



INTEGRATED SOLUTION FOR MOTOTRBO™

# SmartPTT

- ✓ Networks of any size and topology
- ✓ System infrastructure monitoring and control
- ✓ Bridging for different radio networks



**MOTOTRBO™**





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## SmartPTT

- ✓ Networks of any size and topology
- ✓ System infrastructure monitoring and control
- ✓ Bridging for different radio networks



### SmartPTT BASIC

- Small local systems
- Dispatch control through base stations



### SmartPTT ENTERPRISE

- Large distributed systems
- IP Site Connect
- Capacity Plus
- Linked Capacity Plus
- Connect Plus

## CORE FEATURES



RADIO  
DISPATCH



GPS  
TRACKING



TEXT AND DATA  
TRANSFER



EVENT AND  
VOICE LOGGING



TELEMETRY



JOB  
TICKETING

## OPTIONAL FEATURES



### WEB CLIENT

Subscriber control from browser: voice calls, text messages, GPS monitoring, radio check/kill, subscriber registration



### MONITORING

Real-time network infrastructure monitoring with graphical representation of network topology and coverage map analysis



### RADIO NETWORK BRIDGING

Communication between subscribers located in different networks



### TELEPHONE INTERCONNECT

Private and group calls from telephone to radio subscribers and telephone calls to/from the dispatcher consoles



### INDOOR TRACKING

Location tracking inside buildings and other locations where GPS tracking is not available



### DIRECT IP CONNECTION

- Data communications via NAI for Capacity Plus and Linked Capacity Plus
- No control stations and sound cards for IP Site Connect

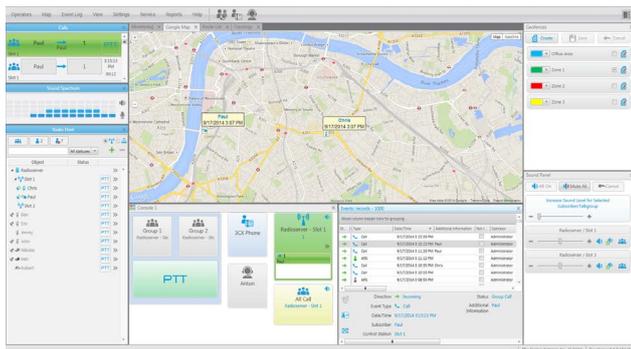


### SMARTPTT MOBILE

- Smartphone operating within SmartPTT network and allowing text message exchange within radio system
- GPS tracking of smartphone users



# Why SmartPTT?

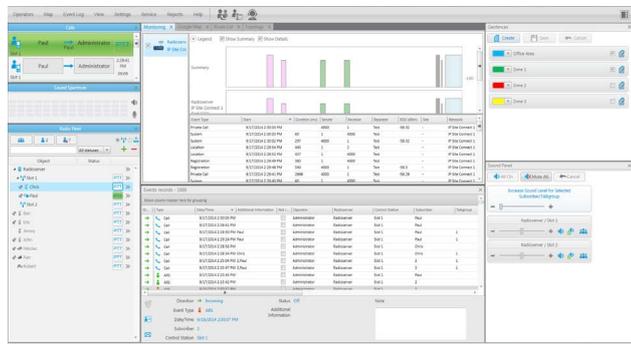


## Integrated Dispatch Control

- All types of voice calls on the dispatch console: private, group, all call
- GPS and indoor tracking
- Emergency calls
- Job ticketing
- Customizable dispatch consoles and touch screen support

## Unified Communication Infrastructure

- Radio network bridging – single communication environment for multiple independent radio networks
- Telephone interconnect – voice calls between radio and telephone subscribers
- Analog Select 5 and MDC signaling support



## Administration and Monitoring

- In-depth network monitoring, analysis and system data logging
- Coverage map display
- Hardware diagnostics and failures logging
- Remote repeater administration: channel change, power level settings, enabling and disabling

## Personnel Safety

- Man Down
- Lone Worker
- Blast Alarms
- Evacuation Voice Messages



## Cutting Edge Technology

- Remote command and control centers
- Dispatch operation over brand new Network Application Interface (NAI)
- Direct IP connection to MOTOTRBO repeaters
- Support for simulcast configurations (Radio Activity solutions)



# Radio Dispatch

The integrated voice dispatch capabilities of SmartPTT enable dispatchers to coordinate tasks efficiently with individual or groups of radio subscribers. SmartPTT supports the standard MOTOTRBO voice call functions such as Call Alert, Radio Check, Remote Monitoring and more.

