

## PC BASED CONTROL SYSTEMS

Direct Digital Control Systems are now available which can provide the design and facilities engineer with virtually unlimited flexibility in the designing and operation of a building. The systems are PC based and as a result their cost is continuously being reduced and their capacity, capability and flexibility increased.

The three basic areas of a modern control system are Direct Digital Control (DDC) capabilities, communications capabilities between devices and a graphic operator interface.

### **Direct Digital Control:**

Direct Digital Control (DDC) of devices and systems has been available to the industrial engineer for at least 15 years. With the ever broadening application of electronic controls and the resulting cost reduction, DDC has become more economical for commercial use. The extensive use of computer logic in home appliances, is an example of one of the many uses of DDC today.

Control devices can be programmed to maintain set points, send data to related systems and components, but more importantly they can make decisions with data inputs from other sources.

Modern DDC Systems are designed as distributed systems in which the electronic controls are installed as close to the controlled device as possible. The distributed DDC controllers are "stand alone" containing all intelligence software and memory required to control the device. Manufacturers of VAV boxes, rooftop AC units and other equipment have started to furnish their equipment with DDC controllers already installed.

### **Communications:**

In order to allow multiple stand alone devices in a system to operate as a single unit i.e. to control energy consumption, maintain comfort or process design conditions and record alarms, each device must communicate with the others, exchange information and

make decisions which are beneficial to the entire system. Fast communication between devices is essential for the system to be effective. This communication is typically done over a twisted pair of wires.

The trend in DDC controls is toward an "open protocol" communications that will allow devices from different manufacturers to communicate. This will drive costs down further and increase the application of DDC controls.

### **Graphics:**

Just as the use of graphical interfaces such as Windows has revolutionized PC's in the office (making the full capabilities of software programs available to the novice computer user), the graphical interface allows the full potential of the DDC control system to be utilized by the building engineer. A modern graphic interface system generally uses a windows type environment and allows the facilities personnel direct access to the control system by way of either a keyboard or a "mouse" and systems are now being developed which are voice activated.

Without the capability of a graphic interface, a trained programmer is be required to make any changes or modifications to the system. This makes day to day changes required by facilities personnel impractical and costly.

Simple access allows operating personnel and design engineers to make large or small operating changes to set points, change operating decisions and increased the likelihood that the system will be utilized to its greatest potential.

Each manufacturer has unique software which makes these systems slightly different from the next. It is essential that a potential user request a demonstration to determine whether all the operating requirements needed are available.