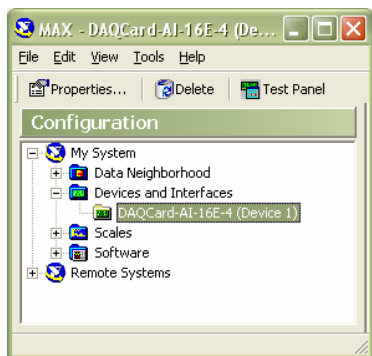
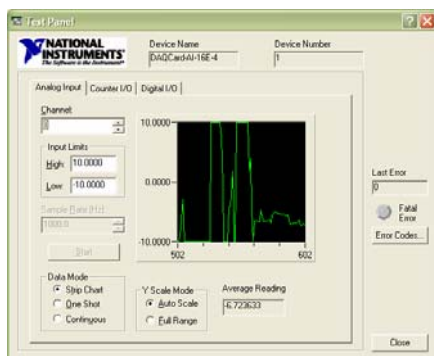


User's Guide NI Hardware 7/21/2003

1. Follow National Instrument's instructions on installing their hardware and software driver (e.g. NI-DAQ). Generally you should install the National Instrument (NI) software first and then the NI hardware. After you have successfully installed NI-DAQ, the NI A/D hardware should appear in the Windows "Device Manager". It will appear under the "Data Acquisition Devices" category with the NI icon. Make sure Device Manager does not indicate any conflicts. Use the NI software that came with your NI hardware, or install NI-DAQ from the Snap-Master CD.
2. Start NI's Measurement & Automation Explorer ("MAX") and it should automatically find your hardware. MAX software provides wizards to configure your hardware and define the characteristics of the channels. The initial screen should look as follows:



3. Right click on your hardware under Devices and Interfaces. Select Test Panel; you should see the following screen. This allows you to test that the hardware is functioning properly with your computer (and temporarily without Snap-Master). Make sure this is working properly before moving to Snap-Master. Set the "Data Mode" to either "One Shot" or "Continuous", and not "Strip Chart". This will assure the board is properly transferring data to the PC at the desired rates.

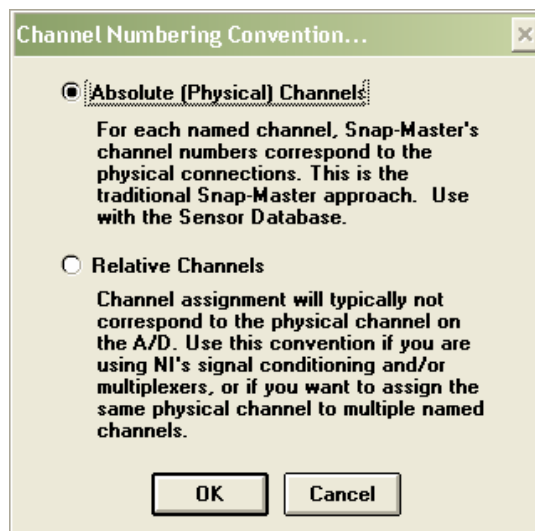


- This version of Snap-Master supports Named Channels in MAX. From the tree shown above in MAX, select Data Neighborhood. Right click and then select Virtual channel and Finished. This opens a wizard that allows you to name the channel, define its units, range, type of channel, and scaling. Also if NI's signal conditioning is used you would define it in this wizard. Scaled data in engineering units is transferred to Snap-Master from NI's driver which includes the gain and signal conditioning information. Note that no channel will appear in Snap-Master unless it is defined in MAX.



- The last screen is very important to be done correctly. Make sure you define a new channel number for each named channel, if you want Snap-Master's channel numbers to correspond to the physical connections (for example channel #2 on the hardware to be A2 in Snap-Master). This channel correspondence is called "Absolute." This is the standard way that Snap-Master has traditionally worked. This approach is also recommended if you are planning to use the Sensor Database in Snap-Master. If you are using the Sensor Database in Snap-Master, then in MAX you should define the channel name and the voltage range you want to use, and then define the scaling in Snap-Master. Note there is no warning in MAX if you do not specify unique channel numbers for each named channel. Close MAX when finished.
- However, you are allowed to have more than one channel number assigned to a physical channel. In this case, you would only select the one channel that you want to use in Snap-Master by its name. In this case there is a "Relative" channel assignment and it does not necessarily correspond to the physical channel it is connected to. For example if you only assigned one channel in MAX and it was channel 2 on the hardware, it would be called A0 in Snap-Master. You should use the relative channel convention if you are using NI's signal conditioning and multiplexers. Also, use Relative channels if you are defining more than one named channel to a physical connection to pre-assign channels for different tests. In Snap-Master, you will then select whether you are using the Absolute or Relative channel convention as described later in this document.
- Now that you have the NI hardware and software working, and you have defined your channels, you should install Snap-Master if you haven't already. Install Snap-Master from the CD. In the Snap-Master Installation directory, run setup.exe.
- For Windows XP, 2000 and XP, register the ocx that was installed by going to Windows Start, Run and type:
REGSVR32 C:\WINDOWS\SYSTEM32\cwdaq.ocx
Then click OK. You should get a message confirming registration.

9. If you are running Windows 98 or Me, use the SYSTEM directory instead of SYSTEM32 in the previous step. Be sure the file is in the directory that you are specifying when registering the OCX.
10. Start Snap-Master. If you receive the message “Bad or missing Configuration File”, just press OK. You will only get this the first time.
11. Drag out the NI A/D icon. If you have installed more than one hardware driver you need to left click on the green A/D icon to check the correct choice. Once this is done, or if you have loaded only one A/D manufacturer, then drag the A/D icon into the instrument window. Double click on the A/D icon
12. At this point you need to select the proper model of your NI hardware and the device. The choice will eventually be made in the Device, Hardware Configuration... dialog. If no device is shown in the dropdown list this means that Windows probably has not recognized your device and you need to start again at the beginning of this procedure.
13. You need to define whether you are using the Relative or Absolute channel convention as described earlier in this document. The default is relative channels. If you want to switch to the opposite setting that is currently active, then you need to click on the other radio button, then save the instrument and close it. You then need to re-open the instrument and it should have switched to the other mode.



14. In Settings, Frame Settings, select Hardware Paced select the sample rate, duration and number of frames.
15. In the A/D table, select the channels you want to acquire. The named channels that you defined in MAX should show up in the table. They will be in numerical order. Make sure the channels you select are all on the same A/D device (e.g. “Device Number 1”. Currently only Device #1 is supported). In other words, the channels cannot be on separate A/D devices. Remember which channel naming

convention you selected and their ramifications; mainly whether the Snap-Master channel numbers correspond with the physical connections on the hardware. It does only for the Absolute naming convention.

16. If you go into MAX and either edit or add more named channels; it is suggested that you close Snap-Master with `c:\sm\SM Exit`. You should put this file on your desktop for easy access. Then restart Snap-Master and the channels should be updated in Snap-Master.
17. If Snap-Master is not running properly you can shut it down using `SM Exit` located in the `c:\sm` directory. `SM Exit` works with Windows NT, 2000, and XP only.

Features Not Available in this version

- D/A, Counter/Timer, and Digital I/O are not supported at this time.
- Hardware trigger is not supported; software trigger is supported.

NI User's Guide NChan.doc