

# IEEE 488

## APPLICATION BULLETIN

### FREQUENTLY ASKED QUESTIONS (FAQ) FOR ICS's 488.2V3 CONTROLLER LIBRARY

**See AB48-43 for questions about ICS's 488.2V4 Driver Library**

#### INTRODUCTION

This application note lists the Frequently Asked Questions (FAQ) for ICS's Model 488-LPCI, Model 488-PXI, 488-USB2, 488-USB and Model 1105 GPIB Controller Products when used with ICS's 488.2V3 Driver Library. This FAQ list changes often so look here first for the latest answers to your problems.

#### **FAQ #1 What version operating system do I need to run ICS's 488.2V3 Library**

You require the following Windows software or later versions:  
For Windows 2K, Service Pack 3  
For Windows XP, Service Pack 2  
For Windows 2003 Server, Service Pack 2 plus other available updates (only for 488-USB and 488-USB2)

You also should have Microsoft .NET Framework 2.0 or later installed to run ICS Explorer. If you have installed Visual Studio 2005 or 2008, then you already have .NET Framework installed. You can look in the Control Panel's Add/Remove Software Window to see if you have .NET Framework 2.0 installed.

In addition, check with your computer manufacturer for the latest version of BIOS for your computer. Some major PC manufacturers ship computers with older versions of BIOS for several months after posting newer versions on their website.

#### **FAQ #2 Do I need .NET Framework installed for the 488.2V3 Driver Library?**

No. The 488.2V3 Installer will install a manual Configure and GPIBkybd Utility programs for users who do not have .NET Framework on their computers. .NET Framework lets you run newer programs like ICS's Explorer. ICS's Explorer automatically configures your GPIB Controller and shows you all of your GPIB Controllers and Instruments in a tree view.

#### **FAQ #3 How do you install ICS's 488.2V3 GPIB Drivers over older GPIB Drivers?**

The GPIB DLLs from ICS have the same names as DLLs from National Instruments, Measurement Computing (formerly Computer Boards) and some other GPIB card manufacturers for program compatibility. However, the GPIB DLLs from different manufacturers are **not** compatible and only work with their respective hardware. See FAQ #21.

**If you had previously installed a GPIB card from some other manufacturer, uninstall the old software before installing ICS's software.** Use the manufacturer's recommended uninstall method. Search for and remove all old copies of GPIB.DLL and GPIB-32.DLL. Then install ICS's driver. ICS's new GPIB-32.DLL and GPIB.DLLDLLs will be placed in the Windows System or System32 directory. For help, refer to our Upgrade Html page at <http://www.icselect.com/upgrade1.html>.

#### **FAQ #4 Card does not function after the installation. Why?**

The GPIB.INI file needs to be created after the card's physical installation. The GPIB.INI file saves the card's configuration settings. You can create the file automatically by running ICS's Explorer or manually by running ICS Configure and clicking on the 'Add Controller' button.

You will not be able to run an application program or ICS's GPIB Keyboard program until you create the GPIB.INI file.

#### **FAQ #5 I get a '.NET not installed' error message when I try to run Explorer. How do I configure the ICS Controllers?**

You can run ICS's Configure program to manually configure ICS's Controllers and create the GPIB.INI file on machines that do not have .NET installed or where you do not want to add .NET. If this is computer is being used to develop programs, you are better off installing .NET Framework 2.0 or later.

**FAQ #6 I get a 'Check Controller connection and re-run program.' error message when I try to run Explorer. What do I do?**

If this is an existing installation that was running correctly, verify that your GPIB Controller card is firmly seated in its PCI connector or that your USB Controller is plugged into a working USB port. The RDY LED on your USB Controller should be blinking.

If this is a new installation and you dismissed the Windows Update function, the USB Driver installation needs to be completed. Go to Device Manager and you will see a list of devices. The ICS GPIB Controller entry should have a yellow '!'. Right click on the yellow '!' and click 'Update Driver'. At this point the New Hardware Wizard will open and ask if Windows can connect to Windows Updates. Select 'Yes, this time only' and click 'Next'. It does not matter if the computer is connected to the Internet or not. On the next windows click 'Next' and 'Finish'. This procedure will have to be repeated for each USB Controller module connected to the computer.

