

# Push-to-Talk Over Cellular (PoC) for Fleet Operations

## WHITE PAPER



Understanding PoC Services, Systems, and Devices for Fleet Communications and Vehicle Location Tracking

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# Introduction: The Benefits of Radio Communications and Vehicle Tracking for Fleet Operators

In the fast-paced world of vehicle fleet management, efficiency, reliability, and safety are paramount. Traditional methods of communication and dispatch often fall short in meeting the dynamic demands of modern fleet operations. Push-to-Talk over Cellular (PoC) nationwide communications and dispatching software with location tracking are enhancing operational efficiency for vehicle fleet operators.

**Real-Time Communication** – PoC radio systems provide instantaneous, clear, and reliable communication for drivers and dispatchers to stay in touch. Unlike mobile phones, radio systems are designed for quick, one-to-many communications, ensuring that critical information can be disseminated swiftly to all relevant parties. This reduces the likelihood of delays and misunderstandings, facilitating smoother and more coordinated operations.



**Efficient Dispatching and Location Tracking** – PoC dispatching software integrates seamlessly with radio communication systems, allowing dispatchers to assign tasks and routes with greater precision. Professional dispatching features enable the optimal assignment of vehicles based on their real-time location, availability, and capacity. This not only improves the efficiency of task allocation but also reduces idle times and ensures that vehicles are utilized to their full potential. The inclusion of GPS-based location tracking within dispatching software provides real-time tracking for monitoring routes, adherence to schedules, and the quick identification of any deviations or delays. With accurate location data, dispatchers can make informed decisions, reroute vehicles to avoid traffic congestion, and provide customers with precise arrival times.



**Enhanced Safety** – Safety is a critical concern for fleet operators. Radio communications ensure that drivers can report emergencies or issues immediately, while location tracking enables rapid response in case of accidents or breakdowns. Additionally, dispatching software can monitor driving behavior, providing alerts for speeding or harsh braking, thus encouraging safer driving practices.

**Data-Driven Insights** – The data collected from radio communications, dispatching software, and location tracking systems can be analyzed to gain valuable insights into fleet performance. Operators can track metrics such as route efficiency, and vehicle utilization. These insights help in identifying areas for improvement, optimizing routes, and implementing cost-saving measures.



**Improved Customer Service** – With precise location tracking and efficient dispatching, fleet operators can provide customers with accurate delivery times and updates. This transparency enhances customer satisfaction and trust. Additionally, any issues or delays can be promptly communicated, allowing for proactive problem resolution.



The integration of radio communications and dispatching software with location tracking is transforming the landscape of vehicle fleet management. These technologies work in tandem to streamline operations, enhance safety, and provide valuable data-driven insights. For fleet operators, adopting these tools means improved efficiency, reduced costs, and superior service delivery. In an industry where time and reliability are of the essence, these advancements are not just beneficial—they are essential.

By leveraging the power of modern communication and tracking technologies, fleet operators can stay ahead of the curve, ensuring that their operations are both effective and competitive in today's demanding market.

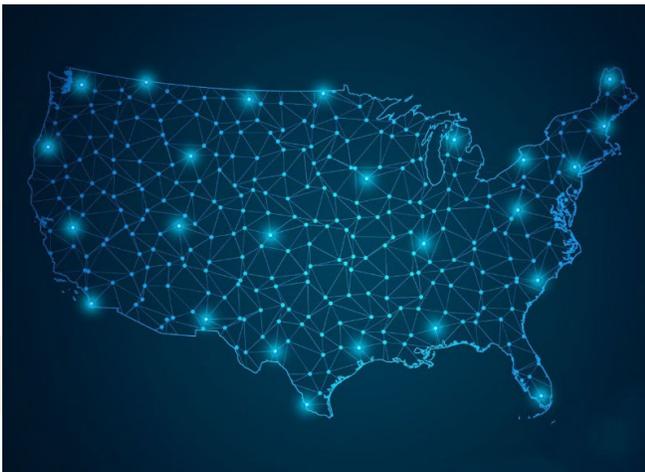
# Push-to-Talk Over Cellular Overview

## What is PoC?

PoC provides group communication services over both Wi-Fi, 4G 5G, and Long-Term Evolution (LTE) technology, creating a nationwide radio network that utilizes the cellular infrastructure of Mobile Network Operators. This enables radio networks with nationwide coverage. Radio users are untethered by the range of repeaters and base stations used in traditional radio networks.

