

# SATELLITE PUSH-TO-TALK



WHITEPAPER  
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# LATITUDE TECHNOLOGIES

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# SATELLITE-BASED PUSH-TO-TALK

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## OVERVIEW

Satellite-based Push-to-Talk communications technology is now a reality for public safety services, bringing secure and unlimited geographic communication coverage for police, emergency medical, fire response, and disaster relief agencies. Purpose-built with an intuitive and remote administration, all services are accessible through conventional web-based browser tools.

Portable handheld products that can be adapted to support these applications are readily available and are cost effective. Until recently, however, there have been no airworthiness approved, i.e. permanently installed airborne products, designed to specifically support safety services and special mission aircraft use.

The advent of the Latitude SkyNode S200-P12 product now provides an airworthy satcom system capable of functioning in either PTT or traditional telephony calling modes. The S200-P12 also supports several flight-crew Control Display Unit (CDU) interface options that meet the highest regulatory Federal Aviation Regulations (FAR) (TC) and (EASA) aerospace installation standards. The Latitude system further supports interoperability with the Public Switched Telephone Network (PSTN), PBx and VOIP networks for dispatch operation centers via secure AES-256 encrypted communications

## WHAT IS PTT?

Dispatch radio Push-To-Talk (PTT) offers instant one-to-many or one-to-one mobile voice communication without the protracted dialing, ringing, and the call answering steps typical of a regular phone call. In addition, a PTT system typically allows only one person to speak at a time (via half-duplex communication) and provides call flow control mechanisms. PTT is best described as a Press-to-Transmit operation, as most radios only transmit when PTT is keyed. Public Safety and Special Mission Dispatch systems integrate a connection of different networks to provide a distributed service without geographic limitations. These networks consist of Land mobile radio (LMR) and wired public switched telephone networks (PSTN), as well as cellular, including Satellite.