**FAQ #7 I switch USB Controllers on my PC and my program does not run. Why?**

Each GPIB Controller has a unique serial number that identifies it as GPIB0, GPIB1 etc. Most programs are developed for GPIB0. When you switch USB Controllers, you have to run ICS's Explorer or Configure to redefine the GPIB0 controller.

To change the GPIB0 controller definition, select the new Controller in Explorer or Configure. Explorer will have automatically added it when you click refresh. In Configure you have to manually add the new GPIB Controller. Change the Interface Name setting on the new Controller to GPIB0 and click Apply to make the change and update the GPIB.INI file.

**FAQ #8 I get a GPIB0 Missing Error Message when I run Explorer. What do I do?**

The message also said to configure another controller as GPIB0 before running any programs. This is normally necessary because most GPIB programs are developed with the Controller as GPIB0. Multiple Controller programs refer to the other Controllers as GPIB1, GPIB2 etc.

Normally this message means that you have accidentally unplugged your USB Controller. Find the open connection and plug it back into the computer. Wait a moment and refresh Explorer's Configuration Tree.

Alternately, you may want to replace GPIB0 with another Controller. In that case, physically plug the Controller into the computer and let Explorer find and configure it. Select the new Controller in the Tree window and click the Configure GPIB Controller button to open the Configure window. Change the Interface Name to GPIB0 and click Apply. Answer Yes when asked if you want to overwrite the existing Controller. Use Cancel to exit and refresh the Tree to see the new system configuration.

**FAQ #9 Can I read the GPIB.INI file values?**

You can read some of the GPIB.INI file settings in Explorer by clicking on 'My Computer' in the Configuration Tree window. The Controllers' virtual name, serial number and status will be listed in the Device Properties window. Select a Controller in the Tree window and click the Configure GPIB Controller button to view each Controller's settings. Use Cancel to exit the Configuration window without changing any settings.

**FAQ #10 What does a blank status mean?**

It means that there is no controller with that serial number found for that virtual controller name. The Controller may be unplugged or it may have been reconfigured as another GPIBn Controller. Typically this happens when several Controllers are plugged into the computer and GPIB0 is removed. Explorer will warn you that GPIB0 is missing and recommend that you assign a Controller as GPIB0. Moving a Controller from GPIBn to GPIB0 leaves a partial entry in the GPIB.INI file.

**FAQ #11 How do I cleanup the GPIB.INI file?**

The GPIB.INI file is located in Program Files\ICS Electronics\Utilities folder. Microsoft's Vista operating system hides the GPIB.INI file. Click the Compatibility Files icon in the Menu bar to see the GPIB.INI file.

Quit all GPIB programs, unplug your USB Controllers and delete the GPIB.INI file. Reconnect the USB Controllers, wait a couple of seconds for the Device Manager to find the USB Controller and run Explorer to recreate a new clean GPIB.INI file.

**FAQ #12 Can I copy my configuration file to another computer?**

Yes you can copy the GPIB.INI file to another computer. This may be helpful when changing or upgrading computers. Please note that the configurations are associated with the USB GPIB Module's serial number or PCI Card slot identification. Unless you are creating the identical configuration, it is easier to run Explorer and let it recreate the GPIB.INI file for you.

**FAQ #13 Are ICS's different GPIB Controllers interchangeable?**

All efforts have been made to make the GPIB Controllers supported by our new 488.2V3 Driver Library interchangeable. Therefore a program developed on a PC with one type of Controller should work on another PC with a different type of Controller. You may experience speed differences between the older 488-USB and the new 488-USB2 Controllers.

The user should verify that his program runs with both Controllers before making a final release.

