

Dataq Software and Hardware Installation Prior to Running Snap-Master

1. Overview of this Manual

This user's manual describes the following:

1. Summary of features that have been implemented
2. How to install the Dataq driver software and hardware
3. Changes in the Snap-Master User Interface

The goal of this manual is to facilitate the set-up of the Dataq hardware with Snap-Master. Use the Dataq and HEM Data manuals as reference. The key integration issues are covered in this document.

2. Feature Summary

The new driver support includes:

- The ability to acquire data with Snap-Master and Windows XP/2000/NT/98/Me.
- Aggregate sample rate throughput was achieved to 200,000 samples/sec. This was achieved on a 1GHz computer using a USB port. An Ethernet connection operates at a maximum of 50,000 samples/sec. The EPP parallel port can achieve 180,000 samples/sec maximum, a bi-directional (60,000 samples/sec maximum) or standard (30,000 samples/sec maximum). An ECP port is not supported.
- 32 single ended and 16 differential channel support.
- Individual channel gains work.
- Software triggers are implemented.
- USB, Ethernet and parallel ports are supported.
- Digital triggering

3. Installation Overview

Prior to installing Snap-Master you must first install the Dataq software and then the Dataq hardware. First you must decide which port you will use to connect the Dataq hardware to your PC. There are three choices:

- USB
- Parallel
- Ethernet

For a given data acquisition box, there is always a parallel port and possibly one other port option. The USB port is the easiest and most reliable to work with. The USB port is more easily setup with the Plug and Play features of the newer Windows operating systems; it also frees up the parallel port for printing. The Ethernet port is slower but has the benefit of being located remotely from your PC. If more than one connection is made to the PC when the device is powered up, the parallel port takes precedence. It is recommended that you only have one connection to the PC at a time.

4. Installing Software Drivers

Once you have decided which port to use, you need to load the correct Dataq drivers. These drivers are located on the Snap-Master CD under the Dataq directory. Load the appropriate drivers as listed below for the port you are using. The number in parentheses is the USB ID or LPT port number.

Port Type	Run This File	Default Name of Device
USB	new_ub.exe	720/730 USB Option (0)
Parallel	new_zq.exe	720 NT (1)
Ethernet	new_en.exe	720/730 Ethernet Option ()

When you run one of these files it will automatically run Activex.exe which Snap-Master needs.

You may load more than one driver, but for simplicity it is recommended that you load only one driver if that is all you need. Once you have loaded the Dataq drivers, you should see in the Program Files a list of WinDaq files. Typical ones you will see are now listed and described. There are several other files that are listed but you can ignore these when using Snap-Master.

File Name	Description
WinDaq USB0	Graphing program that will allow you to see data on a sweep graph. This will help you determine if the hardware and its connection to the PC are working correctly. The modifier after the WinDaq name describes the type of interface to the PC and is helpful if you have more than one interface installed.
WinDaq Lite DI-720	Same as above, but parallel port shows device model instead of interface.
IP Manager	Used with an Ethernet port. This will identify the box's MAC and IP addresses.

5. Hardware Installation

Follow one of the three hardware installation procedures (5A, 5B or 5C) that match the connection you plan to use between your PC and the Dataq hardware.

5A. Installing USB Hardware

If you have a USB follow the instructions in this section; otherwise move to either section 5B or 5C). At this point you should have run new_ub.exe as described above. Run through their wizard to define the connection type. Once you install the file to test their hardware, the file will be named as WinDaq USB0, if for example you are using a USB port, and the device is number 0. The Dataq box is shipped as box 0 (zero).

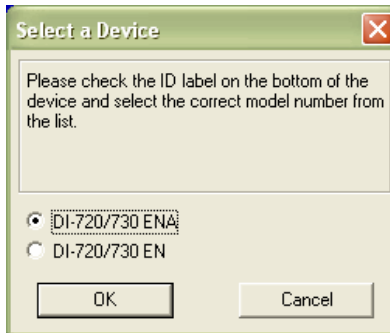
Use the file setusbid.exe to change the device number if you have multiple Dataq boxes. Multiple devices can only be run with both being connected to the PC with each having their own USB connection to the PC. Dataq requires that this program (setusbid.exe) work with Win95/98 only and a bi-directional parallel port must be available for this program to communicate with their box.

When first installing the Dataq hardware with the USB port, the operating system will let you know it has found the Dataq hardware. It will then ask for files related to the hardware. Point the

wizard to look in the Dataq directory on the Snap-Master CD. It is looking for the DI720.inf and DI720.sys files.

