N4903B-01E

S E R V I C E   N O T E

Supersedes:
N4903B-01D

N4903B Serial Bit Error Ratio Tester

Serial Numbers: **DE49100100 – DE49100250**
MY49100300 - MY49100350

There are 3 items to check and modify if required:
1. **An older version of the Agilent IO-Libraries may lead to problems. Check whether the correct version is installed.**
2. *Check the configuration of the Agilent IO Libraries "Internal Instruments".*
3. *An incorrect setting within the Agilent IO Libraries may lead to programmatic inaccessibility and communication failure of the N4903B when connected via the GPIB bus.*

Parts Required:
P/N	Description	Qty.

None

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:		
MODIFICATION RECOMMENDED		

ACTION CATEGORY:	[[]] ON SPECIFIED FAILURE XX AGREEABLE TIME	STANDARDS LABOR: 0.3 Hours	
LOCATION CATEGORY:	XX CUSTOMER INSTALLABLE XX ON-SITE XX SERVICE CENTER XX CHANNEL PARTNER	SERVICE [[]] RETURN INVENTORY: [[]] SCRAP XX SEE TEXT	USED [[]] RETURN PARTS: [[]] SCRAP XX SEE TEXT
AVAILABILITY: PRODUCT'S SUPPORT LIFE		NO CHARGE AVAILABLE UNTIL: 30-Apr-2012	
AUTHOR: HK		PRODUCT LINE: PL24	
ADDITIONAL INFORMATION:			

May 9, 2011

Agilent Technologies

Situation:

A series of steps needs to be performed in order to ensure proper configuration of the Agilent IO-Libraries in the N4903B.

This service note contains also background information in order to understand the steps and to allow trouble shooting in situation where things do not work correctly.

Step 1#: Check installed version of Agilent IO-Libraries

Units in the specified range of serial numbers may have an older version of the Agilent IO Libraries installed which shows unwanted behavior.

Please check the installed version of the Agilent IO Libraries:

1. Identify the icon of the Agilent IO Libraries in the lower right corner of the N4903B display ( ), right-click on it, search for the menu entry "Agilent Connection Expert" and start it.

2. On the menu bar of the Agilent Connection Expert select Help → About

The version number should be at least **15.5.13009.1**. If that is the case please continue with the steps in the next chapter: "Check the configuration of the Agilent IO Libraries "Internal Instruments"

3. If the installed version is lower than that please do the following:

   a. Install the newer version on top of the older version. You can get it from here: \\wbbnps03\ftp_support\All-Support\PV_Software\Agilent_IO_Libs\IO_Libs_15.5\ IOLibSuite_15_5_13009_1.exe
   b. Reboot the N4903B.
   Please check whether the N4903B application starts up without any errors (firmware server and GUI). You should not have to install the N4903B application again after the Agilent IO-Libs update.
   c. Continue with the steps in the next chapter.

Step #2: Check the GPIB0 Interface Card Configuration

The N4903B instrument has a GPIB connector on the rear side (82350 GPIB PCI card).
This GPIB interface card (GPIB0) is only used for programmatic control ("remote programming") of the N4903B.

The typical setup would be as follows: a PC is connected to the back of the N4903B (and potentially other measurement equipment) using GPIB and a program on this PC is controlling the setup.
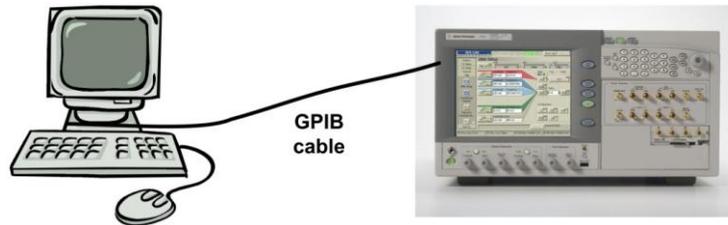

On a GPIB bus there can be several "slaves" but only one "master", which, in the case above, would be the external PC controller connected to the GPIB bus. However, in the noted serial number range of the N4903B product there may be the cases that the N4903B may act as master, too.
This leads to a complete communication failure of the complete GPIB bus.
It is necessary to change the settings of the built-in GPIB controller card with the help of the Agilent IO Libraries ("Agilent Connection Expert").

