

Ultra-high-speed flame detection and releasing system solution: Module enables system to meet 100ms response time requirement

Used with properly designed and third-party-listed flame detection and releasing systems, the Det-Tronics high-speed deluge module helps facilities meet code requirements for ultra-high-speed water spray systems.

Ultra-high-speed deluge systems protect personnel, equipment and buildings from fire and thermal hazards in high-hazard applications — such as, but not limited to munitions — where a fast response time is critical to avert disaster. These systems are designed to respond in milliseconds (ms) by detecting a flame or ignition source in its incipient stage and then extinguishing the threat with large volumes of water.

Some examples of specific codes that address the requirements of flame detection and releasing systems for ultra-high-speed applications include:

- Unified Facilities Criteria — UFC 3-600-01 Fire Protection Engineering for Facilities
- National Fire Protection Association — NFPA 15 Standard for Water Spray Fixed Systems for Fire Protection; and NFPA 72® National Fire Alarm and Signaling Code®

These codes specify that the overall flame detection and releasing system must respond in no more than 100ms from the presentation of an energy source at the detector to the flow of water from the deluge nozzle. In order to meet overall system response time requirements of these codes, it is critical to select the optical flame detection technology that best matches the characteristics of the material of interest. In addition, the flame detection and releasing system must be capable of detecting an event and providing a signal to the deluge system to initiate water flow in compliance with industry codes.

What is a “listed system” and why is it important?

Many codes and standards require that fire alarm systems be “listed” by a Nationally Recognized Testing Laboratory (NRTL). A fire alarm system listed by a NRTL has been designed for reliable performance during a most critical time. Complying with these codes is the basis for good engineering practices and ultimately supports fire prevention and protection.

For example, the Unified Facilities Criteria UFC-3-600, 9-18.12 requires panels used for control or release of fire suppression systems to be listed by a NRTL. NFPA 72®: 2016, 23.11 requires releasing devices for suppression systems to be listed for use with releasing service alarm control units. Codes are typically enforced by Authorities Having Jurisdiction (AHJ).

Ultra-high-speed deluge system components

Typical components of ultra-high-speed deluge systems include ultraviolet (UV), infrared (IR) or UV/IR optical flame detectors, an electronic controller, a squib or solenoid-operated valve, a pre-primed deluge piping system with nozzles, and a water supply. While the speed of flame detector response is important for high-hazard applications, the response speed of the entire system is the most-critical metric.

New deluge module meets ultra-high-speed response standards

The new high-speed deluge module (HSDM) from Det-Tronics expands the capability of the Det-Tronics Eagle Quantum Premier® (EQP) safety system so it can activate ultra-high-speed suppression systems for high-hazard applications.

The 12-channel HSDM is designed to respond to an input in 2ms. When used with Det-Tronics optical flame detectors, the HSDM can help achieve system response times of less than 15ms in ideal conditions.

The HSDM's six input and six output channels are configurable. Each input channel accepts contact closures from fire detection devices such as optical flame, heat and smoke detectors, as well as manual pull stations. Output channels are designed to activate third-party-approved solenoids used to initiate operation of pilot-actuated deluge valves. The HSDM ensures system operation through continuous supervision of all inputs and outputs. Thanks to a unique cascade output feature, the output of one HSDM can be connected to another HSDM, allowing the system to activate additional solenoids with a single input.

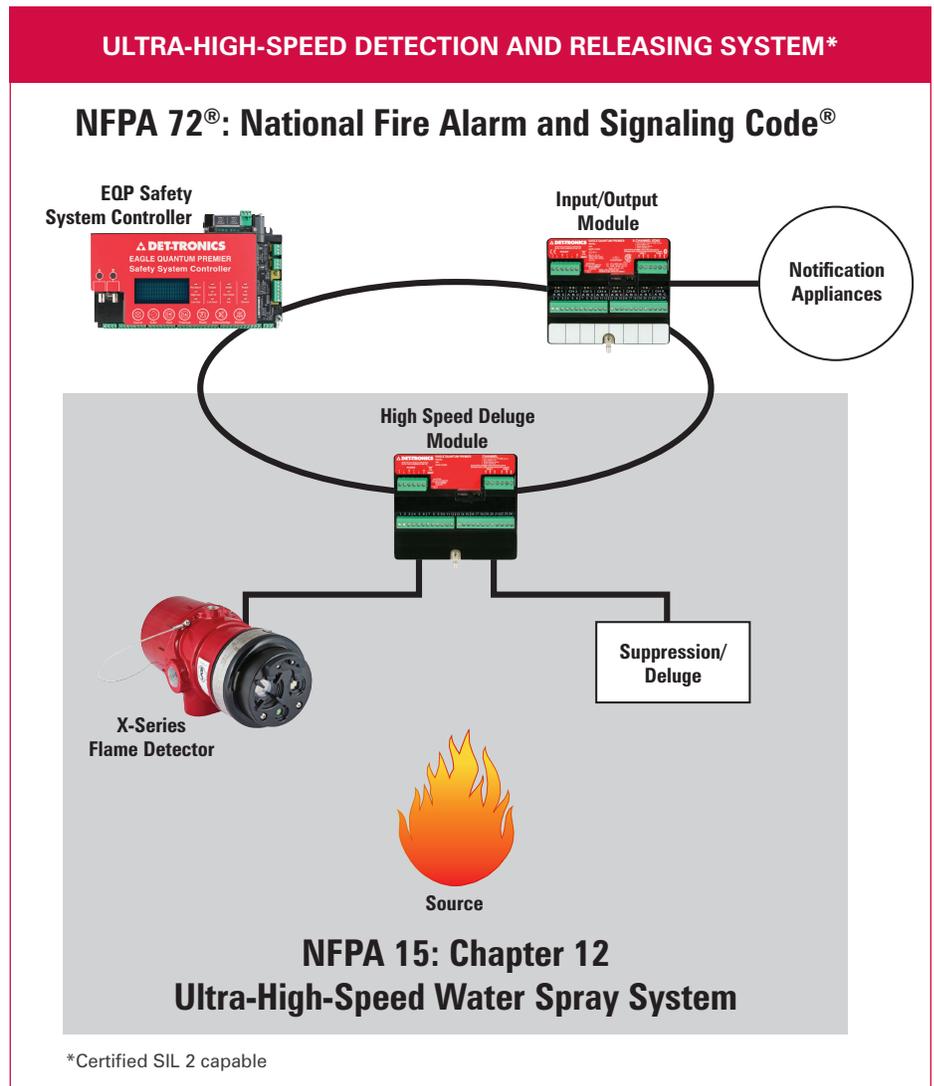
In addition to playing a key role in ultra-high-speed deluge response, the HSDM uses Class A fault-tolerant messaging to communicate with the EQP safety system controller. The HSDM sends priority signals to the EQP controller via a local operating network/signaling line circuit that provides Class X monitoring of the HSDM/controller connection.

How it works

As an ancillary component of the EQP, the HSDM sends information regarding alarm and fault status, as well as important internal functions, to the EQP safety system controller. When the EQP controller receives a priority message from the HSDM, it uses pre-programmed logic to determine the next actions. Typical actions include sending signals to an enhanced discrete input/output module that activates notification appliances.

Alerts can also be sent to building security guards, police and fire departments, and others that should be informed of a fire-related event.

Thanks to its speed and range of functions, the HSDM can help people who work with and are responsible for some of the most dangerous industrial settings comply with UFC and NFPA standards.



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About Det-Tronics

Det-Tronics is a global leader in fire and gas safety systems, providing premium flame and gas detection and hazard mitigation systems for high-risk processes and industrial operations. The company designs, builds, tests and commissions SIL 2 Capable flame and gas safety products ranging from conventional panels to fault-tolerant, addressable systems that are globally certified. Det-Tronics is a part of Carrier, a leading global provider of innovative HVAC, refrigeration, fire, security and building automation technologies.

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