# **Spectrum Safety Solutions: A Comprehensive Product Portfolio Analysis**

## **Executive Summary**

This report provides an exhaustive analysis of the complete product and service portfolio of Spectrum Safety Solutions, a global leader in specialized safety solutions for high-hazard and mission-critical environments. Established in July 2024 following its acquisition by Sentinel Capital Partners, Spectrum Safety Solutions consolidates four iconic, market-leading brands: Autronica, Det-Tronics, Fireye, and Marioff.1 Headquartered in Stamford, Connecticut, the company leverages the distinct expertise of its subsidiaries to offer a comprehensive suite of advanced lifecycle solutions targeting the global critical infrastructure, marine, and energy sectors.1

The collective portfolio represents a synergistic offering covering the full spectrum of hazard management:

* **Autronica** delivers advanced, interactive fire and gas detection systems, specialized marine and offshore detection equipment, and integrated emergency management and voice alarm systems.
* **Det-Tronics** specializes in certified, high-reliability flame and gas detection and hazard mitigation systems engineered for the most demanding industrial applications, including explosion-proof environments.
* **Fireye** is a foundational brand in combustion control, providing a complete ecosystem of flame safeguard controls, burner management systems, and flame monitoring devices for industrial and commercial processes.
* **Marioff** is the global pioneer and leader in high-pressure water mist fire suppression technology, marketed under the HI-FOG® brand, offering solutions that minimize collateral damage in high-value land and marine applications.

This report details over 200 distinct products and systems across these four business units, including current-generation technology, documented obsolete products, and official upgrade paths. The analysis covers product specifications, technological underpinnings, key certifications, target applications, and market availability, presenting a definitive business intelligence resource for stakeholders, clients, and industry analysts.

## **Important Clarifications on Naming and Scope**

To ensure clarity and precision, this report first addresses and dismisses potential brand confusion arising from similarly named entities in the market. The scope of this analysis is strictly limited to Spectrum Safety Solutions and its four subsidiary brands as defined in the corporate structure.

* **Spectrum Safety Solutions:** The subject of this report is the global industrial safety company headquartered in Stamford, Connecticut, formed in 2024 and comprising the brands Autronica, Det-Tronics, Fireye, and Marioff.1 This entity is distinct from and unrelated to:
  + **Spectrum:** The US-based telecommunications and media company.5
  + **Spectrum Safety:** A UK-based supplier of personal protective equipment (PPE) and workwear.6
  + **Spectrum Safety Inc.:** A US-based consultancy specializing in radiation safety programs and compliance.7
* **Fireye:** The brand within the Spectrum Safety Solutions portfolio is a historic manufacturer of flame safeguard and combustion controls for industrial and commercial burners, with roots dating back to the 1930s.1 It is entirely separate from:
  + **FireEye:** The cybersecurity company, now part of Trellix, which specializes in threat intelligence and cyber-attack prevention.10
* **Det-Tronics:** The Spectrum brand specializing in industrial fire and gas detection is Detector Electronics Corporation, commonly known as Det-Tronics.12 It has no affiliation with:
  + **Daktronics:** A manufacturer of large-format LED video displays and scoreboards.14
  + **TDK:** A multinational electronics corporation.15

These distinctions are critical for an accurate assessment of the company's market position and product portfolio. The remainder of this report will focus exclusively on the products and specifications of Spectrum Safety Solutions and its designated brands.

## **Section 1: Autronica Product Portfolio**

Autronica stands as a premier innovator and supplier of fire and gas safety systems, with a comprehensive value chain—from concept and development to manufacturing and service—headquartered in Trondheim, Norway.1 The brand's products are engineered to ensure safety in demanding applications across land, sea, and the petrochemical, oil, and gas sectors.16 The portfolio is logically segmented into integrated detection systems, a wide array of sensing technologies, specialized equipment for marine and offshore environments, comprehensive system components, and advanced presentation and alarm systems. This structure allows Autronica to offer scalable solutions, from small-to-medium commercial installations to the largest and most complex industrial facilities.

### **1.1 Fire and Gas Detection Systems**

Autronica’s core offering is centered around two scalable fire detection system platforms, AutroSafe and Autroprime, which serve different segments of the market. This tiered approach enables the company to provide solutions appropriate for a wide range of project sizes and complexities, from commercial buildings to high-hazard offshore installations.

* **AutroSafe 4 System:** This is Autronica's high-end, interactive fire detection system designed for large and complex buildings, as well as the most demanding industrial environments.1 Since its introduction in 1999, it has been installed in over 15,000 locations worldwide, including cruise ships and offshore drilling platforms.18 The system is built for maximum reliability and is expandable via the AutroNet high-speed, redundant network, which can connect up to 64 system units (panels and controllers).18 Key variants include:
  + **AutroSafe 4 Integrated Fire and Gas (IFG) Panels:** These panels are Safety Integrity Level 2 (SIL 2) approved, making them suitable for critical safety functions in the offshore oil and gas industry.1
  + **AutroSafe 4 Maritime Gas (MG) Panels:** These are specifically designed to meet the unique requirements of maritime environments.1
  + **BS-420 Fire Alarm Control Panel:** The primary control panel within the AutroSafe system, providing full operational capabilities for one or more defined zones.18
* **Autroprime 2 System:** This system is positioned as the solution for small-to-medium-sized installations, offering a cost-effective yet powerful interactive fire detection platform.1 It provides a scalable entry point into Autronica's ecosystem for less complex projects.
* **Obsolete Fire Detection Systems:** The portfolio acknowledges the existence of legacy systems that have been superseded by the current AutroSafe and Autroprime platforms.1

### **1.2 Detection and Sensing Technologies**

Autronica manufactures a comprehensive range of detectors and sensors, all featuring the proprietary DYFI+ filtering technology. This advanced feature uses a combination of transient, pollution, and smouldering filters to intelligently analyze environmental phenomena, which significantly enhances detection speed and accuracy while minimizing the risk of costly unwanted alarms from sources like steam or cigarette smoke.19

* **AutroGuard® Multicriteria Protectors:** Marketed as a "new generation of technology," this device is more than a detector; it is a "protector" that integrates fire detection and local warning capabilities into a single unit, simplifying installation and commissioning.1 This product represents a strategic shift towards more intelligent and multi-functional endpoint devices.
* **Optical Smoke Detectors:** These are the standard detectors for most common areas. They operate by detecting the scattering of light caused by smoke particles entering an optical chamber.1
* **Heat Detectors:** Utilized in environments where smoke detectors are unsuitable, such as kitchens or areas with normal smoke-like fumes. They can be configured to trigger an alarm based on a fixed temperature threshold or a rapid rate of temperature rise.1
* **MultiSensors:** These devices combine both heat and optical smoke detection technologies. This dual capability makes them highly effective in detecting a wide range of fire types, particularly in complex scenarios where a flaming fire might produce significant heat before generating dense smoke.1
* **Flame Detectors:** These detectors are designed to sense the specific radiation signatures emitted by flames, including ultraviolet (UV), infrared (IR), or a combination of both.1 The product line is tiered to address different market needs:
  + **AutroFlame Triple IR Flame Detector:** A sophisticated detector designed for the combustion of carbonaceous materials.1
  + **Multispectrum IR Flame Detectors:** High-end, EX and SIL 2 approved detectors for the most critical maritime and offshore applications.1
  + **Single IR and Dual IR Flame Detectors:** More economical and reliable options for commercial land, maritime, and offshore applications where the highest level of certification is not required.1
* **Detectors for Special Requirements:** A category of detectors designed specifically for challenging environmental conditions, reinforcing the brand's focus on robust solutions for high-hazard industries.1

### **1.3 Omicron Special Detection for Marine & Offshore**

The Omicron product line is a highly specialized portfolio of measuring and detection equipment designed exclusively to meet the rigorous demands of the marine and offshore industries.1 This focus on a specific vertical market demonstrates deep domain expertise and allows Autronica to provide tailored, high-performance solutions for high-risk assets like LNG carriers, FPSOs, and chemical tankers. Since 2018, the production and sales rights for the OVS and OAS systems have been held by FOSSTECH AS, a key detail for procurement and lifecycle support.20

* **Point Gas Detection System – OGS 2.1:** Provides fast and continuous gas detection for high-risk areas. It utilizes components such as the AutroPoint maritime gas detector, a diffusion-based infrared sensor for flammable hydrocarbon gases.1
* **Gas Sampling Systems – OGS 3.1 / OGS 3.11:** These are comprehensive systems for gas sampling applications where direct detection is not feasible. They include specialized detector cabinets and sampling points.1
* **OGS Shale Shaker:** A unique and innovative direct gas sampling system engineered for extremely harsh oil and gas environments, such as shale shaker ventilation channels, where traditional detectors are quickly contaminated. It features a dual-tube sample probe that alternates between drawing gas and self-cleaning, ensuring continuous and reliable detection.1
* **Vapour Alarm System – OVS 2.1:** Designed for monitoring vapour return lines on tankers to prevent hazardous conditions during loading and unloading operations.1
* **Level Alarm System – OAS 5.5:** An independent system for high-level and overfill monitoring in cargo tanks, providing a critical safety layer to prevent spills.1
* **Standard Accessories:** The Omicron range is supported by a suite of accessories, including various test gases (Propane, Methane, H2S) and calibration equipment, essential for maintaining system integrity.20

### **1.4 System Components**

Autronica provides a full range of peripheral devices required to build a complete and compliant fire and gas safety system.

* **Input and Output Units:** A wide selection of I/O units are available for interfacing with and controlling third-party equipment. This includes units with Exn, Exia, and Exd approvals for use in hazardous areas. All units feature automatic addressing and short-circuit protection for simplified installation and enhanced reliability.1 Specific models include the BN-305-2 Dual Monitored Input/Output Unit, BN-310 Single Relay Output Unit, and the BN-221/02 Monitored Output Unit with a 7A relay for high-current applications like horns and strobes.26
* **Manual Call Points:** These devices allow for manual activation of a fire alarm. All Autronica call points are addressable and feature the SelfVerify function. The portfolio includes the standard 300 series and the environmentally protected 500 series for harsh conditions, with Exn and Exia approved versions available.1 Key models include:
  + **BF-34A:** A conventional call point suitable for outdoor use.29
  + **BF-300M/N:** An addressable, Ex ic version for use in Zone 2 hazardous areas.30
  + **BF-500V2/N:** An addressable, Ex ic version for Zone 2 with a resettable plastic element and IP65 rating.31
  + **BF-502 and BF-503/N:** Heavy-duty call points in corrosion-resistant GRP enclosures (IP66/IP67) for the most extreme industrial, maritime, and offshore environments.32
* **Alarm Units:** A range of audible and visual alarm devices (sounders, beacons) for connection to detection loops or dedicated alarm outputs, used to alert personnel in an emergency.1

### **1.5 Presentation & Emergency Management Systems**

Autronica offers sophisticated presentation systems that provide centralized control and a clear, graphical overview of an entire safety system, which is critical for effective emergency management in large facilities.

* **AutroMaster Integrated Safety and Emergency Management System (ISEMS):** This is a complete, high-end presentation system for the control and monitoring of alarmed areas. It integrates seamlessly with AutroSafe and other systems, providing an intuitive graphical interface to display system events, manage subsystems (like door controls and CCTV), and generate detailed reports and maintenance logs. Its capabilities make it ideal for large, complex installations requiring a centralized command and control solution.1
* **AutroMaster V:** A newer, more accessible presentation system designed for simple monitoring and everyday use. It runs on a compact, lightweight hardware platform using a Linux operating system, making it easy to set up and operate without specialized personnel. AutroMaster V provides a modern, graphical interface with powerful zoom functions and is compatible with both AutroSafe and Autroprime systems, targeting a broader range of applications from schools and hospitals to commercial buildings.34 The introduction of AutroMaster V alongside the more powerful ISEMS indicates a clear strategy to serve both the high-end integrated systems market and a broader market that values simplicity and ease of use.

### **1.6 Voice Alarm Systems**

Recognizing that clear communication is vital during an emergency, Autronica offers the AutroVoice system to replace confusing bells and sirens with clear, pre-recorded or live voice instructions.

* **AutroVoice System:** This system utilizes a public address (PA) system to inform occupants about the nature and location of an emergency and provide explicit instructions on what to do.1 The system is built around the EN 54-16 compliant MULTIVES Voice Alarm System (VAS) central unit.41 System components include:
  + **Power Amplifiers:** A family of Class-D power amplifiers, including the 8-channel ABT-PA8080B (8×80W) and ABT-PA8160B (8×160W), and the 2-channel high-power ABT-PA2650B (2×650W).42
  + **Microphones:** The ABT-DFMS-AFS Fireman Microphone Panel for emergency announcements and the ABT-DMS Zone Microphone for general paging.43
  + **Loudspeakers:** A range of loudspeakers, including the highly directional ABT-TNL100 Tunnel Loudspeaker, specifically designed for challenging acoustic environments.45
* **AutroVoice BR-45:** A compact, all-in-one voice alarm system designed for small-to-medium-sized applications. It includes monitored amplifiers, speaker circuits, a built-in MP3 module for messages, and a fireman's microphone, all in a single unit compliant with BS 5839.8 and EN 60849.46

### **1.7 Fire Suppression Systems (Danish Market Focus)**

Autronica's portfolio of fire suppression systems is noted as being primarily available in the Danish market.1 This geographical concentration suggests a strategic focus built on local expertise, certifications, and a strong market presence in Denmark, supported by multiple Danish offices.48

* **Argonite - Inert Gas Suppression Systems:** An inert gas system that extinguishes fires by reducing oxygen content. It is designed for critical facilities where water-based suppression is undesirable, as it is safe for sensitive electronic equipment and the environment.1
* **Novec 1230 Fluid:** A clean agent gaseous fire suppression system that is safe for use in occupied spaces and protects high-value assets without leaving a residue.1
* **Kidde Wet Chemical System for DFF Protection:** A specialized system using wet chemical agents to extinguish fires in commercial cooking appliances and ventilation systems, commonly known as deep fat fryers (DFF).1
* **Water Mist Systems:** Autronica also offers water mist fire suppression technology within the Danish market.1
* **Inerting Systems for Silo Protection:** Systems designed to prevent explosions in silos by maintaining an inert atmosphere.1
* **CO2 Systems:** High-pressure Carbon Dioxide systems, specifically designed for the protection of galley ducts. The system quickly achieves the necessary CO2 concentration to extinguish fires inside the ductwork.1
* **Obsolete Suppression Systems:** The portfolio notes that a Dry Chemical Powder System for Bunkering Stations and Drencher Systems are obsolete product lines.1

## **Section 2: Det-Tronics Product Portfolio**

Detector Electronics Corporation (Det-Tronics) has, since its founding in 1973, established itself as the preeminent brand for certified, high-performance fire and gas safety systems engineered for the world's most hazardous industrial environments.12 The brand's portfolio is built around a core philosophy of reliability and performance, evidenced by a deep commitment to global certifications such as

SIL 2, NFPA 72®, FM, and SOLAS.12 The product line is centered on the versatile Eagle Quantum Premier® (EQP) safety system, which integrates a comprehensive range of industry-leading flame and gas detectors. The company's engagement in "Factory 4.0" initiatives further signals a strategic focus on providing digitally integrated safety solutions for modern industrial operations.1

### **2.1 Certified Fire and Gas Safety Systems**

The cornerstone of the Det-Tronics offering is its integrated and certified safety system platform, which provides detection, alarm signaling, and mitigation control.

* **Eagle Quantum Premier® (EQP) Safety System:** This is a certified SIL 2 capable, distributed fire and gas safety system that serves as the central controller for the entire Det-Tronics ecosystem.51 It is approved to FM 3010 in accordance with NFPA 72® and is qualified for Safety of Life at Sea (SOLAS).51 The EQP system is designed for high-value, high-hazard facilities and is certified for installation in Class I, Div 2/Zone 2 hazardous locations.51 It manages all inputs from detectors and outputs to notification and suppression systems, and it can be easily integrated with plant-wide control systems (PCS, DCS, SCADA) via multiple communication protocols, including Modbus, ControlNet™, and EtherNet/IP™.51
* **EQ3900G Pre-Engineered Systems:** To meet the demand for rapid deployment, Det-Tronics offers a series of pre-engineered, listed, and certified EQP systems. These standardized configurations provide a quick-ship solution for common applications in both hazardous and non-hazardous areas.54
* **Ultra-High-Speed Flame Detection and Releasing Systems:** This is a highly specialized solution tailored for niche markets with extreme fire risks, such as the manufacturing and processing of energetic materials like gunpowder and propellants. This system provides nearly instantaneous detection and suppression activation to mitigate explosions.54

### **2.2 Flame Detection Technologies**

Det-Tronics is a market leader in optical flame detection, offering a wide array of detectors that utilize sophisticated signal processing and multiple sensing technologies to ensure rapid detection while providing superior false alarm immunity. All modern X-Series detectors are certified SIL 2 capable and available with HART communication for advanced diagnostics.53

* **X3301 Multispectrum Infrared (IR) Flame Detector:** The flagship product for hydrocarbon fires, using patented multispectrum IR processing algorithms for long detection range and excellent false alarm rejection.53
* **X3302 Multispectrum Infrared (IR) Hydrogen Flame Detector:** A specialized detector engineered to reliably detect the nearly invisible flames of hydrogen fires, a critical capability for the growing hydrogen economy and clean energy sectors.53
* **X5200 Ultraviolet Infrared (UV/IR) Flame Detector:** This detector enhances reliability by correlating signals from both a UV and an IR sensor, allowing it to confirm a fire while rejecting false alarm sources like arc welding or lightning that may only emit radiation in one spectrum.53
* **X9800 Single Frequency Infrared (IR) Flame Detector:** A robust and reliable detector that uses patented signal processing to detect the IR radiation from hydrocarbon fires.53
* **X2200 Ultraviolet (UV) Flame Detector:** Provides a very fast response to a wide variety of fires by detecting the UV radiation they emit. A unique optical design ensures it is not falsely triggered by sunlight.53
* **PM-5MPX Dual Spectrum IR Flame Detector:** A highly specialized detector designed exclusively for the unique fire risks present in semiconductor fabrication processes.55

### **2.3 Gas Detection Technologies**

Det-Tronics provides a comprehensive portfolio of gas detection solutions covering a wide variety of technologies to meet requirements for combustible gases, toxic gases, and oxygen depletion.1

* **Combustible Gas Line-of-Sight (LOS) Detection:**
  + **FlexSight™ LS2000:** An infrared hydrocarbon gas detector that continuously monitors for gas clouds in large open areas (up to 120 meters) between a transmitter and a receiver. It is ideal for perimeter monitoring and replaces the legacy Open Path Eclipse® (OPECL) detector.56
* **Combustible Gas Point Detection:**
  + **PointWatch Eclipse® PIRECL:** A top-selling stainless steel point infrared detector for flammable hydrocarbon gases like methane, propane, and butane. It is performance certified and carries a 5-year warranty.58
  + **Catalytic Bead Gas Sensor (CGS):** A cost-effective solution for detecting a broad range of combustible gases, and the preferred technology for high-temperature applications and hydrogen detection. It is certified SIL 2 capable when used with a FlexVu® display.58
* **Toxic Gas and Oxygen Depletion Detection:**
  + **GT3000 Electrochemical Gas Detector:** A versatile detector with hot-swappable, intrinsically safe sensor modules for a variety of toxic gases (H2S, CO, NH3, Cl2, SO2) and oxygen. The H2S and O2 sensors are certified SIL 2 capable.58
* **Acoustic Gas Leak Detection:**
  + **FlexSonic® Acoustic Gas Leak Detector:** An innovative detector that listens for the distinct ultrasound generated by pressurized gas leaks. Its response is instantaneous and unaffected by wind direction, making it effective in outdoor environments where traditional gas detectors might fail to detect a dispersed gas cloud.56
* **Universal Displays:**
  + **FlexVu® Universal Display Family:** A series of explosion-proof display units (e.g., UD10) that provide a local interface for a wide range of Det-Tronics gas detectors and other 4-20 mA devices. They allow for non-intrusive, one-person calibration and provide local event logging and diagnostics.56

### **2.4 Explosion-Proof Smoke & Heat Detection**

Det-Tronics offers ruggedized smoke and heat detectors designed and certified for use in hazardous locations where standard commercial detectors cannot be deployed.

* **SmokeWatch™ U5015 Explosion-Proof Smoke Detector:** A photoelectric smoke detector with Division and Zone explosion-proof ratings (Class I, Div 1). It features self-checking circuitry, multiple outputs (0-20 mA, relays), and a hot-swappable, intrinsically safe sensor module that allows for live maintenance without de-classifying the area.60
* **Duct Mounted Smoke Detector (Q5016):** An accessory that adapts the U5015 SmokeWatch™ for monitoring air ducts in HVAC systems.61
* **Heat/Risk Area Detector (Model HD):** A rate-compensated heat detector designed for the most demanding applications where rapid temperature rise is a key fire indicator.62

### **2.5 System Devices and Modules**

To complement the EQP controller, Det-Tronics offers a suite of addressable and non-addressable modules that expand the system's flexibility and functionality, allowing for complete customization to meet unique site requirements.1

* **Input/Output Modules:** Multi-channel modules that expand the I/O capabilities of the EQP system. Models include the Enhanced Discrete I/O Module (EDIO), Explosion-proof I/O Module (EIO), and the 8-channel Analogue Input Module (AIM) for 4-20 mA devices.1
* **Smoke, Heat and Notification Devices (Addressable):** These devices improve system reliability and pinpoint alarm locations. This includes the Addressable Smoke and Heat Module (ASH / EQ3750ASH), which integrates addressable smoke and heat detectors into the EQP system.1
* **High-Speed Deluge Module (HDSM):** A specialized, SIL 2 capable module designed to provide the fast-acting control outputs required to activate ultra-high-speed suppression systems.53
* **Other Devices:** The portfolio also includes a Relay Module for protecting remote hazardous zones and modules for interfacing with Non-Addressable Notification Devices.1

### **2.6 Accessories, Spares, and Product Upgrades**

Det-Tronics supports its product lines with a full range of accessories and a clear strategy for technology upgrades.

* **Accessories & Spares:** A wide selection of accessories are available to enhance performance and simplify maintenance, including mounting hardware, sun shades, and air shields for detectors.1
* **HART Accessories:** To support its HART-enabled detectors, Det-Tronics offers the rugged AMS Trex™ Field Communicator, which simplifies configuration, calibration, and diagnostics in the field.69
* **Product Upgrades:** The company provides carefully engineered upgrade paths for its legacy products. This allows customers with long-life facilities to migrate from older technology (e.g., legacy flame detectors, OPECL gas detectors, R-Series controllers) to the latest generation of products (e.g., X-Series detectors, FlexSight™ LS2000, EQP controller).1 This approach is a cornerstone of the brand's customer relationship strategy, acknowledging the long operational lifespan of industrial assets. By providing clear migration paths, Det-Tronics minimizes the complexity and cost of modernization for its extensive installed base, fostering customer loyalty and reducing the likelihood of a competitor displacing them during a technology refresh cycle. This transforms the product end-of-life process from a customer challenge into a structured business opportunity for both parties.

### **2.7 Legacy Products and Official Upgrade Paths**

Det-Tronics maintains a comprehensive and publicly accessible list of its legacy and obsolete products, along with their officially recommended factory replacements. This transparency is highly valuable for asset owners planning maintenance and capital upgrade projects. The following table summarizes this critical information.

| Legacy Product Name/Model | Status | Suggested Factory Replacement |
| --- | --- | --- |
| Open Path Eclipse® (OPECL) IR Gas Detector | OBS | FlexSight™ LS2000 Line-of-Sight IR Gas Detector |
| U7600/U7602/U7652 Series UV & UV/IR Detectors | OBS | X2200 UV or X3301/X5200 Multispectrum IR/UVIR Flame Detector |
| U7099 Dual Frequency IR Detector/Controller | OBS | X3301 Multispectrum Infrared Flame Detector |
| U7698 Series Single Frequency IR Detector | OBS | X9800 Single Frequency IR Flame Detector |
| X3300 Protect-IR Multispectrum IR Flame Detector | OBS | X3301 Multispectrum Infrared Flame Detector |
| C7050/C7051 Series UV Flame Detectors | OBS | X2200 Ultraviolet Flame Detector |
| C7052 Series UV/IR Flame Detectors | OBS | X5200 Ultraviolet Infrared Flame Detector |
| R-Series Controllers (R7302, R7303, R7404, etc.) | OBS/ROS | Eagle Quantum Premier® (EQP) Safety System |
| U8700x/U8800x/U9500 Gas Transmitters | OBS | FlexVu® UD10 Universal Display |
| 400/405B/505 Series Combustible Transmitters | OBS | FlexVu® UD10 or CTX10 |
| 410/415/700/704 Series H2S Transmitters | OBS | FlexVu® UD10 with GT3000 Sensor |
| R8460/R8466/R8471 Series Gas Controllers | OBS | GP16 Gas Panel or EQP System |
| Eagle Quantum Premier (V1.0) EQ3000 | OBS | Current Eagle Quantum Premier® (EQP) Safety System |
| FDRS Flame Detection Releasing System | ROD | Ultra-High-Speed Flame Detection and Releasing System (Ultra FDRS) |
| PM-5MP & PM-5MP+ Dual Spectrum IR Detector | OBS | PM-5MPX Dual Spectrum IR Flame Detector |

Status Key: OBS = Obsolete; ROS = Repair Only; ROD = Repair Only Discontinued.

Data Sources: 1

## **Section 3: Fireye Product Portfolio**

Fireye is a foundational brand in the field of combustion safety, with a history of innovation stretching back to the 1930s when it introduced the first commercial electronic flame safeguard control.9 The brand specializes in a complete, integrated ecosystem of products for flame safeguard, burner management, and combustion control, serving the HVAC and industrial process industries worldwide. Fireye's products are critical components in power plants, pulp and paper mills, petrochemical facilities, and commercial properties, ensuring the safe and efficient operation of burners and boilers.8 The portfolio is structured to cover every stage of the combustion process, from ignition and flame sensing to sequencing and fuel/air ratio control, allowing customers to source a complete Burner Management System (BMS) from a single, trusted vendor.

### **3.1 Burner Management and Flame Safeguard Controls**

These microprocessor-based controls provide the core logic for proper burner sequencing, ignition, and flame monitoring to ensure safe operation.

* **BurnerPRO™:** A compact, primary flame safeguard control system designed for on-off, multi-stage, or modulating burners in commercial heating and process equipment. It features two built-in amplifiers for flexibility with UV and/or flame rod (FR) sensors, smart diagnostic LEDs, non-volatile lockout, and airflow proving.1 Some models include advanced features like valve proving and a Modbus interface.74
* **BurnerLogix™ System:** A more advanced and versatile burner management control system for automatically ignited oil, gas, and combination fuel burners. The system is modular, consisting of a chassis (e.g., YB110) with a specific flame amplifier, an interchangeable programmer module (e.g., YP100 series) that defines timing and functions, and an optional alphanumeric display for full-language diagnostics and status updates. It supports Modbus communications and features like proof of fuel valve closure and revert-to-pilot functionality.1
* **Flame-Monitor E110:** A modular flame safeguard control that serves as the basic building block for a system. It consists of a chassis and dust cover, which is then completed with the addition of an application-specific programmer, amplifier, and flame scanner.1
* **Other Control Systems:** The portfolio also includes the **MB Industrial Multiburner Control System**, the **MicroM Flame Safeguard Control System**, and the **SB Modular Single Burner Management System** for various specialized applications.1

### **3.2 Flame Monitoring Systems**

Fireye offers a wide range of flame scanners and sensors to accurately detect the presence or absence of a flame under diverse industrial conditions.

* **Integrated Flame Scanners:** These advanced, microprocessor-based scanners integrate the sensor, amplifier, and safety determination into a single unit.
  + **InSight® Series (I, II, IV):** The InSight II (95DSS3) is a premier dual-cell scanner using both UV and IR sensors for superior flame discrimination. It features two independent flame relays, two 4-20mA analog outputs, and electronic self-checking, and is available in housings rated for hazardous areas.1
  + **Phoenix™ Flame Scanners:** The Phoenix Series 2 (85UVF/IRF) are microprocessor-based scanners with a solid-state sensor and an internal flame relay that automatically sets its own ON/OFF thresholds, eliminating the need for a remote amplifier. They are SIL 3 certified, offering a high level of safety reliability.1
* **Discrete Flame Scanners:** These are traditional scanners that require a separate amplifier, typically housed within the burner control.
  + **Ultraviolet (UV) Scanners:** Models include UV1A, UV7, 45UV5, 55UV5, and 65UV5.1 The Simplicity series (65UV5-1004) is also part of this line.80
  + **Infrared (IR) Scanners:** Model 48PT2 is available for applications where IR sensing is preferred.1
* **Flame Sensors:** This category includes flame rods for flame rectification sensing and specialized sensors for harsh environments and turbine applications.1

### **3.3 Combustion Control Systems**

These systems are designed to optimize the fuel-to-air ratio throughout the burner's firing range, increasing efficiency and reducing emissions.

* **Nexus® Family:** Fireye's premier line of combustion controls that manage the entire burner operation. The Nexus system offers parallel positioning of the fuel valve and combustion air damper for precise control.1 Key components include:
  + **Nexus Touchscreens:** User-friendly interfaces for system configuration and monitoring.80
  + **NX6100 and PPC 6000:** Advanced microprocessor-based fuel/air ratio controllers for industrial or commercial burners.80

### **3.4 Ignition Systems**

Fireye provides reliable ignition sources for a wide range of industrial burners and boilers.

