



# SAFE MANUFACTURING

DRIVING PRODUCTION FORWARD WITH SMART, INTEGRATED TECHNOLOGIES



# CREATING SAFE MANUFACTURING

Today, modern manufacturers are continually tasked with optimizing operations, ensuring uptime and maintaining visibility throughout production. The push toward smart manufacturing and Industry 4.0 is introducing increased connectivity and automation throughout the daily workflow in order to produce quality products while reducing costs and minimizing downtime. Organizations are looking to accelerate improvements by connecting machines, people, data and value chains throughout their facility. The movement toward “smart” factories can deliver measurable business results and is expected to be the main driver of manufacturing competitiveness in the next five years.<sup>1</sup> And all of this must come together while ensuring a production environment that is safe and secure for employees, visitors, property and assets.

At Motorola Solutions, we’ve created the first and only end-to-end technology ecosystem that unifies voice, video, data and analytics on one single platform — providing you with the foundation of safety for your operations that you need to stay focused on the job. Assuring managers and employees that when situations arise there is technology in place to resolve issues as quickly as possible to prevent them from escalating beyond control.

We’ve reimagined how the technologies used to help keep your facility safe, can do even more — minimize downtime, improve efficiency and productivity and generate better outcomes throughout all phases of the manufacturing process. Because safety, efficiency and productivity are deeply interconnected. With the right technologies, you can be faster, smarter, more focused and more resilient — better at everything you do.

Our technology ecosystem allows intelligence to advance outwards, giving you eyes and ears where you’ve never had them before. Information can move where and when it’s needed — from cameras, to radios, to smart devices and machine sensors, alarms and productivity tools, to security and operations centers both on and off-site — and provides meaningful and actionable workflows. Technologies integrate seamlessly across diverse areas and functions to provide efficiency and visibility. Common interfaces and workflows makes it easier to manage teams and train new team members.

And because manufacturers face wide-ranging regulatory requirements that impact security and operational needs depending on their size and what they are producing, our ecosystem includes scalable technologies and solutions that can be adjusted to address your facility’s unique needs.

Our Safe Manufacturing technologies come together to keep your facility safe and operations efficient — delivering the certainty of safety you need to deliver on your promise of producing quality products to customers and profitably for your business.



## EXAMPLE USE CASE: RESTRICTED/HAZARDOUS RISK AREA

Our Safe Manufacturing integrated ecosystem allows you to address everyday concerns as well as emerging situations through the four pillars — Detect, Analyze, Communicate and Respond. We will explore how these pillars work together to address your manufacturing challenges through the example of a Restricted/Hazardous Risk Area.



# DETECT

Overseeing the widespread and diverse areas and machinery of your facility can be a challenge. From controlling multiple points of entry, monitoring worker safety and securing and monitoring key areas and equipment, detection plays a critical role in improving situational awareness and decreasing response times to potential issues and operational problems.

Integrated video security uses artificial intelligence to create high visibility across your diverse facility all in one view. Access control provides entry management, immediate lockdown capabilities and push notifications to devices. Radio alerts ensure all personnel — across multiple teams — are automatically informed of critical information simultaneously. Sensors and alarms help to oversee and maintain worker safety and plant production capabilities.

All of this comes together to provide you with better insights — so you always know what is happening across your facility.



Avigilon Video Security Cameras

## DETECTION SOLUTIONS

### Video Security

Deter threats and enhance visibility across your facilities with specialized wide-view cameras for every location — such as fisheye cameras for secure areas, multi-sensor for corridors, pan-tilt-zoom for parking lots and plant floors and explosion-protected for highly combustible locations.

### License Plate Recognition & Watch List Alerting

Monitor all roads and parking lots approaching and surrounding your plant with license plate recognition analytics and automatically detect and alert potential breaches with a secure, controlled watch list of known license plates created and maintained by authorized users within your security team. Expand the power of this capability to detect specific people of interest with the optional inclusion of facial recognition technology.

### Access Control

Manage access to different buildings or restricted areas within your facilities using a role-based system with instant detection of individuals at access points and camera-based verifications.

### Radio Alert

Instantly receive video analytic and access control alerts directly to your two-way radio via text message and text-to-voice alerts — including license plate recognition, breaches, loitering and presence detection.

