

WHITE PAPER

Push-to-Talk Over Cellular (PoC)

Embrace Hytera PoC, Enjoy Worldwide Communication, Reach Unlimited Possibilities



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PUSH-TO-TALK OVER CELLULAR (POC) OVERVIEW

What is PoC?

Push-to-Talk over Cellular (PoC) provides two-way radio services over 3G, and LTE technology, creating a worldwide radio network that utilizes the cellular infrastructure of Mobile Network Operators. This enables radio networks with very wide coverage areas. Radio users are untethered by the range of repeaters and base stations used in traditional radio networks.

PoC utilizes the 3G and LTE cellular infrastructure of Mobile Network Operators, creating a wide-area radio network that provides global coverage with the bandwidth for data and video applications.

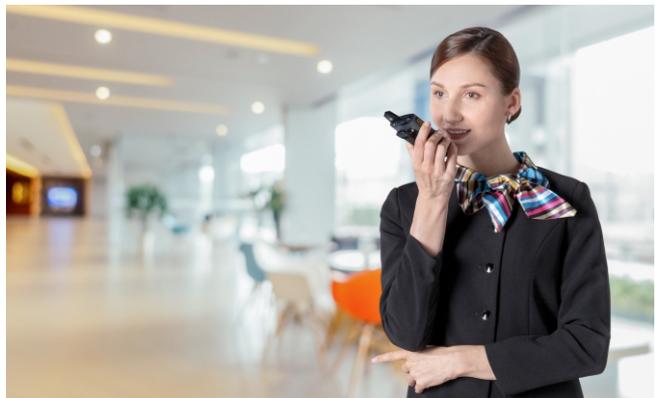
The concept of Push-to-Talk over Cellular was introduced by Nextel in 1987 as an alternative to two-way radios. Nextel revolutionized business communication when it started to pass small voice packets from radios across their iDEN network. Prior to cellular push-to-talk, business communication was dominated 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 because it could not support modern LTE data and video bandwidth requirements.



Today, PoC provides the best of both narrowband digital radios and broadband 3G/LTE networks. PoC radios support the advanced features of Private Mobile Radio (PMR), including messaging, instant group/individual calling, GPS location tracking, and emergency notifications. Combining this functionality with 3G/LTE cellular networks provides the bandwidth required for modern data, photo, and video applications, along with the global coverage area of 3G and LTE.

How PoC Works

PoC devices connect to the cellular infrastructure networks of Mobile Network Operators, using a SIM card identical to those installed in cell phones. PoC network services are hosted in the Cloud. The Cloud services are located on privately hosted servers owned and operated by the PoC platform. Gateway routers provide connectivity between the Mobile Network Operator networks and the PoC servers.



The advantage is a highly reliable network that requires no network infrastructure investment and maintenance. An app on the radio (typically an Android operating system) provides simple and convenient access to PoC services.

PoC Radios also support WLAN connectivity. The WLAN capability enables calls inside buildings with WLAN network coverage that fill gaps where an LTE network has limited connectivity. PoC radios automatically and seamlessly switch to an LTE network when a caller moves outside WLAN network range.

PoC Market Growth

Growth in PoC services is being driven not just by the technology, but also by the increase in mobile workforces, and the global adoption of the Internet of Things (IoT). There is proven demand for PoC services. At its peak, Nextel had over twenty million subscribers in the United States.

According to Persistence Market Research, the PoC market will grow at a Compound Annual Growth Rate (CAGR) of 9.7% from 2019 to 2029; with the market value increasing from \$3.2 billion to \$10 billion over the next 10 years. The market is shared by public safety & security, transportation & logistics, energy & utility, construction, manufacturing, defense, travel & hospitality and others.

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Who Uses PoC

Industries which use PoC services are looking for wide-area communications with a low startup cost. These industries include transportation and logistics, security, construction, government organizations, hospitality, manufacturing, retail, and others.



PoC is particularly useful for organizations and businesses needing to communicate across widely dispersed sites or with mobile work forces, such as service companies with vehicle fleets and logistics firms. These are companies with service fleets and multiple locations that don't want to invest capital in the infrastructure required for wide-area radio networks.

- Public Safety & Security
- Municipal Management
- Property Management
- Transportation & Logistics
- Energy & Utility
- Construction
- Manufacturing
- Retail
- Event Management
- Travel & Hospitality

PoC also provides a cost-effective solution for smaller organizations, such as retail outlets or hospitality, where traditional Private Mobile Radio (PMR) solutions might be more than is required or too high of an investment.

OPEX vs CAPEX Model

Traditional wide-area private radio networks require significant up-front Capital Expenditures (CAPEX), that include base stations, repeaters, routers, and antennas. PoC is based on Operational Expenditures (OPEX) with a low-cost, subscription-based service. The only up-front investment is the PoC radios and SIM cards.