PoC utilizes cellular LTE network infrastructure to create a wide-area radio network that provides national coverage for voice communications and fleet tracking

The concept of Push-to-Talk over Cellular was introduced by Nextel in 1987 as an alternative to two-way radios. Nextel (revolutionized business communication when it started to pass small voice packets across their iDEN network. Prior to PoC, business communication was dominated by two-way radios on peer-to-peer and local radio networks. Nextel was acquired by Sprint, and in 2013 Sprint decommissioned the Nextel iDEN network.



Today, PoC provides the best of both narrowband digital radios and broadband 4G/5G/LTE networks. PoC radios support the advanced features of Digital Mobile Radios (DMR), including messaging, instant group calling, GPS location tracking, and emergency notifications. Combining this functionality with Wi-Fi and 4G/5G/LTE cellular networks provides the national coverage area and bandwidth required for modern data applications.

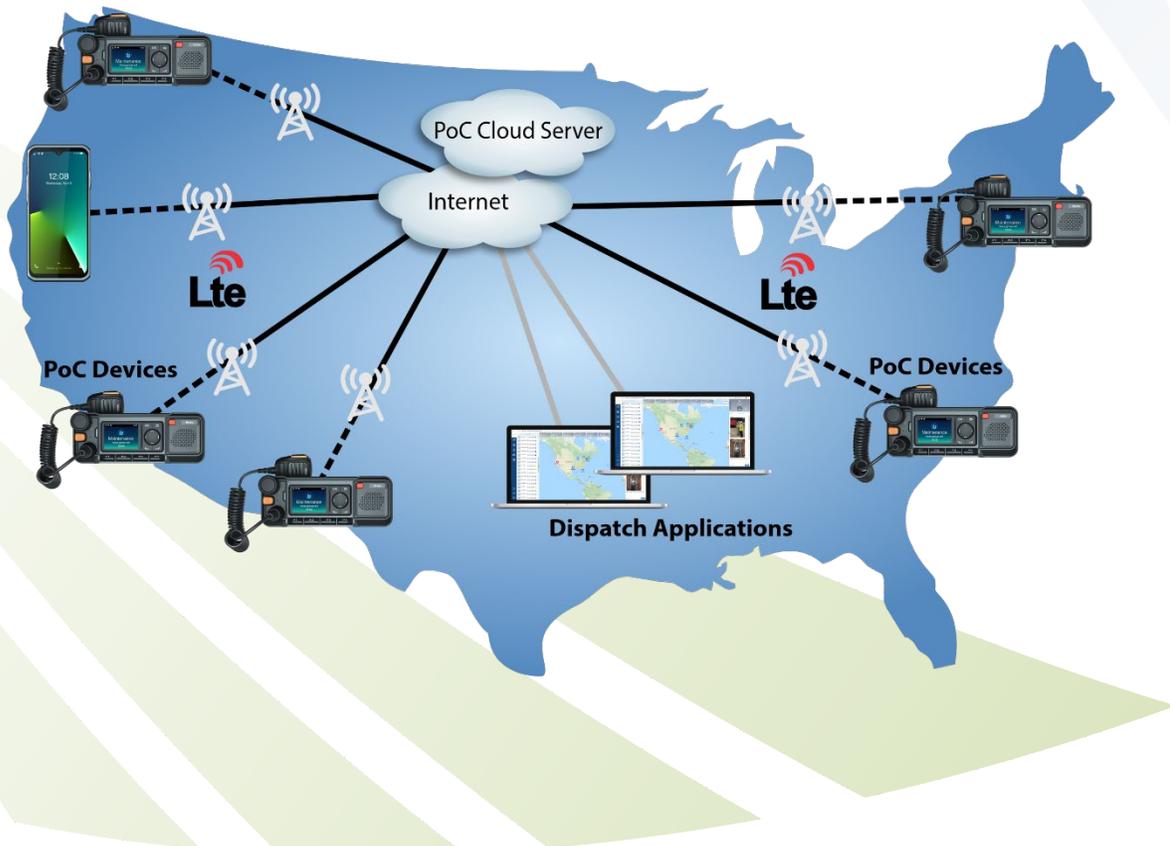
## How PoC Works

PoC is also referred to as Radio over IP (RoIP). Similar to Voice over IP (VoIP), RoIP devices are handheld two-way radios that access cloud based PoC services via the internet for voice calling. A data plan SIM card (similar to those used in cell phones) is installed in the PoC device to enable access to the internet using the 4G/5G/LTE cellular infrastructure of Mobile Network Operators like AT&T and T-Mobile.

PoC radios are also known as Internet of Things (IoT) devices that access the internet for data communications and can also access the internet via Wi-Fi networks like any other mobile device.

This alphabet soup of terminology gets confusing, but simply put, PoC devices access the internet through 4G/5G/LTE cellular networks and Wi-Fi networks for wide-area radio communications. The result is access to existing and reliable networks that require no maintenance or operational expenses. An app on the PoC device (typically an Android operating system) provides simple and convenient access to PoC services.

PoC network services are typically hosted on the cloud using PoC controllers (network appliances) that are operated by a PoC platform service provider. PoC controllers can also be privately owned and operated by the customer. Gateway routers provide connectivity between the 4G/5G/LTE network and the cloud hosted PoC controller. Dispatch Applications and the Management Application (used to configure customer accounts) are connected to the PoC cloud server through the internet.



## PoC Group Calling

PoC provides the same group calling capabilities as traditional two-way radio systems to enable instant group calls to multiple users with the press of a PTT button on a radio or from a dispatching application.

Call groups are set up based on all call and emergency calls, types of employees (supervisors, administrators, etc.), remote employees and mobile service fleets, employee locations, type of projects, etc. Radio users can belong to multiple groups as shown in the overlapping areas.



## PoC Features and Benefits

### Nationwide Coverage

PoC devices connect to cellular 4G/5G/LTE networks with the installation of a SIM card in the PoC device. This provides connectivity for communications with fleet vehicles across town or across the country.

### No Radio Infrastructure or FCC Frequencies Required

Since existing cellular 4G/5G/LTE and Wi-Fi networks are the network infrastructure for PoC, there is no need to purchase, operate and maintain any traditional two-way radio network equipment. This reduces capital equipment costs and day-to-day operation and maintenance costs. PoC also eliminates the need for expensive FCC radio frequency licenses, and in high-density urban areas there may be no frequency spectrum available.

### Rapid Deployments

PoC systems can be deployed very quickly over existing cellular and W-Fi networks. PoC radios can work out-of-the-box with SIM cards pre-installed, and system configuration is done through an easy-to-use web-based dispatch application.

### Instant Push-to-Talk Group Calling

PoC technology enables subscribers to make one-to-one (individual) calls or one-to-many (group) calls to separate groups of people at the same time. One press of a button on a radio and you are talking to a predefined group.

## Encrypted Communications

PoC systems support the ARC4 (Alleged RC4) and AES (Advanced Encryption Standard) encryption algorithms to secure digital voice and data transmitted over the radio network. This digital encryption provides private end-to-end communications, and if AES encryption is enabled, an AES cryptographic key is generated that enables the device access to the network, so only PoC radios with encryption enabled can access the system.

## GPS Location Tracking and Dispatching

PoC devices with integrated GPS enable location tracking via a dispatcher application. This is an essential tool for managing, scheduling, and tracking vehicle fleets and remote teams in real time. PoC dispatch applications that support Geo Fencing enable alarm triggers when employees enter or exit the virtually defined territories. Dispatchers are typically web-based applications allowing for easy deployments and minimal start-up costs.

## Scalable for Small Businesses and Large Enterprises

PoC systems enable adding many users quickly to any size deployment, so they are scalable for small/medium sized businesses and large enterprises with thousands of users. Large Enterprises can have access to a PoC Systems Operations Management and can run their own PoC system to:

- Define geographic segmentation for multiple locations so users only call other users at the same location
- Remotely manage and update call groups across the system
- Program radios in bulk, and add or remove users
- Generate network traffic reports for optimizing system configuration
- Create a privately branded system with company logos on device and dispatch application screens

## Radios-as-a-Service

PoC radio services are typically purchased on a subscription basis. The subscriptions are available as monthly or annual plans that can include the PoC devices, or the PoC devices can be purchased and owned by the subscriber. The subscription costs typically include the SIM card which has a monthly service fee from the mobile cellular operator (AT&T or T-Mobile for example) to access the LTE network through the SIM data plan.

## The Benefits of PoC Subscription Services

- PoC subscription plans are very inexpensive and cost-effective
- OPEX cost model with minimal up-front costs and low monthly or annual payments
- The easiest and fastest way to get reliable wide-area radio communications
- No investment in depreciating radio network infrastructure
- No equipment to house, power, and maintain
- No FCC frequency licenses required
- Scalable with unlimited subscribers so the system can easily grow with the needs of the organization

## Who Uses PoC?

Enterprises and organizations which use PoC services are looking for wide-area workforce communications with low start-up and operational costs. PoC is particularly useful for businesses with vehicle fleets, as asset tracking via GPS is an integral component of the PoC dispatch solution.

- Contractors and Building Materials
- Security Guards and Patrols
- Transportation and Logistics
- Student Transportation
- Hospitals and Ambulance Services
- Service Fleet Companies
- Waste Management
- Tow Truck Companies
- Delivery Services
- Landscaping and Tree Trimming
- Shuttle Services



## PoC Market Growth

Growth in PoC services is being driven not just by the 4G/5G/LTE technology, but also by the increase in the nationwide mobile workforces, and the adoption of the Internet of Things (IoT). At its peak, Nextel had over twenty million subscribers, proving the demand for wide-area workforce communications. The following growth projections from leading research firms show strong growth in the PoC market.



**Markets and Markets** – Markets and Markets predicted that the PoC market will grow at a 10.5% a Compound Annual Growth Rate (CAGR) over the next four years, with the greatest growth taking part in the Commercial sector.



**Allied Market Research** – The PoC market size was valued at \$3.43 billion in 2019, and is projected to reach \$6.95 billion by 2027, growing at a Compound Annual Growth Rate (CAGR) of 9.4% from 2020 to 2027



**Persistence Market Research** – PoC market revenue totaled \$3.9 billion in 2020, and is expected to reach \$12.4 billion by 2031, increasing at a CAGR of over 11% through 2031.

# Safe and Legal Devices to Use While Driving

Organizations may choose to have employees use personal smartphones, company-issued smartphones, or computer tablets for fleet monitoring and communication. One of the key disadvantages of handheld devices is that they are unsafe and illegal to use while driving in most states. PoC mobile radios are safe, legal, and DOT approved communications devices for use while driving. This is because the driver uses a handset with a push-to-talk button that is easily within reach and can keep their eyes on the road while talking. PoC mobile radios are installed inside the vehicles cab (either on the dash, under the dashboard, or above the windshield).



PoC Mobile Radio with Handheld Microphone

PoC handheld devices can also be used for safe and legal in-vehicle calling when installed using a car kit that mounts to the vehicle dashboard and features a handheld microphone. This innovative installation method locks the in place and allows the handheld radio to be used inside *and* outside the vehicle. PoC handheld radios are locked in the car kit, and they can be easily removed and used as a compact and portable handheld device. For example, remote service technician drives to a jobsite and leaves the vehicle to perform work at the jobsite. The technician will often require communication with a dispatcher or supervisor to receive technical advice or order parts and materials.



PoC Handheld Radio with Car Kit

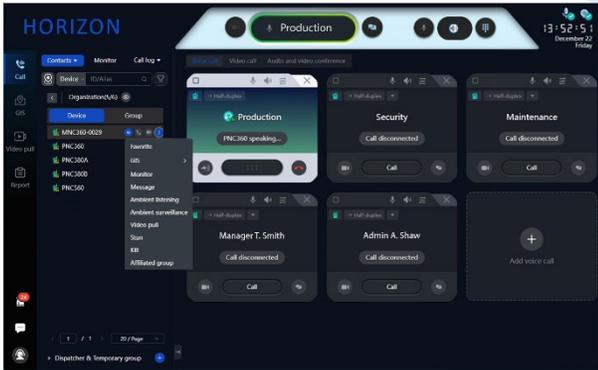
## Advantages of PoC Devices over Smartphones

In addition to PoC mobile radios and handheld radios with car docking kits being safe and legal to use while driving, there are other advantages to providing employees dedicated PoC devices:

- PoC devices and service plans are much less expensive than smartphones and cellular plans
- PoC devices ensure employees use the devices exclusively for business-related communications and reduces the distractions of personal smartphones
- Instant Push-to-Talk group and individual calls without launching apps, looking up contacts, or waiting for users to answer the phone
- PoC handheld devices provide features typically not supported on smartphones:
  - Rugged devices that withstand high impact (dropping), water submersion, and dust
  - High volume speakers and noise cancelling technology for use in loud vehicles and environments
  - High power batteries that guarantee calling availability for the entire work shift
  - One touch emergency alarms for worker safety

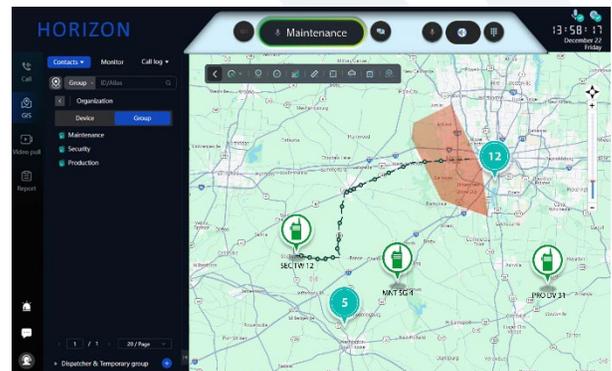
# PoC Dispatching Applications

PoC systems include web-based dispatching applications that can be run on a web browser. Dispatch applications provide a comprehensive fleet dispatching and group calling interface for instant nationwide calling and GPS location tracking.



Dispatchers can customize the dispatch interface to add any group or device to the main operating screen, making the handling of multiple calls much easier and faster. Each calling tile has separate volume controls and calling options, allowing the dispatcher to quickly send a text or image, or make an individual or group call. Group calls can be made to pre-programmed groups, or groups can be built on the fly by selecting users from a list or by selecting users on the dispatch map.

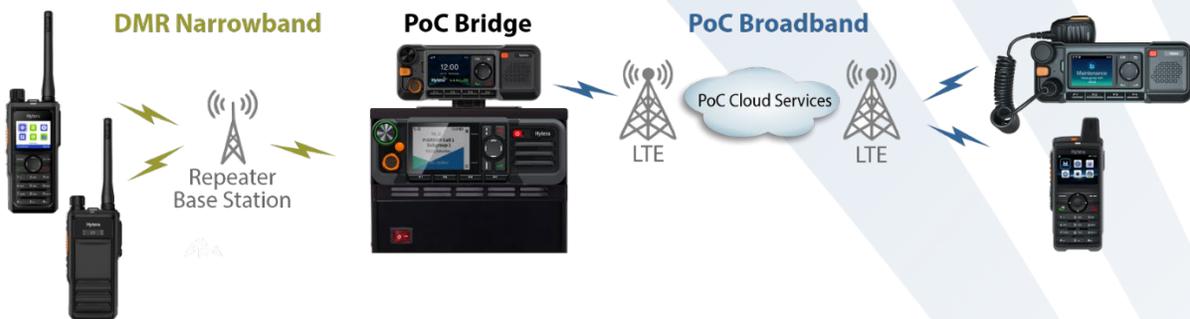
Dispatch applications can track multiple user locations and travel routes with job site time stamps to manage and dispatch vehicle fleets and remote workers. Dispatchers can draw geofences on the map to define boundaries for territories and service areas. Alarms can be generated when users enter or leave geofenced areas. Alarms can also be generated when drivers exceed the speed limit, or have been driving for an extended period of time.



PoC dispatch applications also feature call record storage and reporting options. Dispatchers can instantly review, play, search, and export logs for calls, messages, emergency alarms, geofencing alarms, and overspeed alarms. Report data can be exported to create reports with tables, statistics, and graphs for individual and group call counts.

# Connecting PoC Devices to Existing Radio Systems

PoC bridging systems provide a simple, reliable, and cost-effective Radio over IP (RoIP) gateway between broadband PoC radios and a variety of narrowband DMR and analog radio systems. PoC bridging systems enable low-latency group radio calling connectivity between PoC radios and analog radios or DMR standards compliant radio systems. A typical use for a PoC bridge is adding fleet vehicle communications with PoC mobile radios to an existing single site DMR or analog radio system. This provides a cost-effective way to add PoC wide-area communications and preserves investments in existing DMR and analog radio systems.



The PoC bridge provides a single talk channel interconnect from PoC to DMR radios with a special mobile radio hardware and software system that interconnects and re-broadcasts communication between the PoC and DMR or analog radio systems. Multiple talk channels can be deployed between the two radio systems by installing additional PoC bridges.

## Criteria for Selecting PoC Services and Devices

### PoC Systems and Subscription Services

**Is the Service Reliable?** PoC subscription services from well-known companies are having issues with regular system outages. When selecting a PoC service platform provider, check on the system reliability and service availability. Ask if they have had service outages, for how long, and how often. Select a PoC service that runs on the latest high-capacity and high-performance servers, and ones that have geographically diverse redundancy. That means that if a server or even an entire datacenter goes down, the service will switch to another back-up server to in a different location with no down time for the subscribers.

**Is the System Scalable?** PoC subscriptions should enable adding PoC subscribers to your radio system quickly and easily. For large enterprises, providing access to the PoC system management enables complete customer control of the system with the ability to silo users at different locations, create and modify call groups, and quickly program and deploy radios across the system.

**Is There a Dispatching App?** If your organization has fleet vehicles and remote workers, then a professional web-based dispatching app is a necessity for centralized communications, location tracking, and making group calls.

## PoC Devices

**Are They Well Built and Reliable?** There has been a race to the bottom over the past few years on PoC device pricing. Consumers have benefitted from this trend with lower priced PoC devices, but it has also resulted in cheap, low-quality PoC devices on the market. There are visible differences in quality between different PoC manufacturers' devices, so inspect them carefully. Some PoC devices have only a six-month warranty and have high failure rates after the warranty expires. Look for devices that have at least a two-year warranty from manufacturers that are confident in their device quality and back it up with a longer warranty.

**Are They Rugged?** It is important for PoC devices to stand up to long-time use in tough environments and deliver extended life value. PoC devices are used over long shifts and need to stand up to everyday use and abuse that includes dropping on hard surfaces, getting wet or submerged in water, getting dirty and exposed to fine dust particles. Look for devices that are IP67 and IP68 rated for water and dust protection. IP67 and IP68 ratings ensure the device is impenetrable by water (sprayed water and full submersion) and fine dust particles. A MIL-STD rating means the devices are durable to withstand dropping and repeated impacts, along with exposure to extremely high humidity.

**Is Audio Quality Loud and Clear?** There is also a discernable difference in audio quality between different PoC devices on the market. Many devices have substandard audio quality, especially when used in a loud environment. Seriously, what is the point of having radio communication if you can't understand the person speaking? Make sure the PoC devices have high-quality loudspeakers and digital noise cancellation that separates human voice from background noise in real time. The latest PoC devices have AI-based noise cancellation and can learn the human voice to remove background noise as loud as 60db for crystal clear radio communications.

**Are There the Right PoC Devices and Features to Meet Your Specific Needs?** When provided with a wide variety of devices, companies can select the devices that match the specific needs of staff and departments instead of being sold what happens to be in stock. This ensures that the PoC communications solution is highly effective, aligns costs with value, and the system is utilized to its full capabilities by employees.

Handheld PoC radios are available as ultra-compact and cost-effective devices that provide excellent value for employees that need simple voice communications. Handheld PoC radios are also available with a full set of features that can include cameras for sharing pictures and videos, and keypads for configuring features and sending text messages. PoC devices are also available as mobile smart computers for employees and managers

that need a mobile device that run business apps in addition to providing PoC communications. These are available with cameras, and infrared scanners for reading barcodes.