5B. Ethernet Connection

Follow the instructions in this section if you have a Ethernet port connections to the Dataq box. At this point you should have run new_en.exe as described above. Run through their wizard as described below. Once you install the file to test their hardware, the file will be named as WinDaq ENA



Select the ENA option.



The MAC address is unique to your box. The address is located on a sticker on the bottom of the Dataq box.

Type 0 (zero) for the password.

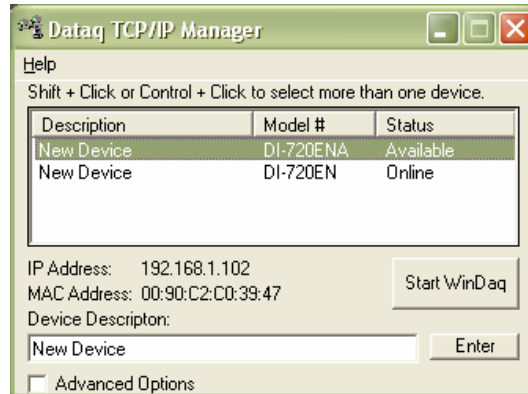
Click OK

Enter your name and company.

Select no backups, then OK and then OK.

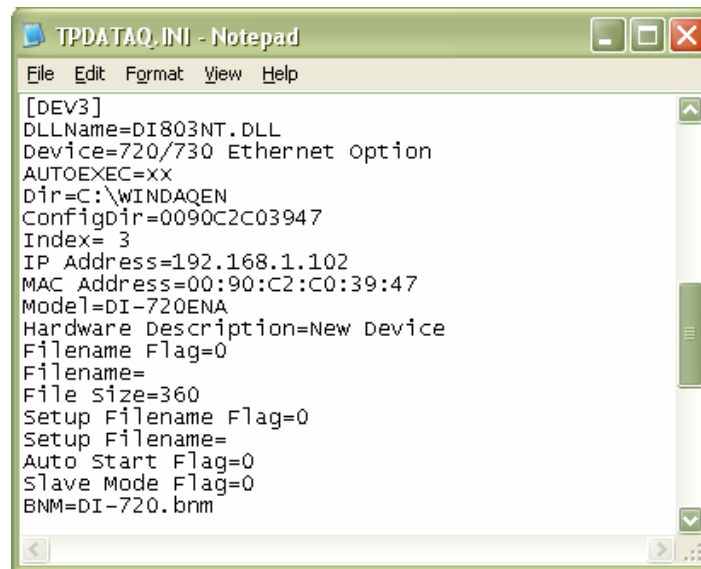
After the drivers are installed, go to Start, Programs, WinDaq, IP Manager. You should see the following window. Within a short time you should see your device as DI-720ENA for example and that its status is Available. Also notice that the IP Address and MAC address are listed. If this

information is not being displayed then there is something wrong with your Ethernet connection. Please verify and retry. If you have been successful to this point, then click on the Start WinDaq button. This will load an Ethernet driver and start WinDaq. You should see a plot of your data. If so, close WinDaq by clicking on the X in the upper right corner and selecting OK. You are now ready to load Snap-Master.



Click Start WinDaq button.

This IP Address information is added to the file c:\windows\TPDataq.ini as seen below. If the IP Address is dynamically assigned and it changes, you either need to rerun the IP Manager or if you are having problems, you may need to manually update this address.



Note almost half way down is the IP Address.
Manually change this if it is not correct.

5C. Parallel Port Connection

Follow the instructions in this section if you have a parallel port connections to the Dataq box. At this point you should have run new_zq.exe as described above. Run through their wizard to define the connection type. For the password, type 0. The rest of the questions should be clear. There is no need to select back-up files as an installer option.

Once you install the file to test their hardware, the file will be named as WinDaq Lite DI-720.

1. Set your parallel port to EPP. You cannot use ECP, which some computers default to. This change is generally done in Setup while the computer boots up. If you are unsure how to do this refer to the computer's user's manual or contact the manufacturer. If you do not have an EPP (180,000 samples/sec maximum) port, you can also use a bi-directional (60,000 samples/sec maximum) or standard (30,000 samples/sec maximum) parallel port but the throughput will be slower. Note also, that the parallel port interface on models DI-720-USB and DI-720-EN does not support a standard parallel port configuration.
2. After installing new-zq.exe, you will then need to reboot the computer. Make sure that the Dataq DI-720 box is connected to the computer and turned on prior to rebooting the computer.
3. If you started the computer and forgot to turn on the Dataq box, or if at any time the Dataq box loses power, then go to Start, Programs, WinDaq, 720Loader.
4. Run the Dataq software to ensure that the drivers are working correctly. Snap-Master will not work correctly if they are not. To check the driver, go to Start, WINDAQ, WinDaq Lite DI-720.
5. WinDaq should start plotting data. If you get an error message that the device could not be opened, then make sure that it is properly connected to the parallel port (LPT1 for example) and has power. If it wasn't powered and connected correctly then go to Start, Programs, WinDaq, 720Loader.
6. If WinDaq Lite software does show the correct data then close the program by clicking on the X in the upper right corner and selecting OK.