PoC Radios vs. Phones

Employees can use personal cell phones, company issued cell phones, or PoC radios for internal company business communication. Providing an employee with a dedicated PoC device ensures employees use the devices exclusively for business-related communications.

There are several advantages to PoC radios:

- Large PTT button for instant group calls, no dialing the phone number, no waiting for the phone to ring
- 2W audio power and noise cancellation for using in noisy conditions
- Reliable and durable enough to be used in harsh environments
- Simple designed UI, more work oriented and professional
- Provides one touch emergency alarms
- There are several drawbacks to cell phones:
 - No instant group calling
 - 0.5-1W audio power, not loud enough to hear clearly in noisy surroundings
 - Distract users with diverse entertainment functions
 - More suitable for daily leisure, easily damaged in harsh environments



There are several drawbacks to cell phones:

- No group calling
- Cell phones services are much more expensive than PoC subscriptions
- Cell phones enable employees to waste time on social media, games, and calling and texting friends
- Cell phones do not support advanced radio features like noise suppression for talking in loud environments, Man Down notification, and remote shut off.

PoC Radios vs. Traditional Two-Way Radios

Two-way radios are limited in range, and the radio coverage is dependent upon investment in infrastructure equipment like repeaters, power supplies, antennas and in securing a spectrum license. This can be expensive to purchase and maintain.

PoC leverages existing cellular and Wi-Fi networks, providing instant nationwide communications, without having to spend on infrastructure. However, if there is already a significant investment in a radio communications system, PoC can be deployed in an integrated hybrid solution that enables existing radios to be connected to PoC radios and devices. Besides, based on broadband network, PoC solution can provide you with not only voice calls, but also video calls, multimedia messages, video dispatch, etc.



PoC FEATURES AND BENEFITS

• Nationwide Coverage

PoC leverages 3G/LTE and WLAN networks to provide a secure, instant, and global communications solution for today's mobile workforce.

• No Infrastructure Required

The customer no longer needs to purchase, operate and maintain any infrastructure, as this is all done by the Mobile Network Operators. This gets rid of the day-to-day responsibilities of owning and maintaining the infrastructure, reduces operating costs and dispenses with the need for frequency licenses for PMR systems.

• Rapid Deployments

Since the radio network infrastructure already exists, PoC systems can be deployed very quickly. PoC radios can work out-of-the-box with SIM cards pre-installed, and system configuration such as call groups, emergency alarms, and geo fencing can be easily done through a web-based dispatch application.

• Unlimited Bandwidth

LTE networks support bandwidth-hungry applications like video

calling and video streaming. Besides, unlike PMR networks where channel capacity is finite, PoC platforms allow any number of virtual channels and as many call groups as required to be created, including the ability to create dynamic call groups.

• Push-to-Talk Individual and Group Calling

PoC technology enables subscribers to make one-to-one (individual) calls or one-to-many (group) calls to different groups of people at the same time over a mobile operator's network. One press of a button on a rugged handheld device and you are talking to your group or an individual.

• GPS Location Tracking

PoC devices with integrated GPS enable location tracking via a dispatcher. This is an essential tool for managing, scheduling, and tracking remote teams. PoC dispatch application like geo fencing enables the alarm to trigger when employees enter hazardous areas, or when remote service employees stray from defined territories. Dispatching platform is typically web-based, allowing for easy deployments and minimal start-up costs.

PoC DEVICES AND SOFTWARE APPLICATIONS

Hytera HyTalk

Hytera HyTalk is a complete end-to-end PoC solution that includes PoC network access, radios, bodycams, management platform, and dispatch application.

Hytera HyTalk also supports Bring Your Own Device (BYOD) cell phones with the appropriate app installed, providing flexibility for users who may also need cellular access.

Hytera PoC Handheld Radio

Hytera **PNC370 PoC Radio** is a compact, rugged, and easy-to-operate PoC handheld radio. The PNC370 enables fast voice communication and data transmission with a nearly limitless connection over worldwide LTE cellular networks.

- Sleek, compact and durable devices designed specifically for business PoC communications
- Digital noise suppression and high-volume speakers for excellent voice quality in noisy environments
- Full-duplex and half-duplex individual calls
- Built-in Wi-Fi enables connectivity to Wi-Fi networks, and automatically switches over to the LTE network when out of Wi-Fi range
- Built-in Bluetooth supports wireless connection with audio accessories for improved efficiency and hands-free operation
- High-power flashlight
- GPS enables tracking and positioning for the dispatching application and Real Time Clock for displaying call history
- IP55 rated for dust and moisture resistance
- Meets MIL-STD-810 G standards for shock and vibration resistance
- Supports individual or group texting



PNC370 PoC Radio

- Pre-installed Hytera HyTalk Android app for simple and convenient access to PoC services
- Powerful battery provides up to eighteen hours of operation
- Other advanced PoC radio features include Lone Worker monitoring and alarms, remote (by dispatcher) over-the-air stun or kill of devices, full call recording, logging and playback services

Hytera **PNC380 PoC Radio** combines the instant communication and multimedia applications into a single device. Over the 3G, LTE, and WLAN networks, the device delivers rich multimedia data services, including video transmission, location sharing, and instant messaging.