* **SureFire™ Spark Igniters:** This product line consists of heavy-duty, high-energy spark igniters designed for the reliable light-off of large industrial burners and pilots in utility and process applications.1
* **SureFire™ II Pilot Burners:** A range of natural draught and forced draught gas pilots that provide a stable and effective source of ignition for main burners.1

### **3.5 Controller Accessories and System Components**

Fireye supports its control systems with an extensive catalog of auxiliary products and components, allowing for the construction of fully customized and integrated burner management systems.1

* **Key Components:**
  + **Displays, Servos, and Actuators:** For remote monitoring and control of dampers and valves.1
  + **Communication Modules:** For interfacing with plant-wide control systems.1
  + **System Modules:** Including Annunciator Modules, Flame Amplifiers, Programmer Modules, and Expansion Boards.1
  + **Hardware:** Chassis, Wiring Bases, Mounting Hardware, and Remote Mounting Kits.1

## **Section 4: Marioff Product Portfolio**

Marioff is the globally recognized pioneer and market leader in high-pressure water mist fire protection technology, marketed exclusively under the HI-FOG® brand name.88 Originating from a background in marine and offshore high-pressure hydraulics, Marioff launched HI-FOG® in 1991, revolutionizing fire suppression in applications where water damage is a significant concern.89 The brand's entire product strategy is centered on this single core technology, which it has adapted into a versatile range of systems and components for a vast array of high-value applications on land and at sea. The fundamental value proposition of HI-FOG® is its ability to provide superior fire suppression while using up to 90% less water than traditional sprinkler systems, thereby minimizing collateral damage, cleanup costs, and business downtime.91

### **4.1 HI-FOG® High-Pressure Water Mist Technology**

The HI-FOG® system's effectiveness stems from its ability to generate micro-droplets of water and discharge them at high velocity. This creates an extremely large surface area for heat absorption. The technology attacks a fire using three distinct mechanisms simultaneously 91:

1. **Cooling:** As the fine water mist enters the fire plume, it rapidly evaporates, absorbing a massive amount of heat energy from the fire and surrounding gases.
2. **Inerting:** The process of water turning to steam causes it to expand in volume by approximately 1,700 times. This rapid expansion displaces oxygen at the seat of the fire, effectively starving it of a key element needed for combustion.
3. **Radiant Heat Blocking:** The dense cloud of micro-droplets acts as a barrier, blocking the transfer of radiant heat to adjacent combustibles and preventing the fire from spreading.

This technology is proven effective against Class A (solid combustibles), B (flammable liquids), C (electrical), and K (kitchen) fires.95 Because it uses only small amounts of pure, potable water, it is harmless to people and the environment, allowing spaces to be entered during discharge and enabling rapid cleanup and re-occupation of the protected area.91

### **4.2 HI-FOG® System Types**

Marioff has engineered four distinct system configurations of the core HI-FOG® technology to meet the specific operational requirements of different environments. These are not different technologies, but rather different methods of activating and delivering the water mist.

* **Wet Pipe System:** The simplest configuration, where the piping network is constantly filled with pressurized water. In a fire, a heat-sensitive glass bulb in the sprinkler head breaks, allowing for immediate discharge of water mist. This system is used in temperature-controlled environments where there is no risk of freezing.1
* **Deluge System:** This system uses open spray heads and dry piping. It is activated when an external fire detection system sends a signal to open a "deluge" valve, which then floods the piping network and discharges water mist from all spray heads in a protected zone simultaneously. It is ideal for protecting high-hazard machinery spaces, turbines, and generators, and can be configured for either local application (protecting a specific piece of equipment) or total flooding (protecting an entire room).1
* **Dry Pipe System:** Designed for areas subject to freezing temperatures, such as car parks or unheated storage areas. The piping is filled with pressurized air or nitrogen instead of water. When a sprinkler's glass bulb breaks, the air pressure drops, which triggers a main valve to open and release water into the pipes for discharge. This prevents pipe damage from ice formation.1
* **Pre-action System:** This is the most advanced configuration, designed for water-sensitive environments where even the smallest risk of accidental discharge must be eliminated. Applications include data centers, museums, archives, and cultural heritage sites. The system requires a "double interlock" for activation: a signal must be received from a separate fire detection system (e.g., smoke detectors), AND a sprinkler's heat-sensitive glass bulb must break. Only when both conditions are met will the pre-action valve open to release water. This dual requirement provides maximum protection against unnecessary water damage.1

### **4.3 HI-FOG® System Components**

The reliability and performance of the HI-FOG® system are dependent on its range of high-quality, purpose-built components.1

* **Sprinklers and Spray Heads:** These are the discharge nozzles of the system.
  + **Sprinklers:** Closed-head devices containing a heat-sensitive glass bulb (available in activation temperatures from 57°C to 141°C) that breaks to release water. They are used in wet pipe, dry pipe, and pre-action systems. Models include the 1000, 1900, 2000, and 3000 series.1
  + **Spray Heads:** Open-head nozzles used in deluge systems for total flooding of machinery spaces or for specialized applications like duct protection and deep fat fryer systems.1
* **Pump Units:** These are the heart of the HI-FOG® system, responsible for generating the high pressure needed to create the water mist.
  + **HI-FOG Land Pump Unit (LPU):** A modular, electric-powered pump unit designed for land-based applications. Its modularity allows for flexible configuration and fast delivery.1
  + **HI-FOG Electric Pump Unit (EPU):** An electric pump unit (e.g., SPU series) featuring an advanced control system with a frequency converter to conserve energy by producing the exact pressure and flow required.1
  + **HI-FOG Gas Pump Unit (GPU):** A self-contained, gas-driven piston pump that operates on compressed nitrogen or air. It requires no external power source, making it a simple and reliable option for machinery spaces or locations with unreliable power.1
* **Accumulator Units:** These units use cylinders of compressed gas (air or nitrogen) to discharge a pre-filled amount of water. They are ideal for protecting smaller, enclosed spaces or for providing an initial discharge or backup for a larger system.1 Models include:
  + **Machinery Space Accumulator Unit (MAU):** For small machinery spaces and gas turbine enclosures.
  + **Kitchen Accumulator Unit (KAU):** Optimized for protecting kitchen appliances like deep fat fryers.
  + **Accumulator Unit (ACU) & Water Accumulator Unit (WAU):** Designed specifically as backup units for sprinkler systems in marine applications.
* **Valves:** Marioff designs and manufactures a wide selection of high-quality valves for various system functions.1 This includes sprinkler section valves, machinery space section (deluge) valves, pre-action valves, stabilization valves, non-return valves, and ball valves.
* **Other Components:** The complete system also includes specialized small-diameter stainless steel tubing, fittings, water supply connections, and fire hoses.1

### **4.4 Application-Specific Solutions**

Marioff leverages its versatile HI-FOG® technology to provide tailored fire protection solutions across two primary market divisions: Land and Marine.

* **Fire Protection for Land:** The benefits of low water usage and minimal damage make HI-FOG® an ideal choice for a wide range of land-based critical infrastructure and high-value facilities. Key target applications include automotive manufacturing, battery energy storage systems (BESS), cultural heritage buildings, data centers, the food industry, hospitals, hotels, power generation facilities, and office buildings.1
* **Fire Protection for Marine:** Building on its origins, Marioff remains a dominant force in the maritime sector, where space, weight, and the consequences of a fire are all critical considerations. HI-FOG® systems are installed on thousands of vessels worldwide. Target applications include cargo ships, cruise ships, ferries, naval vessels, luxury yachts, and offshore oil and gas platforms.1

## **Appendix: Master Product Catalog**

| Brand | Product Category | Product Name / Model | Type / Technology | Function & Description | Target Market(s) / Availability | Status |
| --- | --- | --- | --- | --- | --- | --- |
| **Autronica** | Fire Detection Systems | AutroSafe 4 | High-End Interactive Fire Detection System | Control system for large, complex buildings and high-hazard environments. | Global (Land, Marine, Offshore) | Current |
| **Autronica** | Fire Detection Systems | AutroSafe 4 Integrated Fire and Gas (IFG) Panel | SIL 2 Approved Control Panel | Integrated fire and gas control panel for critical safety functions. | Offshore | Current |
| **Autronica** | Fire Detection Systems | AutroSafe 4 Maritime Gas (MG) Panel | Maritime Control Panel | Fire and gas control panel specifically for maritime environments. | Marine | Current |
| **Autronica** | Fire Detection Systems | Autroprime 2 | Interactive Fire Detection System | Control system for small-to-medium sized installations. | Global (Land) | Current |
| **Autronica** | Detectors | AutroGuard® Multicriteria Protector | Multicriteria Detector/Alarm | Combines fire detection and warning functions in a single unit. | Global (Land) | Current |
| **Autronica** | Detectors | Optical Smoke Detector | Photoelectric Smoke Detector | Standard detector for common areas, detects smoke particles. | Global (Land, Marine) | Current |
| **Autronica** | Detectors | Heat Detector | Thermal Detector | Detects fixed temperature or rate-of-rise of heat. For areas unsuitable for smoke detectors. | Global (Land, Marine) | Current |
| **Autronica** | Detectors | MultiSensor | Heat + Optical Smoke Detector | Combination detector for complex fire scenarios. | Global (Land, Marine) | Current |
| **Autronica** | Detectors | AutroFlame Triple IR Flame Detector | Triple Infrared (IR3) Flame Detector | Detects IR radiation from combustion of carbonaceous materials. | Global (Land, Marine, Offshore) | Current |
| **Autronica** | Detectors | Multispectrum IR Flame Detector | Multispectrum Infrared Flame Detector | High-end, EX and SIL2 approved detector for critical applications. | Marine, Offshore | Current |
| **Autronica** | Omicron Special Detection | Point Gas Detection System – OGS 2.1 | Point Gas Detector System | Provides fast and continuous gas detection in high-risk areas. | Marine, Offshore | Current |
| **Autronica** | Omicron Special Detection | Gas Sampling Systems – OGS 3.1 / OGS 3.11 | Gas Sampling System | Provides gas detection via sampling for areas where direct detection is not possible. | Marine, Offshore | Current |
| **Autronica** | Omicron Special Detection | OGS Shale Shaker | Specialized Gas Sampling System | Self-cleaning gas sampling system for harsh oil and gas environments. | Offshore | Current |
| **Autronica** | Omicron Special Detection | Vapour Alarm System – OVS 2.1 | Vapour Detector System | Monitors vapour return lines on tankers. | Marine | Current |
| **Autronica** | Omicron Special Detection | Level Alarm System – OAS 5.5 | Level Alarm System | Independent high-level and overfill monitoring for cargo tanks. | Marine | Current |
| **Autronica** | System Components | Input and Output Units (Various) | I/O Modules | Interface with and control third-party equipment. Ex-rated versions available. | Global (Land, Marine, Offshore) | Current |
| **Autronica** | System Components | Manual Call Points (300 & 500 Series) | Manual Alarm Initiating Device | Addressable call points with SelfVerify. Includes environmentally protected and Ex-rated versions. | Global (Land, Marine, Offshore) | Current |
| **Autronica** | Presentation Systems | AutroMaster ISEMS | Integrated Safety & Emergency Management System | High-end graphical presentation system for control and monitoring of large, complex sites. | Global (Land, Marine, Offshore) | Current |
| **Autronica** | Presentation Systems | AutroMaster V | Graphical Presentation System | Simplified, modern graphical interface on a lightweight hardware platform. | Global (Land) | Current |
| **Autronica** | Voice Alarm Systems | AutroVoice (MULTIVES) | Voice Alarm / Public Address System | EN 54-16 compliant system for clear emergency communication. | Global (Land) | Current |
| **Autronica** | Voice Alarm Systems | AutroVoice BR-45 | Compact Voice Alarm System | All-in-one voice alarm system for small-to-medium applications. | Global (Land) | Current |
| **Autronica** | Fire Suppression | Argonite - Inert Gas Suppression System | Inert Gas Suppression | Extinguishes fire by reducing oxygen; safe for critical equipment. | Danish Market | Current |
| **Autronica** | Fire Suppression | Novec 1230 Fluid System | Clean Agent Suppression | Gaseous suppression safe for occupied spaces and high-value assets. | Danish Market | Current |
| **Autronica** | Fire Suppression | Kidde Wet Chemical System | Wet Chemical Suppression | For fire protection of commercial kitchen cooking appliances. | Danish Market | Current |
| **Autronica** | Fire Suppression | CO2 System | Carbon Dioxide Suppression | High-pressure CO2 system designed for galley duct protection. | Danish Market | Current |
| **Autronica** | Fire Suppression | Dry Chemical Powder System | Dry Chemical Suppression | For bunkering stations. | Danish Market | Obsolete |
| **Det-Tronics** | Certified Safety Systems | Eagle Quantum Premier® (EQP) | SIL 2 Capable Fire & Gas Safety System | Distributed safety system for detection, alarm, and releasing control. NFPA 72 compliant. | Global (Industrial, Energy, Marine) | Current |
| **Det-Tronics** | Certified Safety Systems | EQ3900G Pre-Engineered Systems | Pre-Engineered Safety System | Certified, pre-configured EQP systems for rapid deployment. | Global (Industrial, Energy, Marine) | Current |
| **Det-Tronics** | Flame Detection | X3301 Multispectrum IR Flame Detector | Multispectrum Infrared (IR) | High-performance detector for hydrocarbon fires with superior false alarm immunity. | Global (Industrial, Energy) | Current |
| **Det-Tronics** | Flame Detection | X3302 Multispectrum IR Hydrogen Flame Detector | Multispectrum Infrared (IR) | Specialized detector for invisible hydrogen fires. | Global (Industrial, Energy) | Current |
| **Det-Tronics** | Flame Detection | X5200 UVIR Flame Detector | Ultraviolet/Infrared (UV/IR) | Dual-spectrum detector for complex environments; rejects false alarms from non-fire sources. | Global (Industrial, Energy) | Current |
| **Det-Tronics** | Gas Detection | FlexSight™ LS2000 | Line-of-Sight (LOS) IR Gas Detector | Monitors for hydrocarbon gas clouds over long distances in open areas. | Global (Industrial, Energy) | Current |
| **Det-Tronics** | Gas Detection | PointWatch Eclipse® PIRECL | Point Infrared (IR) Gas Detector | Rugged point detector for flammable hydrocarbon gases. | Global (Industrial, Energy) | Current |
| **Det-Tronics** | Gas Detection | FlexSonic® Acoustic Gas Leak Detector | Acoustic Gas Leak Detector | Detects the ultrasound of pressurized gas leaks; unaffected by wind. | Global (Industrial, Energy) | Current |
| **Det-Tronics** | Gas Detection | GT3000 | Electrochemical Gas Detector | Detects a range of toxic gases (H2S, CO, etc.) and oxygen depletion. | Global (Industrial, Energy) | Current |
| **Det-Tronics** | Smoke & Heat Detection | SmokeWatch™ U5015 | Explosion-Proof Photoelectric Smoke Detector | Certified for Class I, Div 1 hazardous locations; features a hot-swappable sensor. | Global (Industrial, Energy) | Current |
| **Det-Tronics** | System Devices | EQP System Devices (EDIO, EIO, AIM, ASH, HDSM) | I/O & Control Modules | A suite of modules to expand and customize the EQP safety system. | Global (Industrial, Energy, Marine) | Current |
| **Det-Tronics** | Legacy Products | Open Path Eclipse® (OPECL) IR Gas Detector | Line-of-Sight (LOS) IR Gas Detector | Legacy line-of-sight gas detector. | Global | Obsolete |
| **Fireye** | Burner Controls | BurnerPRO™ | Primary Flame Safeguard Control | Compact, microprocessor-based control for commercial heating and process burners. | Global (HVAC, Process) | Current |
| **Fireye** | Burner Controls | BurnerLogix™ | Burner Management System | Advanced, modular burner control for oil, gas, and combination fuel burners. | Global (Industrial, Process) | Current |
| **Fireye** | Flame Monitoring | InSight® II (95DSS3) | Integrated UV/IR Flame Scanner | Advanced dual-sensor scanner with integrated amplifier and safety functions. | Global (Industrial, Power Gen) | Current |
| **Fireye** | Flame Monitoring | Phoenix™ (85UVF/IRF) | Integrated Flame Scanner | SIL 3 certified scanner with internal flame relay and auto-configuration. | Global (Industrial, Power Gen) | Current |
| **Fireye** | Combustion Controls | Nexus® Family (NX6100, PPC 6000) | Fuel/Air Ratio Controller | Controls entire burner operation for increased efficiency via parallel positioning. | Global (Industrial, Power Gen) | Current |
| **Fireye** | Ignition Systems | SureFire™ Spark Igniters | High-Energy Spark Igniter | For reliable light-off of large industrial burners and boilers. | Global (Industrial, Utility) | Current |
| **Fireye** | Ignition Systems | SureFire™ II Pilot Burners | Gas Pilot Burner | Provides a stable ignition source for main burners. | Global (Industrial, Utility) | Current |
| **Marioff** | Water Mist Systems | HI-FOG® Wet Pipe System | High-Pressure Water Mist | Water-filled piping for immediate discharge in temperature-controlled areas. | Global (Land, Marine) | Current |
| **Marioff** | Water Mist Systems | HI-FOG® Deluge System | High-Pressure Water Mist | Open-head system for total flooding or local application in high-hazard areas. | Global (Land, Marine) | Current |
| **Marioff** | Water Mist Systems | HI-FOG® Dry Pipe System | High-Pressure Water Mist | Air-filled piping for use in areas subject to freezing. | Global (Land, Marine) | Current |
| **Marioff** | Water Mist Systems | HI-FOG® Pre-action System | High-Pressure Water Mist | Double-interlock system for water-sensitive areas like data centers and museums. | Global (Land) | Current |
| **Marioff** | System Components | HI-FOG® Pump Units (LPU, EPU, GPU) | High-Pressure Pump | Electric and gas-driven pumps that generate the high pressure for the water mist system. | Global (Land, Marine) | Current |
| **Marioff** | System Components | HI-FOG® Accumulator Units (MAU, KAU, ACU) | Accumulator Unit | Gas-pressurized cylinders for water mist discharge in small spaces or as backup. | Global (Land, Marine) | Current |
| **Marioff** | System Components | HI-FOG® Sprinklers & Spray Heads | Discharge Nozzles | Specialized nozzles that create the fine water mist. Includes closed-head and open-head versions. | Global (Land, Marine) | Current |
| **Marioff** | System Components | HI-FOG® Valves | System Control Valves | A range of specialized valves for system control, including section, deluge, and pre-action valves. | Global (Land, Marine) | Current |

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