- Two-way radio communications with individual, group and all calls from the SmartPTT dispatch console
- Conference calls enable dispatchers to temporarily patch call between dispatchers, individuals and talkgroups
- Voice calls within the system are recorded on the Radioserver and Dispatcher consoles for instant recall to verify the details of a call or investigating an incident
- Emergency calls are supported from the emergency button of the radio, man-down option boards or using SmartPTT's lone worker features
- Radio Kill enables dispatchers to block or inhibit a subscriber's access to the radio system
- Deferred voice and text messages can be created for offline subscribers. When the subscriber registers onto the system SmartPTT will automatically send the message(s) to the subscriber
- Audio can be selected/deselected, muted/unmuted and volume control can be managed for individual talkgroups
- Communications with non-MOTOTRBO systems is supported with the SmartPTT dispatch console. For example a P25 radio system or an analog radio system using MDC-1200 or 5-Tone signaling
- Intercom functionality for voice and text communications between dispatchers
- Call Alert for private calls

## Customizable Interface of SmartPTT Dispatch Console

The SmartPTT dispatch console can be customized for the unique needs of each dispatcher. Panels can be dragged and dropped to a desired location. Multiple screens and touch screens are also supported. The Custom Console feature enables the creation of an individual screen to manage talkgroups, voice notifications, channel selections and other functionalities.

The screenshot displays the SmartPTT Dispatch Console interface. The main window is divided into several panels:

- Map:** A central map showing the River Thames and surrounding areas. Two subscribers, Paul and Chris, are tracked on the map. Paul's location is marked at 9/17/2014 3:07 PM, and Chris's location is marked at 9/17/2014 3:07 PM.
- Calls:** A panel on the left showing active calls for Paul and Chris. Paul's call is in Slot 1, and Chris's call is in Slot 2.
- Sound Spectrum:** A panel below the Calls panel showing the audio spectrum of the active calls.
- Radio Fleet:** A panel below the Sound Spectrum panel showing the status of the radio fleet.
- Track Animation:** A panel below the Radio Fleet panel showing the track animation for the selected subscriber (Chris).
- Events:** A panel at the bottom right showing a list of events (calls and ARS) with columns for Date/Time, Additional Information, and Operator.
- Geofences:** A panel on the right showing the configuration of geofences (Office Area, Zone 1, Zone 2, Zone 3).
- Sound Panel:** A panel at the bottom right showing the sound level for the selected subscriber/talkgroup.

The interface also includes a menu bar (Operators, Map, Event Log, View, Settings, Service, Reports, Help) and a status bar at the bottom indicating the license belongs to ELOCM, Developer 8.6.0.15146.



# GPS Tracking

SmartPTT allows for the tracking of personnel and vehicles equipped with GPS enabled MOTOTRBO portable and mobile two-way radios.

SmartPTT's GPS capabilities can help increase worker safety using speed rules/alerts and geo-fences to notify users of hazardous work areas. Operational cost efficiencies can be achieved using GPS to assign the closest available unit or use route rules to ensure drivers take the most efficient route both save man-hours and fuel. When a unit has an emergency, GPS enables the dispatcher to quickly identify the location of the user in distress to coordinate help.

- Support for online and offline maps including Google Maps, OpenStreetMap, Vector and Raster maps. Online maps offer address information along with GPS coordinates.
- Real-time subscriber location monitoring
- Subscriber location requests can be done automatically, manually or by event.
- Geo-fence rules can monitor the entry and exit of work and hazardous zones.
- Subscriber location logging for reports and track animations.
- Subscriber stop & start control
- Point of Interest (POI)
- Speed rules notify the dispatcher of subscribers exceeding defined speed limits
- Export locations to KML files for location monitoring in third-party applications such as Google Earth

The SmartPTT Dispatcher Console allows displaying multiple maps arranged within the console or in an independent window on an external display.

The screenshot displays the SmartPTT Dispatcher Console interface. The top menu includes Operators, Map, Event Log, View, Settings, Service, Reports, and Help. The main area is divided into several panels:

- Call Log:** Shows a list of calls with columns for Slot, Name, Group, and Time. For example, Administrator John at 1642:33:00:11.
- Sound Spectrum:** A panel for monitoring audio signals.
- Radio Fleet:** A tree view showing the status of various radio units, including Administrator, Pablo, John, and Nikolas, grouped by Slot and Group.
- Map:** A Google Map showing the real-time location of subscribers. Markers are visible for Paul (9/17/2014 3:07 PM), Nikolas (04.03.2015 16:56), and Chris (9/17/2014 3:07 PM).
- Notifications:** A table of recent events, including calls and messages.

DL	Type	Date/Time	Additional Information	Not r...	Operator	RadioServer	Control Station	Subscriber	Talkgroup	Status	Duration	Co
	Call	04.03.2015 16:42:14			Administrator	A RadioServer	Slot 2	John		Private Call	12	DM
	Message	04.03.2015 16:35:04	1k		Administrator	A RadioServer	Slot 2	John		Message accepted		DM
	Message	04.03.2015 16:33:59	b1		Administrator	A RadioServer	Slot 2	John		Message accepted		DM

At the bottom, a detailed view of a message is shown, including its direction (Incoming), status (Message accepted), event type (Message), date/time (04.03.2015 16:33:59), subscriber (John), and control station (Slot 2).



## Text and Data Transfer

### ■ Text Messages

Text messages can be sent between the dispatch console, radio subscribers and talkgroups. Adding an SMS gateway enables texting between smartphones and the dispatcher console, radios and talkgroups.

### ■ Status Control

Customized color-coded lists of subscriber statuses can be created in SmartPTT. Statuses can be assigned to the subscriber from the dispatcher console or by pressing the accessory button on the radio. Dispatchers can filter the selection of subscribers based on their current status.

### ■ Email Gateway

- Email users can send text messages to a MOTOTRBO radio subscriber or talkgroup
- Text messages can be sent from radios to email addresses specified in the Radioserver Configurator

### ■ Telemetry

SmartPTT supports the MOTOTRBO telemetry functions. The dispatcher console can receive telemetry updates, as well as control the GPIO contacts of the subscriber radio.

### ■ Job Ticketing Tool

The job ticketing tool in SmartPTT enables dispatchers to assign work orders or tasks to MOTOTRBO subscribers and talkgroups monitor the completion of the task. Job ticketing helps ensure work orders issued accurately and are seen through to completion.



## Event Log and Voice Recording

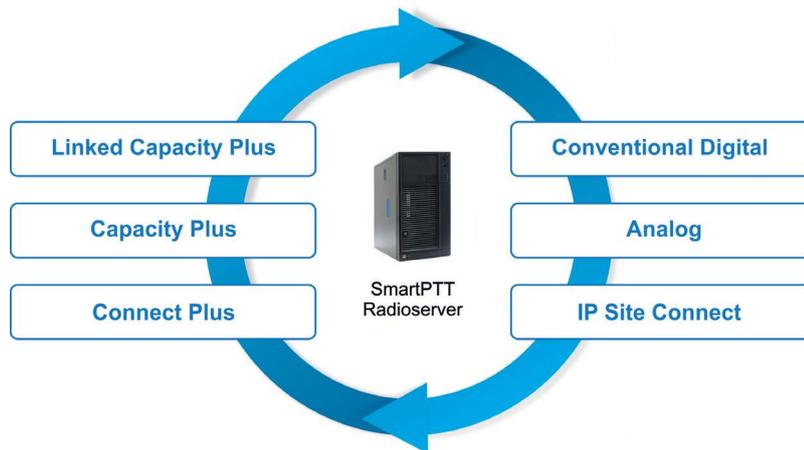
- Voice calls are recorded on both the client and server sides of SmartPTT in MP3 format to a specified folder. The voice recording feature enables instant recall, so dispatchers can verify details of a call or managers can investigate incidents.
- SmartPTT logs all system events such as registration, voice calls, text messages, status change, radio kill, telemetry and GPS location into the database. SmartPTT uses MS SQL Server for data storage (SmartPTT setup package includes MS SQL Express free edition).

- Event logs are stored on both the client and server sides of the system.
- The event log can be filtered, grouped and sorted for searching and reporting.
- Based on incoming events, customized rules can be created within SmartPTT to perform specific tasks when an event occurs. For example if a piece of equipment fails and the failure is reported via telemetry, SmartPTT can automatically send a text message to the maintenance talkgroup reporting the failure, so that maintenance can respond without delay.



## Radio Network Bridging

SmartPTT's Radio Network Bridging option enables interoperability between radio networks of different types (i.e. MOTOTRBO, P25, Tetra, LTR, analog, etc.). For example a small municipal police department using MOTOTRBO could communicate with a larger state or national police agency using P25 during times of emergency. Likewise a manufacturer migrating from an LTR trunking system to a MOTOTRBO Linked Capacity Plus system would be able to maintain voice communications during migration while still experiencing the benefits of digital radio.



Routing rules are easily created using the dispatcher console. Routes can be one-way, two-way, between different networks and radioservers. Typical routes include:

- Routing of all calls from one radio network to another
- Routing of group calls for specified talkgroups
- Routing of private calls for specified subscribers
- Dynamic intelligent routing based on information about subscriber registration in the network



## SmartPTT Mobile

SmartPTT Mobile is a mobile application for smartphones and tablets (iOS and Android). The mobile app enables users to exchange voice and text messages with MOTOTRBO subscribers and SmartPTT dispatchers when off-duty or outside of radio network coverage. Note: SmartPTT Mobile is under development and features listed may not be currently available.

### SmartPTT Mobile Features

- Voice calls including Private Call, Group Call and All Call
- Text message exchange within the radio system
- GPS tracking of radio subscribers
- SmartPTT dispatchers can track mobile application users



# SmartPTT Indoor Tracking

SmartPTT Indoor Tracking is a specially designed Indoor Positioning System for use with Motorola MOTOTRBO radios. The solution supplements subscriber tracking via GPS, allowing dispatchers to monitor the position of employees whether they are located indoors or outdoors.



## Benefits

- Employee Safety – in case of emergency situations, you know the exact location of your employees. This allows minimizing response time that could be lifesaving.
- Employee Accountability – with the advanced system of rules and alerts you can set the guard patrol route for buildings and premises, and the dispatcher will be informed about any deviations from it.
- Easy Deployment – data from the beacons is transmitted over the radio channel, so you don't need advanced network infrastructure. It ensures simple and low-cost system deployment in mines, tunnels, and industrial objects.
- Independent Operation – beacons operate on batteries, which require replacement only once every 2-3 years.

## Features

- Real-time indoor positioning system for MOTOTRBO subscribers
- Display subscriber movements in 2D or 3D plans
- Easily switch between floors for multi-level buildings
- Subscriber track animation
- Guard patrol route control
- Geo-fencing with configurable alarms
- Lone Worker support

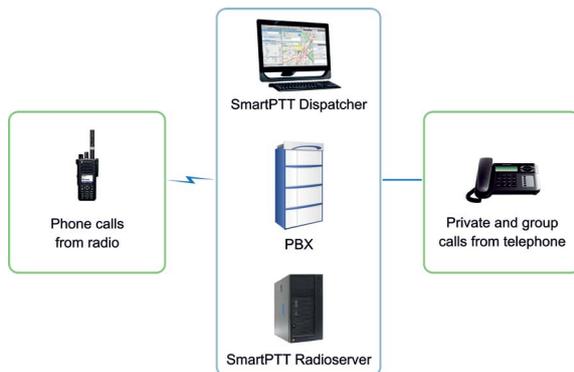


## Telephone Interconnect

The SmartPTT radio-telephone interconnect (phone patch) option enables MOTOTRBO radio subscribers and dispatchers to make and receive telephone calls with landline or cellular phone users. During emergencies this option enables users to contact emergency responders or communicate with off-duty managers.

### Telephone Interconnect Features

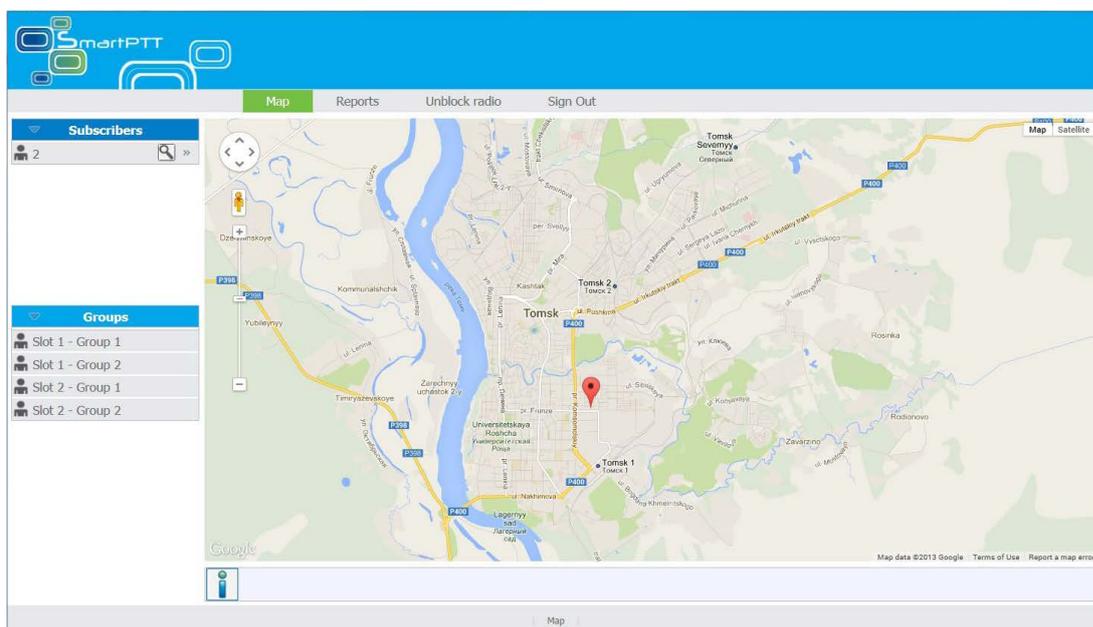
- Private and group calls from a landline or cellular phone
- Multiple simultaneous channels to the telephone network
- Limit access to only authorized radio subscribers
- Telephone calls are recorded in MP3 format
- Full duplex calls between phone callers and dispatcher console
- SIP connection to IP-PBX or VoIP-gateway



## Web Client

The SmartPTT Web Client is an application that enables access to and monitoring of the MOTOTRBO radio system from a PC's web browser. The Web Client supports voice calls and text messages between radio subscribers and the Web Client user. Additionally the web client user can monitor the GPS and registration of subscribers and perform Radio Check and Radio Kill commands.

Reports can be generated to show the GPS and radio traffic history of a subscriber or group of subscribers.





# Monitoring

SmartPTT Monitoring is a tool for in-depth analysis and control over connected MOTOTRBO infrastructure. SmartPTT Monitoring allows checking the performance of the dispatcher system, providing the following information.

- RSSI – received signal strength
- Type of transmission: ARS, GPS, text, voice call, emergency, etc.
- Transmission duration
- Caller and Receiver IDs
- Repeater ID

## Supported MOTOTRBO Systems

- Standalone repeater
- IP Site Connect
- Capacity Plus
- Linked Capacity Plus

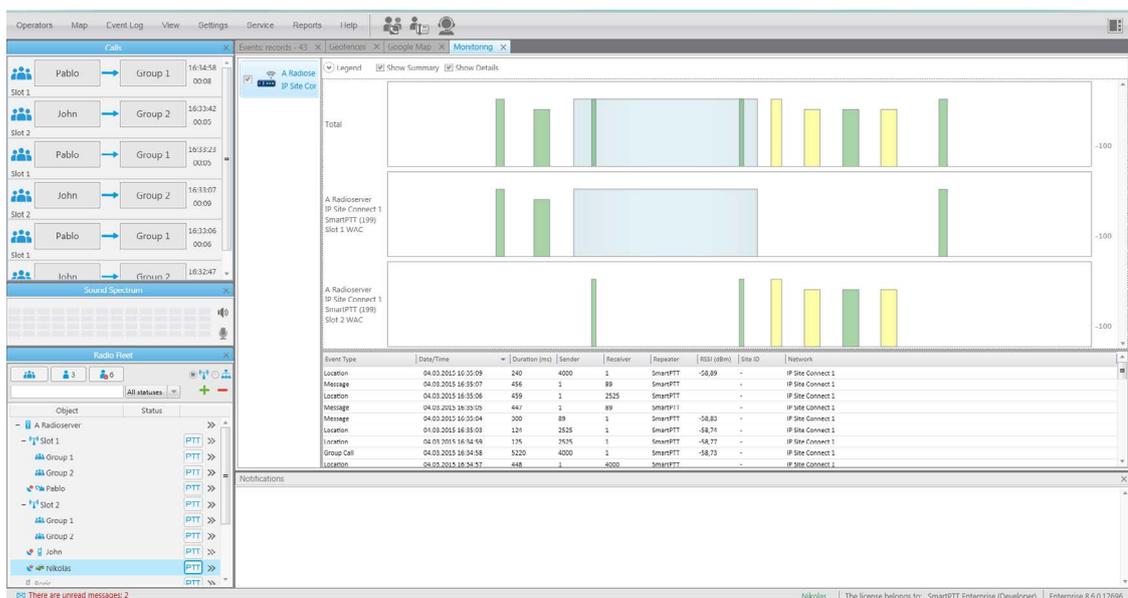
## Supplied in 2 variants

- Service inside SmartPTT Enterprise
- Independent product

## SmartPTT Monitoring Functionality

### Real Time Monitoring

Graphical representation of voice and data activity received from MOTOTRBO repeaters allows watching over the system in real time. Flowing bars representing the activity and signal level are displayed for each connected channel individually and in aggregated view. The bar height corresponds to the received signal strength.

