

Information is power! This is especially true for building systems in critical environments such as data centers, telecommunications facilities, and healthcare facilities. Operators of critical facilities typically monitor critical power, cooling and security systems (at a central, on-site location, for example) via a Building Automation System (BAS). This allows the owner of the critical facility to detect and address abnormal building conditions before costly outages occur. Wouldn't it make sense to communicate information from fire alarm (FA) and detection systems to the BAS?

Local building codes usually require that fire alarm and trouble signals are monitored by a central station. The equipment and transmission methods are closely regulated by local "Authorities Having Jurisdiction" (AHJs include fire and building officials, for example); codes and standards such as NFPA 72; and testing and approval agencies such as Underwriters Laboratories or Factory Mutual Global. Typical monitoring methods consist of transmission over phone lines (these lines have special requirements) to an approved central station, which initiates action including dispatch of fire departments, as appropriate.

In addition (not in place of) to this required monitoring, fire alarm and detection systems may also interface with the owners' BAS. Particularly where Very Early Warning Fire Detection systems are used, action can be taken by the owner in the incipient stages of a fire emergency to avoid or minimize facility downtime. This could include air sampling systems or other smoke detection systems and may be on the order of a thousand times more sensitive than conventional spot smoke detectors. Interface of the fire alarm system with the owner's BAS can be accomplished in the following manners:

- **Interfacing FA system directly with the BAS:** BAS systems can recognize communication directly from a fire alarm panel when the fire alarm system is equipped to communicate in a language which is understood by the BAS system. Typical languages include BACNet, Modbus or LonTalk, for example. Not all fire alarm systems have these capabilities, or these capabilities may only be available as an option. This option requires:
 - A study of the BAS system to identify desired communications protocol
 - Evaluation to identify if this feature is available from one or more fire alarm manufacturers
 - Coordination of specifications for fire alarm and BAS systems
- This option can result in the sharing of very discrete information from the FA to the BAS systems. Disadvantages may include a limited selection of fire alarm manufacturers, higher cost of initial installation and ongoing maintenance for the life of the equipment. Several BAS manufacturers also manufacture fire alarm equipment, or have agreements with fire alarm manufacturers, so that BAS/FA systems are designed to interface with one another.
- **Interfacing FA system with the BAS System via "Black Box":** System integrators can custom build interpreters so that fire alarm information can be translated and understood by the BAS system. While this type of system can work effectively, it is a highly proprietary type of system, which may limit future programming and maintenance of the system to the original installer. This may result in higher maintenance costs or life cycle issues if the original installer/integrator goes out of business, or parts used in the integration become obsolete.
- **Interfacing FA system with the BAS system via FA addressable relays:** This method requires a separate relay for every condition desired to be transmitted to the BAS, and proper programming of the fire alarm and BAS systems. Relays only annunciate "ON-OFF", or "Normal-Alarm", so the information is not as discrete as with other methods, or large numbers of relays are required to annunciate the desired conditions. This may be cost effective where limited numbers of conditions are desired to be annunciated and discrete information is not required. This method allows any addressable fire alarm system to communicate with any BAS.
- **Interfacing FA system with the BAS system via FA dry contacts:** FA panels are equipped with Form "C" dry contacts that activate upon fire alarm or trouble. These contacts can be monitored by the BAS system. The only information that can be transmitted via this method would be which FA panel originated the signal, and that it is in alarm or trouble condition. Specific information on the type of alarm is not available. However, if very discrete information is not required, this configuration would provide the most cost savings on the initial install.
- **Interfacing other systems with the FA system:** It is also possible for fire alarm systems to monitor non-fire alarm devices or systems. NFPA 72 allows non fire alarm devices to be connected to the FA system as long as the activation or failure of the non-FA devices does not impact the ability of the FA system to perform its intended function (ref NFPA 72, section 6.8.4, 2007 edition). This allows devices such as door position switches, carbon monoxide detectors, or process alarms to be connected to FA systems. Fire alarm relays may be necessary to monitor these devices, so information may not be very discrete, or large numbers of relays may be necessary. However, this can be a very cost effective method to monitor other critical alarms/systems for small facilities which do not have BAS systems installed for this purpose.

Careful coordination and study of hardware and programming requirements is necessary in the implementation of the above methods to ensure that information can be shared without compromising the ability of the fire alarm system to operate in standalone mode as required by NFPA 72 and the local building codes. Successful implementation can result in a system which allows for early human intervention to avoid or mitigate costly downtime.