### IIoT & Safety Alarms

Incorporate your third-party sensors and IIoT devices on your machines and people into the unified workflow to receive direct notifications and alarms on your integrated radios and software in order to quickly coordinate an appropriate response.

## RESTRICTED/HAZARDOUS RISK AREA - DETECT



### Employee Enters Monitored Area

Employee enters a hazardous area that is monitored with video at all times.

## HAZARD AREA

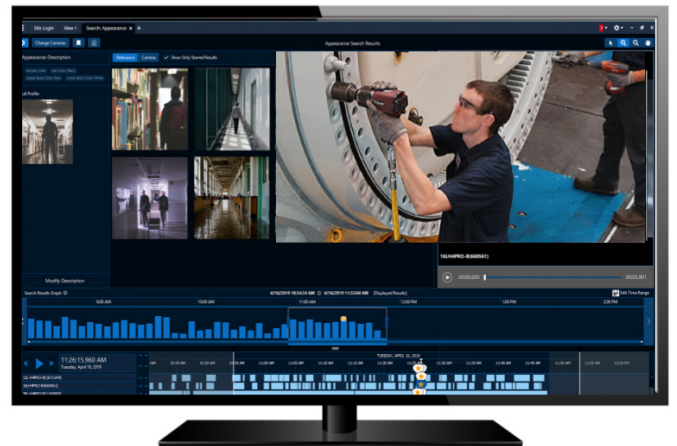


# ANALYZE

You're responsible for monitoring a large facility filled with workers, secure areas, vast spaces, critical materials and equipment. Identifying unwanted individuals, tracking persons of interest, locating missing inventory and recognizing hazardous situations in this environment is a demanding task.

Appearance Search capabilities quickly and seamlessly explore video footage to identify persons or vehicles of interest across the plant floor or parking lot. Video analytics detect potentially suspicious or hazardous activity, providing real-time insights into facility-wide movements. The Focus of Attention interface quickly brings your attention to areas of video security interest, increasing efficiency and improving response time when evaluating a situation.

Ultimately, these solutions and insights are crucial to cutting through the noise, proactively locating points of interest and recognizing which events are important — so you can have eyes on the scene to evaluate and make an informed decision to take action.



Appearance Search

## ANALYTIC SOLUTIONS

### Avigilon Appearance Search™

Find who you are looking for faster with video search that can be initiated by selecting specific physical descriptions such as hair or clothing color, gender and age category or vehicle type and color.

### Self-Learning Video Analytics

Use advanced pattern-based analytics and teach-by-example technology to proactively monitor and accurately recognize movements of people and vehicles while ignoring motion not relevant to a scene that could pose a safety or operational risk. Additional rules-based analytics help ensure your security staff don't miss important events that need further investigation, such as loitering.

### Focus of Attention

Easily identify where action is required with potentially critical video activities identified by color-coded hexagons so you can focus on what's important.

### Unusual Motion Detection

Turn unknowns into insights and reveal anomalies that may pose security or safety risks with artificial intelligence that "learns" typical activities in the plant to automatically detect and flag unusual motion or activity that may otherwise be missed.

### Identity Search

Intelligently integrate ID badges with the power of video to map personnel movement throughout your entire premises via scanned door badge activity linked with video feeds.

## RESTRICTED/HAZARDOUS RISK AREA - ANALYZE



### Extended Presence Recognized

Alarm is triggered when employee presence exceeds the predetermined time limit and Focus of Attention provides exact location.



# COMMUNICATE

Whether you are a foreman on-site needing to routinely communicate with your floor staff, plant management and other areas of the plant, or a response team dealing with a large-scale emergency such as a dangerous accident or hazardous material spill, clear and timely communication is key to keeping your teams connected and informed.

Radio communications instantly and reliably connects security, response teams, floor staff, field workers, foreman, plant management and local first responders when needed. Broadband push-to-talk with multimedia capabilities extends your reach by enabling voice and data information to be shared across devices to those in other buildings or off-site. Mass notification capabilities make it easy to notify and share information with your entire organization at a moment's notice.

Connectivity — across devices, networks and locations — is an important part of ensuring you and your entire team are aware and informed at all times.



Dispatch Software

## COMMUNICATION SOLUTIONS

### Two-Way Radio Communication

Communicate securely across all facilities and in the toughest environments with rugged two-way radios that deliver superior voice clarity, rugged design, long battery life and outstanding range — ensuring personnel can hear and be heard regardless of their surroundings. Additionally, transmit multimedia and data rich intelligence on your two-way radio using broadband enabled, purpose-built radio devices. Sensors embedded in your radio device can also monitor for inactivity to warn when there may be a potential problem or man-down situation.

### WAVE PTX: Broadband Push-to-talk with Multimedia Sharing

Share voice and data without boundaries, enabling smart phones with push-to-talk capabilities enhanced with the ability to push details via text, photo, video or file attachment to smartphones, tablets, laptops and even land-lines.

### Dispatch Software

Simplify and standardize your dispatch process and workflow with streamlined dashboard views and instant communications across different devices, networks and locations scaled to your facility's specific needs. Leverage All Call to quickly and efficiently reach all uses on a channel or system.

### Mass Notification

Notify and mobilize critical personnel at a moment's notice with automated alerts sent by text, email or voice message from laptops or smartphones, ensuring easy information sharing across groups.

### CBRS Private LTE (NITRO)

Do more with less with enterprise-grade private broadband with twice the capacity, up to four times the range of Wi-Fi and the ability to share multimedia and data across your facilities using a private data network managed via a cloud-based portal.

## RESTRICTED/HAZARDOUS RISK AREA - COMMUNICATE



### Notifications Communicated

Ops Center notifies floor supervisor with location information to retrieve employee from the area.

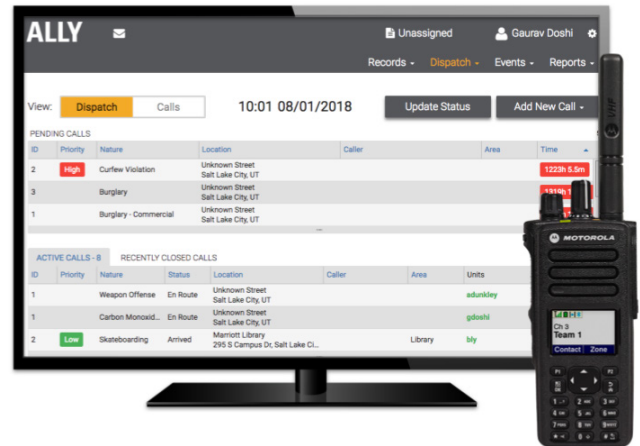


# RESPOND

Whether it's an everyday incident or an emergency situation, your response teams and facility personnel need to communicate with each other to coordinate a response in the most efficient way possible. Being ready and aware is critical to ensuring your team can quickly respond to incidents or problems before they escalate — decreasing downtime, maintaining productivity and ensuring the health and safety of workers.

Dynamic interoperability makes it easy to directly share data with response team personnel in real-time, enhancing situational awareness. Incident management streamlines the logging of incident reports and makes it easy to share multimedia with other personnel when needed and inform future decision-making for safety, security and operational procedures. Work order ticket management makes it easy to track work orders and close out tickets quickly and efficiently directly from your radio.

Because enabling rapid response and documenting past incidents can be the key to preventing incidents from becoming tragedies.



Ally Incident Management

## RESPONSE SOLUTIONS

### CommandCentral Aware Enterprise

Provide critical incident insights and eyes-on-the-scene with real-time video, resource location information, streamlined incident intelligence and direct communication connections within your facility and with response teams.

### Incident and Records Management

Streamline end-to-end incident and records management with customizable record fields and multimedia attachments, all accessible from web-enabled devices.

### Critical Connect

Easily enable and disable dynamic, seamless and secure temporary communication links between networks with interoperability between response teams and on-site staff, and even with local first responders.

### Workforce Efficiency & Productivity Management

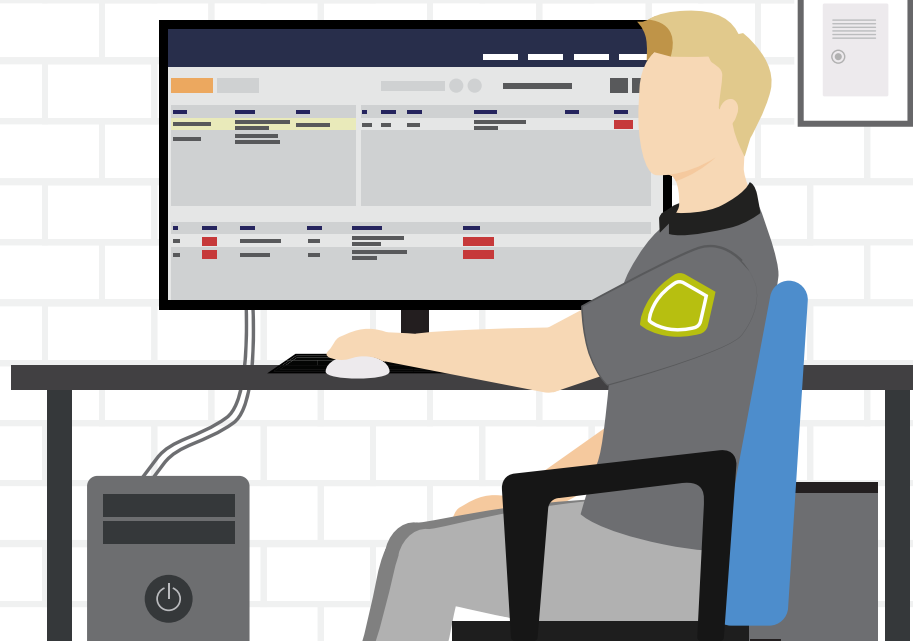
Centralize documentation and easily organize and access work order tickets with cloud-based capabilities for easy sharing and reference across teams. Increase workforce efficiency, productivity and safety even further with fleet administration, GPS and more.

## RESTRICTED/HAZARDOUS RISK AREA - RESPOND



### Employee Located

Employee is located, and condition confirmed ok. Reports are run weekly to monitor violations and inform for additional training or procedural adjustments.



# AUTOMATE WORKFLOWS. MANAGE OPERATIONS. CONFIGURE YOUR TECHNOLOGY.

Get it done with Orchestrate.

Time is precious. And managing the communications, video and software that comprise your security and operations technology ecosystem can be a time-consuming, challenging task. What if there was a way for you to focus on what matters most, and automate the rest?

That's why we created Orchestrate. It's a simple, user-friendly and cloud-based interface tool that gives administrators the ability to configure and automate workflows that control their integrated security technology ecosystem. These intelligent, automated workflows also enhance efficiency as well as improve response times, effectiveness and overall personnel safety. It equips your security network operations teams with the capabilities they need to detect triggers across a number of installed devices and quickly take actions to reduce risk of breaches and downtime by automatically alerting the appropriate teams and executing the proper procedure. Orchestrate makes managing your day-to-day operations effortless by providing a self-service workflow management tool at your fingertips.

## KEY FEATURES

Complex workflows, simplified.

Our business workflow automation solution, Orchestrate, is designed for your unique ecosystem. It allows you to integrate individual processes, fully manage and optimize workflows, and deliver a consistent response every time. The number and complexity of workflows can scale to meet the needs of your operations. Because Orchestrate is a secure, cloud-based, cross-technology platform, users can access and build customized solutions from anywhere, at any time.

## AUTOMATATION

Let intelligent workflows do the work.

Your organization is being continually challenged to do more with less — and to do it quickly, efficiently and cost-effectively — all while protecting people's safety. When you are able to immediately recognize and respond to threats and unexpected events, you are able to focus on the work at hand. Ensuring nothing is missed. From simple machine-assisted decision-making to complex workgroup action and event management, Orchestrate empowers you to address the unique challenges of your operation, automatically. All so you can keep your focus on what matters most.

## EMPOWER YOUR OPERATIONS

Address the unique challenges of your operation, automatically.