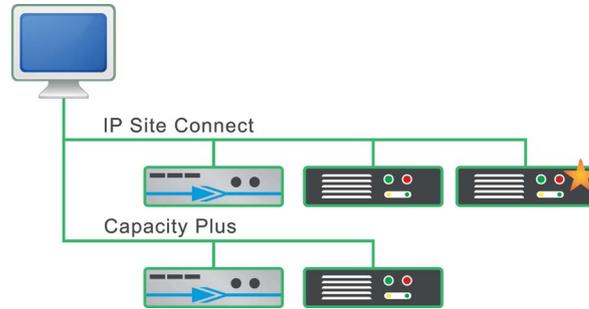


### Alarm Log

Log of alarms about repeater connection or about Cisco and Eaton state. Events with severity “Critical”, “High Alarm” and “Minor Alarm” are highlighted red, pink and yellow respectively. Besides reviewing current events, the Log provides the ability to view saved events for some particular time period.

## Network Topology

Graphical representation of radio network schema defined by means of Radioserver Configuration tool and presented in the dispatcher console displaying network structure, state and workload percentage of each repeater, state of each UPS and router. Network structure includes all MOTOTRBO repeaters and software peers arranged in accordance with the specification of the connected systems. Each IP Site Connect, Capacity Plus or Linked Capacity Plus system is represented by a separate branch with the number of corresponding repeaters.



## Repeater control

Remote repeater administration for connected MOTOTRBO repeaters: channel change, power level settings, enabling and disabling.

## Hardware Diagnostics

Information about the current state of connected MOTOTRBO repeaters, system infrastructure (UPS, routers, servers) monitoring via SNMP, hardware failures logging.

- IP Address
- Model Number
- Firmware Version
- Rx/Tx Frequencies
- Rx/Tx Alarm
- Temperature Alarm
- Fan Alarm
- AC Power Alarm

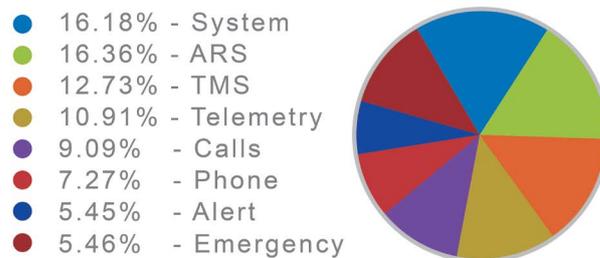
## Coverage map

Graphical representation of network coverage area based on RSSI level of the received signals from GPS-enabled MOTOTRBO radios.

## Monitoring Analytics

Graphical representation of the collected monitoring data:

- Proportions of event duration during a chosen time frame and per day
- Proportions of voice and data activity per day during a chosen time period



## Monitoring Reports

Detailed report based on collected monitoring data and filtered by a number of criteria. Report provides information about MOTOTRBO repeater radio ID, source and destination subscriber radio ID or talk group ID, event duration, event type, RSSI, etc.

# SmartPTT System Design

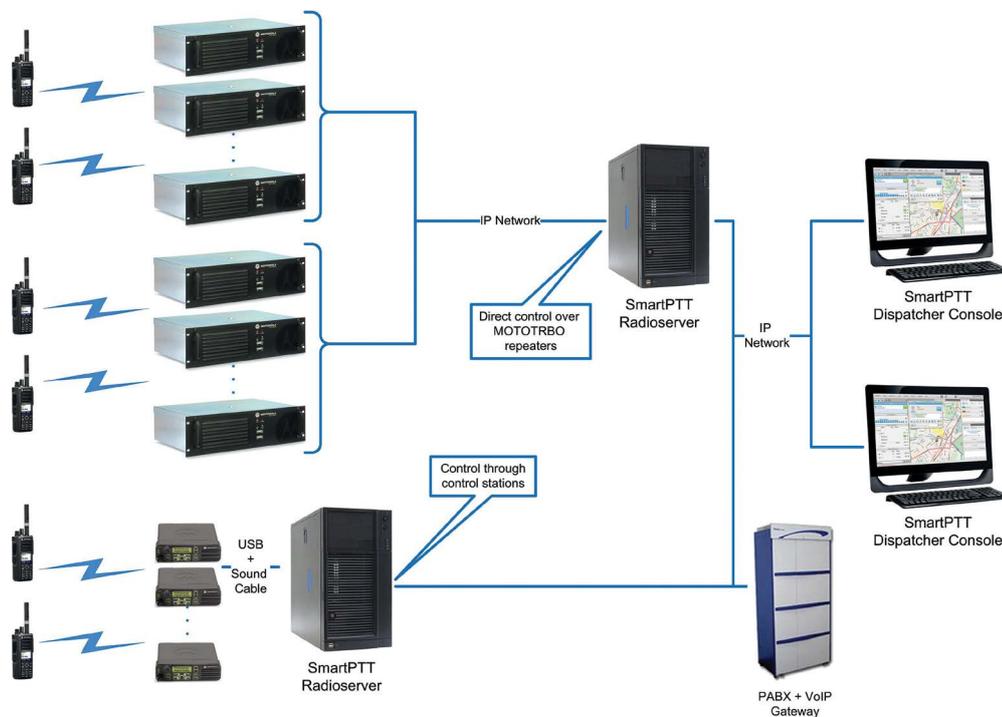
**SmartPTT** is designed on the base of flexible client-server technology that allows the user to build a dispatch control system with an unlimited number of dispatch consoles, exercising control over any number of networks.

