Factory Automation Solutions Tutorial

The selection of factory automation hardware and software is a topic still quite new to many users of conventional flow instrumentation. They are presented with a increased range of possible solutions to their plant wide automation needs.

Broadly speaking there are three basic approaches to solve instrumentation and control needs. These are networks of instrumentation, or PLC based designs, or PC based designs. Each has its own merits based on the size of the plant and the need for local control.

Industrial PC's are finding their way into more and more monitoring and control applications each year. In most cases the PC is used as an operator station or data gathering station which collects information from a number of instruments or PLC's.

Many users are trying to grow their own system by looking at their need for information and tackling small portions of their plant one step at a time and slowly adding these to their existing PC network within their plant.

How will information be displayed on my PC? Generally speaking there are two broad mechanisms which are involved in the display of factory information on a PC. One program is gathering and sharing data with the display, or "client" program. The data gathering program is called a "Server/Driver". "Client" programs include "HMI" or Human Machine Interface programs and common PC Spread Sheet and/or Database report programs. Many are available on the market.

How do I select an Industrial PC? In most cases the hardware selection is done after you have decided on the software, on what you want this to do, and how it will be connected to the rest of the plant. Many experts agree that you should purchase a PC which is compatible with your software and with the best capabilities you can afford. Industrial PC offerings change frequently.

What are some of the selection criteria for Industrial PC's? Most customers begin by reviewing the processor, memory and hardware requirements for the software they plan on using since this lists the minimum requirements for any PC they might use. Next the desired display type/size, operator input, environmental ratings, and materials of construction are reviewed. The number and type of required field and/or instrument communication channel and the desired network connection is also considered. Supplier quotations are then solicited.

What are the common field or instrument communication channels? There has been a lack of standardization in instruments and PLC's. There are many on the market and in most plants. As a result it is not uncommon to find that several communication ports are required on your PC. Industrial PC's are usually provided with 2 or 4 RS-232 serial com ports. Instruments and PLC's are arranged into groups that share a communication channel hardware and protocol type. Each com port is then associated with a "Server" software that knows how to gather information over that channel and how to share that information with the "client" software which is running on that or remote PC's. In some cases a "signal adapter or converter" is required to convert the COM Ports RS-232 into the signal type required by that channel. An example might be a RS-485 communication channel with several instruments which uses the MODBUS-RTU protocol would connect to COM PORT1 using a RS-232 to RS-485 adapter.

What are the common office LAN connections used in business? It is important to note that an industrial PC is after all a PC. Your system administrator will add a network card and software in the same manner as other PC's in your office. Many Industrial PC's come with an Ethernet connection as standard or as a option.

Typical Application: