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FlameRanger

Autonomous Robotic Fire Suppression System

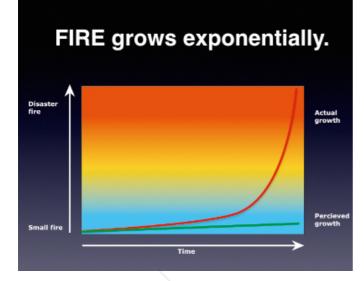
Introducing the world's most advanced, fully autonomous fire detection and suppression systems combining stateof-the-art flame detection with advanced, high flow robotic nozzles.



Made in Sweden

Welcome to 21st Century Firefighting!

Traditional Method, with a 21st Century Kick



The Problem

Fire grows exponentially quickly. Traditional methods often result in late detection of a fire and long waits until adequate suppression can begin. By that time, loss to property and life can be catastrophic.

The Solution

Rapid detection, coupled with rapid, high-flow suppression, is the key to maximizing the chances of successfully fighting a fire—<u>before</u> it spreads out of control.

Enter FlameRanger. It constantly detects for the presence of flames, 24/7/365. Any fire that breaks out is detected almost instantaneously. Unifire's sophisticated computing and software technology intelligently guide its advanced robotic nozzles with precision to aim a high volume of water or foam to directly suppress the fire (or fires) at its source. Fire suppression commences in as little as 5 seconds, and typically in less than 15 seconds.

Problem \rightarrow Solved.

Suppress While the Fire is Small!

Example: small (1m²) pan fire detected from 58 meters.

Fire typically detected, targeted, and suppression commenced in *less than 15 seconds from fire ignition*.

> Click to Watch the Video on YouTube.

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Detect, Locate, Aim, Suppress, Automatically, Robotically, 24/7/365.



Enter the Age of Robots

FlameRanger is a unique and first-of-its-kind autonomous robotic fire suppression system that automatically detects a fire, determines its location, and intelligently directs a high volume of water or foam directly onto and around the fire to suppress it with betterthan-human performance—and all within seconds of a fire breaking out, and without any human intervention.

Unifire's FlameRanger[™] is the World's Most Advanced and Flexible Intelligent Firefighting Robot



1 Detect

Using the best fire detection technology(ies) for the job, rapidly and reliably detect a fire with an absolute minimum risk of false alarms.

2 Locate

3 Aim

Locate the fire with as much accuracy as possible, preferably in three-dimensions with real-time tracking.

Intelligently aim the robotic nozzle at the fire and its surroundings and adjust the spay angle according to its distance from the nozzle. When allowed by the detection technology, achieve dynamic fire suppression based on 3D location and real-time tracking.

4 Suppress

Suppress the fire with 1000 to 5000 liters (365 to 1320 gallons) per minute of water or foam. Numerous robotic nozzle configurations, nozzle tips, swing arms and booms are available to accommodate any installation requirements.

...and do it all within seconds!

5 Stand-by

Shortly after the fire has been extinguished, the system automatically shuts off the water (or foam) supply, takes the robotic nozzle to stow position, and continues actively detecting for any new fires, ready to respond immediately if detected.

Swedish Quality & Technology, Unleashed

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So, What Is It, Exactly?

With regard to robots, in the early days of robots people said, 'Oh, let's build a robot' and what's the first thought? You make a robot look like a human and do human things. That's so 1950s. We are so past that. Neil deGrasse Tyson

Fire starts out small, but then grows exponentially quickly. Extremely rapid detection and suppression are crucial to successfully fighting a fire, before it has a chance to develop into a catastrophic, uncontrollable fire. FlameRanger detects & fights fires at their source in seconds from ignition, with better-than-human control!

What FlameRanger Does:

FlameRanger is a Swedish autonomous robotic fire suppression system ("ARFSS"). It is designed to rapidly detect a fire, locate it, and begin suppressing it with a high volume of water or foam, typically in less than 15 seconds of fire ignition. FlameRanger operates completely autonomously around the clock, but also allows human operators to remote control the robotic nozzles at any time.

How it Works:

FlameRanger uses any one or more third-party fire detection technologies to rapidly and reliably detect and locate fire. Detection capabilities are unlimited, but most often include IR3 flame detectors, thermal imaging cameras, video analytics, hybrid thermal imaging / video analytics, hybrid flame detection / video analytics, or combinations of these. Unifire works with you to determine the best detectors (or combination of detectors) for your needs.

When a flame is detected, FlameRanger commences suppression and intelligently guides Unifire's advanced Force[™] robotic nozzles to aim at the fire. A high flow of water (or foam) is accurately aimed directly onto and around the target fire (or fires). The spray angle is also automatically adjusted depending on the distance of the fire from the robotic nozzle.

When the fire is out, the system automatically shuts off and returns to stand-by mode, ready to reactivate should a new fire be detected.

Human Remote Control at Any Time:

The FlameRanger robotic nozzles can be manually remote controlled at any time, regardless of whether a fire has been detected or not. FlameRanger provides all of the benefits of a traditional remote control fire monitor system coupled with nearly instantaneous and fully autonomous fire detection and suppression with the reliability of cutting-edge robotics and fire detection technologies. Take control via Unifire's joysticks, ONE App for iOS and Android, and/or by computer.

Ammolite[™] Graphical User Interface (GUI):

Unifire's Ammolite[™] Graphical User Interfaces (GUI) provides easy system setup and calibration, real-time status and data of all system components, and system remote control.

Remote, World-Wide Commissioning & Technical Support

Unifire can provide remote commissioning and technical support to any system in the world, in real time, without incurring travel expenses and delays. With minimal assistance from our customers, we can log in to your FlameRanger system and commission, troubleshoot, assist with system settings, update software, etc., resulting in rapid intervention, significant cost savings and reduced potential system downtime.

A Melange of Technology, Seamlessly Blended





Unifire Force™ Robotic Nozzle

Industrial robot BLDC motors, highest quality internal gears, stainless steel 316L construction. Flows from 800 to 5000 litres (210 to 1320 gallons) per minute.

Combine 1 or More Proven Fire Detection Technologies, Minimalize False Alarms

FlameRanger is extremely flexible and works with a wide variety of proven and tested third-party fire detection technologies to offer the best solution possible for your individual needs and preferences, including 3IR flame detectors, thermal imaging cameras, video analytics, hybrid thermal imaging and video analytics, linear heat detection, and more.



TARGA - Advanced Computing & Software

Unifire's in-house developed TARGA PLC and software provide the world's most advanced autonomous robotic fire suppression systems, technology and inSeamlessly enable interactive data and control from any authorized device anywhere in the world.



ONE App & Ammolite Graphical User Interfaces

Complete monitoring and control





Tested, Proven & in Operation in Over 130 Installations on 5 Continents









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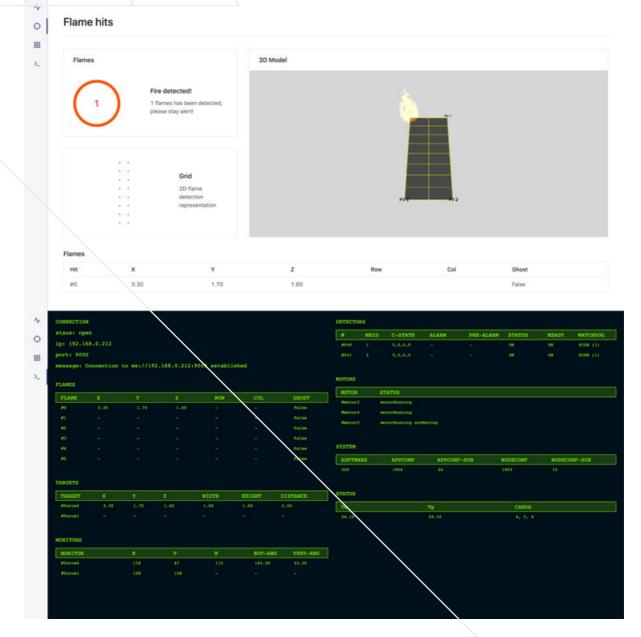




Full Situational Awareness

While completely autonomous and fully automatic, Unifire's Graphical User interface (GUI) can inform authorized personnel anywhere in the world of real-time system status, fire alarms, and take complete remote control.

FLAMERANGER



Reliable in the Harshest Environments







Take Remote Control at Any Time, Anywhere!

Although FlameRanger reacts in seconds to intelligently suppress fires, a human operator can take control of the robotic nozzle (fire monitor) at any time, regardless of whether the system has detected a fire or not.





Unifire's remote control capabilities are unmatched. FlameRanger systems can be networked, monitored, and even manually remote controlled from any authorized device—smart phone, tablet, laptop, or PC. Use one or an unlimited number of devices and controllers to take remote control—**from anywhere in the world via a secure connection!**





Remote Commissioning & Technical Support

At the user's request and assistance, Unifire can remotely commission systems, saving you valuable time and money. Our technicians can even adjust settings, update software, and provide full technical support intervention, al via the Internet, instantaneously from Sweden to any location on Earth!



