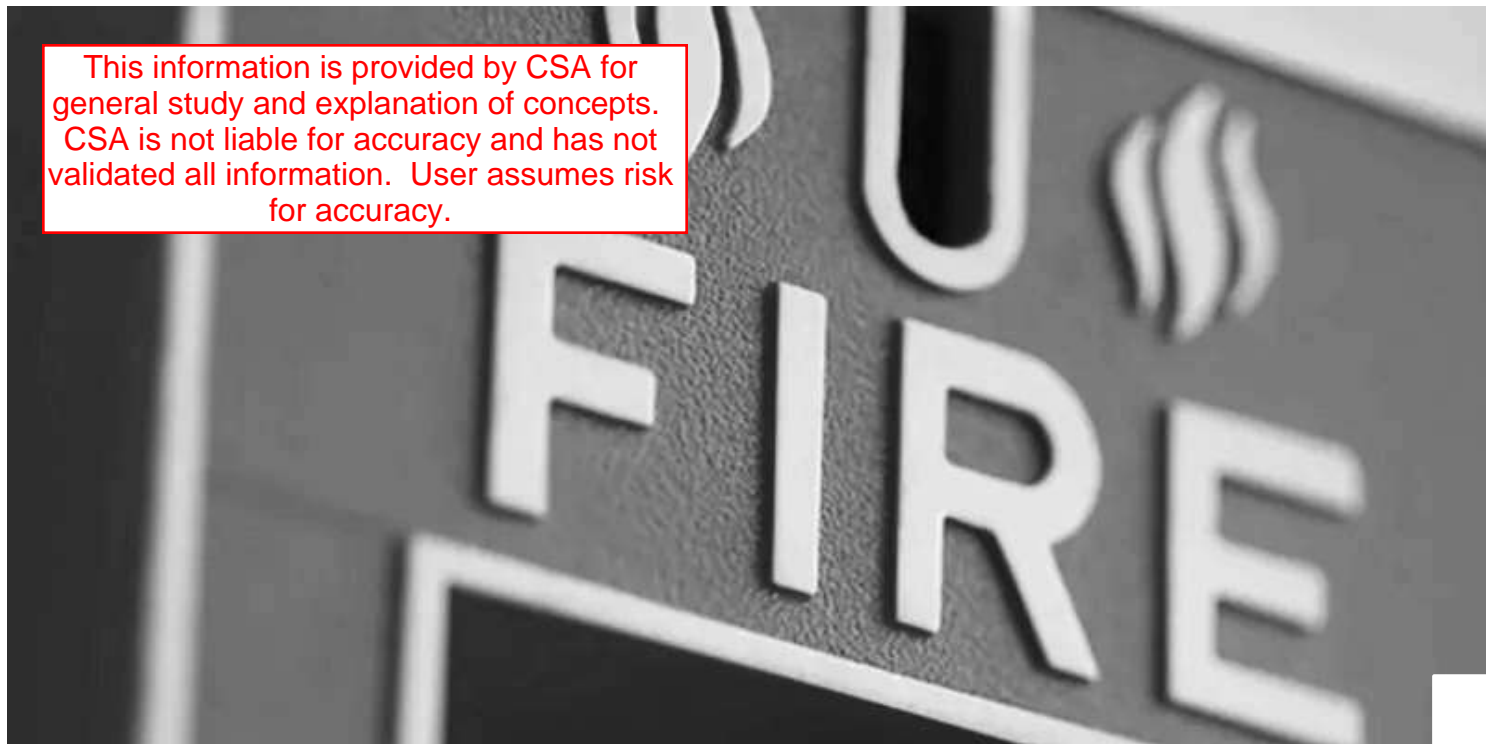




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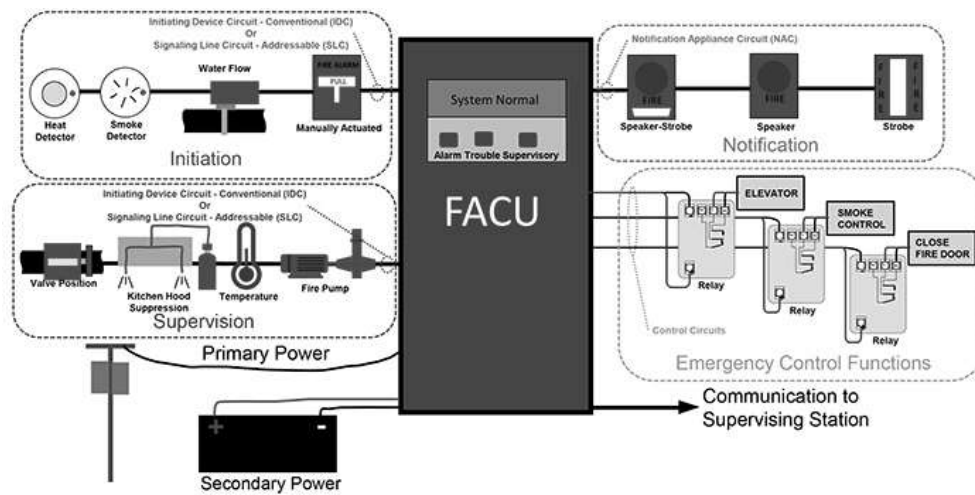
A Guide to Fire Alarm Basics

By Shawn Mahoney

02-Mar-2021

A fire alarm system is a crucial part of the fire and life safety of a building and its occupants. There are many functions that are served by the fire alarm system and it all may be a bit confusing to someone new to fire alarms, so I decided to create a visual guide to fire alarm basics. The objective of this blog is to share that visual guide and to discuss some of the major components and functions of a fire alarm system.





[See larger image](#)

FACU - Fire Alarm Control Unit

The fire alarm control unit serves as the brain of the fire alarm system by monitoring all the inputs and controlling all the outputs. Some may also refer to this as a fire alarm control panel or fire alarm panel. The different types of conditions that can be seen at the fire alarm control unit are Alarm, Supervisory, and Trouble, these conditions can also result in a signal being sent to the supervising station.

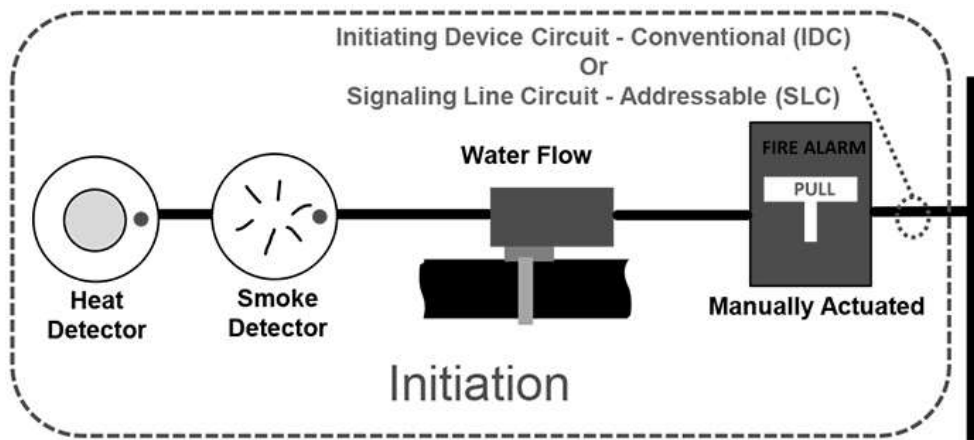
Alarm – An alarm condition means there is an immediate threat to life, property, or mission. An example of this would be a smoke detector sending a signal to the fire alarm control unit that there is a presence of smoke, which would initiate notification to the occupants to evacuate.

Trouble - A trouble condition means there is an issue or fault with the fire alarm system. An example would be a break in an initiating device circuit. This would show up as a trouble signal on the control unit.

Supervisory – A supervisory condition means there is an issue with a system, process, or equipment that is monitored by the fire alarm control unit (see supervision section). An example of this would be a sprinkler system valve being closed, this would show up as a supervisory signal on the control unit. Here is a [blog](#) discussing some of the places you may find a fire alarm control unit.

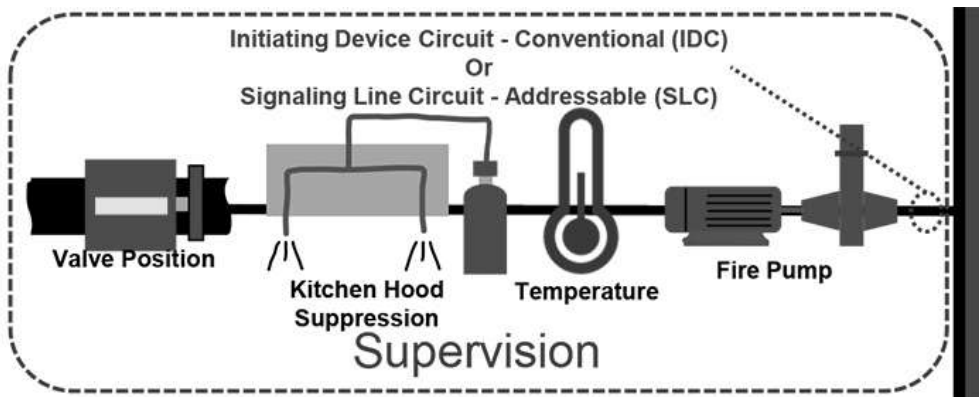
Initiation

The initiation of a fire alarm system includes all the devices and circuits that send a signal to a fire alarm to provide the status of a protected space or the existence of a fire. Initiation devices include, but are not limited to heat detectors, smoke detectors, water flow switches, manually actuated devices, and pressure switches. Depending on the system, the signal from an initiating device can create an alarm condition or a supervisory condition. Based on the type of detectors and fire alarm control unit, the signals can be sent over an initiating device circuit (IDC) for conventional systems, or a signaling line circuit (SLC) for addressable systems. For more information regarding fire alarm initiation, take a look at this [blog](#) I created diving deeper into fire alarm initiation.



Supervision

It is possible to utilize a fire alarm system to monitor the condition of other systems, processes, or equipment that are related to the building's fire and life safety as well as crucial to the mission of the building. Supervision can include but is not limited to valves on fire protection systems, other fire protection systems such as kitchen hood suppression systems, valve room or storage tank temperatures, and fire pump condition issues with these systems would provide a signal to the fire alarm control unit via an initiating device circuit (IDC) for conventional systems, or a signaling line circuit (SLC) for addressable systems and would create a supervisory condition at the fire alarm control unit. For more information regarding fire alarm supervision, take a look at this [blog](#) I created diving deeper into fire alarm supervision.



Power

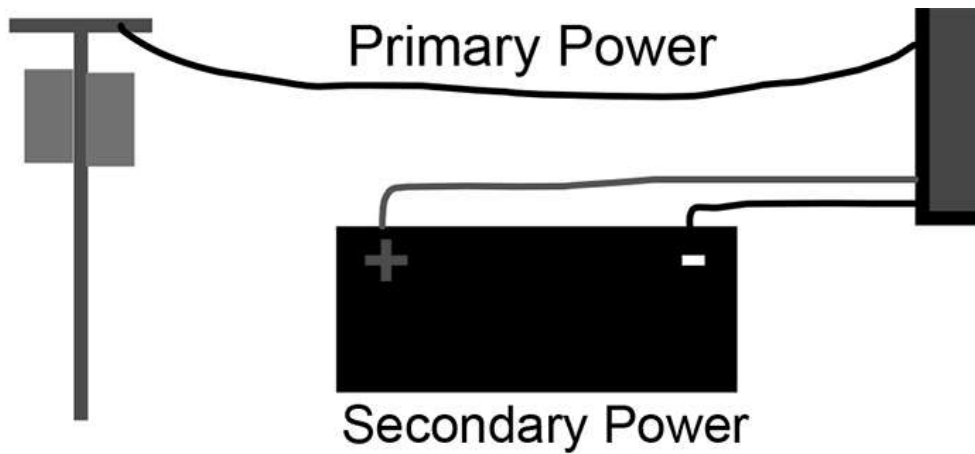
It is important that a fire alarm system be provided with reliable power so it can operate during any emergency. For a deeper dive into fire alarm power supplies including battery calculations, take a look at this [blog](#).

Primary Power

Primary power to the fire alarm system can be provided by the electric utility, an engine-driven generator (this is not a standby generator, however, it is a site generator meeting the requirements in NFPA 72[®], Fire Alarm and Signaling Code[®]), an energy storage system, or a cogeneration system.

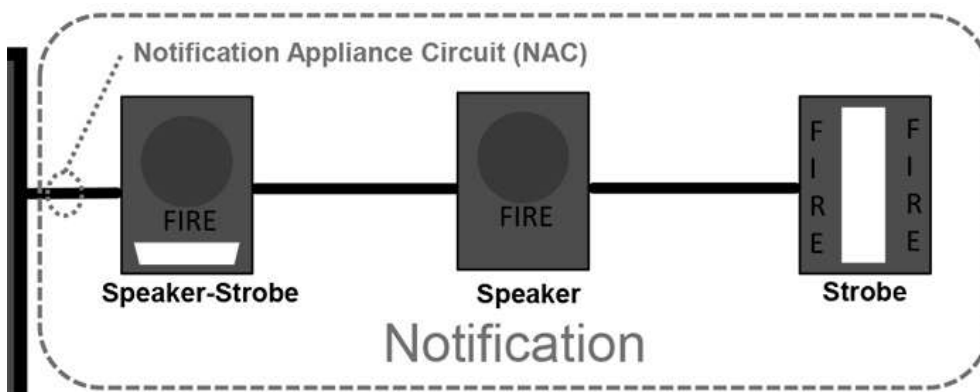
Secondary Power

Secondary power to the fire alarm system can be provided via properly sized batteries, batteries and a standby generator, or an Energy Storage System.



Notification

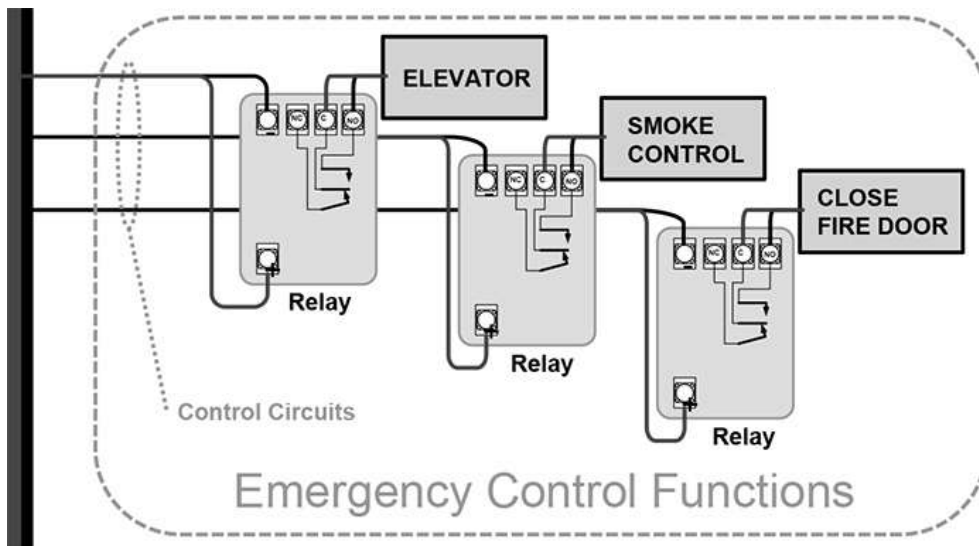
A fire alarm system is able to provide notification to alert the occupants and in some cases on site emergency forces. Notification is provided via visible and audible notification appliances. The visible notification is typically provided via strobes, and audible notification is provided by either speakers, which can provide different tones and voice signals, or horns, which can only provide a single tone. The fire alarm control unit provides the signal to the notification appliances via a notification appliance circuit (NAC). For more information regarding fire alarm notification, take a look at this [blog](#) I wrote on the topic.



Emergency Control Functions

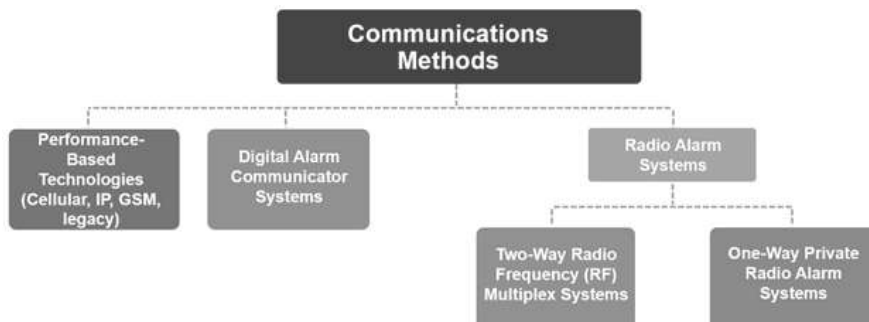
The fire alarm control unit can be used to control the function of other systems such as elevator recall, door closers, smoke control systems, and so on. The most common way that the fire alarm can do this is through the use of a control circuit and a relay. For more information regarding fire alarm emergency control functions, take a look at this [blog](#).





Communication to Supervising Station

Supervising stations monitor the premises and include Central Station Service, Proprietary Supervising Stations, and Remote Supervising Stations. The communication method to those supervising stations is done with the communication methods shown below. Based on the types of signals received from the fire alarm control unit and the type of supervision station, the supervising station may alert the emergency forces or dispatch a runner service to fix a trouble to supervisory condition. For more information regarding off-premises signaling and supervising stations, take a look at this [blog](#).



I hope you found this guide to fire alarm basics informative, would you be interested in some more guides on other fire protection and life safety topics? If so, let me know in the comments below what systems or concepts you would be interested in.

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Fire Alarm Basics Fact Sheet

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Shawn Mahoney

NFPA Technical Services Engineer

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Fantastic information and resource. Thank you for putting this and the associated articles together.

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