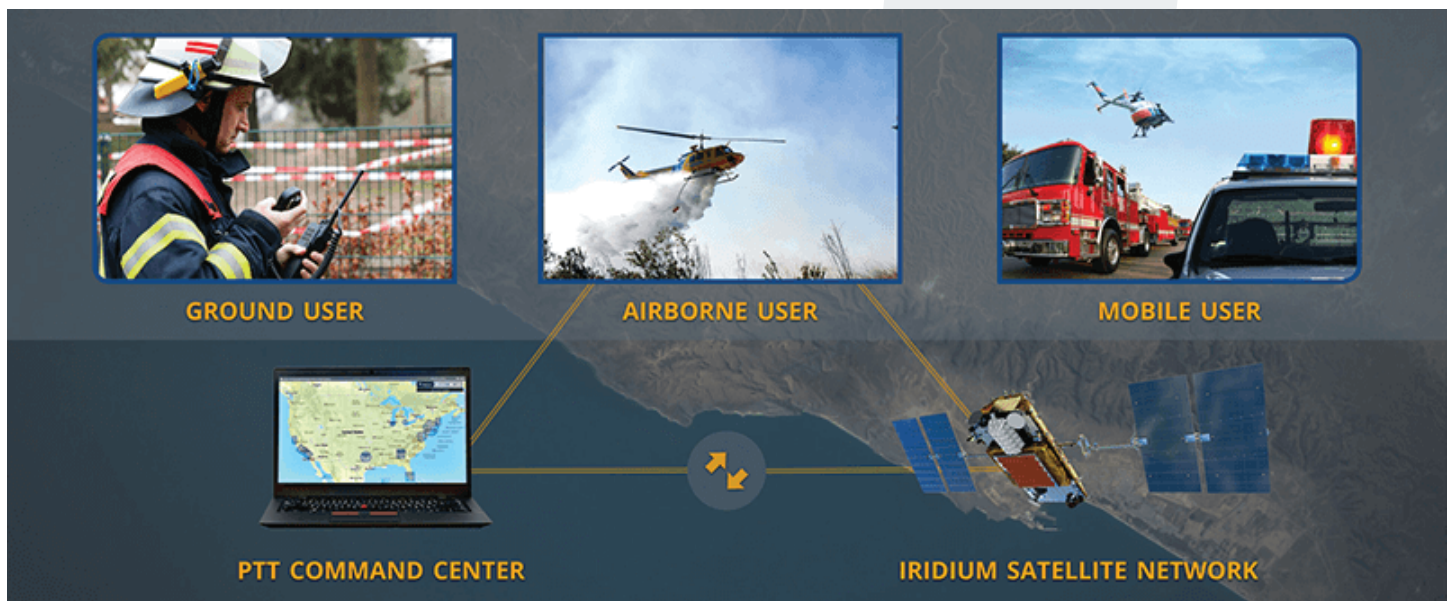


## REVOLUTIONARY NEW MISSION CAPABILITY

An entirely new airborne system that will transform mission communications recently debuted at Heli-Expo 2018 called the SkyNode S200-P12, developed by Latitude Technologies Corporation. Designed with the purpose to satisfy the critical communications needs of air-medical, forestry, and search-and rescue mission operations, the SkyNode interfaces with Technisonic Industries Ltd. commonly installed radio system. This includes both traditional Land Mobile Radio (LMR) as well as over-the-horizon, point-to-point type of communication. That means that when a disaster such as a hurricane or an earthquake destroys traditional communication infrastructure, PTT can still connect aircraft to ground crews, staging depots, or even resources thousands of miles away in mere moments. This is an instant response capability that has never been available in aircraft.

## IRIDIUM SATELLITE PTT NETWORK

The Iridium Satellite constellation is a mesh network consisting of 66 low-earth-orbiting satellites that provide complete pole-to-pole communication coverage. Aside from indoors, there are no dead spots, making it the ideal system for voice, data and PTT services. Iridium PTT is especially helpful in regions where LMR and/or PSTN infrastructure is sparse, overloaded or non-existent.