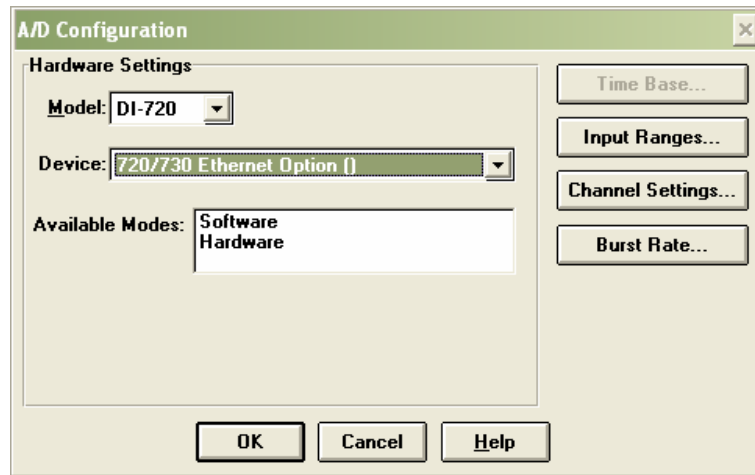
6. Installing and Running Snap-Master

Start the Snap-Master installer by running setup.exe. The installer copies the following files to your hard disk to the directories listed.

- *c:\sm\dataq32.dll*
- *c:\sm\dataq16.dll*
- *c:\sm\hdi1632.dll*
- *c:\sm\HDIDataSrv.exe*
- *c:\sm\sysdata\dataq16.ini*
- *c:\sm\defuser\sm.ini*
- *c:\sm\defuser\dataq16.cnf*

The following procedure will setup Snap-Master with the Dataq hardware. If you need assistance with Snap-Master, consult the Snap-Master User's Manual or on-line help.

1. Start Snap-Master. Build your instrument with the Dataq A/D icon. Double click on the A/D icon. Go to Device, Hardware Configuration. Make sure the correct Dataq Device is selected. For a USB port, it will read 720/730 USB Option (0), for an Ethernet port it will read 720/730 Ethernet Option (), and for a parallel port it will read 720 NT (1). The number in parentheses is the device number or LPT port number for the parallel port.

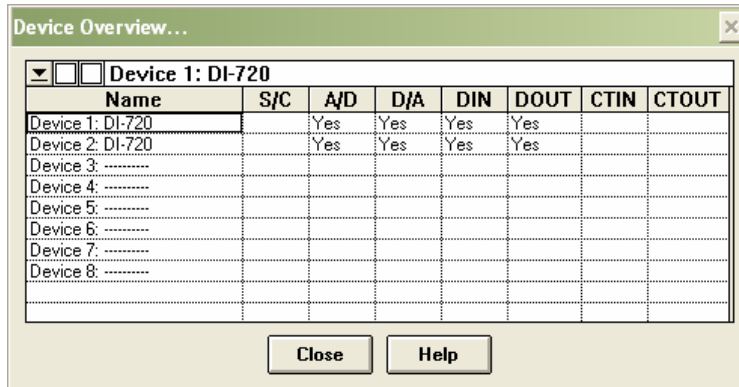


2. The Input Ranges button is not needed since this is only used if the hardware ranges are jumper selectable. The Dataq hardware is advanced and allows the channels to be software selectable on a channel by channel basis. The Input Ranges are selected using Settings, Ranges in the main A/D dialog.