**SmartPTT Dispatch Console** is a software application that provides dispatcher with all the system functionality and radio network control.

- Dispatch over the networks through radioservers
- Connection to the radioservers over the Internet or via dedicated IP-channels
- Can be located at any distance from the controlled networks
- Installation of any radios is not required at the dispatcher console
- Supports simultaneous connections to multiple radio servers

**SmartPTT Radioserver** provides an interface between radio networks subscribers and dispatch consoles, and also implements some functionality of the system.

- Interface to radio network via control stations or via IP-connection to the repeaters
- Telephone interconnect
- Email gateway
- Configurable operator profiles to limit their access to the system
- Each Radioserver can simultaneously serve multiple dispatch consoles



## Note:

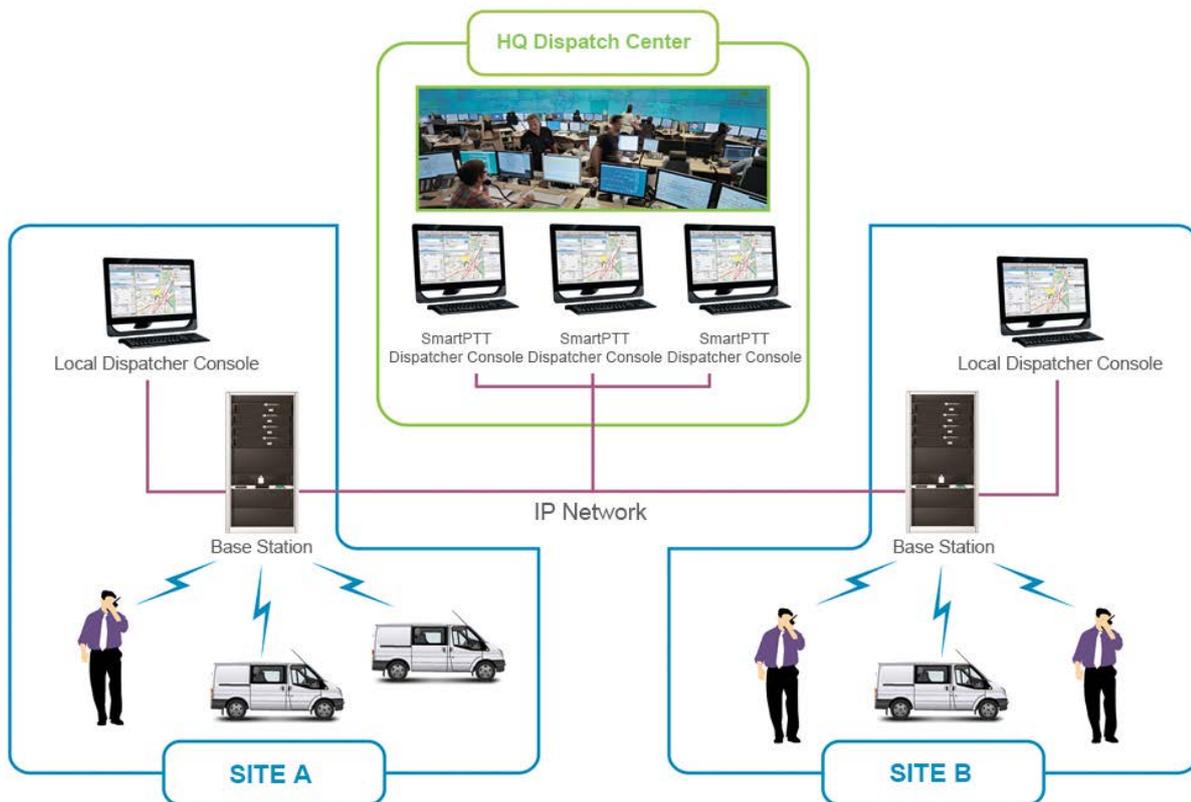
SmartPTT Dispatcher Console consists of ordinary Windows-based PC and SmartPTT software only. Installation of any radios is not required at the dispatcher console.