Talkgroup User Network





# SATELLITE-BASED PUSH-TO-TALK

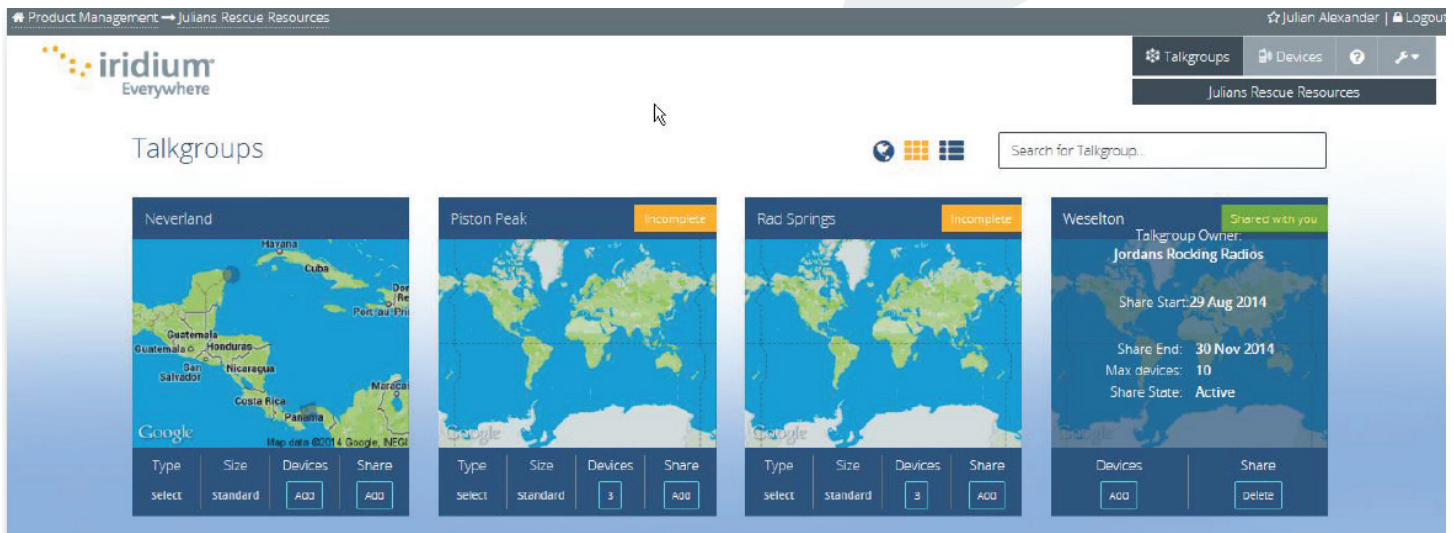
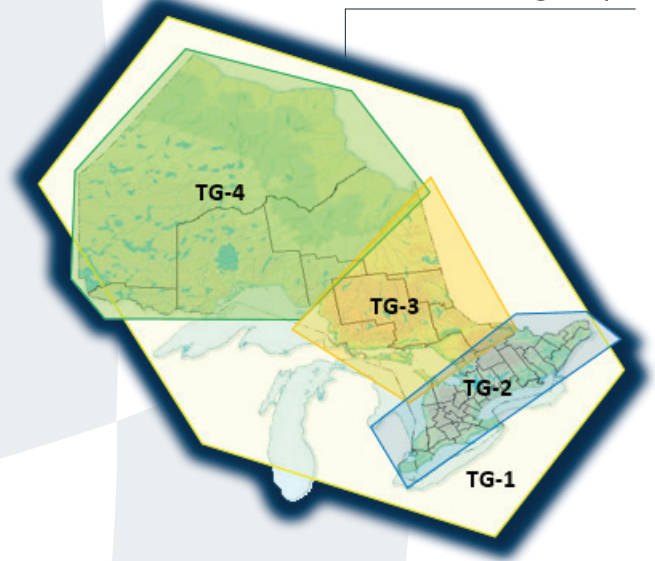
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## PTT TALKGROUPS

Operational regions are termed “Talkgroups” and are easily established using a web-based program situated around an area (in square kilometers) selected to cover all Iridium PTT devices. A single Talkgroup operates similarly to a conventional LMR radio channel. A transmitting device is heard exclusively by devices that are connected to that particular Talkgroup. Talkgroups are not required to be geographically contiguous and can be set up within minutes. As dictated by specialized operations, further areas can be added or expanded upon, and additional Talkgroups can be created within or overlapping other Talkgroups. An example is the creation of dedicated Talkgroups for specific Police, Fire and Ambulance operations, in addition to sharing a common Talkgroup for group coordination. Device operators can select an available preferred Talkgroup or can scan all available Talkgroups for current activity.

Iridium Talkgroup



Manage All Your Talkgroups

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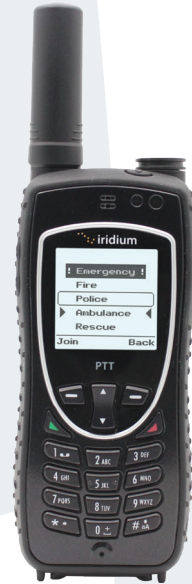
## HANDHELD & CRADLE MOUNTED PTT EQUIPMENT

Iridium PTT equipment for public safety and special mission applications are typically broken into mobile or fixed (base station) categories. Mobile includes portables and fixed mount systems for vehicles, marine-craft, and aircraft.

For portable applications, the Iridium Extreme® PTT is a versatile handheld device that can be operated as is or hands-free with a shoulder mic system, or semi-permanently mounted in an auxiliary powered cradle for vehicular use.