- Sleek, compact and durable devices designed specifically for business PoC communications
- Supports both Push-to-Talk over Cellular (PoC) and phone calls
- On-site video to the dispatcher or supervisor in real time over 4G network, improving situational awareness and facilitating decision-making
- Certified with IP67 rating, fully protected from dust and is water-proof up to 1 meter for 30 minutes
- Meets MIL-STD-810G standard, withstanding 1.5-meter drop
- 4,000 mAh Li-ion battery offering over 24 hours of talk and standby time on a 5-5-90 duty cycle



PNC380 PoC Radio

Hytera **PNC550 PoC Radio** is a smart terminal integrating smart phone and professional Push-to-Talk over Cellular function.

- 5-inch multi-touch display, visible under strong sunlight, supports wet hand and glove operation
- Dual-sim card dual-standby
- Supports both Push-to-Talk over Cellular (PoC) and Phone Calls
- With exquisite structural technology, IP68, military standard(MIL-STS-810G) and 1.2m drop-proof-design, rugged and purpose-built for professional communications
- Features instant voice and video group calling
- Supports Android apps, including Hytera apps and third-party apps
- Sends, receives, and views text messages between dispatcher and other Hytera PoC devices



PNC550 PoC Radio

Hytera **PDC550 PoC Radio** enables the collaboration of multiple communication modes including broadband and narrowband networks as well as public and private networks in various scenarios.

- Enables the collaboration of multiple communication modes including broadband and narrowband networks as well as public and private networks in multiple scenarios
- AI-powered noise reduction and up to 2.5W speaker provides loud and clear audio quality for versatile voice service
- 5-inch multi-touch display, visible under strong sunlight, supports wet hand and glove operation
- With exquisite structural technology, IP68, military standard(MIL-STS-810G) and 1.2m drop-proof-design
- Features instant voice and video group calling
- Supports Android apps, including Hytera apps and third-party apps
- Send, receive, and view text messages between dispatcher and other Hytera PoC devices



PDC550 PoC Radio



Hytera PoC Body Worn Camera

Hytera **VM780 Body Worn Camera** integrates a body camera with Push-to-Talk over Cellular (PoC) voice communications to capture, store, and share video, audio, and image evidence in the field. The VM780 features video transfer, evidence collection, and dispatching software applications.

- All-in-one design reduces equipment costs and simplifies communications
- Full duplex voice and video calling
- 2.8-inch touch display
- Full HD 1080P video recording with AES256 advanced encryption
- Stream video over 4G/LTE or Wi-Fi networks for nationwide monitoring of events
- GPS built-in
- Video conferencing
- Supports individual and group calls between dispatch, VM780, and other POC devices



VM780 Body Worn Camera

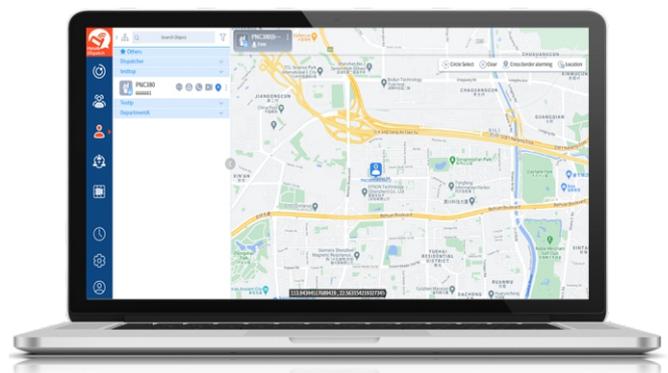
- IP68 and MIL-STD-810G rated to withstand harsh environments
- Powerful battery life supporting up to nine hours continuous recording

Hytera HyTalk/Hytera HyTalk Pro Solution

Hytera HyTalk/Hytera HyTalk Pro Solution includes a powerful dispatch and fleet management application that provides tracking of driver locations and travel routes with time stamps. The dispatch application works with the GPS integrated into the PNC370 radios and VM780 bodycams and supports geofencing capabilities.

HyTalk solution is available as a web-based application accessed through a web browser.

It supports instant group 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, perform Lone Worker monitoring, receive emergency alarms, along with full call recording, logging and playback.



Hytera HyTalk/Hytera HyTalk Pro Solution



Hytera Communications Corporation Limited

Stock Code: 002583.SZ

Address: Hytera Tower, Shenzhen Hi-Tech Industrial Park North, Beihuan RD.9108#, Nanshan District, Shenzhen, P.R.C.

Tel: +86-755-2697 2999 **Fax:** +86-755-8613 7139 **Post:** 518057

Http://www.hytera.com **marketing@hytera.com**



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