



MOTO**TRBO**™







### DIRECT IP CONNECTION

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



- 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)

# 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



#### **!** Please Notice

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)

#### **!** Please Notice

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 Dispatch

- Two-way individual, group and all calls from SmartPTT Dispatch Console
- Conference calls to individuals or groups
- Recording of all voice calls even individual between subscribers
- Job Ticketing
- Hot keys for quick and group calls
- Calling Subscriber Identification
- Remote Monitoring
- Emergency Calls
- Voice calls and text message exchange between dispatchers (Intercom)
- Radio Check

- Call Alert
- Radio Kill
- Voice announcements
- Flexible sound control
- Customizable Subscriber Call windows
- Subscriber categorization
- Configurable profiles to manage access of dispatchers to control stations, groups, services, MOTOTRBO IP Site Connect slots
- Channel selector for switching channels at the control stations
- Separate volume control for talk groups
- Deferred voice calls and messages

SmartPTT Dispatch Console can be installed at any Windows-based PC. Also SmartPTT supports multi-touch screens, as well as specialized dispatch terminals (TIPRO dispatch terminals).

#### Customizable Interface of SmartPTT Dispatch Console:

- Drag & Drop support for adjusting the position and size of the panels
- Multi-touch screen support
- Custom consoles



#### SmartPTT Dispatcher Console supports 4 subscriber types or dispatcher voice communication:

- MOTOTRBO Subscriber Radios (individual, group, all calls)
- Analog Subscriber Radios (all calls)
- Telephone Subscribers (full duplex voice connection by SIP-protocol)
- Other SmartPTT Dispatcher Consoles (full duplex voice connection)



# 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 vall, 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 if 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.



# **Radio Network Bridging**

SmartPTT Radio Network Bridging allows call patching between multiple radio networks of the same or different type, as well as between multiple SmartPTT Radioservers. Subscribers from one network by means of SmartPTT are able to communicate with subscribers from a different network.

Patching rules (routes) are flexibly defined using the Dispatch Console. SmartPTT supports both one-way and two-way routes. Possible route types depend on the type of the connected radio networks, the typical ones are listed below.

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





# **GPS** Tracking

SmartPTT allows monitoring of MOTOTRBO subscriber radios with embedded GPS-receiver.

- Real-time subscriber location monitoring
- Support for different map formats (vector, raster, web-based)
- Subscriber location logging
- Track display for required period
- Track animation
- Subscriber movement detailed report
- Geofencing, monitoring of control zones enter and exit
- Control the subscriber route
- Subscriber stop&start control
- Points of Interest (POI)
- Automatic subscriber location request
- Location request by event
- Manual location request
- Export locations to KML (for location monitoring in third-party applications such as Google Earth)
- Speeding" GPS rule (ability to monitor subscriber driving over the prescribed speed limit
- Address information for GPS locations on the map or in the Subscriber Report

SmartPTT Dispatcher Console allows opening several maps of different types arranged in a convenient way. Maps in the dispatch console can be displayed in independent windows on external display or plasma panel.







# **Telephone Interconnect**

**SmartPTT** software implements a Telephone Interconnect Gateway to make calls between MOTOTRBO or analog radios and telephone subscribers. The gateway is the software component embedded into the SmartPTT Radioserver service. Telephone interconnection is established by SIP through IP-PBX or VoIP-gateway connected to PBX or PSTN.

### **Telephone Interconnect Features**

- Private and group radio calls from a regular phone
- Multiple concurrent channels to the telephone network
- Possibility to limit list of authorized radio subscribers
- Voice call recordings in MP3 format
- Full duplex phone calls to and from Dispatch Console



Phone call can be initiated in different ways.

- Dial the subscriber or talk group ID from phone
- Dial phone number from radio
- Patch of phone and radios by means of dispatch console



# Text and Data Transfer

#### Text Message Service

SmartPTT Dispatcher Console allows sending text messages either to individual MOTOTRBO subscribers or groups. Subscribers with the radio having a display and keyboard can send text messages back to the Dispatcher Console.

#### Email Gateway

- Ability for email users to send text messages to the particular subscriber or talk group in the MOTOTRBO radio network
- Functionality to duplicate messages sent within the MOTOTRBO radio network to the email addresses specified in the Radioserver Configurator

#### Status Control

SmartPTT supports flexible list of statuses for subscribers. Every status can have its own color. Statuses can be assigned to subscribers, either from the dispatcher console or by pressing accessory button on subscriber radio. Status filter in the dispatcher console allows easy selection of the subscribers having specific status.

#### Telemetry

SmartPTT supports all functionality of native MOTOTRBO telemetry feature. Dispatcher Consoles allows controlling over GPIO contacts of MOTOTRBO subscriber radios.

#### Job Ticketing Tool

Job ticketing tool in SmartPTT dispatch console allows a dispatcher to assign tasks to MOTOTRBO subscribers and follow the process of task completion. Convenient ticketing table provides quick tasks filtration by their name, status, recipient, creation time, and status change time.



## **Events and Voice Logging**

SmartPTT logs all system events such as registration, voice calls, text message, status change, radio kill, telemetry signal, GPS location into database. SmartPTT uses MS SQL Server as data storage (SmartPTT setup package includes MS SQL Express free edition).

• Voice logging in SmartPTT is done by saving sound files in MP3 format to a specified folder. For those files tags are set to easily identify and group the records.

Distributed event and voice data storage: logging can be done on both client and server sides of the system.

• Event viewer in SmartPTT Dispatcher Console has embedded functionality to filter, group and sort records displayed in the viewer. Besides that the flexible report engine is implemented in SmartPTT. It is possible to build different types of reports such as subscriber's activity, location and past movement, channel loading.

SmartPTT supports customized rules for event processing on both server and client side of the system.



# Web Client

**SmartPTT Web Client** is an application for convenient subscriber control and monitoring from a browser. Web Client comes as a part of basic configurations of SmartPTT Enterprise and SmartPTT Basic and provides all common functionality of dispatch consoles.

### SmartPTT Web Client Features

- Voice calls from browser
- Radio check and radio kill
- Real-time GPS monitoring with detailed report
- Text message exchange
- Subscriber registration

**SmartPTT Web Client** provides a great opportunity to instantly send a message, check subscribers' locations or make a voice call from a PC that doesn't have a dispatcher application installed on it.





# SmartPTT Mobile

With SmartPTT Mobile solution all employees having smartphones have an opportunity to be a part of SmartPTT network and communicate with MOTOTRBO subscribers and dispatchers.

### SmartPTT Mobile Features

- Text message exchange within radio system
- GPS tracking of smartphone users
- iOS support

### **Coming Soon**

- Voice calls to MOTOTRBO radios
- Android support



Modern dispatch control system is not only hardware. Nowadays software plays a key role in the system. It realizes the potential of a 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.





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