Many organizations rely on cell phones and handheld devices for communicating with drivers in fleet vehicles. This is an unsafe practice that brings liability to the company, and it is illegal in most states. Mobile PoC radios with handheld microphones are a legal and DOT approved way to safely communicate with drivers who can make and receive calls while keeping their eyes on the road.

**The Proof is in the Product.** The best way to find the right PoC services and devices for your organization is to get a demonstration and test the PoC devices firsthand before you buy. Check the PoC system yourself and determine if the device quality, service quality, and audio quality is to your standards, and use the features on the devices and decide if they are beneficial to your specific business needs.

## Hytera PoC Solutions

### HORIZON Push-to-Talk over Cellular Platform

# HORIZON

[HORIZON](#) is a Push-to-Talk Over Cellular (PoC) service that provides instant individual and group calling over the most advanced and reliable cloud-based communications network. HORIZON utilizes the 4G/5G/LTE cellular infrastructure of Mobile Network Operators and Wi-Fi networks to access the cloud-based PoC servers. 4G/5G/LTE cellular networks enable unlimited coverage area so radio users are untethered by the range of repeaters and base stations used in traditional radio networks.

HORIZON has unparalleled reliability and service availability with high-performance and high-capacity cloud servers with geographically diverse failover. So even if an entire data center goes down, the servers will switch to new redundant location so there is no service outage to HORIZON subscribers.

PoC systems from Hytera US Inc are available as a subscription service (OPEX cost model), or as customer owned equipment (CAPEX cost model), where the PoC server is owned and operated by customer.

## Hytera PoC Devices

Hytera provides a wide variety of PoC handheld radios, PoC mobile radios, and PoC handheld smart devices. These compact, rugged, and easy-to-operate handheld devices enable group voice communications over Wi-Fi and nationwide cellular 4G/5G/LTE networks.



### The key features of the Hytera PoC devices:

- High-quality devices backed by a two-year warranty
- Wide variety of device types and features to align the devices with any organizations' specific needs
- AI-Based noise suppression and high-volume speakers for industry-leading voice quality in loud environments
- Built-in Wi-Fi that automatically switches over to the LTE network when out of Wi-Fi range
- GPS enables tracking and positioning for the dispatching application
- Ruggedized to IP67/IP68 and MIL-STD-810 G/H standards
- Supports instant individual and group calling, texting, and sharing images and videos
- Mobile PoC radios are DOT approved and legal to use in vehicles while driving
- Car kits are available for specific handheld PoC radios to provide safe, and DOT approved use in vehicles
- Powerful battery provides reliable operation for over 24 hours
- Multi-unit chargers available for most PoC handheld devices
- Built-in Bluetooth supports wireless connection with audio accessories for hands-free operation
- PoC handheld smart devices run any Android business app for a true unified communication device

## Hytera BRIDGE PoC Radio Gateway

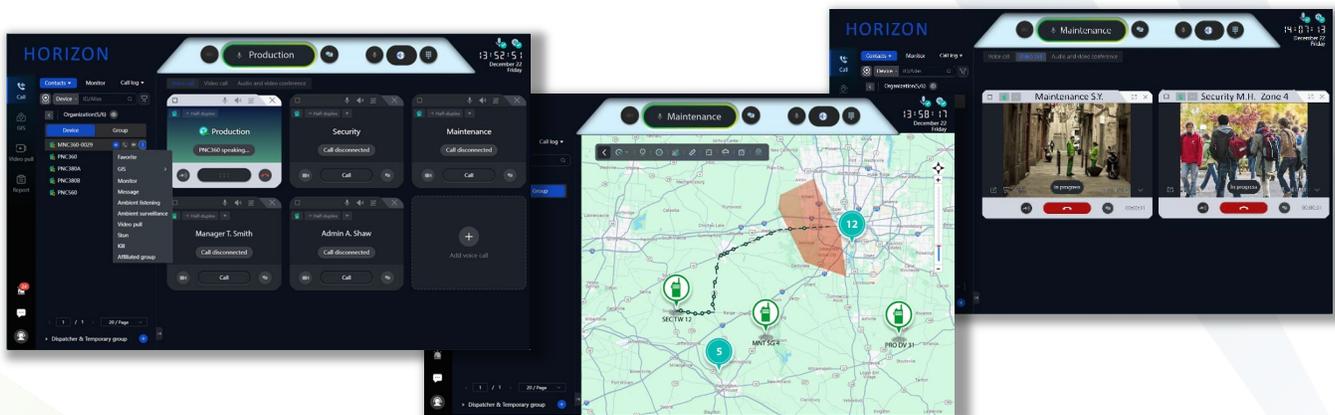
[Hytera Bridge](#) is a simple, reliable, and cost-effective Radio over IP (RoIP) gateway that enables connectivity between PoC radios and existing Analog and DMR radio systems.