### A VERSATILE AIRCRAFT PTT SYSTEM

The Latitude SkyNode S200-P12 Push-to-Talk Satcom transceiver unit is configurable to support various pilot/flight-crew interfaces depending on the aircraft type and intended mission. Special mission aircraft including airborne law enforcement and emergency medical aircraft (both helicopters and fixed-wing types), typically have crowded instrument panels, which limit space available to install new communications equipment. However, many of these aircraft are already fitted with P25 and/or tactical FM band radios by Technisonic Industries Ltd. The Latitude S200-P12 Satcom unit is able to interface with either the TDFM 9100 or 9000 series to utilize its display and user interface capabilities. In addition to saving valuable panel space, users already familiar with the operation of the Technisonic radio can intuitively understand the function of the added “new” SkyNode S200-P12 Satellite radio. The key difference is that instead of adding a single frequency, there is now a choice of Talkgroups (TGs) to choose from.



Iridium Extreme PTT  
and Fixed Dock



SkyNode S200-P12 for Push-To-Talk





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Latitude further supports additional CDU interfaces that can be customized to fit with specialized mission requirements.



The Technisonic TDFM-9100 CDU

## BASE STATION INTEROPERABILITY

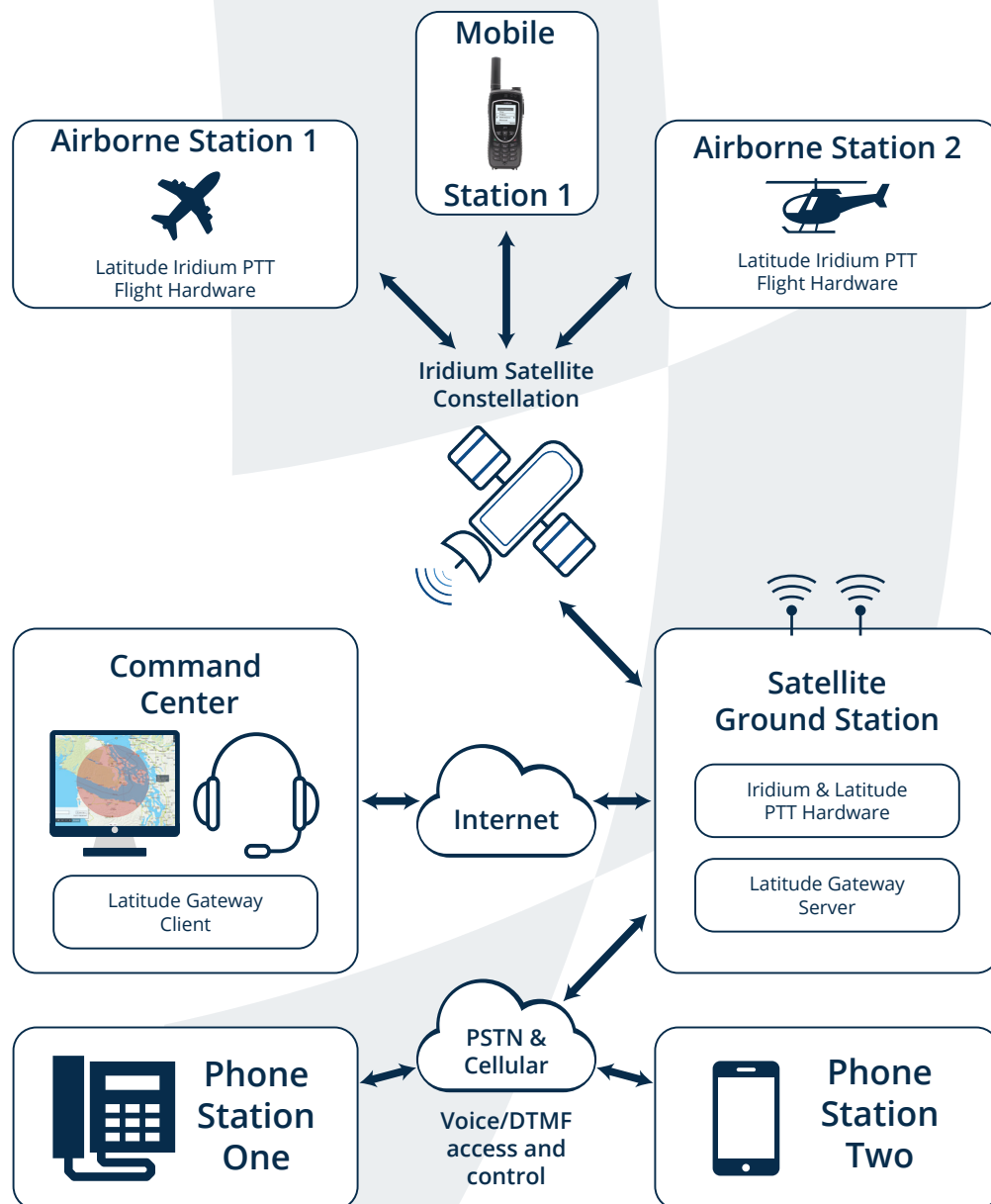
PTT device interoperation into a communications dispatch center requires a minimum of one PTT device per Talkgroup. Dispatches with rooftop antenna facilities that support less than four Talkgroups can use Iridium Extreme handhelds. Simply pair the handheld with a cradle to provide power as well as a 2-wire POTS signaling interface to the dispatch center's PBx telephone switch. This process makes distribution to dispatch consoles possible through one streamlined process.

For distributed communications centers that do not have readily accessible rooftop antennas, a remotely mounted system providing secure IP-based access for telephony and signaling is required. These systems are scalable to support distributed network architectures and can be set so that several dispatch operation centers have the ability to share access to the same resources.



## LATITUDE PTT GATEWAY SYSTEM

The Latitude PTT Gateway System enhances the capabilities of Iridium PTT communications by creating network distributed VoIP access to assigned Talk Groups on the Iridium Push-to-Talk Network. The gateway server and client are IP-based services and may be remotely deployed from one another, requiring only Internet connectivity between them.



PTT Gateway System Network





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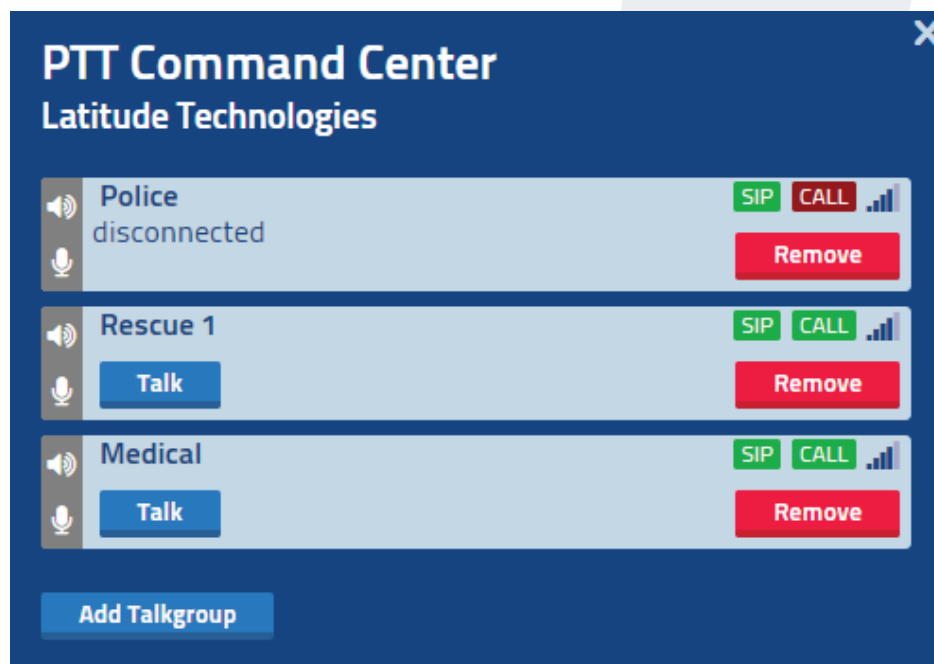
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The Latitude PTT Gateway Server dedicates an Iridium Transceiver to each active Talkgroup, ensuring that the gateway continuously monitors PTT traffic without any gaps or delays. Talkgroup activity can be recorded by the Gateway Server in order to satisfy record retention laws.