Solution/Action:
Please execute the following steps to check and correctly configure the N4903B GPIB interface card:

1. Identify the icon of the Agilent IO Libraries in the lower right corner of the N4903B display ( ), right-click on it, search for the menu entry "Agilent Connection Expert" and start it.
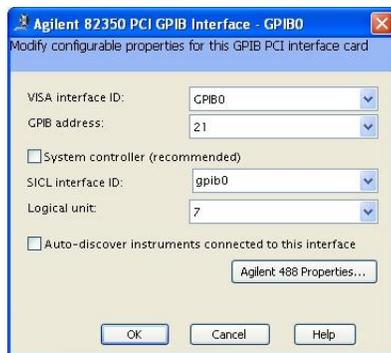
2. You will see the following window:
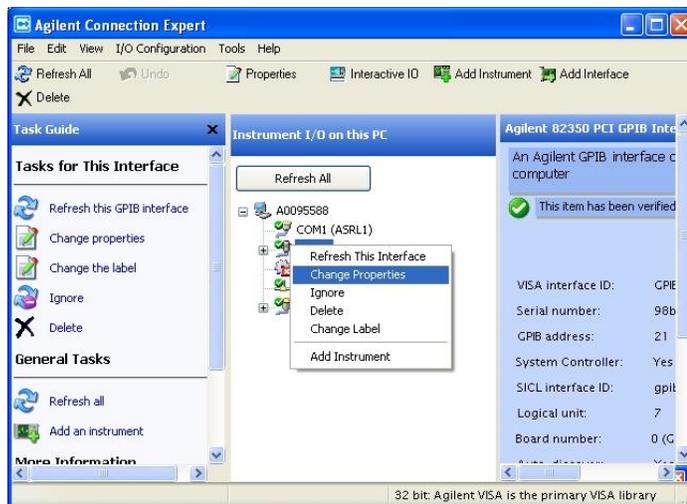
   Identify the **GPIB0 interface card**, select it with the mouse and right-click it to get the menu shown above. In the menu select **"Change Properties"**.

3. You will see the following picture:
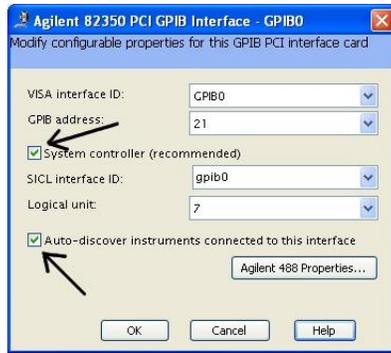
You will find the 2 checkboxes checked as shown in the picture above.

4. Please **uncheck both checkboxes** as shown in the next picture:

The correct settings shown in the picture above will make sure that the N4903B does not act as GPIB master and does not disturb communication on the GPIB bus.