- Add nationwide PoC calling to existing two-way radio systems
- Enables a variety of flexible system interconnect configurations
- Preserves investments in existing DMR and Analog systems



## HORIZON Dispatch

[HORIZON Dispatch](#) is a powerful web-based dispatch and fleet management application that tracks driver locations and travel routes with time stamps. The dispatch application works with the GPS built into Hytera PoC devices and supports geofencing capabilities.



HORIZON Dispatch supports instant group voice calling as well as individual calling. Dynamic call groups can be quickly created with a simple list selection or geographically by selecting an area on the dispatch map. The dispatcher may stun (turn off) and reactivate a radio and receive emergency alarms. HORIZON Dispatch supports call record storage and reporting to instantly review, play, search, and export logs for calls, messages, emergency alarms, geofencing alarms, and overspeed alarms.

# Summary

**Efficiency & Reliability** – Push-to-Talk over Cellular (PoC) systems offer instant, reliable communication, enhancing the coordination between drivers and dispatchers, leading to smoother operations.

**Location Tracking** – Integrated GPS tracking allows for real-time vehicle monitoring, optimizing dispatching, reducing idle times, and providing precise delivery times.

**Safety** – Enhanced safety is achieved through immediate communication capabilities and real-time tracking, enabling quick responses to emergencies and monitoring of driver behavior.

**What is PoC?** PoC operates over Wi-Fi, 4G, 5G, and LTE networks, offering nationwide coverage, unlike traditional two-way radios limited by range.

**Functionality** – PoC supports advanced features like group calling, GPS tracking, and emergency notifications, combining narrowband radio capabilities with broadband cellular networks.

**Who Uses PoC?** Various industries including transportation, security, and service fleets, benefit from PoC's cost-effective wide-area communication and tracking capabilities.

**Safe Use While Driving** – Unlike cell phones, tablets, and other handheld devices, PoC mobile radios are safe and legal to use while driving. PoC handheld devices can also be used in vehicles with a car kit.

**Dispatching Capabilities** – PoC dispatch applications offer web-based platforms for instant group calling, and GPS tracking, with customizable interfaces for efficient fleet management.

**Subscription Services or Customer Owned Systems** – PoC services can be accessed via affordable subscription models or through customer-owned systems, providing flexibility in cost and deployment.

**Bridging Existing Systems** – PoC bridging systems enable connectivity between PoC radios and traditional DMR or analog radio systems, allowing fleet operators to expand communication capabilities while preserving existing investments.

## About Hytera US Inc

Hytera US Inc is a US corporation with offices, warehouses, and support facilities based in Irvine, California and Sunrise, Florida.

Hytera US Inc boasts an experienced staff of professionals that have been implementing innovative radio communication solutions in the US for more than 15 years and are established specialists in DMR, push-to-talk over cellular, and related communications technologies.

We regard ourselves as a solution provider whose core area of expertise is providing cost-effective radio communications systems of the highest reliability, durability, and quality.

Hytera US Inc is a rapidly growing company with an expanding US radio communications market share. Our solutions are provided to a broad base of customers that range from small to medium sized businesses, Fortune 500 companies, and other organizations. There are hundreds of thousands of Hytera radio users nationwide from the industrial, education, hospitality, transportation and logistics, security, construction, energy, and health care markets.

Hytera US Inc focuses on products specifically designed for the US market and develops our own customized systems and software solutions.

- Push-to-Talk over Cellular Devices and Systems
- DMR Two-Way Radios
- Analog Two-Way Radios
- Wide-area and High-Capacity Radio Systems and Applications

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