	Interrupt Mask 2
0EE1	2EE1	4EE1	6EE1	Serial Poll Status	Serial Poll Mode
12E1	32E1	52E1	72E1	Address Status	Address Mode
16E1	36E1	56E1	76E1	CMD Pass Through	Auxiliary Mode
1AE1	3AE1	5AE1	7AE1	Address 0	Address 0/1
1EE1	3EE1	5EE1	7EE1	Address 1	End of String

Configuring the GP488B Interface I/O Base Address

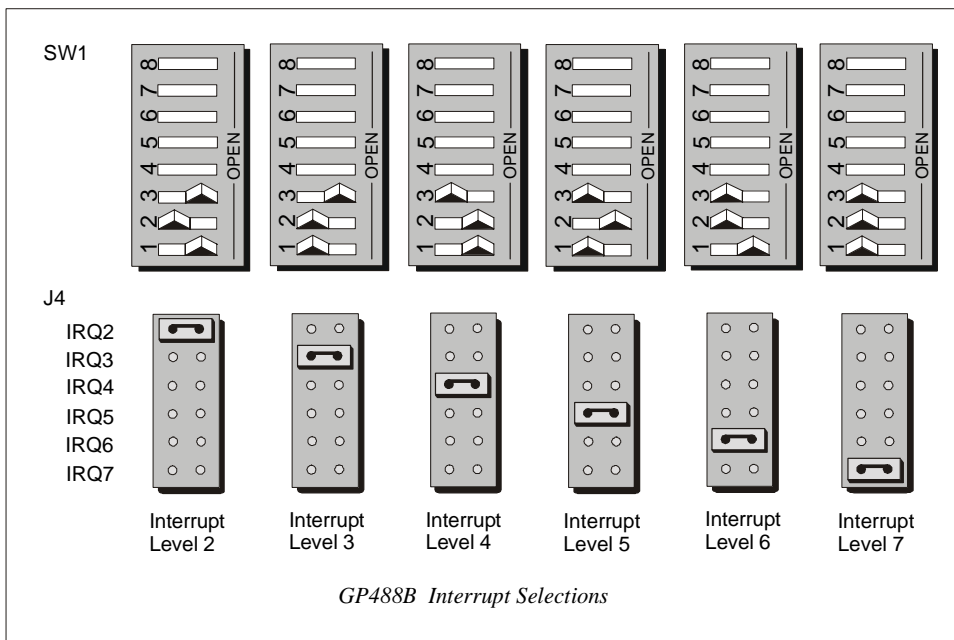


The factory default I/O base address is **02E1**. If this creates a conflict, reset SW1 microswitches 4 and 5 according to the figure and following table. The register addresses will be automatically relocated at fixed offsets from the base address. If reset, record the new Input/Output (I/O) address being used.

The I/O base address sets the addresses used by the computer to communicate with the IEEE 488 interface hardware on the board. The address is normally specified in hexadecimal and can be **02E1**, **22E1**, **42E1**, or **62E1**. The registers of the IOT7210 IEEE 488 controller chip and other auxiliary registers are then located at fixed offsets from the base address.

Most versions of Driver488 are capable of managing as many as four IEEE 488 interfaces. To do so, the interface configurations must be arranged to avoid conflict amongst themselves. No two boards may have the same I/O address; but they may, and usually should, have the same DMA channel and interrupt level.

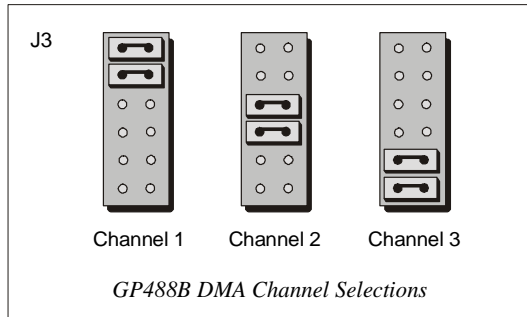
Configuring the GP488B Interface Interrupt (IRQ)



The factory default Interrupt (IRQ) is 5. If this creates a conflict, reset SW1 microswitches 1, 2, and 3, and jumper J4 according to the figure. The switch and jumper settings must both indicate the same interrupt level for correct operation with interrupts. If reset, record the new Interrupt (IRQ) being used.

The GP488B interface board may be set to interrupt the PC on the occurrence of certain hardware conditions. The level of the interrupt generated is set by J4. The GP488B adheres to the "AT-style" interrupt sharing conventions. When an interrupt occurs, the interrupting device must be reset by writing to I/O address **02FX**, where X is the interrupt level (from 0 to 7). This interrupt response level is set by switches 1, 2, and 3 of SW1 which must be set to correspond to the J4 interrupt level setting.