5. Click **ok** in the window above (step 4) and return to the main screen of the "Agilent Connection Expert".

6. Identify the GPIB0 interface, select it with the mouse and right-click it to get the menu shown above. In the menu select "Ignore".
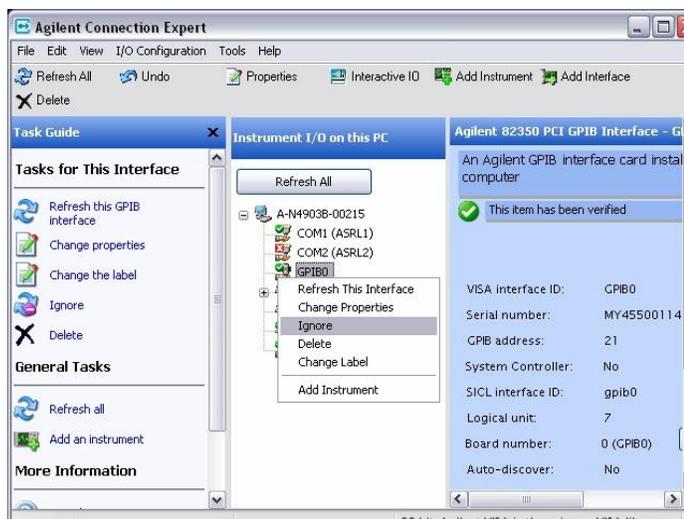
7. The green next to the GPIB0 in the list should change to purple as shown in the picture below. "Ignore" means, that the "Agilent Connection Expert" will ignore devices connected to this interface on future device scans. This will prevent the "Agilent Connection Expert" from reconfiguring devices connected to this interface and the configuration steps described above will persist.
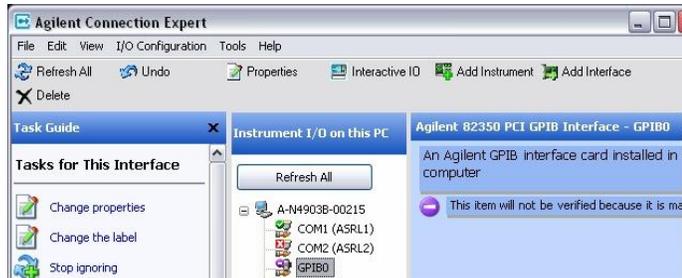
8. **Now reboot** (important!!) the N4903B to check for the firmware/hardware handshake and **then verify** the implemented "Agilent Connection Expert" configuration is unchanged.

NOTE: At the end of this document you find instructions on how to correct the configurations in case they do not match the descriptions!

Questions and Answers:

- **I do not have a GPIB0 interface in my Agilent Connection Expert window**
    o Please check page 14 and following to delete the existing configuration and replace it with a new configuration

- **What will happen if GPIB0 is configured in the wrong way?**
    o You will not be able to control your N4903B via a remote program that resides on the external controller PC
    o Your GPIB bus that is connected to the GPIB0 interface of the N4903B will have 2 masters. This will lead to a communication breakdown on the GPIB bus. An external control PC will not be able to control some or all the devices that are connected to the GPIB bus. The complete test setup may "hang".

- **Will I be able to use the N4903B?**
    o Your N4903B would function correctly and is able to take measurements as long as it is not connected to any GPIB bus via the GPIB0 interface card on the rear side. However, this is not recommended. Please check the GPIB0 interface card configuration and make changes as necessary.

- **My remote program is not able to connect to the N4903B or does not work!**
    o You have a setup similar or identical as shown on page 3. It is very likely that the GPIB0 interface card is configured incorrectly. Please check and adapt the configuration as it is described in the previous chapter.

Step #3: Check the GPIB2 ("Internal Instrument") Configuration

The N4903B instrument has two LAN connectors on the back (LAN0 and LAN1).
Either LAN interface can be used for programmatic control ("remote programming") of the N4903B.

The typical setup would be as follows. A PC is connected to the TCPIP network and the N4903B (and potentially other measurement equipment) is connected to the network, too. A program on the PC is controlling the setup by sending commands.
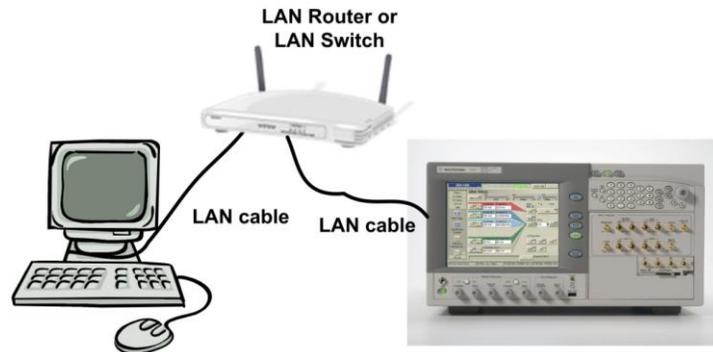
The Agilent IO Libraries have the task to route the network packets that contain the commands and that come from the external PC controller over the network to the N4903B software and hardware.