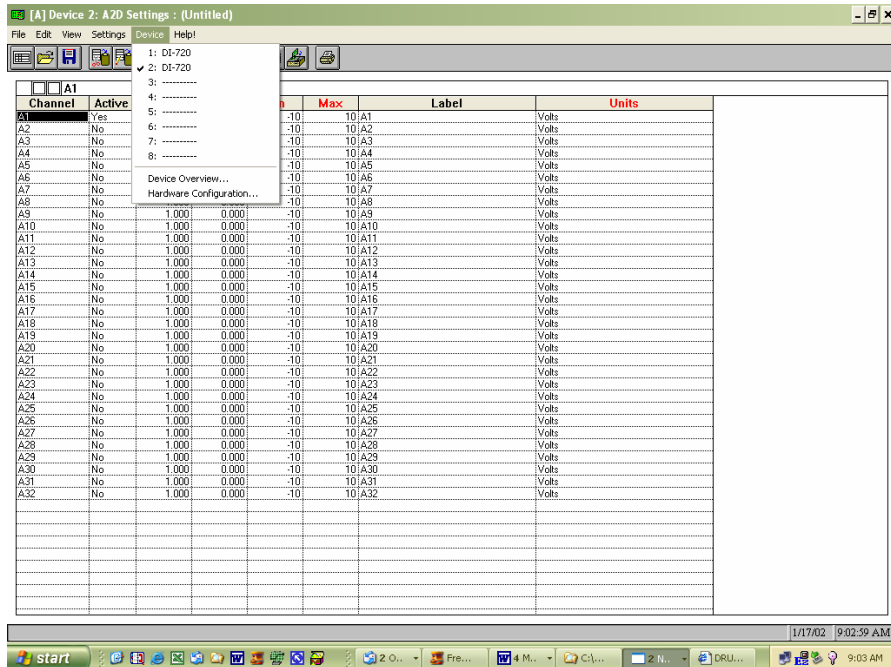
3. Click on the Channel Settings... button. The default function is average and Input Type is single-ended. Dataq hardware has the ability to oversample and can therefore provide the average, maximum, minimum or last point. Conventional hardware only provides the last point. At sample rates above half the burst rate that is what the Dataq unit would provide as well. The last column allows you to select the connection type for each channel as either single-ended or differential. This can be selected on a channel by channel basis.

7. Multiple Devices

In Snap-Master, the Device Overview dialog defines multiple Devices. From the dropdown list add any new devices.



To select which device number is to be used for the specific A/D icon you have just double clicked on, use the Device menu, and then check the device number you wish to assign to the currently opened A/D icon.

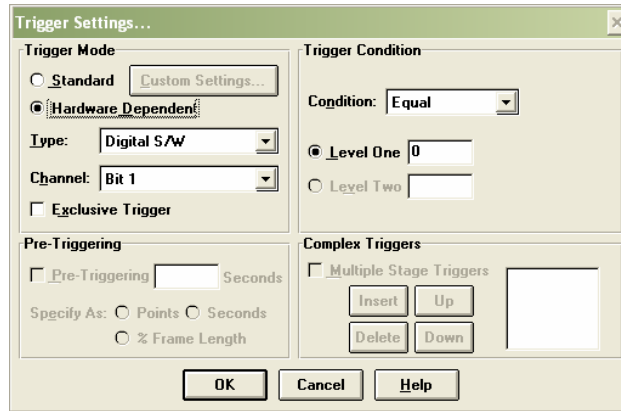


8. Error Messages

If you get an error message in Snap-Master that the Burst Rate is set too low, the remedy is to copy dataqsdk.ocx into the c:\windows\system32 or c:\winnt\system32 directory. Note the directory name may change slightly depending on the operating system you are using. Then use the Start, Run command and type regsvr32 dataqsdk.ocx. The file dataqsdk.ocx is in the Dataq directory.

9. Digital Trigger

The digital trigger for Dataq is a software-based trigger. However, in the following dialog it is selected as shown below – Hardware Dependent, Digital S/W.



The first choice is to select the bit number. Bit 1 is pin 25 on the connector and pin 19 is analog and digital ground. To test the digital trigger, connecting pin 19 and 25 produces a short to ground or a 0 value. Keeping them separate produces a digital value of 1.

There are four trigger conditions: equal, not equal, rising edge, and falling edge. The dialog values for the level one and two should be left at 0 and are not needed. Inherently the value of 0 is assumed. The table below assumes you are triggering on bit 0; if not, change pin 25 to the corresponding pin for the bit used for the trigger.

Trigger Condition	Description
Equal	Trigger when = 0; when pin 25 and 19 are connected
Not Equal	Trigger when not equal to 0; when pin 25 and 19 are not connected
Rising Edge	Trigger when a 0 condition is first detected (primer) followed by a 1 condition, so we know we have found a rising edge of a square pulse.
Falling Edge	Trigger when a 1 condition is first detected (primer) followed by a 0 condition, so we know we have found a falling edge of a square pulse.