#### FAQ #14 What does the manual mean when it says some ibconfig functions are supported but are not used?

While it is possible to set up some ibconfig functions and to read them back with ibask, the unused functions do not change the behavior of the ICS's Controllers. They are supplied for compatibility with existing programs that may have called them. An example is ibcDMA which does nothing since ICS's GPIB Controllers do not use DMA.

#### FAQ #15 What do I have to do to run LabVIEW?

Install any version of LabVIEW (from version 6.1) and then install ICS's 488.2V3 Driver and run the ICS\_NI\_Support Utility program as described in paragraph 4.7.2 in the 488.2V3 Manual. Always download the latest version of the 488.2V3 Driver Library from ICS's website.

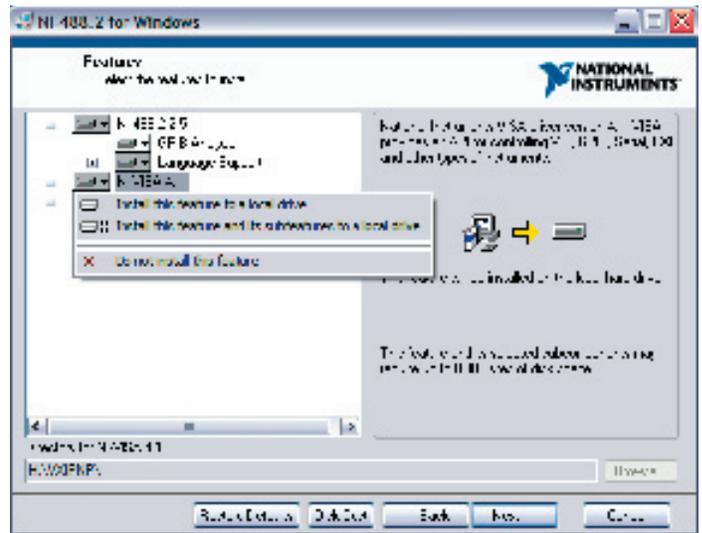
Test the VISA Drivers as directed in the manual to be sure that NI VISA is installed correctly and that it is working. **Always write your programs with synchronous commands when making VISA calls.** Also see FAQs 16 - 18.

#### FAQ #16 How do I install LabVIEW Runtime?

National Instruments' LabVIEW Runtime package is designed to give you a way to run compiled LabVIEW programs. It assumes that you have installed National Instruments NI 488.2 driver and VISA layers. The correct installation sequence to use the LabVIEW Runtime package with ICS's GPIB Controllers is:

1. Stop all GPIB programs and unplug the 488-USB Controller if it is connected to your computer.
2. Download and install National Instruments' LabVIEW Runtime package for your version of LabVIEW
3. Download National Instruments NI-488.2 Drivers. Run the install program and manually select the NI-VISA 4.x option. Failure to do so will result in no VISA layer and no Runtime to ICS Driver communication. to be sure the ICS GPIB-32.DLL is installed.
4. Install ICS's 488.2V3 Drivers even if they were already installed
5. If you are using a 488-USB module, connect to the PC at this time. Note that the PC will find the new USB Controller twice if this is your first installation.
6. Run ICS's Explorer to define the USB Controller as GPIB0 and to verify communication with your instruments. If you do not have Microsoft's .NET 2.0 installed, you will have to run ICS Configure to define the GPIB0 Controller and then GPIBkybd to test communication with your instruments.
7. At this time you can run your LabVIEW program.

If you have any problems, first check the NI VISA layer operation with the VISA Interactive Control Program. See paragraph 4.7 in your 488.2V3 Driver manual for directions on how to do this.



NI-488.2 Driver Install Window

#### FAQ #17 Can I run multiple Controllers with LabVIEW?

Yes if you have access to version 1.7 of National Instruments' NI 488.2 Driver. If you use version 1.7, it is possible to define and run multiple ICS GPIB Controllers. Uninstall the current NI 488.2 Driver and install version 1.7. Use the Add Hardware Wizard to sequentially add ICS's GPIB Controllers by selecting a non-Plug&Play AT/GPIB card.