It is necessary to have the GPIB2 "Internal Instrument" setup correctly in order for this chain to work.
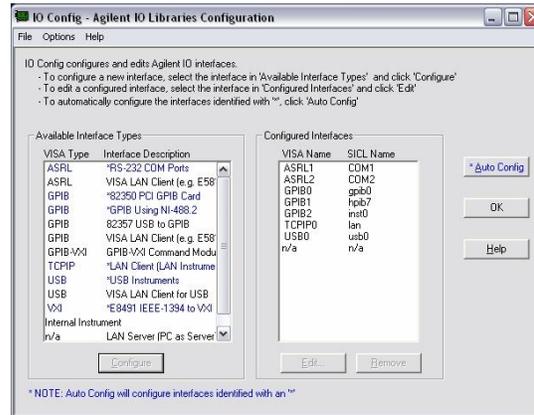
Please check the following:

1. Identify the icon of the Agilent IO Libraries in the lower right corner of the N4903B display (![IO icon]), right-click on it, search for the menu entry "Agilent Connection Expert" and start it.

2. You will see the following window:

Identify the **GPIB2 interface**. It has a red cross and it shows an error in the right half of the screen. That is normal in this case. Do not get confused by that!

3. Close the Agilent Connection Expert.

4. Start the IO Configuration Manager "iocfg32.exe" on the N4903B which is located in the directory
C:\Program Files\Agilent\IO Libraries Suite\bin
You will get the following window:

5. On the left side, under "Available Interface Types" you should see a line "Internal Instruments".
If you do not have the line "Internal Instruments" please do the following:
   a. Exit the IO Configuration Manager" by pressing ok.
   b. Go to the following directory
      C:\Program Files\Agilent\N4903B\GPIB
   c. Execute the program "install.exe" by double-clicking on it.
   d. Again start the IO Configuration Manager "iocfg32.exe" on the N4903B which is located in the directory
      C:\Program Files\Agilent\IO Libraries Suite\bin.
   e. Now you should have a line item "Internal Instruments" on the left side.

6. On the right side you should see the following important and configured interfaces: ASRL1, ASRL2, GPIB0, GPIB1, GPIB2, TCPIP0 and USB0. Now let's check the configuration for the GPIB2 interface

7. GPIB2
GPIB2 is a virtual LAN interface ("Internal Instrument") which allows programmatic access to the N4903B via LAN.
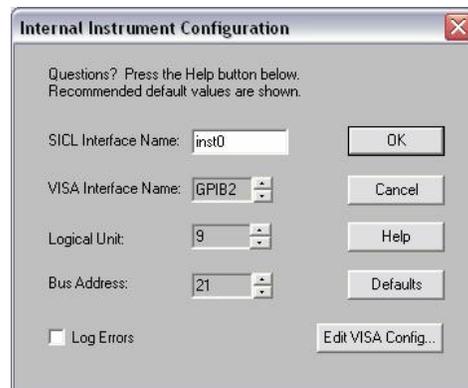
Important is the correct "SICL Interface Name": "inst0"

NOTE: At the end of this document you find instructions on how to correct the configurations in case they do not match the descriptions!

Questions and Answers:

- **My remote program works correctly when using GPIB. However, I want to use a LAN connection to send my remote commands, but LAN does not seem to work!**
  - Your remote program resides on an external PC controller that is located somewhere in the LAN. The program is supposed to control the measurements running on the N4903B. However, the program does not run. It does not seem to find the N4903B.
  - Check whether both instruments (external PC controller and N4903B) have valid IP addresses and check whether each device can access the other one.
    Use ping <IP Address>.
  - Check the configuration in the Agilent Connection Expert.
  - Check the GPIB2 configuration as explained above.

Step #4: Check the GPIB1 ("Internal Instrument") Configuration

The N4903B product itself contains a PC (running WinXP), which controls the N4903B measurement hardware. The display of this internal PC controller is the front panel of the N4903B.

Instead of using an external PC controller, you can also use this built-in PC to run programs that control the N4903B measurements ("remote programming").

The Agilent IO Libraries have the task to route the commands from your program running on this internal PC controller to the N4903B measurement software and hardware.

It is necessary to have the GPIB1 "Internal Instrument" setup correctly in order for this chain to work.

Please check the following:

1. Identify the icon of the Agilent IO Libraries in the lower right corner of the N4903B display (![IO]), right-click on it, search for the menu entry "Agilent Connection Expert" and start it.