The Latitude PTT Client Application provides the same PTT advantages with instant one-to-many or one-to-one mobile voice communication without the protracted dialing, ringing, and call answering steps typical of a regular phone call. The Latitude PTT Client is a Windows-based application that accesses the Gateway Server via appropriate Internet routing and security management. The client uses industry standard TLS encrypted SIP and IM protocols that route securely through corporate firewalls.

From the client, the user can hear and see activity from multiple Talkgroups. Each group can be separately or simultaneously monitored, muted, or accessed. The audio for the user of the application is provided by any of the available Windows audio inputs and output, a headset, speakers, microphone, etc. The PTT Command Center can communicate to any Iridium PTT transceiver assigned to the appropriate Talkgroup. This includes both the Latitude S200-P12 system and the Iridium PTT Extreme handhelds.



Monitor Talkgroups Directly

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## SUMMARY OF SYSTEM CAPABILITIES

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Using the Latitude PTT System as an example, here are some important capabilities to look for in an aircraft satellite PTT system:

- FAA, TC, EASA Civil Aviation Authority Approved Equipment
- Range of Control Display Unit (CDU) Interface options to suit aircraft and mission type. Interfaces with existing aircraft coms equipment (e.g. Technisonic TDFM)
- Interoperability with P25, Trunked Radio Systems, LMR or tactical radio systems (e.g. Technisonic TDFM)
- AES 256-based voice and signaling encryption
- Location mapping, range & bearing on device
- Global coverage (no dead spots)
- 1:1 private call (using direct dial function)
- Pre-arranged group call
- Ad hoc group call
- Real-time presence
- Talk group scanning with priority
- Centralized, Web-based contact and group management
- Supervisory override
- High scalability
- High reliability





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## SUMMARY

PTT as an application for Public Safety and Special Mission is available over LMR, broadband and now Iridium Satellite networks. Since 2016 Latitude has been developing aircraft PTT solutions for aircraft with secure and hardened access to IP networked base stations and interoperable with existing airborne P25 equipment. For more information about Latitude and its solutions, please visit [www.latitudetech.com](http://www.latitudetech.com)



## GLOSSARY OF TERMS

AES	Advanced Encryption Standard
APCO	Association of Public Safety Communications Officials International
CDU	Control Display Interface
EASA	European Aviation Safety Agency
FAA	Federal Aviation Administration
IP	Internet Protocol
LMR	Land Mobile Radio
PBx	Private Branch Exchange
PSTN	Public Switch Telephone Network
PTT	Push-to-Talk
P25	Project 25 is a set of standards initiated by APCO
TC	Transport Canada
TDFM	Technisonic Digital Frequency Modulation





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## REFERENCES

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Dash, Amitav (March 2018 Insight Magazine), "Giving your communications greater Latitude, MHM Publishing.

Dash, Amitav (March 2018 Insight Magazine), "Making the Mission Possible" , MHM Publishing.

Iridium PTT Command Center - version 02.01.27 Copyright 2018 Iridium Communications Inc., iridium.com, retrieved April 2018.

Iridium PTT Command Center Demo - YouTube: [https://www.youtube.com/watch?v=bOuF2jB\\_JyE](https://www.youtube.com/watch?v=bOuF2jB_JyE)



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