### The interface in the radio network can be implemented in two ways:

- Classic approach based on control stations: one or more (up to 15) control stations are connected to radioserver via special cables. Voice calls and data transfer commands are processed through these radios.
- Direct connection to MOTOTRBO repeaters via IP-channels: Radioserver may be at any distance from controlled radio networks, no additional stations required, that simplifies deployment and reduces system cost. One Radioserver can be connected to an unlimited number of repeaters.

### SmartPTT supports:

- Digital conventional networks
- MOTOTRBO IP Site Connect
- MOTOTRBO Capacity Plus
- MOTOTRBO Linked Capacity Plus
- MOTOTRBO Connect Plus
- Analog radio networks



### Architecture details

- Dispatch console can be simultaneously connected to an unlimited number of radioservers
- Radioserver can serve an unlimited number of dispatch consoles simultaneously
- Distributed storage of event log and call records
- Dispatcher can be launched in offline mode (without connection to radioserver)

### Note:

SmartPTT allows the use both of the digital features of MOTOTRBO two way radios and analog mode to facilitate gradual upgrade to the new radio communication standard by means of a mixed mode of operation when some sites operate in an analog mode and others operate in digital.



## Direct IP Connection to MOTOTRBO repeaters

SmartPTT Enterprise introduces the most efficient way for dispatch control over MOTOTRBO systems based on direct IP connection to the repeaters. SmartPTT direct IP connection is applicable for all dispatching functionality including voice calls.

### Reliability

SmartPTT dispatch system based on a direct IP connection doesn't need any control stations and sound cards installed at the radioserver. The radioserver itself can be located at any distance from the radio coverage area and only requires a stable IP connection to MOTOTRBO repeaters.

### Scalability

With a direct IP connection a single SmartPTT Radioserver can handle multiple distributed MOTOTRBO systems over large distances providing seamless integration of different sites into a single radio network. Multilevel bridging feature allows establishing routes between SmartPTT Radioservers providing the ability of bridging between independent dispatching systems located in different regions.

### Cost-effectiveness

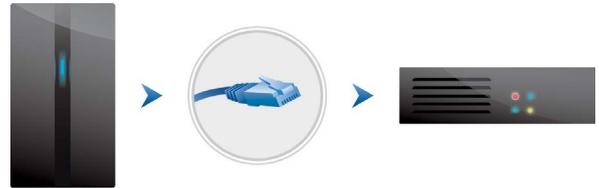
Systems based on SmartPTT direct IP connection allow considerable reduction of costs eliminating the need for control stations, extra server computers and extra sound devices.

### Functionality

**Enhanced Logging.** Only a direct IP connection based system has the ability to log all voice calls and text messages including private ones and collect the information about the repeater used for transmissions.

**Support of Digital Telephone Patch.** With the direct IP connection to IP Site Connect systems SmartPTT supports Motorola Digital Telephone Patch providing SIP interface to telephony and ability to do simultaneous phone calls to MOTOTRBO subscribers on both time slots.

**Monitoring.** SmartPTT Monitoring service provides in-depth analysis and control over connected MOTOTRBO repeaters via direct IP connection.



## Simulcast Support

SmartPTT brings extended dispatch functionalities to simulcast DMR networks with support for Radio Activity simulcast base stations. This technology allows simultaneous voice call broadcast by a number of repeaters on a single radio frequency so that several repeaters operate as one.

Simulcast networks provide for wider area coverage with fewer frequencies, assure real-time roaming and handover during a call and unify all network users in one communication team. SmartPTT is fully compatible with the RadioActivity solution.

### Benefits:

- Reduction of frequency license costs
- Easy conference call organization
- Integrated communications for all services in case of emergency

**Radio Activity**  
**Solutions**

Modern dispatch control system is not only hardware. Nowadays software plays a key role in the system. It realizes the potential of hardware platform and provides an ultimate adaptation of dispatch system functionality to meet the requirements of every particular user.

## SmartPTT

- facilitates the construction of a complex dispatching system
- includes all benefits of the MOTOTRBO digital platform by Motorola

### SmartPTT Users

**Mobile subscribers** use MOTOTRBO radios and have access to the radio network system within its coverage area.

**Dispatchers** use the advanced features and capabilities, e.g. communicating with mobile subscribers, as well as monitoring their activity. Dispatchers have access to the system using the dispatcher console and they are responsible for management and maintenance of the whole communication system.

**Department heads** have access to analytical information.

### SmartPTT Application

#### Linear-extended objects

Multi-site dispatcher control systems for oil- and gas-pipelines, power grids, highways, railways, etc.

#### Geographically distributed objects

Dispatching systems for emergency services, municipalities, public transportation, security services, etc.

#### Local objects

Single-site systems for manufacturing enterprises, airports, supermarkets, hotels, etc.