2. You will see the following window:

   Identify the **GPIB1 interface** and notice the line underneath:
   "N4903B (GPIB1::11::INSTR).

3. Close the Agilent Connection Expert.

4. Start the IO Configuration Manager "iocfg32.exe" on the N4903B which is located in the directory
   C:\Program Files\Agilent\IO Libraries Suite\bin

You will get the following window:
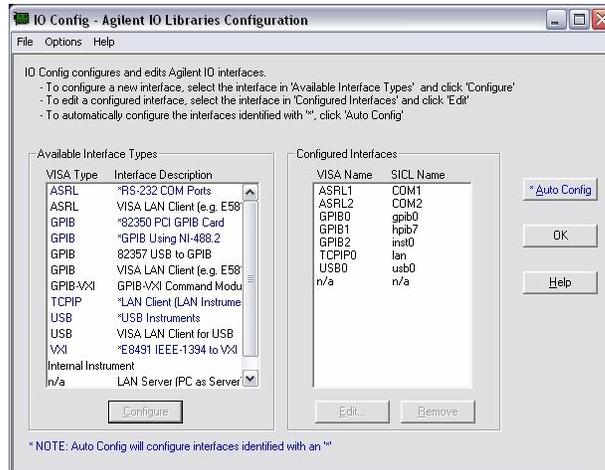
5. On the left side, under "Available Interface Types" you should see a line "Internal Instruments".
   If you do not have the line "Internal Instruments" please do the following:
   f.   Exit the IO Configuration Manager" by pressing ok.
   g.   Go to the following directory
        C:\Program Files\Agilent\N4903B\GPIB
   h.   Execute the program "install.exe" by double-clicking on it.
   i.   Again start the IO Configuration Manager "iocfg32.exe" on the N4903B which is located in the directory
        C:\Program Files\Agilent\IO Libraries Suite\bin.
   j.   Now you should have a line item "Internal Instruments" on the left side.

6. On the right side you should see the following important and configured interfaces: ASRL1, ASRL2, GPIB0, GPIB1, GPIB2, TCPIP0 and USB0. Now let's check the configuration for the GPIB1 interface.

7. GPIB1
   GPIB1 is a virtual GPIB interface ("Internal Instrument") which allows programmatic access to the N4903B via GPIB using the internal PC controller (**not** an external PC controller).
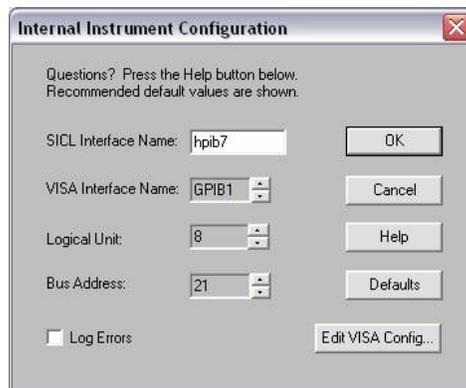
Important is the correct "SICL Interface Name": "hpib7"

NOTE: At the end of this document you find instructions on how to correct the configurations in case they do not match the descriptions!

Questions and Answers:

- **I do not have a GPIB1 interface as shown above in my Agilent Connection Expert window. Can I still use my N4903B?**
    - Please fix the GPIB1 interface as described above and on 14 and following.
    - Without the GPIB1 interface correctly configured you still can do the following:
        - Run N4903B measurements using manual operation (front panel)
        - Run remote programs residing on an external PC controller which is connected via GPIB (using the GPIB0 interface) or which is connected via LAN (using the GPIB2 internal instrument interface).
    - Without the GPIB1 interface correctly configured you cannot run programs using the internal (N4903B built-in) PC controller

Step #5: Check the remaining Interface Configurations

Please check the following:

