



FlameRanger™

Autonomous Robotic Fire Suppression (ARFS) System

FlameRanger™ systems. The world's most advanced autonomous robotic fire suppression (ARFS) systems for waste, recycling and industrial special-risk fire protection.

FlameRanger™ is engineered to automatically detect, locate, track, and suppress fires in seconds, with a high volume of water or foam. FlameRanger™ is trusted by leading operators of waste and plastic recycling centres, and waste-to-energy plants. It is also ideal for battery storage facilities, aircraft hangars, logistics warehouses, and many other high-risk environments.

Combining high-performance fire detection with intelligent location algorithms, and advanced, precision robotic water cannons, FlameRanger™ is a powerful, cost-effective, and scalable solution that radically improves fire safety while minimising false alarms and human error.

Unifire FlameRanger™

nobel-fire-systems.com



The FlameRanger™ System

At the heart of the FlameRanger™ autonomous robotic fire suppression system is a unique integration of advanced fire detection technology with Unifire's stainless steel water cannons.

The system continuously monitors for fire around the clock. Upon fire detection, it instantly calculates the fire's location, directs the robotic nozzle(s) to the source, and intelligently guides a high volume of water or foam suppression stream-typically within 10-15 seconds from ignition. The system intelligently suppresses the fire and shuts off shortly after the fire is extinguished.

All of this happens without human intervention, 24/7/365-yet a human operator can also take control of the robotic nozzles at any time.

Unlike systems that rely on conventional smoke, heat, or static flame sensors combined with fixed spray nozzles or deluge zones, FlameRanger™ provides faster response, precision targeting around and directly over the fire, and significantly higher suppression efficiency.



Market Applications



Waste and Recycling



Waste to Energy



BESS



Marine & Offshore



Warehousing & Logistics



Industrial Manufacturing



Tunnels



Aviation Hangars



Infrastructure

FlameRanger™ is ideal for industries with fast-moving processes, combustible materials, or storage of high-energy fuels and components.

- **Waste & Recycling Facilities.** Paper, plastic, e-waste, RDF, tyre and metal processing
- **Waste-to-Energy Plants.** Fuel bunkers, conveyors, boiler rooms and tipping areas
- **Battery Energy Storage Systems (BESS).** Cooling and water barrier to mitigate propagation
- **Marine and Offshore.** Weather decks of ro-ro ferries, cargo holds and machinery spaces
- **Warehousing.** High-risk storage including military and hazardous materials
- **Industrial Manufacturing.** Cement plants, biomass, chemicals and wood processing
- **Tunnels.** Road and rail tunnels
- **Aviation Hangars.** For construction and storage of aircraft and helicopters
- **Infrastructure.** Port facilities and transit depots



FlameRanger™

Smarter, Faster, Safer Fire Suppression

- **Autonomous operation.** Instant detection and suppression without human error.
- **Systems on 6 continents.** Over 200 systems currently protecting facilities. FlameRanger™ is proven in harsh environments across a wide range of applications.
- **Precision targeting.** Pinpoint suppression around and on the source of fire with powerful robotic nozzles, keeping collateral water damage and toxic runoff to a minimum.
- **Flexible Integration.** Compatible with all third-party thermal cameras, flame detectors, video analytics, linear heat detection systems and other detection technologies.
- **Scalable architecture.** From a single monitor to large multi-zone systems with dozens of cameras and nozzles.
- **Rapid response.** Typical fire detection and suppression within 10 to 15 seconds.
- **Minimal false alarms.** Advanced algorithms and design substantially reduce the risk of nuisance activation.
- **Remote control option.** Although fully autonomous, operators can control the robotic nozzles at any time using a CANbus joystick, wireless radio remote control, or via the proprietary ONE App.
- **Remote commissioning & technical support.** Built-in web server enables worldwide tech support.
- **Unmatched control interfaces.** Ammolite™ GUI simplifies setup, diagnostics, and maintenance.
- **Future-ready.** State-of-the-art electronics and software developed by Unifire in Sweden, FlameRanger is flexible, networkable, customizable and ready for future adaptations.
- **No Recurring Fees associated with FlameRanger.** Including the ability to remote control the robotic nozzles from on or off site.

FlameRanger™

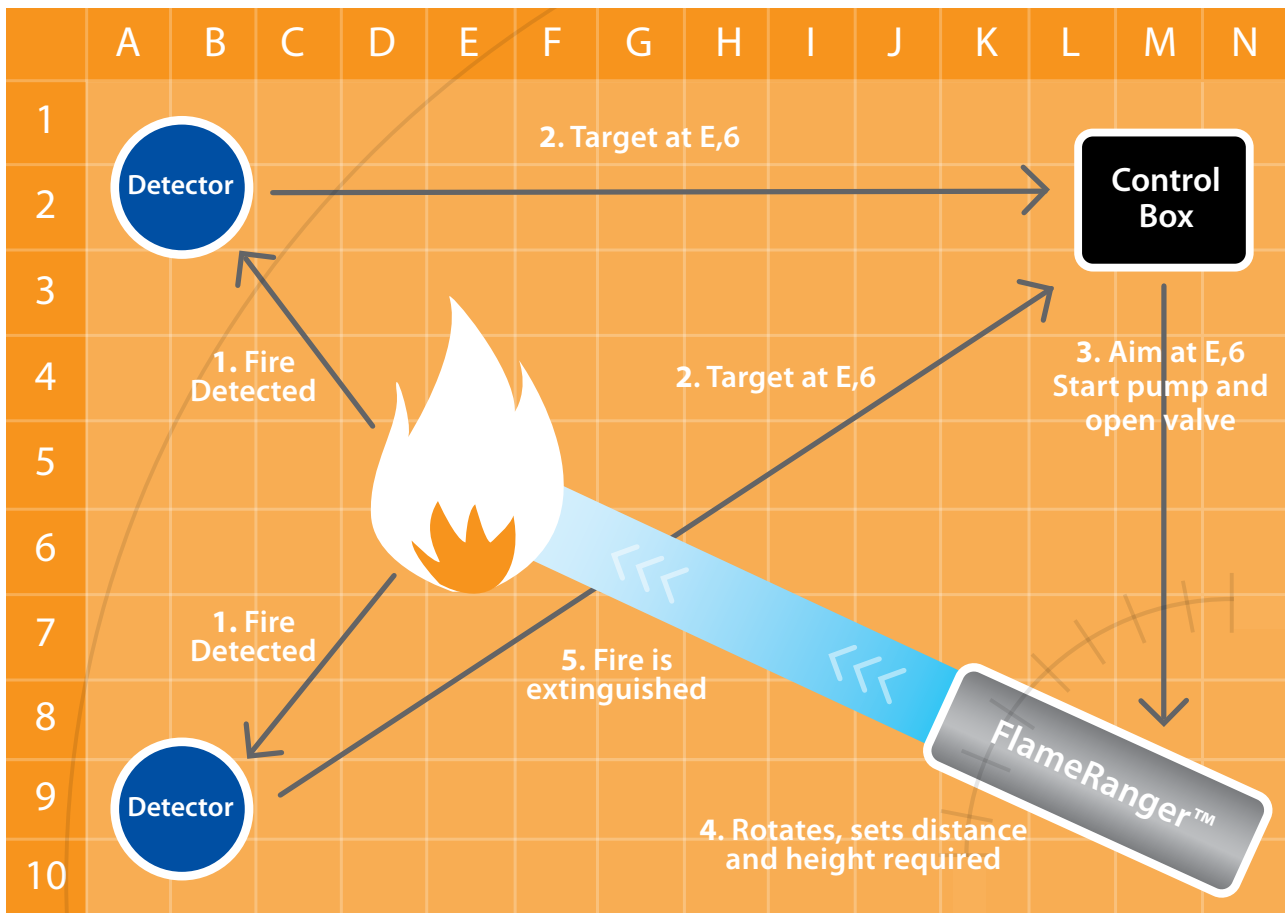
How the system works

The system uses one or more fire detection technologies to almost instantaneously detect a fire or heat buildup.

When a fire is detected, the system guides the advanced robotic nozzles to aim at the fire and open the valve (or start the pump) when the nozzle is aimed at the target fire.

A large flow of water (or foam) is then accurately aimed directly around and onto the target fire (or fires). The spray angle is also automatically adjusted. The stream is intelligently guided to efficiently suppress the fire.

When fire is no longer detected, the system automatically shuts off and returns to stand-by mode, and the water supply closes automatically, takes the robotic nozzle back.



Unifire's 3D Dynamic systems uses highly effective triple-IR (IR3) detectors, that provide the fire's x,y coordinates. The system triangulates the third dimension, giving the exact size and position of the flame.

Detectors



FlameRanger™



Software



Comparison with Conventional Methods

Conventional systems, whether fixed deluge, spark detection with spray zone or thermal camera-triggered cannons, often suffer from one or more limitations: slow response times, high false alarm rates, limited coverage, manual control requirements, or ineffective blanket suppression.

FlameRanger™ overcomes all these challenges

- Real-time dynamic fire detection and suppression capabilities
- Intelligent 3D targeting. We also offer 'zone based' systems
- True and total autonomy. No operator required
- Minimal water usage through precision aim and automatic shut-off
- Custom system designs tailored to each customer's risks and challenges
- Integrated control of multiple zones and detection methods

The Result. Faster suppression, reduced risk, and lower damage and downtime.

Comparison with Competitive Systems

Developed by Unifire in Sweden, no other system comes close.

FlameRanger™ advantages include

- The only fully three-dimensional, dynamic system
 - Ability to combine detection technologies
 - The most advanced remote control features: CANbus joystick, radio remote control, Unifire's ONE App for iOS/Android devices, and/or ONE-Web and ONE-Direct for easy and intuitive control by computer over a secure network from anywhere in the world
 - No recurring fees after initial purchase
 - Lifetime technical support
 - Remote commissioning and technical support anywhere in the world
 - Networkable for high-level intelligence combining multiple systems
 - Highly customizable to provide the most effective solution for virtually any risk and facility
 - The world's highest quality robotic nozzles. Made from stainless steel 316L. Featuring industrial robotic brushless (BLDC) motors, providing 10,000 hours life expectancy.
 - Exceptionally low maintenance-even in the harshest industrial and marine environments
 - Highly reliable and proven at facilities around the world
 - Extensively tested by world renowned fire testing labs and authorities.
 - Over 200 systems in current use on 6 continents, and growing rapidly
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FlameRanger™

Protecting People, Property and Business Continuity

In high-risk environments where seconds count, FlameRanger™ provides the peace of mind that comes from knowing that fires will be automatically and immediately suppressed, 24 hours a day, 7 days a week.

Whether you manage a waste or recycling facility, a waste to energy facility, a battery energy storage site, a marine vessel, or high-risk storage facility, FlameRanger™ ensures your assets, operations, and personnel are protected by the world's most advanced fire suppression systems. Combining high-performance fire detection with intelligent location algorithms, and precision robotic water cannons, FlameRanger™ is a powerful, cost-effective, and scalable solution that radically improves fire safety while minimising false alarms and human error.

Key Benefits

- Proven worldwide in critical risk sectors
- Flexible and modular for any facility layout
- Fully autonomous - no delay or operator risk
- High-precision targeting of fire source
- Advanced fire detection and minimal risk of nuisance alarms
- Integrates with existing safety and alarm systems
- Customised designs and scalable solutions
- Significantly reduces water usage and toxic runoff / environmental damage
- Backed by Nobel Fire Systems' expert support in the UK

FlameRanger™
Water test at a waste client site



To view the video
[click here](#)

To visit the Nobel website
[click here](#)



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