Configuring the GP488B Interface DMA Channel

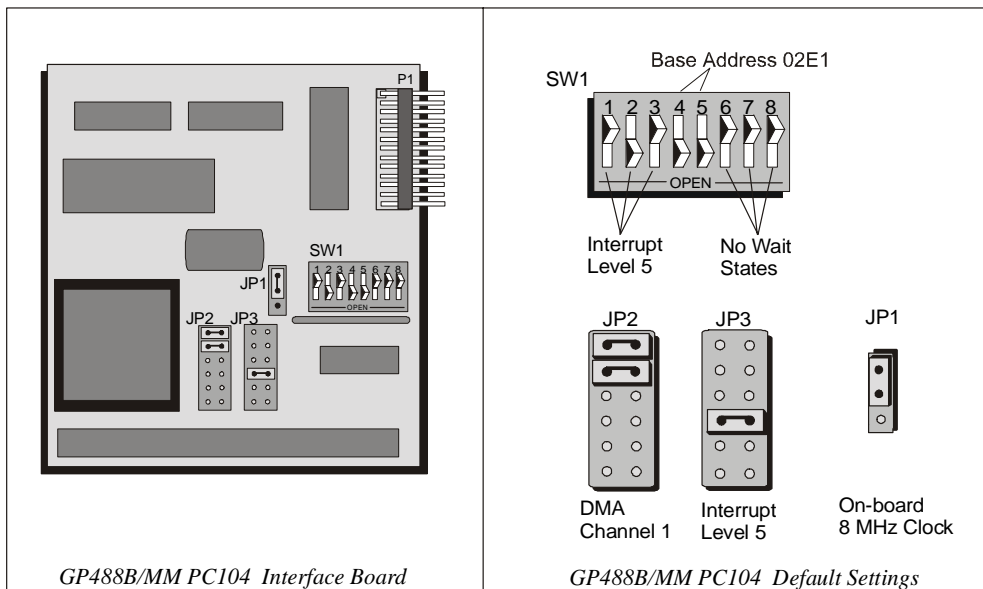


The factory default DMA channel is 1. If this creates a conflict, reset jumper J3 according to the figure. If reset, record the new DMA channel being used.

Direct Memory Access (DMA) is a high-speed method of transferring data from or to a peripheral, such as a digitizing oscilloscope, to or from the PC's memory. The PC has four DMA channels, but Channel 0 (Disabled) is used for memory refresh and is not available for peripheral data transfer. Channel 2 is usually used by the floppy disk controller, and is also unavailable. Channel 3 is often used by the hard disk controller in PCs, XTs, and the PS/2 with the ISA bus, but is usually not used in ATs. So, depending on your hardware, DMA Channels 1 and possibly Channel 3 are available. Under some rare conditions, it is possible for high-speed transfers on DMA Channel 1 to demand so much of the available bus bandwidth that simultaneous access of a floppy controller will be starved for data due to the relative priorities of the two channels.



GP488B/MM PC104 Configurations

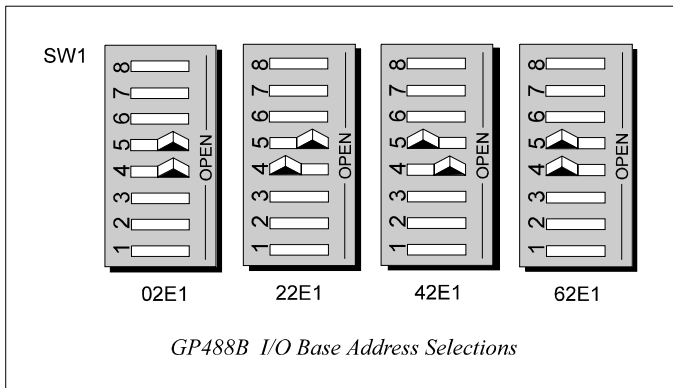


The I/O base address, IRQ, and DMA settings are switch/jumper selectable via the following locations on the GP488B/MM interface board: One 8-microswitch DIP switch labeled SW1, two 12-pin headers labeled JP2 and JP3, and one 3-pin header labeled JP1. The DIP switch settings and the arrangement of the jumpers [on the headers] set the hardware configuration.

For the next steps, make sure that the I/O address, IRQ, and DMA, set on the interface board are different from any existing ports in your system. A conflict results when two I/O addresses, IRQs, or DMAs are the same. (As the exception, additional GP488B/MM interfaces may share the same IRQ and DMA values). If there is a conflict, reconfigure the switch/jumper settings. Refer to the following figures as needed.

Selected I/O Base				Register	
Address					
02E1	22E1	42E1	62E1		
Automatic Offset Addresses				Read Register	Write Register
02E1	22E1	42E1	62E1	Data In	Data Out
06E1	26E1	46E1	66E1	Interrupt Status 1	Interrupt Mask 1
0AE1	2AE1	4AE1	6AE1	Interrupt Status 2	Interrupt Mask 2
0EE1	2EE1	4EE1	6EE1	Serial Poll Status	Serial Poll Mode
12E1	32E1	52E1	72E1	Address Status	Address Mode
16E1	36E1	56E1	76E1	CMD Pass Through	Auxiliary Mode
1AE1	3AE1	5AE1	7AE1	Address 0	Address 0/1
1EE1	3EE1	5EE1	7EE1	Address 1	End of String