1. Close the Agilent Connection Expert.

2. Start the IO Configuration Manager "iocfg32.exe" on the N4903B which is located in the directory
C:\Program Files\Agilent\IO Libraries Suite\bin
You will get the following window:
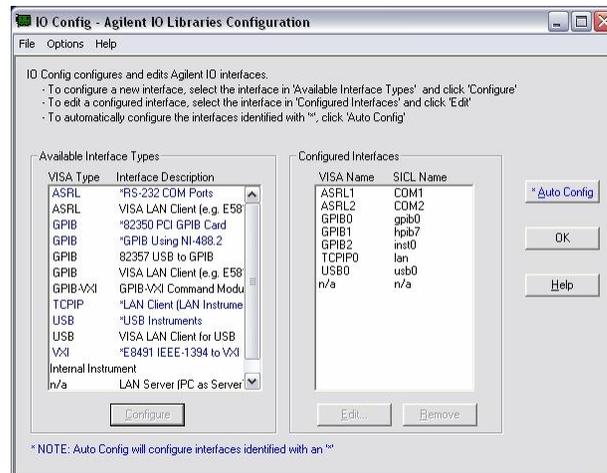
3. On the left side, under "Available Interface Types" you should see a line "Internal Instruments".
If you do not have the line "Internal Instruments" please do the following:
    k. Exit the IO Configuration Manager" by pressing ok.
    l. Go to the following directory
        C:\Program Files\Agilent\N4903B\GPIB
    m. Execute the program "install.exe" by double-clicking on it.
    n. Again start the IO Configuration Manager "iocfg32.exe" on the N4903B which is located in the directory
        C:\Program Files\Agilent\IO Libraries Suite\bin.
    o. Now you should have a line item "Internal Instruments" on the left side.

4. On the right side you should see the following important and configured interfaces: ASRL1, ASRL2, GPIB0, GPIB1, GPIB2, TCPIP0 and USB0. Now let's check the configuration for each of the important ones.
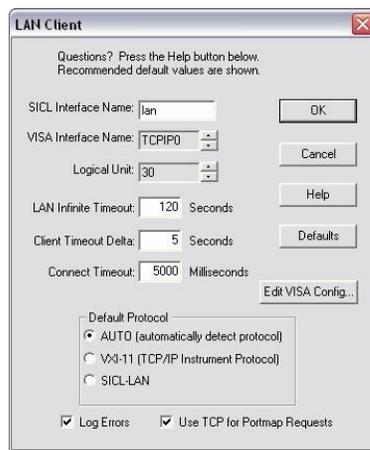
5. GPIB0
   GPIB0 is the physical 82350 PCI GPIB card that is accessible from the rear side of the
   N4903B. The serial number of the N4903B is shown in the field at the top.
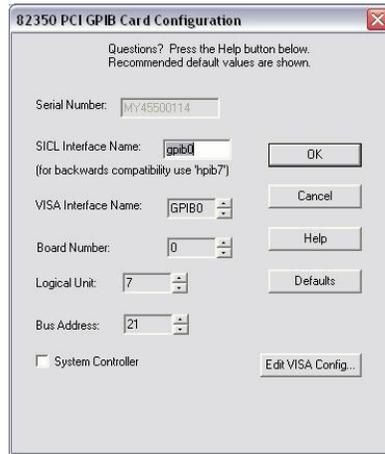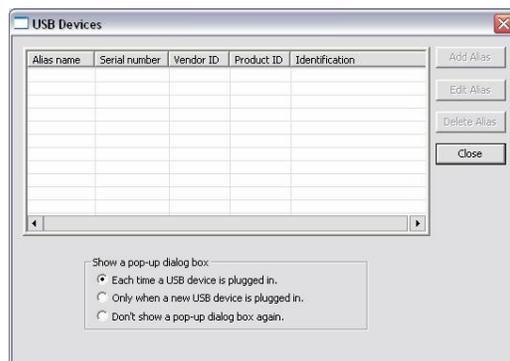

6. TCPIP0
   TCPIP0 is the physical LAN interface of the N4903B, accessible from the rear side of the
   N4903B.

7. USB0
   USB0 is the physical USB interface of the N4903B. There may be entries in the table below
   depending on whether one of the following devices was connected to the instrument:
   N4916A, N4916B, N4876A or alike.

My Configuration Settings to do match! What do I do?

My Agilent Connection Expert does not show a GPIB0 interface

The absence of a GPIB0 interface has nothing to do with the N4903B software or hardware. It is solely related to either a hardware problem related to the interface card itself or the built-in PC or a configuration problem of the Agilent IO Libraries.

Please check the following:

1. Open the Device Manager (Control Panel → System → Hardware) of the internal PC controller via the front panel of the N4903B. You should see the 82350B PCI GPIB interface card as shown below:
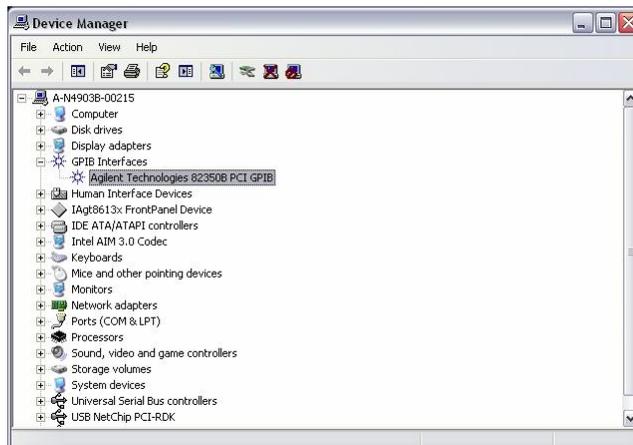
    If you do not see the card or the card show a "yellow bang" in the window above, the card itself may be dead or not seated correctly in the PCI slot of the internal PC. Please check.

2. If you see the card in the window above, start the IO Configuration Manager "iocfg32.exe" on the N4903B which is located in the directory
    C:\Program Files\Agilent\IO Libraries Suite\bin
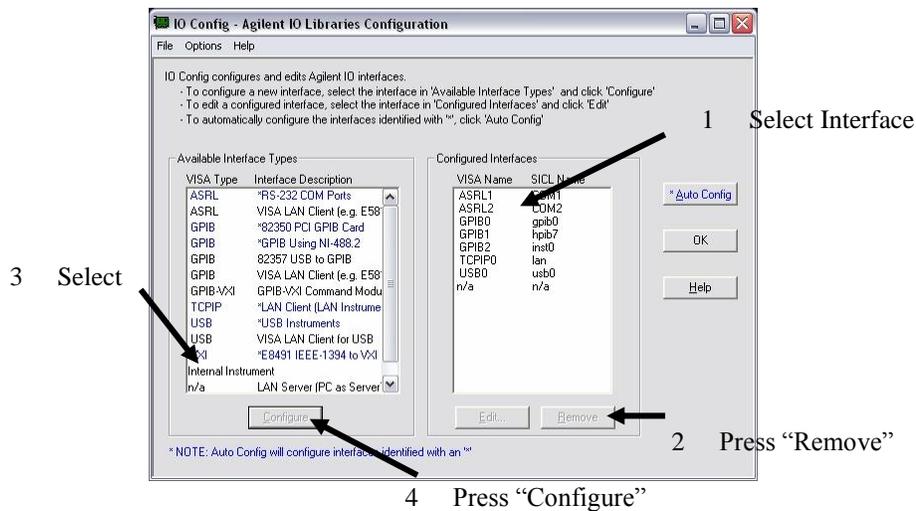   You will get the following window:
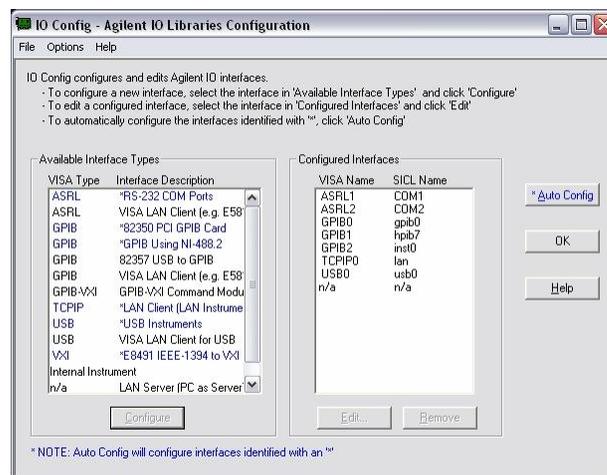
3. GPIB0
   GPIB0 is the physical 82350 PCI GPIB card that is accessible from the rear side of the
   N4903B. The serial number of the N4903B is shown in the field at the top. Check all fields.
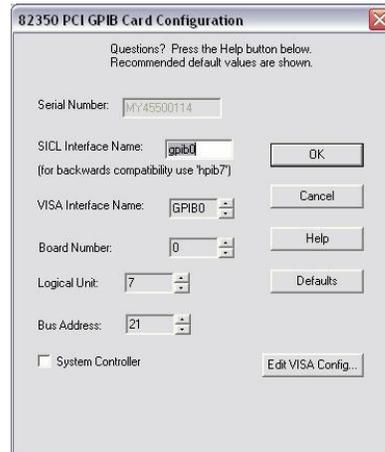
My "Internal Instruments" Configurations do not match