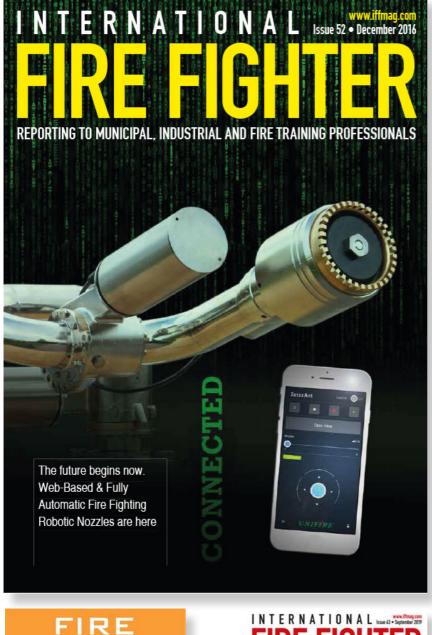
Self-Monitoring & Alerts



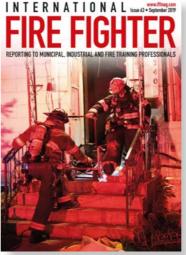
The FlameRanger system is self-monitoring and capable of alerting local fire authorities and other authorized individuals of fires detected as well as any system errors that require attention.

Making Headlines!

FlameRanger is making news across the firefighting industry. Check out some of the numerous articles written about us at https://unifire.com/news/









he fires on ro-ro ships that carry wheeled cargo te lorries and cars have been in the spotlight in sorth years. The 2019 Annual Report of The lordic Association of Marine Insurers points to he high fire frequency in the car/to-ro category. fore than 1 % of vessels in this segment.

All Data. All the Time. At Your Fingertips.

IR Processes	System monitoring	System
		Dashboard 6.42.3
	CPU ARMv7 Processor rev 5 (v7t)	Backend 3.5.4 Restart
		OS Linux
		Php 7.0.33-0+deb9u3
		Targa Software 309
		Nodeconf 7367
	Memory	Sub Nodeconf 8
	Random Access Memory	Appcont 7367
	926 MB	Sub Appcont 8
	Total memory	Processes
		User pid CPU Memory Process
	Allocated Cached Available	
	39 MB 781 MB 718 MB 4% 84% 78%	
		No Data
		- HO Main
		Volumes
	System Uptime	



A Simple User Interface for Exquisite Nozzle Control



Unparalleled Quality DS/EN ISO 9001:2008 Certified Manufacturing Facilities

SV:

Unlimited Applications



Recycling & Waste Facilities

Plastic Recycling & Waste-to-Energy (WtE), facilities all require 24/7/365 protection, with immediate reaction to fire. FlameRanger is ideally suited for a variety of waste and recycling facilities and applications.



Marine Fire Protection

Aircraft carriers and other large storage areas on naval vessels and ships present a significant challenge to fire safety. FlameRanger provides ideal automatic fire protection on the high seas.



Aircraft Hangars

Trust FlameRanger to protect even the highest value aircraft and hangar facilities. Our system detects fires around the clock and, in seconds of breakout, deploys a high volume of foam, directly on the fire, until it's out!



Coal Storage

FlameRanger detects and suppresses heat buildups with targeted focus. A human operator can intervene at any time, whether or not an alarm has triggered automatic function.



High-Rise Building Exteriors

Protecting the exteriors of high-rise buildings is a formidable challenge. Until now. Unifire's FlameRanger XT has been specifically developed to detect and suppress these fires with speed & precision.



Tunnel Fire Protection

Tunnel fires are among the most difficult to combat and among the most destructive in terms of loss of life and property. FlameRanger is like having a firefighting crew on site the moment fire erupts.



Historical Buildings

FlameRanger is ideal for protecting rare and valuable historical buildings around the clock. Made for outdoor, harsh environments, our systems are designed to react immediately and autonomously.



Factories & Warehouses

Traditional methods of protecting large open spaces in building interiors from fire are often ineffective. FlameRanger offers unprecedented fire protection capabilities in these environments



Oil & Gas Facilities

Unmatched detection & suppression for oil & gas facilities of many kinds. Targeted, high-volume foam suppression begins in seconds of a fire breaking out. Large networked systems centrally monitored & controlled.

... and many more



Shift Your Paradigm.

The FlameRanger can be adopted to numerous types of installations to suit virtually any application.



Global Service

FlameRanger is available around the globe.

From initial consultation to project planning, sales, installation, support and service, Unifire and its world-class partners can assist around the globe.

Contact us. Unifire.com Unifire AB, Bultgatan Sweden, SE442-40 Kungälv, Sweden Sales@Unifire.com

