

How to Communicate with ESP300 Motion Controller Over GPIB Interface

Version 1.0
May 16, 2005



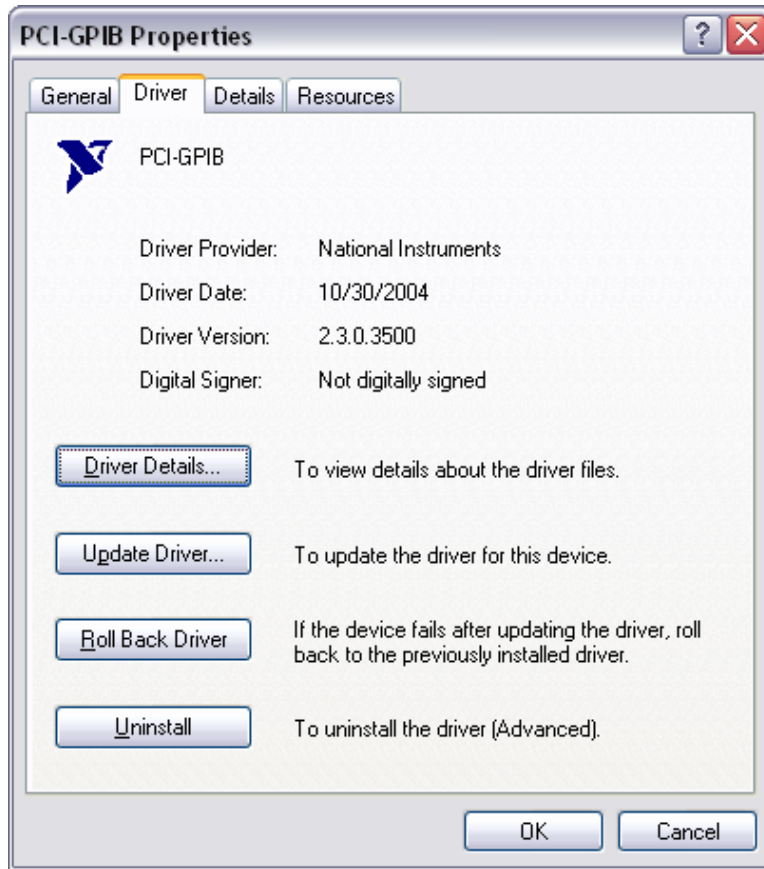
1. Required Firmware/Software:

- 1.1. ESP 300 Firmware Version: 3.09 (05/04/2005)
- 1.2. National Instruments GPIB Driver Version: 2.3.0.3500 (10/30/2004)
- 1.3. National Instruments Measurement & Automation Explorer Version: 3.1.0.3021

NOTE: Newport Corporation supports GPIB communication with ESP300 motion controller using National Instruments GPIB cards only.

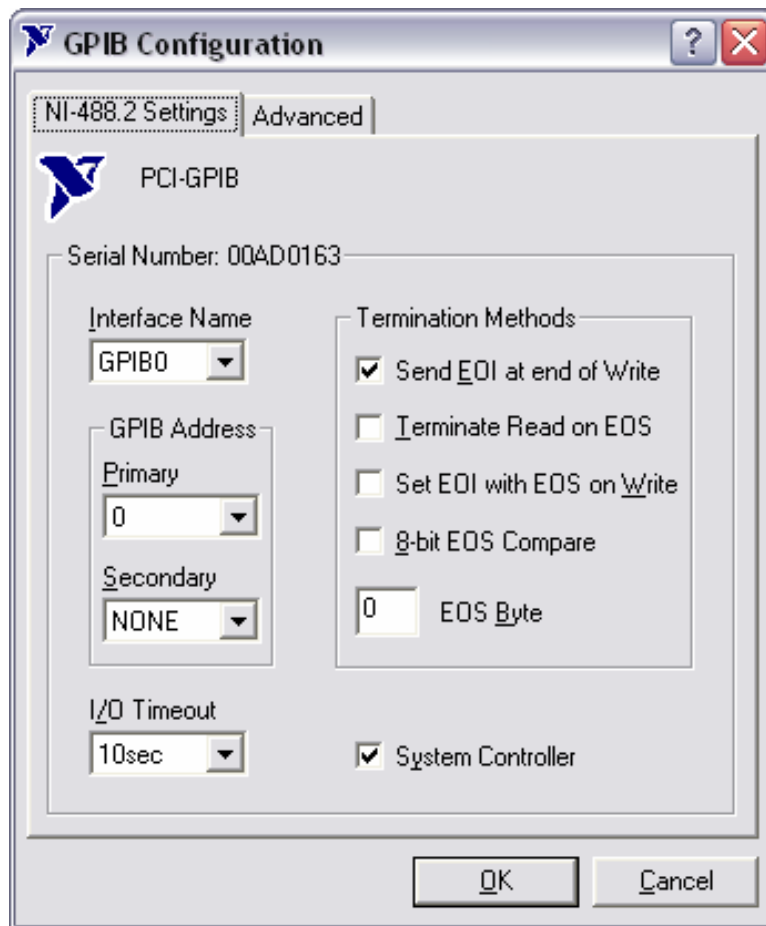
2. Configuring the GPIB Interface:

- 2.1. Follow the directions supplied by National Instruments to setup and configure the GPIB interface.
- 2.2. Make sure that the latest GPIB drivers are installed:
 - a. Right Click on “My Computer” icon on your desktop and select “Properties.”
 - b. “System Properties” window will open. Select “Hardware” tab and click on “Device Manager” button.
 - c. “Device Manager” window will open. Open up the “National Instruments GPIB Interfaces” by clicking on the “+” sign next to it. Right click on your GPIB card and select “Properties.”
 - d. A “Properties” window for your GPIB card will open. Select “Driver” tab and note down the Driver Date and Driver Version. Make sure they match the versions specified in section 1. See the screen capture below for an example.

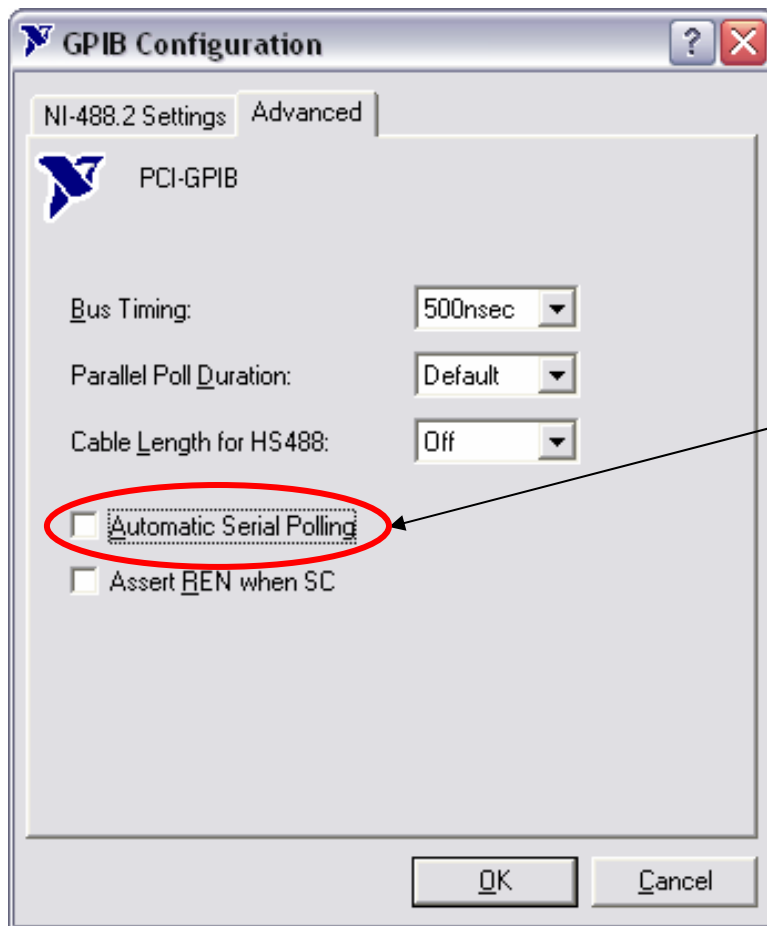


2.3. Configure your GPIB interface as follows:

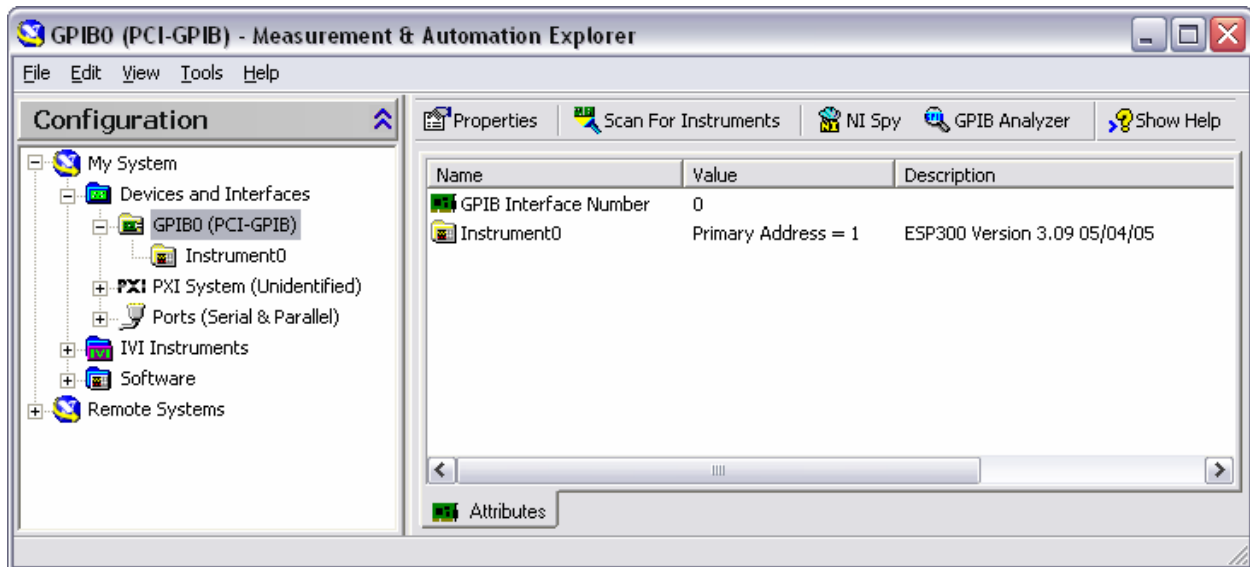
- a. Start National Instruments Measurement & Automation Explorer (NI-MAX) software by either double-clicking on the "Measurement & Automation" icon on your desktop or by double-clicking on "NIMax.exe" file in "C:\Program Files\National Instruments\MAX" folder.
- b. View your existing configuration by selecting "View" menu and checking the "Configuration" sub-menu.
- c. Select "Devices and Interfaces" folder available under "My System" in the "Configuration" menu, and open it by clicking on the "+" sign next to it.
- d. Right click on your GPIB interface and select "Properties."
- e. The existing configuration for your GPIB interface will open.
- f. Click on the "NI-488.2 Settings" tab. Make sure all the parameters on your screen match the following screen capture. If any of the settings do not match, modify them and click on "OK" button.



- g. Click on the “Advanced” tab. Make sure all the parameters on your screen match the following screen capture. If any of the settings do not match, modify them and click on “OK” button.



- h. Connect ESP 300 motion controller to your GPIB card and power it ON. If there are more than one device on the GPIB bus, **make sure that they all have unique GPIB addresses.**
