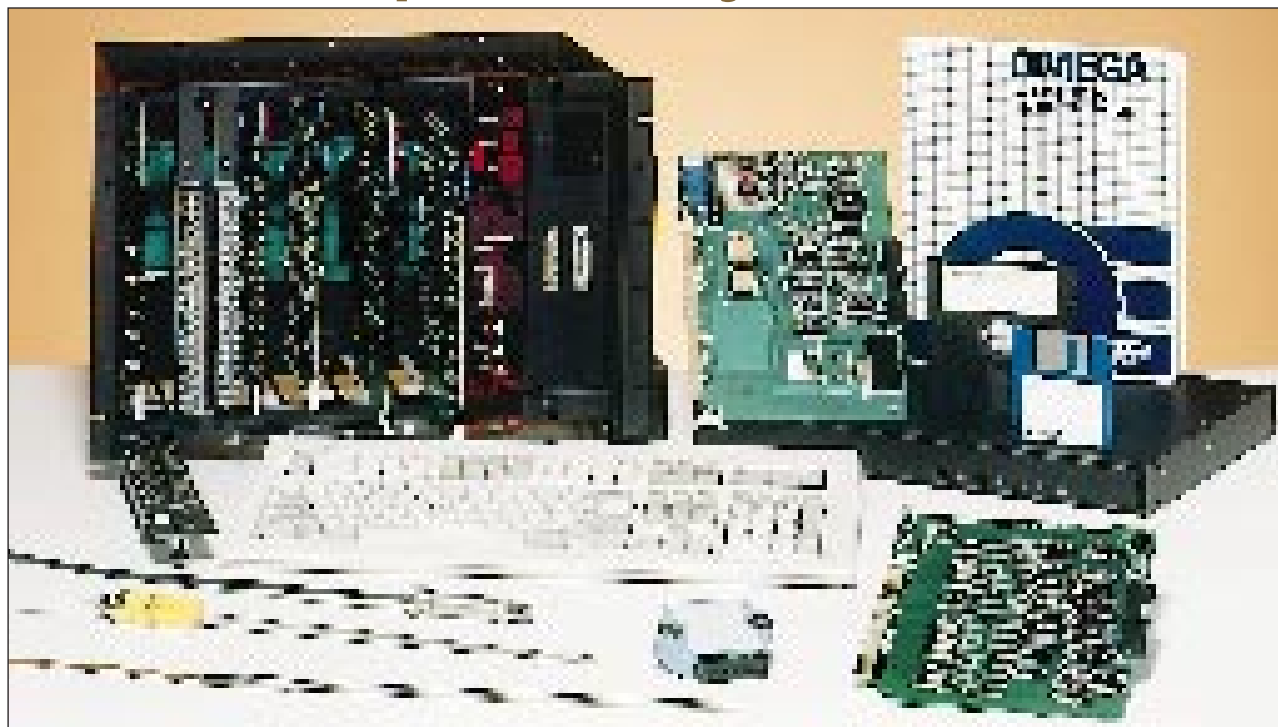


Introduction to Communication-Based Acquisition Systems



Why should I use a communication-based, or front-end, system for my data acquisition and control?

A communication-based data acquisition system offers many advantages when compared to plug-in systems. Some of these include size and expandability. Simple products, such as the D1000 Series, will accept only one input, while others, such as the OMB-TEMPSCAN and Workhorse systems, can be expanded to several hundred analog inputs. One large advantage of a front-end is that you can start small and build the system as your requirements grow. Putting together a system in this way keeps your initial cost low, yet provides you with the ability to add channels at any time in the future. Lastly, as you build and expand your system, the cost on a per-channel basis decreases. Since each system requires only one master, or CPU/power module, additional units are not needed for expansion; the only cost incurred is for the actual channels you desire.

Unlike a plug-in card, a communication-based system can be placed in almost any environment. To install a plug-in on the factory floor, for example, you have to dedicate a PC to that location; in fact, depending upon the exact location, you might incur the added expense of having to purchase an "industrialized" PC, that has been built for the more rigorous requirements of the factory. With a front-end, however, you can place the system in almost any location, including a 19" industrial rack. Industrial enclosures are also available, to provide additional protection for the system. And, to talk to the host computer, you don't even have to worry about a special communication cable; most front-ends can talk to the host over telephone lines using a modem.

Perhaps one of the biggest factors in selecting a communication-based data acquisition system is the type of computer you are using. Plug-in cards are designed to work with only one computer type. Cards are available for either the IBM PC or Apple computers. If you don't have either of those computers or a true compatible, the plug-in won't work. On the other hand, a front-end can talk to any computer that has a communications port. Different systems can communicate with the host computer using the RS-232-C, RS-422, RS-485 or IEEE-488 standard.

If you'd ever like to move your data acquisition system from one location to another, it's an easy task for the communication-based system. With a plug-in, however, it can be a monumental task because the field wiring terminates at the computer. If you have a computer at the new location, you have to open up the old one, disconnect the wiring, remove the card, close up the old computer, and re-run the input wires; then, do everything in reverse to re-install it.

Available software and ease-of-use are also important considerations in selecting a type of data acquisition system. Communication-based systems use simple commands that are easy to learn and make common sense. They are also available with a selection of third-party software that's been designed to work with the system and will help you to take full advantage of its capabilities.

Lastly, if the system you're looking to install now is only the first of many such data acquisition systems, a front-end can be duplicated easily for installation in a second or third location, as can the control software.

What are the differences between the various communication-based acquisition systems?

There are a number of factors to consider when selecting a front-end system. Begin by analyzing your requirements; do you need only analog inputs, or analog outputs *and* digital I/O? How many inputs and outputs will you need? Pricing is also a very important factor, in that different systems have different initial costs, with various upgrade/enhancement prices. One major consideration in choosing the right system in the future: if you can anticipate your future needs and requirements, make sure that the system you select either has them now, or can be easily upgraded with them later.



The OMB-DAQBOOK Portable System

Lastly, there are two types of communication-based systems: ones that can stand alone for a period of time, and those that must be in constant communication with a host in order to operate. This difference is profound. Are you willing to dedicate a computer/terminal for communications with the system when it is operational, or do you want the system to perform the acquisition and control without the use of a host, and have the system "dump" the information to the host at a later time, when you can analyze it? A stand-alone system offers you enhanced programmability, and has storage



The OMB-TEMPSCAN Temperature Measurement System



The Workhorse Modular System

capacity for both the program and the data which enables it to perform its functions. The trade-off for these capabilities, however, is price. More enhanced systems, with added features, are more expensive.



The DRX Series Distributed Modules

What is networking, and how can it help with my data acquisition requirements?

A networked system is a system in more than one location. It can consist of one central master, or host, unit that communicates to the main computer, and remote "satellites" that communicate only through the master unit. Another type of networked system is one without a master. Each unit is like a link in a chain, with one end of the chain connected to the host computer. For the computer to communicate with each link, it has only to specify which link in the chain it is addressing.

Network systems offer many advantages over conventional communication-based systems. They can be placed in many locations in one building, or even in different buildings. They are also very easy to expand; just add a new link to the chain, or attach a new "slave" to the master. The network allows you to collect your data without tying up a host computer in each location.



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