

## Software Options for Programming the KPCI-PIO24 or KPCI-PIO96

Unlike the PIO series of boards, the KPCI-PIO series of boards are memory mapped devices. Use of simple inp or outp statements from 16-bit DOS compilers is typically not an option. The inp and outp statements can address only the lower 64K of memory ( I/O space ), and so cannot address the memory regions that a PCI card occupies. Keithley does not provide any DOS driver for these boards. For digital I/O from pure DOS with a PCI card, consider the **KPCI-3160** which is an I/O mapped, 96 line, digital I/O card.

### Options when using DriverLINX:

DriverLINX provides three different API for programming a PCI digital I/O board (see the section titled "Programming the KPCI-PIO Series" in the kpcpio.pdf software guide in the drive:\drvlinx4\docs\notes folder for full information).

**First recommendation** is to use the Direct I/O COM object. This object allows continued use of simple read and write commands to interact with the digital I/O boards. The Direct I/O object is compatible with any ActiveX hosting language (VB, MSVC++, Delphi, Excel, CVI, etc.). The methods of this control emulate the 8-bit port I/O behavior of an Intel 8255 chip (one control register and one register for each 8-bit digital port). The kpcpio.pdf document gives a good step by step process of how to use this object from the Visual Basic environment. Additional examples are available in the download center of this web site.

**Second recommendation** is to use the full DriverLINX API. The advantage of the Service Request API is that it provides a hardware independent means of programming common functions of plug-in data acquisition boards. For example, the same DriverLINX code that controls a port of a KPCI-PIOxx board can be reassigned to the corresponding digital I/O port of a multifunction board such as the KPCI-3108 with its 4 digital ports (32 lines of digital). The calls are the same because the underlying driver files handle the hardware differences. Thus the required code does not change, and time invested in application development is easily ported to new hardware when using the DriverLINX API. Example programs for use of the full DriverLINX API for digital I/O are available in the download center.

**Windows 95/98 only:** The **third** and final API of DriverLINX is an I/O emulator. This API does not work in WinNT, Windows 2000 or Windows XP. The primary advantage of this API is that DOS programs (Quick Basic, Turbo Pascal, C/C++, etc.) written for ISA cards which made use inp and outp type statements, can be ported to these memory mapped PCI boards. The emulator will intercept inp and outp calls to the I/O space of the 'emulated' PIO board and properly communicate those commands to the KPCI-PIO board. The Windows 95/98 operating system must be in use, but it is sufficient to boot to the command prompt or to launch the program in a DOS window. **This API is not recommended for new applications, as upgrading to other Windows versions will render the application code useless.**