

Why use an industrial Ethernet Switch?

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Using retail or office-grade Ethernet equipment in a Building Automation System can have a big negative impact on reliability and ultimate project cost.

When interconnecting Ethernet equipment within a control panel, the temptation is to select an office-grade or small office - home office (SOHO) Ethernet switch from one of the mass merchandisers. This equipment is readily available and inexpensive! Since the equipment works at home or on the bench, it should certainly function in a control application.

This can lead to large problems in a Building Automation System.

Switch Power

Retail and office equipment require external regulated 5 DC power supplies that plug into a common line voltage duplex outlet. These power supplies are frequently called a "wall wart" since it hangs from a duplex receptacle. If a receptacle is not present in the control panel, it must be provided at extra cost. Since a wall wart can be easily dislodged during shipment or use, some municipalities require the wall wart to be attached to the wall plate with a screw, creating additional labor. Failure to do so can result in a "red tag" given by an electrical inspector. However, most wall warts do not provide the ability to secure them with a screw to the outlet box. In addition, the 5 volt end of the wall wart is a simple push-on connector causing another potential point of failure. It can easily fall out and disrupt system operation resulting in an expensive service call.

Professional Alternative

Professional Building Automaton Ethernet switches are low-voltage. They're powered from a wide range of AC or DC operating voltages allowing the same equipment to work worldwide. For safety purposes, most control panels run from either 24V AC or DC sources so it is simple to power a Professional Building Automaton Ethernet switch from the same power source as the other control equipment in the panel. There is no need to have higher voltages present in the panel just to power the Ethernet switch.

Mounting

Retail and office equipment is made for the table top typically having four rubber pads to prevent surface marring of a desk or shelf. Mounting this equipment in a control panel takes extra labor and materials either by fabricating a bracket or a shelf to hold the unit. Amazingly as it seems many people in a rush simply use tie wraps to quickly secure these devices (Velcro® or duct tape has been used in some extreme cases!). How can you explain this kind of installation to the customer on a walk through of a project or to a code inspector?

Further, since retail and office equipment usually has LED indicators on the opposite side of the RJ-45 connectors, either the LEDs can be viewed or the connectors can be viewed but not both when mounted in a panel.

Professional Alternative

Professional Building Automaton Ethernet switches are made for control panel mounting. Flanges are provided for panel mounting and a DIN clip is provided for DIN-rail mounting. Once mounted, the Professional Building Automaton Ethernet switches appear like it belongs with the other equipment. Both the LED indicators and RJ-45 connectors are near one another and are easily viewable when the door of the control panel is opened. The installation is neat, organized and worthy of the price the customer is being charged for the Building Automation System.

Redundant Power

Because of Ethernet's star topology, the Ethernet switch is crucial to control system operation and, therefore, must function continuously. A loss of primary power would disrupt system operation. Retail and office equipment have no provisions for redundant power. ***Professional Alternative***

Professional Building Automaton Ethernet switches have redundant power connections allowing the switch to continue to run without disruption from the loss of primary power. Since the unit can be powered from wide range AC or DC power, the backup power source does not need to have identical capability. Any voltage source in the specified range can serve as a backup power source including batteries.

Regulatory Approvals

Most municipalities require a UL or CSA label applied to the control panels. A common standard is UL 508 Industrial Control Equipment, which Professional Building Automaton Ethernet switches comply. For more stringent applications, a UL 864 Smoke rating may be required. Retail and office equipment has neither of these approvals and installing a non-approved device in a UL control panel is an invitation for a red tag by an inspector.

Professional Alternative

Professional Building Automaton Ethernet switches are definitely more rugged than retail and office equipment. Four-layer printed circuit boards and input filters are used to meet the industrial limits of electromagnetic compatibility (EMC) standards EN 55022 and EN 55024. It is this attention to design that allows Professional Building Automaton Ethernet switches to function in less than desirable EMC environments.

There are two widely accepted temperature range specifications for Professional Building Automaton Ethernet switches. The 0 to 60 ° C temperature range is consistent with the ratings of BAS controllers, security, and fire equipment. The second is the wide temperature range or outdoor range from -40 to 75°C. Retail and office equipment is either rated from 5 to 40°C or not rated at all. The Ethernet equipment should have equal or better environmental specifications as the connected control equipment.

Product Support

Ethernet technology is complex and equipment selection from repeating hubs, plug-and-play switches and managed switches can be a confusing process. Troubleshooting problems in the field can be tedious and that is why Professional Building Automaton Ethernet switches are equipped with ample LEDs to indicate crucial parameters such as data rate, activity, valid link, and duplex. Professional Building Automaton Ethernet switches have an area for "as-built" filed markings on the device itself to note connections with field equipment. This aids the technician to quickly find the source of a problem when drawings cannot be found.

Professional Alternative

Professional Building Automaton Ethernet switches are built for control applications, the limits of Ethernet equipment and the use of fiber or twisted-pair cabling. Manufacturers of Professional Building Automaton Ethernet switches provide support to assist in discussing issues such as auto-negotiation, auto-MDIX as well as advanced features such as virtual LANs, trunking and simple network management protocol. This level of support cannot be gained from the mass merchandisers.

Product Consistency

Retail and office switches change constantly, "flavor of the month" let us say. Even the electronics and performance can change in the same make and model because the company finds a cheaper vendor in Asia. The size and shape of the product's packaging can change regularly, too.

Professional Alternative

System integrators make money when there are no surprises in installation, commissioning, and start-up. Professional Building Automaton Ethernet switch manufacturers understand this and provide consistent product form, fit, and function for years. You can standardize panel layouts and design with confidence knowing it will be good for years to come. "Set it and forget it." Design it in once and don't worry about it on future builds. More profits and no surprises.

Bottom Line

Protect your profits and customer satisfaction with Professional Building Automaton Ethernet switches. The added labor and risks of using retail and office switches far offsets the additional cost of using a high-quality Professional Building Automaton Ethernet switch. Customers want 100% uptime and a switch failure results in expensive service calls and customer dissatisfaction, so why not choose the best for the customer? A neat, clean, professional and reliable installation will satisfy the customer and lead to repeat business for the installer.

Source:

<http://www.automation.com/library/articles-white-papers/building-automation/why-use-an-industrial-ethernet-switch>