In case the configurations you find do not match the descriptions above, please change them using the
following steps:

1. Exit the Agilent Connection Expert on the N4903B.
2. Start the IO configuration manager "iocfg32.exe" on the N4903B which is located in the
   directory
   C:\Program Files\Agilent\IO Libraries Suite\bin.
3. Check each of the interfaces for correct configuration: GPIB0, GPIB1, GPIB2, TCPIP0,
   USB0 as described on the previous pages
4. **Delete all incorrectly configured interfaces from the list of interfaces below: select the
   mismatching interface and press "Remove" in the window below (step #1 and #2).**

5. Select "Internal Instrument" in the window above and press "Configure" (step #3 and #4).

   **NOTE: Enter the fields (e.g. SICL interface Name, VISA Interface name, etc.) exactly
   as shown below!**

I.   GPIB0
      GPIB0 is the physical 82350 PCI GPIB card that is accessible from the rear side of
      the N4903B. The serial number of the N4903B is shown in the field at the top.

II.   GPIB1
      GPIB1 is a virtual GPIB interface ("Internal Instrument") which allows
      programmatic access to the N4903B via GPIB.
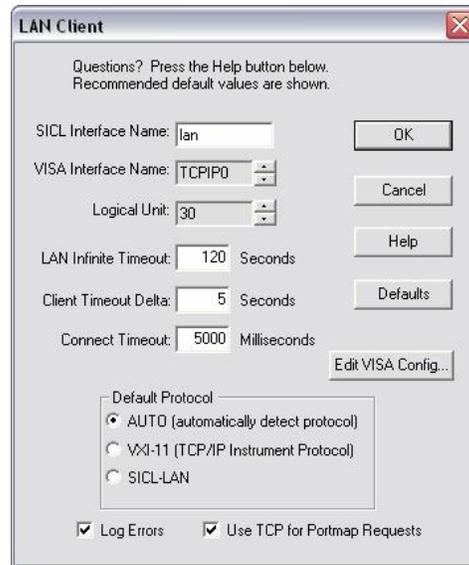

III. GPIB2
      GPIB2 is a virtual LAN interface ("Internal Instrument") which allows programmatic
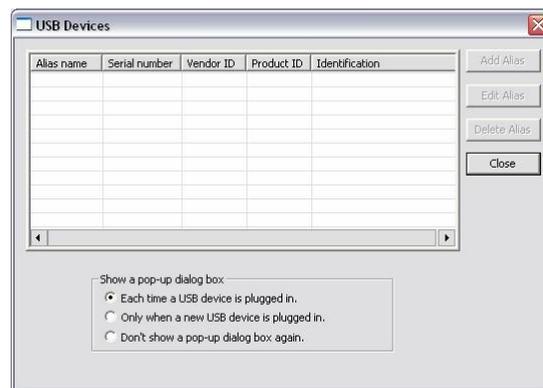   access to the N4903B via LAN.

IV.   TCPIP0
      TCPIP0 is the physical LAN interface of the N4903B, accessible from the rear side

of the N4903B.

V.   USB0
      USB0 is the physical USB interface of the N4903B. There may be entries in the table
      below depending on whether one of the following devices was connected to the
      instrument: N4916A, N4916B, N4876A or alike.

6. **Reboot** (important!!) the N4903B and check again.
    Use the ViFind32 debug utility to check the results

7.

The important line is circled in yellow:

The Agilent Connection Expert shows the following: