Direct memory access operation
Direct memory access (DMA) improves system performance by allowing external devices to transfer information directly to or from the PC’s memory without using the CPU. The PCL-818L's DMA capability significantly improves the system performance in high speed A/D applications.

**Introduction to the 8237 DMA controller**

The 8237 DMA controller chip on the PC system board handles the DMA operation. This chip has four prioritized direct memory access channels. Channel 0 is reserved by the PC system refresh its dynamic RAM. Channel 2 supports floppy disk operations. Channel 3 is normally used for hard disk operations. Channel 1 is not reserved for any internal operations and is available for your applications.

Each channel has two associated control signals associated with it. The DMA request signal (DRQ) triggers a DMA operation, and the DMA acknowledge signal (DACK) authorizes the 8237 to start the data transfer.

The 8237 DMA chip has four operating modes (single, demand, block and cascade) and four control registers. These registers are:

1. Operation mode register (set mode of operation)
2. Address register (specify memory segment starting address)
3. Word count register (specify the number of transfers)
4. Initialization register (enable and disable DMA channels)

Note that you must properly set all four registers before requesting the DMA operation.
Using DMA transfer with the PCL-818L

DMA transfer is a powerful but complicated operation. Different parts of the DMA transfer have been covered in other parts of this manual, especially Chapter 5. The following steps summarize how to use DMA transfer with the PCL-818L:

1. When you configure your hardware, check your to see which (if any) PC DMA channel is available (level 1 or level 3) and set PCL-818L jumper JP1 accordingly.

2. If you will be using the PCL-818L driver for your DMA transfer programming, see the Software Drivers User’s Manual for information.

3. If you choose to conduct your own DMA operation, you will need to have a solid understanding of the PC, 8237 DMA controller and the PCL-818L. Make sure you perform the following steps in your DMA transfer:
   a. Initialize 8237 DMA controller register and page register.
   b. Send DMA enable and trigger source data to the PCL-818L control register located at address BASE+9.
   c. Set an external trigger pulse or pacer trigger rate.
   d. Enable the trigger source to start the A/D conversion