Configuring the GP488B/MM PC104 Interface I/O Base Address

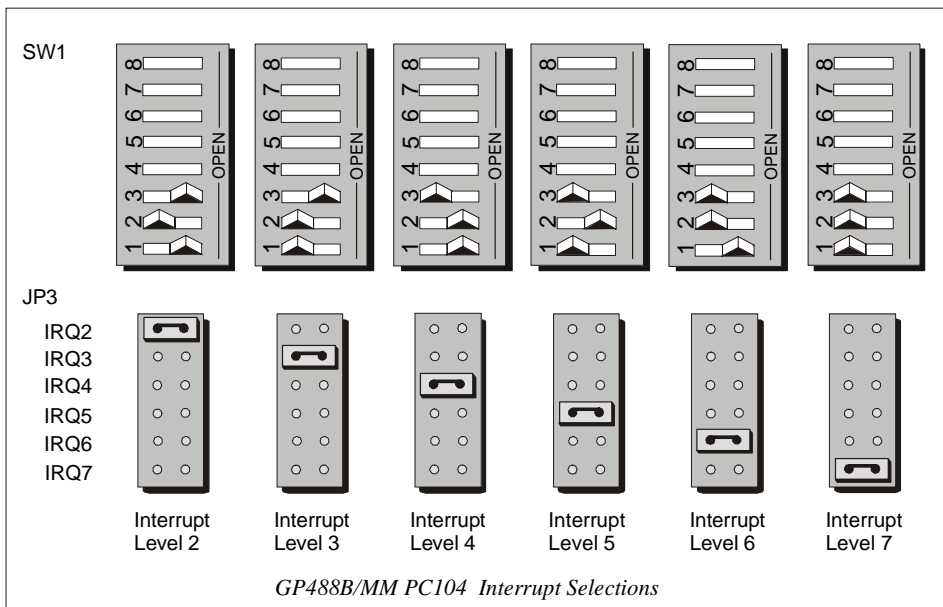


The factory default I/O base address is **02E1**. If this creates a conflict, reset SW1 micro-switches 4 and 5 according to the figure and following table. The register addresses will be automatically relocated at fixed offsets from the base address. If reset, record the new Input/Output (I/O) address being used.

The I/O base address sets the addresses used by the computer to communicate with the IEEE 488 interface hardware on the board. The address is normally specified in hexadecimal and can be **02E1**, **22E1**, **42E1**, or **62E1**. The registers of the IOT7210 IEEE 488 controller chip and other auxiliary registers are then located at fixed offsets from the base address.

Most versions of Driver488 are capable of managing as many as four IEEE 488 interfaces. To do so, the interface configurations must be arranged to avoid conflict. No two boards may have the same I/O address; but they may, and usually should, have the same DMA channel and interrupt level.

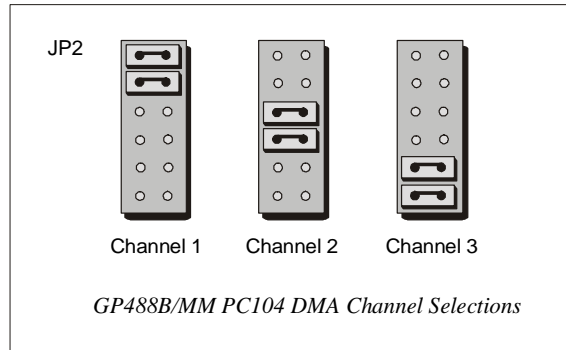
Configuring the GP488B/MM PC104 Interface Interrupt (IRQ)



The factory default Interrupt (IRQ) is 5. If this creates a conflict, reset SW1 micro-switches 1, 2, and 3, and jumper JP3 according to the figure. The switch and jumper settings must both indicate the same interrupt level for correct operation with interrupts. If reset, record the new Interrupt (IRQ) being used.

The GP488B/MM interface board may be set to interrupt the PC on the occurrence of certain hardware conditions. The level of the interrupt generated is set by JP3. The GP488B/MM adheres to the "AT-style" interrupt sharing conventions. When an interrupt occurs, the interrupting device must be reset by writing to I/O address **02FX**, where X is the interrupt level (from 0 to 7). This interrupt response level is set by switches 1, 2, and 3 of SW1 which must be set to correspond to the JP3 interrupt level setting.

Configuring the GP488B/MM PC104 Interface DMA Channel



The factory default DMA channel is 1. If this creates a conflict, reset jumper JP2 according to the figure. If reset, record the new DMA channel being used.

Direct Memory Access (DMA) is a high-speed method of transferring data from or to a peripheral, such as a digitizing oscilloscope, to or from the PC's memory. The PC has four DMA channels, but Channel 0 (Disabled) is used for memory refresh and is not available for peripheral data transfer. Channel 2 is usually used by the floppy disk controller, and is also unavailable. Channel 3 is often used by the hard disk controller in PCs, XTs, and the PS/2 with the ISA bus, but is usually not used in ATs. So, depending on your hardware, DMA Channels 1 and possibly Channel 3 are available. Under some rare conditions, it is possible for high-speed transfers on DMA Channel 1 to demand so much of the available bus bandwidth that simultaneous access of a floppy controller will be starved for data due to the relative priorities of the two channels.