### AUTOMATE WORKFLOWS

Expand reach



### IDENTIFY BOTTLENECKS

Minimize inefficiencies



### BOOST PRODUCTIVITY

Reduce manual effort



### INCREASE FOCUS

Focus on high value activities



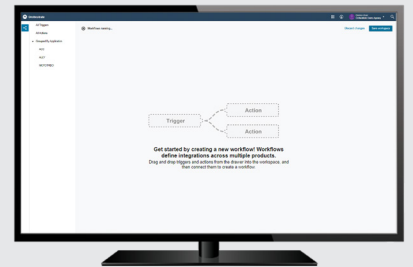
### IMPROVE TRANSPARENCY

Track status at every stage

## HOW ORCHESTRATE WORKS

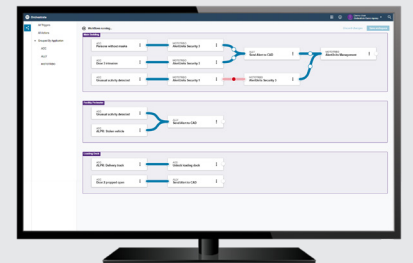
Self-service workflow creation.

Administrators can create rule-based, automated workflows between their technology sleeves to enhance efficiency as well as improve response times, effectiveness and overall safety.



### EXPLORE

Define business logic with a simple to use, single-pane graphical interface



### CONFIGURE

Create automated workflows for machine-assisted decision-making



### ACTIVATE

Leverage analytics to trigger conditional logic, alerting and informing relevant teams



## SERVICES

Effectively managing a complex ecosystem can be complicated. You need the right service, support and management to ensure your day-to-day needs are taken care of — ensuring smooth operations. At Motorola Solutions, our unique service offerings provide technical support, hardware repair and replacement and software updates to ensure your two-way radio, infrastructure, cameras and software are always working at peak performance.

# 395,000

manufacturing workplace injuries  
were reported in 2019<sup>2</sup>

### Technical Support

Effectively troubleshoot and promptly resolve technical and non-technical issues with dedicated experts.

### Repair and Replacement

Protect system components from normal wear and tear and keep them in operation with state-of-the-art diagnostics equipment, repair tools and replacement parts.

### Software Updates

Ensure continuous security, extended performance and enhanced functionality of two-way radios, infrastructure and cameras with certified and pre-tested software updates.

## COVID - 19

COVID-19 has impacted manufacturing facilities nationwide. Worker safety is increasingly top of mind as organizations look to implement new safeguards to ensure their team members are safe and healthy. New technologies are emerging that enable manufacturers to return to operation while supporting worker health. As a result, facilities are looking to integrate smart technologies to better support operations and worker safety.

### COVID-19 Response Solutions

- Elevated Temperature Detection
- No Face Mask Detection
- Occupancy Counting
- Contact Tracing Technology
- Social Distancing Technology







“If you put all of your time and effort into safety and quality, it sets a culture of attention to details ... You actually touch on all the other KPIs without having to actively manage every single one of them by driving that hardcore safety culture.”  
- Manufacturing Operations Lead

## BUILT FOR MANUFACTURING

Regardless of the size of your plant or the environment you work in, data has become a valuable tool for your organization — enabling you to track products in the warehouse, share critical information with your teams and monitor production lines. The rise of IoT sensors, robotic integrations and connected machines is increasing the need for lightning-fast data across every level of your operation.

With Motorola Solutions Nitro™, our unified data and voice CBRS private LTE platform, your organization has access to enterprise-grade private broadband across your entire facility. Nitro provides the secure backhaul that your organization's increasing voice and data pressures demand. So your team can stay connected and informed — from virtually any location.

Sources:  
<sup>1</sup> Bureau of Labor Statistics  
<sup>2</sup> 2019 Deloitte and MAPI Smart Factory Study

Learn more at:  
[motorolasolutions.com](https://motorolasolutions.com)



## TAKING MANUFACTURING SAFETY TO THE NEXT LEVEL

It's time to reimagine what safety technology can do for your manufacturing facility — driving efficiencies, bolstering performance and helping you deliver on your promise of delivering quality products to customers.

The Motorola Solutions Safe Manufacturing integrated technology ecosystem unifies mission-critical technologies to improve safety and security across your facility while also helping your facility to be smarter and more efficient. By bringing together the integrated and innovative technology you need to detect, analyze, communicate and respond, we're helping to reduce operational downtime, and maintain efficiency and effectiveness across the board.

By enabling modern incident and operational management, you can be sure your teams are working safer, smarter and more productively. And that when incidents happen, your teams are assured there is technology in place to resolve them as quickly as possible so they can stay focused on the job at hand.