- i. Select your GPIB interface and click on "Scan For Instruments" icon. The NI-MAX software will now detect the presence of all devices connected to this interface. Make sure that your ESP300 motion controller is detected and that it has the right firmware version as mentioned in section 1. See the screen capture below for an example.



- j. Configuring your GPIB interface for communicating with ESP300 motion controller is now complete. You can close the NI-MAX software at this time.

3. Writing Software for ESP300 Motion Controller:

Please follow the guidelines presented in this section if you want to write software using LabVIEW programming language.

The software CD that accompanies ESP300 motion controller has folders for LabVIEW 6.0 and LabVIEW 7.0 in “C:\Program Files\Newport\ESPMotionControllers\Samples\LabView\GPIB Interface” folder. The following four (4) VIs are present here:

1. **esp_gplib_init_system.vi**: This VI shows how to initialize GPIB communication.
2. **esp_gplib_comm_ASCII.vi**: This VI shows how to communicate with the controller—send commands and query responses.
3. **ESP300 GPIB Comm Test.vi**: This sample program can be used to perform the following:
 - a. Cycle up to three (3) motorized positioners between any two positions
 - b. Query the actual position value of three (3) axes
 - c. Query error messages
 - d. Change the trajectory mode—trapezoid or s-curve.
4. **ESP300 GPIB LP Sample.vi**: This sample program can be used to list the stored programs present in the controller. Querying a stored program listing is slightly different from querying a response (querying a position value, for instance) because each line in the stored program is terminated by CR/LF (carriage return/line feed). The application has to keep querying for responses until it sees a “END” statement. “END” signifies the end of a stored program listing.

NOTE:

1. Always terminate the commands by a CR/LF. Use “EOI” on the LF. In LabVIEW GPIB Write.vi, this is done by using mode = 3.
2. Use at least 300ms as a timeout period for GPIB Write/Read operations.
3. Always issue “_?” command after performing a GPIB Write or a GPIB Read operation. This will send Untalk (UNT) followed by Unlisten (UNL) over the GPIB bus. The following LabVIEW wiring diagram shows a GPIB Write followed by UNT/UNL.