#### FAQ #18 Can NI's Measurement and Automation Explorer (MAX) see my ICS GPIB Controller?

No. National Instruments has modified MAX so it only 'sees' the latest NI GPIB Controllers.

However, if you have access to an older version of National Instruments' NI 488.2 Driver, (version 1.7 or earlier) and use it to replace the current NI-488.2 Driver, then MAX can be made to see ICS's GPIB Controller Cards. The steps are: Uninstall the current NI 488.2 Driver and install version 1.7. Locate and run ICS\_NI\_Support\_Install utility. This utility is located in the ICS\_Electronics Utility Programs folder in the Program Files directory. Use the Add Hardware Wizard to sequentially add ICS's GPIB Controllers by selecting a non-Plug&Play AT/GPIB card.

### **FAQ #19 How can I run an ICS GPIB Controller with another GPIB Controller from National Instruments or Measurement Computing?**

All three companies install their own GPIB-32.DLL as part of their installation program. Each installation normally overwrites any existing GPIB-32.DLL with their own DLL. If you want to run GPIB Controllers from different companies, you must be using each company's GPIB-32.DLL with their GPIB Controllers.

In Windows 2K, XP or Vista, the GPIB-32.DLL is located in the C:\WINNT\System32 directory. Run each company's installation program and copy their GPIB-32.DLL into a sub-directory labeled such as NI\_DLL or ICS\_DLL. Copy the appropriate GPIB-32.DLL back into the System32 directory before running that company's GPIB Controller.

Note that you should not be running any programs that call the GPIB-32.DLL, or have a USB GPIB Controller plugged into the computer or be running a NI service that use the GPIB-32.DLL at the time you are making the switch.

If you run into any problems doing this, you will have to uninstall and reinstall the driver.

### **FAQ #20 How do I install the 488.2V3 Driver on a PC with Windows 2003 Server?**

Microsoft built in a requirement that 2003' Drivers must be Digitally Signed for the auto installation to work properly. Consequently, the ICS\_4882V3\_Install program completes but the USB drivers are not automatically installed by the Device manager. (ICS's 488.2V3 Driver does not support the 488-LPCI or 488-PXI cards on Windows 2003.)

The installation requires that you be logged in as an administrator and that you have all of the latest Windows 2003 updates installed. Update .NET Framework 1 to .NET Framework 2.0.

Remove any older GPIB Drivers. Download and run ICS\_4882V3\_Install to install the latest 488.2V3 Driver. Then do the following to complete the installation:

1. Plug your 488-USB or 488-USB2 into the PC's USB port.
2. Launch the Windows Device Manager
3. Identify the ICS USB Device.
  - a. If it is a 488-USB, it will be listed under the group labeled "ICS GPIB Controllers" and have a yellow exclamation mark (!) in front of it.
  - b. If it is a 488-USB2 and this is the first cycle through, it will be listed under the Other Devices group with a yellow exclamation mark (!) in front of it.
  - c. If it is a 488-USB2 and this is the second cycle through, it will be listed under the ICS GPIB Controllers with a yellow exclamation mark (!) in front of it.
4. Double-click the device with the yellow exclamation mark.
5. Select the Reinstall Driver button.

6. Use the default selection of Install the software automatically and select Next.
7. After a few moments a new window will appear, labeled Security Alert - Driver Installation. Select Yes and the driver installation will proceed.
8. After it finishes, select the Finish button.
9. If this is the first cycle, you will now see the ICS GPIB Controller reappear with a yellow exclamation mark. Repeat steps 1-7 above to install the second driver. (The 488-USB and 488-USB2 have two USB drivers.)
10. If the ICS GPIB Controller device appears without a yellow exclamation mark, you may now exit the Device Manager and use the 488-USB or 488-USB2 device.

Following the manual installation of the 488-USB or 488-USB2 device drivers, double click the ICS Explorer icon on the desktop to run ICS's Explorer and create the GPIB.INI file.

### **FAQ #21 How do I copy an ICS SPY listing to a text file?**

ICS SPY is an MSDOS window and if the QuickEdit option is set, you can copy the SPY listing by selecting your text and then right click on it to copy it. Open Notepad and paste the copied selection into Notepad. The QuickEdit mode can be set by right clicking on the top bar of the MSDOS window and selecting Properties. Select the Options tab and check the QuickEdit mode box.

### **FAQ #22 How can I run an ICS GPIB Controller with HTBasic?**

HTBasic version 9.5 currently has a problem trying to call the ICS 488.2V3 driver. However, you can run ICS's GPIB Controllers with HTBasic if you download and install Agilent's SICL library. SICL is installed as part of Agilent's IO Library Suite 15.

Run Agilent's Connection Expert and follow their instructions to add an interface and to add instruments until all of your instruments appear in the tree view. You will get a SICL name for the GPIB Controller like 'gpib0'

Run HTBasic and open the Device Setup Window. Click Add and select 'HPIB SICL Driver'. Highlight it in the Device Setup window and set its properties. Use the SICL name obtained in Agilent's Connection Expert. Set the Bus address to 21 or 0, Select code to 7 and Timeout to 3. Close properties and click the Load button. Close the Device Setup window and run your HTBasic program.

### **FAQ #23 How can I run Tektronix's Wavestar program?**

Tektronix's Wavestar program is written to make VISA calls and requires a working VISA->GPIB-32.DLL link. The following steps will enable you to run Wavestar with ICS's 488-USB or 488-USB2 modules. Unplug the 488-USB module from the PC and reboot the PC during the installation as directed by the installation packages.

1. Install Wavestar.
2. Install a VISA layer by one of the two following steps:  
Step A - Download National Instruments NI-488.2 Drivers. Run the install program and manually select the NI-VISA 4.x option. Failure to do so will result in no VISA layer and no Runtime to ICS Driver communication.  
Step B - Download and install Agilent's IO Libraries package to install a VISA library.
3. Install ICS's 488.2V3 Drivers even if they were already installed.
4. Run ICS\_NI\_Support Install.
5. Connect the 488-USB module to the Oscilloscope and to the PC. Note that the PC will find the new USB Controller twice if this is your first installation.
6. Run ICS's Explorer to define the GPIB0 Controller and to verify communication with the Oscilloscope. If you do not have Microsoft's .NET 2.0 installed, you will have to run ICS Configure to define the GPIB0 Controller and then GPIBkybd to test communication to the oscilloscope.
7. Run the Tek VISA Resource Manager. Use Refresh to find the new GPIB0::3::INSTR link.
8. Run the Tek Instrument Manager to add the oscilloscope to the instrument list.

You can now run Wavestar and read waveforms from the oscilloscope.

### **FAQ #24 Why cannot I find my instrument in Explorer or GPIBkybd?**

If the instrument is properly connected and turned on, Explorer and GPIBkybd should see it. However there are two potential problems:

1. Oscilloscopes may be left in talk-only state and do not respond to the FindLstn protocol. Set them to the auto-address mode and rerun FindLstn.
2. The instrument address may be the same as the GPIB Controller's. Change the GPIB Controller's address to an unused GPIB address such as 21 and rerun FindLstn.

### **FAQ #25 How can I run Visual Basic programs with ICS 488-PC2 commands with the 488.2V3 Driver?**

The 488.2V3 Driver does have support for ICS' PC2 ie type Command Set. Installing the 488.2V3 Driver places a set of Visual Basic demo programs in the c:\Program Files\ICS Electronics\ folder. Locate the ICS-PC2cmds sub-folder. Inside is an example VB6 project with the files needed to run your ieCommand programs with the new 488.2V3 driver.

Add the PC2W32.bas file into your VB6 project to link to the PC2W32.DLL. The PC2W32.DLL is a thunk DLL that calls the GPIB-32.DLL in the 488.2V3 Driver. Put the PC2W32.DLL down in the c:\WINIT\SYSTEM32\ folder with the GPIB-32.DLL so that it can be called from any location in the computer. Recompile your program and test it.

### **FAQ #26 Why can't I link my older C language programs to the new 488.2V3 Driver?**

With this problem you may get a "LNK2001: unresolved external symbol" error message for all DLL functions. The problem is caused by a compatibility problem between the system that you used to compile your program and the one we used to develop the 488.2V3 Driver. The work around is simple, just change the extension on your file name from .C to .CPP. You do not need to rewrite your program.

The Microsoft Visual Studio system does name mangling and their treatment of public label names differs depending on whether the file extension is .C or .CPP. If you examine the Visual Studio online help for name mangling, you will find a chart showing the treatment of public names. It is possible to modify the project settings to do equivalent name handling, but it is much simpler to simply change the file extension to .CPP.

### **FAQ #27 How can I use ICS's new 488-LPCI card with the older 488-PCI or 488-PCII cards?**

ICS's 488-PCI and 488-PCII cards use the older 488.2 driver while the new 488-LPCI card uses the new 488.2V3 Driver. The 488.2V3 driver was completely rewritten to solve a lot of problems present in the 488.2 driver. This includes overcoming blue-screen problems, becoming Vista compatible and greater NI 488.2 compatibility for smoother operation with programs written for the NI cards and LabVIEW.

For Visual Basic programs, both drivers supply a GPIB-32.bas file that links the VB program with the GPIB-32.DLL. The old GPIB-32.bas file included a *GetIBVars* command that is not supported in the new GPIB-32.bas file or in the new GPIB-32.dll. Trying to run older VB programs on the new 488.2V3 driver will result in an "ibvars entry point not found" error.

First save the current VB source and executable files in a separate folder. The solution is to replace the GPIB-32.bas file with the new 488.2V3 version and then recompile the VB program. If *GetIBVars* was called in the original VB program, it needs to be replaced with a subroutine that calls *ThreadIbcnt*, *ThreadIbcntl*, *ThreadIberr*, and *ThreadIbsta* to return the correct variable values. Run and verify the program operation. Especially check the error cases since the new 488.2V3 driver status variables provide improved error bit handling. The 488.2 Driver ignored many error bits.

Run the new compiled program on systems with the 488-LPCI cards and the new 488.2V3 driver. Run the saved old compiled program on systems with the 488-PCI or 488-PCII cards and the 488.2 driver. The new compiled program will probably run on systems with the older boards but we have not back tested it for all cases and cannot guarantee full backward compatibility in all cases.

If your company requires that all test stands use the same test program version, contact ICS and ask about a trade-in program for your older GPIB controller cards.

**FAQ #28 ICS's GPIB-32.DLL is being copied over by another GPIB-32.DLL when not running an installation program.**

A background service running in your PC is the likely culprit. Agilent's PNA software is one source of such a service. Look in the Task Manager > Process Tab to see if a *AgGPIB325vc.sys*, *AgGpib32Controller.exe* or a similar service is running. Go to the Service manager under Administrative Tools and find the service in the list. Stop the service and then disable it. To be sure it stays disabled, use its properties to change ownership so only an administrator can re-enable it.

We recommend that you create an *ICS\_DLL* subdirectory in the *SYSTEM32* directory and put a copy of ICS's DLL in it. That way, if you ever need to use the Agilent service, you can easily restore the ICS DLL when you are done.

**FAQ #29 Should I upgrade my 488.2V3 driver to 488.2V4?**

No. Updating is not necessary. Only install the 488.2V4 Driver on new Windows XP, Vista or Windows 7 systems. The 488.2V4 Driver does not provide any significant performance improvements over the 488.2V3 Driver.

**FAQ #30 Can I install the 488.2V3 Driver on Windows 7?**

No. Use ICS's 488.2V4 Driver for Vista, Windows 7 and 64-bit XP operating systems.