Hytera
Respond & Achieve

Hytera DMR Trunking Pro

DMR
DIGITAL MOBILE RADIO ASSOCIATION

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System Overview

Hytera DMR Trunking Pro , developed from ETSI DMR open standard, is an IP-based Digital Trunked System Infrastructure specifically designed to provide mission critical voice, dispatching and management capacity across various geographic areas. With all-IP architecture, centralized networking and modular design, the system aims to deliver the solution with high spectrum efficiency, wide coverage, flexible networking, cost effective and high security. It can be deployed for different network scale from single site network to national-wide network.

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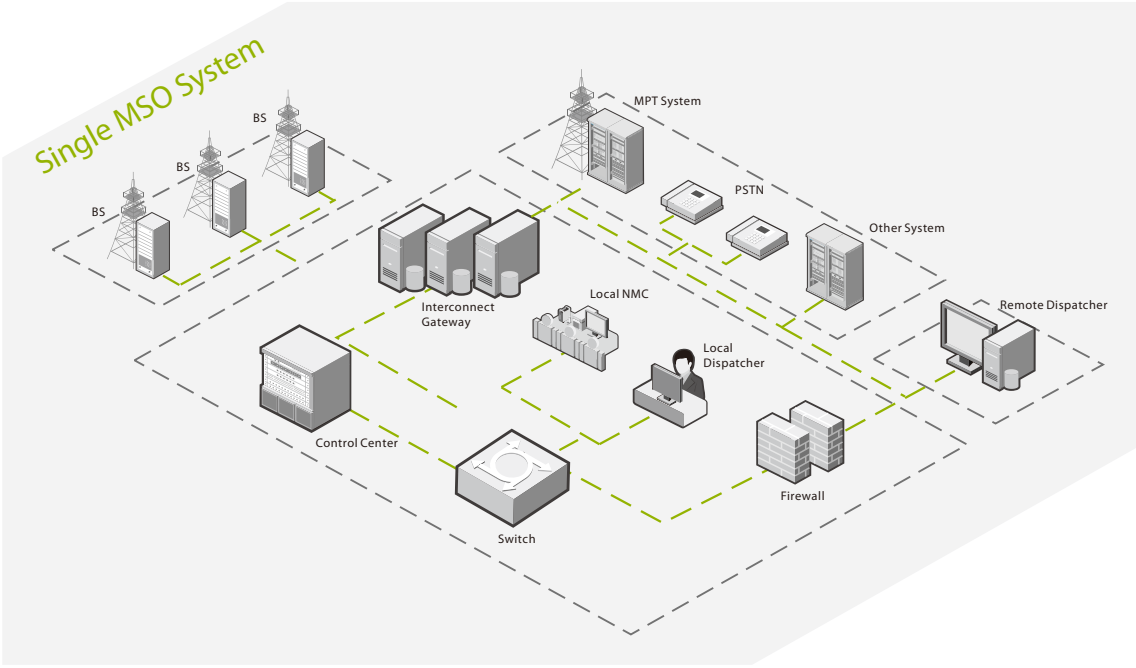
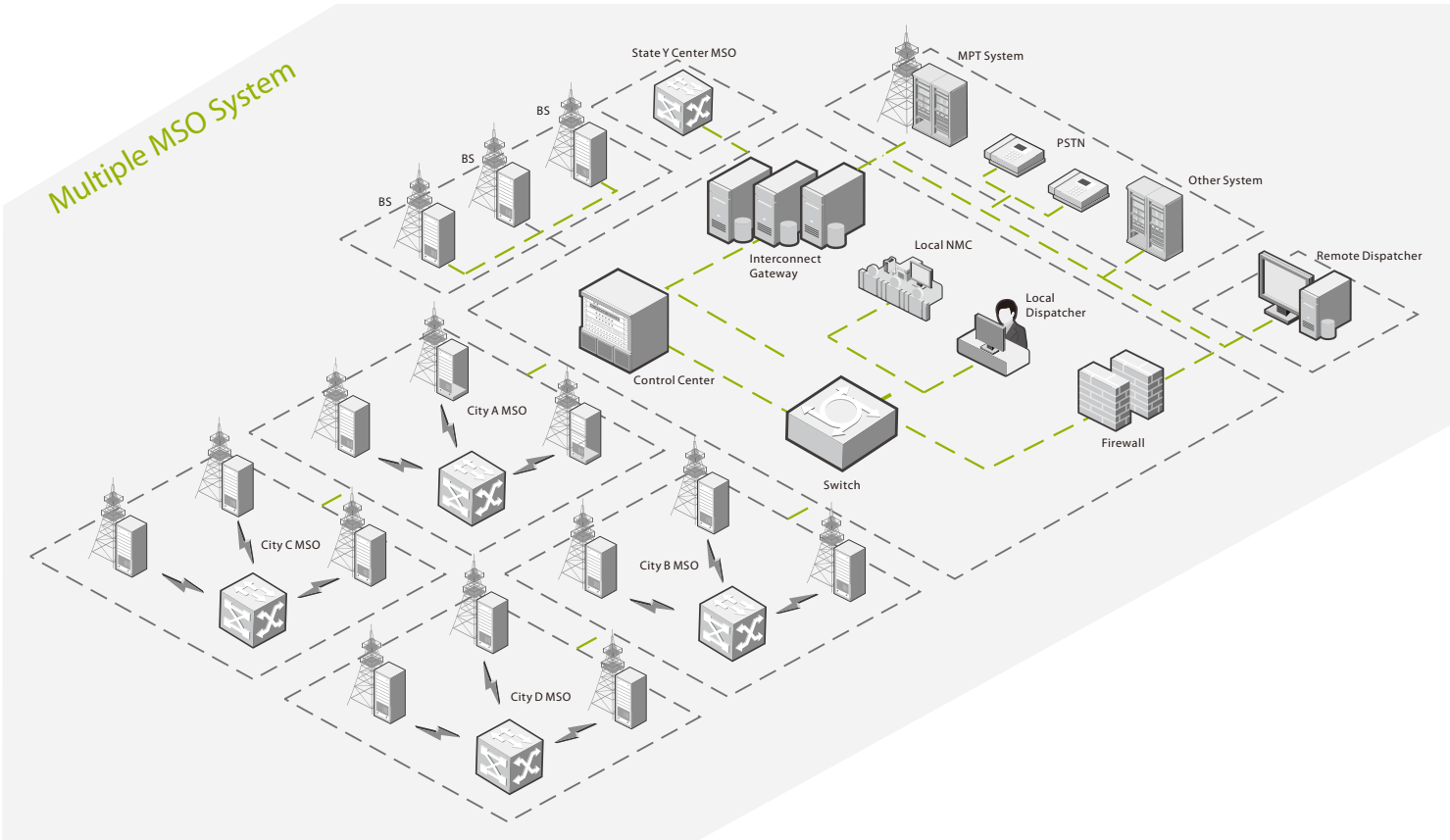
System Structure

The Hytera DMR Trunking Pro logically consists of base station system, service terminal, bearer network and mobile switching office (MSO). One MSO supports up to 100 sites, 800 carriers. A single base station supports up to 16 carriers.

MSOs are connected via IP transmission equipment so as to build a large scale network.





As the core of Hytera DMR Trunking Pro , MSO comprises a wide array of subsystem to enrich the application functions, such as Network Management System (NMS), Dispatching System and Digital Voicing Recording System (DVRS).

System Key Features

① Superior System Reliability

- Modularized design and multi-level fault-tolerant capability for enhanced reliability and efficiency.
- Redundancy capability for key hardware components such as base station control unit, trunking main control channel and power supply unit.
- MSO supports local and geography redundancy mechanism. When one fails, the other one can take over its services immediately.

② Versatile Services

- Mobility management services: registration/deregistration, handover/roaming, etc..
- Data services: text message, GPS data polling, packet data*, status message, emergency alarm, etc..
- Advanced services: late entry, ambience listening, discreet listening, interrupt/override, dynamic group number assignment, voice recording, remote monitor, include call*, super group call, OTAP, Vote now,Group patching etc..
- Voice services: individual call, group call, emergency call, broadcast call, all call, dispatcher call, PSTN call, MPT call, DMR conventional call, analog conventional call, full duplex individual call for mobile radio, etc..
- Providing Integrated Command Control System and Police Geographic Information System for public security.
- Providing API for further development, such as customized dispatcher, billing system, etc..
- Security services: ESN Check, authentication, stun/revive, kill, end-to-end encryption, etc..

*This function will be supported in future system release.

③ Bigger Coverage

- Fully Compliant with DMR Tier 3 technology which born with the advantage of big coverage over other technologies.
- 50W RF module.
- Innovative triple-diversity receiving technology with 3-5dB gain.

④ Flexible Networking

- The IP-based architecture enables flexible networking.
- The system supports multiple transmission links (IP, E1, etc.) and network topologies.

⑤ Powerful Dispatching Capability

- The Client/Server structure ensures networking and expanding capabilities.
- Touch screen technology.
- GPS visual dispatching system.
- User-friendly operation interface and versatile functions.

Base Station

Overview

Powered by cutting-edge technology and versatile functions, Hytera DMR Trunking Pro base station offers refreshing communication experience with ultimate reliability and scalability.

Base Station Components

① Channel Unit (CHU)
② Base Station Control Unit (BSCU)
③ Power Supply Unit (PSU)
④ Fan Unit (FAN)
⑤ Divider Unit (DIU)
⑥ Router
⑦ Combiner Unit (COM)

Highlights

Innovative Design

- Blade structure to facilitate O&M and enhance cooling performance.
- Modularized design for customization.
- Triple diversity technology to increase dynamic receiving sensitivity.
- Input & output alarm port.

High Reliability

- Modularized design and fault-tolerant capability to significantly enhance reliability and efficiency.
- The redundancy mechanism is employed for key devices such as the base station control unit (hot standby), trunking channel unit, power supply unit, link, etc.

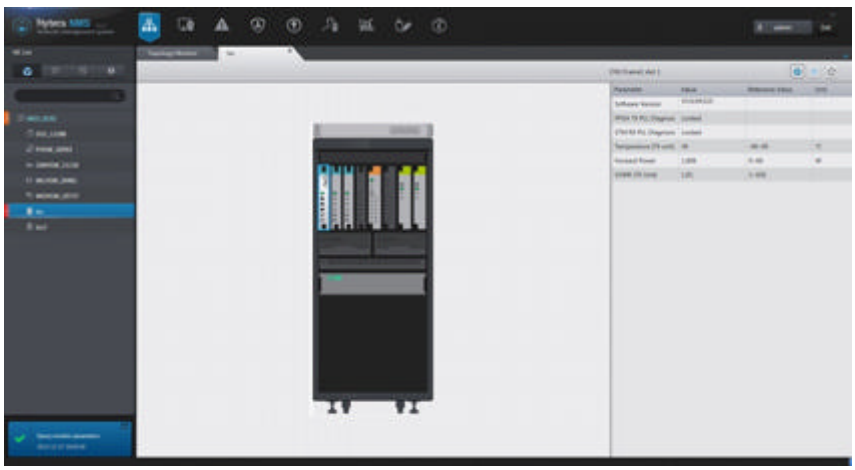
Network Management System

Overview

The network management system is composed of the server and clients. It supports management, monitoring, operation and maintenance functions for the system.

Key Features

- Provide a complete management capabilities such as user management, configuration management, fault management, security management, topology management and performance statistics.
- Support SNMP to facilitate integration into different NMS as required; adopt C/S structure to support multi-user operation in complex and large networks.
- Support remote upgrading and OTAP function.



Dispatching System

Overview

The dispatching system is composed of modules such as dispatch server, dispatch clients. As a part of the Hytera DMR Trunking Pro , the dispatching system provides basic voice services such as individual calls and group calls. By maximizing the benefits of digital trunking and incorporating data services (SMS, status message, and GPS data) with voice dispatching capability, the system enables the Hytera DMR Trunking Pro to deliver enhanced dispatching capabilities for professional users in public security, public utility and enterprise & business.

Key Features

- Voice call
  -Support versatile voice calls, including individule call, group call, broadcast call, PSTN call, PABX call and all call.
  -Support group call late-entry and emergency call.
  -Detailed call history to record call parties.
  -Various indicating sound & light.
- Text message
  Support predefined text message, status message, text messaging group sending; message template and emergency messaging.
- External call
  Support calls between dispatchers.
- Advanced function
  Support DGNA, automatic voice recording, monitor, AVL, etc.
- The system supports external tools like multi-touch touch screen, foot-tap PTT, and microphone with PTT.
- Automatic Vehicle Location (AVL)
  -GIS map load & display.
  -Terminal location tracking & display.
  -Track playback.
  -Geo-fencing.
- Encryption
  Supports end-to-end encryption.

Main Interface

AVL Interface

Digital Voice Recording System

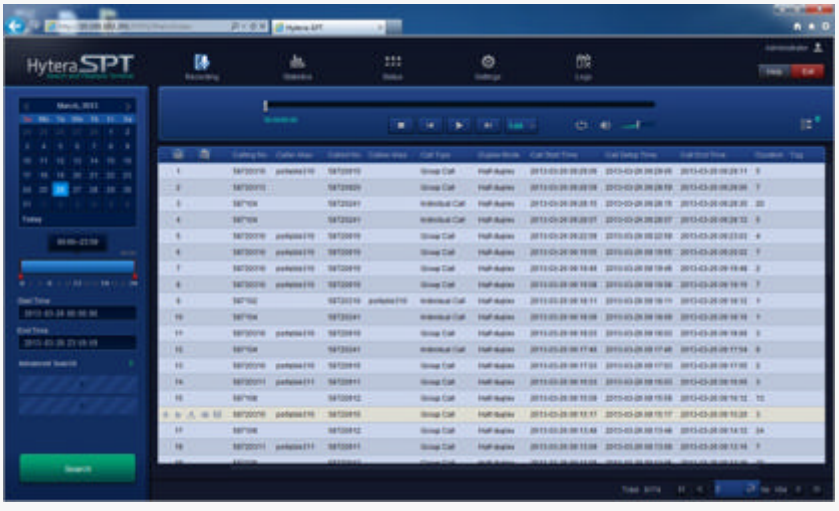
Overview

Developed on Hytera DMR Trunking Pro, DVRS is a voice recording software based on IP network. The voice recording capacity is huge, which can record both voice and SMS converstation of the whole network without any omission and keep high voice quality of the audio files. The access control based on the licensing mode presents high security for voice recording, while the B/S architecture allows query and playback of the audio files at any time anywhere.

Key Features

- IP-based digital network-wide voice recording.
- Browser/Server architecture.
- Hot standby for stability improvement and 24-hour voice and SMS recording.
- Access control based on licensing mode with high security.
- Statistics analysis for voice and SMS recording data.
- Files online playback and download.
- Flexible configuration and voice recording object.

Main Interface



PD70X

PD78X

MD78X

X1e

X1p

PD79X Ex

DMR Trunking Terminals

Highlights

- The most complete DMR trunking terminal portfolio. Portable radio PD70X, PD78X, X1e and X1p, mobile radio MD78X, intrinsically-safe radio PD79X Ex.
- The smallest full power DMR trunking portable terminal in the world -X1e & X1p.
  The world's first full duplex DMR Trunking mobile radio, MD78X.
- Four-mode DMR Trunking terminal, supporting analog conventional mode, DMR conventional mode, MPT Trunking mode and DMR Trunking mode.
- All the terminals support software upgrade from conventional mode to trunking mode.
- All the portable terminals support IP67, all the terminal radios supports GPS and MIL-STD-810C/D/E/F/G.

X=0, 2, 5,6 or 8, model number varies geographically. For details, please contact our regional sales representatives.

Base Station Specifications

General	
Operating Frequency	VHF: 136-174MHz/UHF1: 400D-470MHz/UHF3: 350-400MHz UHF5: 806-825MHz, 851-870MHz/896-902MHz, 935-941MHz
Carrier Spacing	Cavity Combiner: ≥250KHz; Wideband Combiner: ≥25KHz (only for base station with less than 4 carriers)
Multi-access Method	FDMA/TDMA
Duplex Spacing	5.3MHz (VHF)/10MHz (U1, U3)/45MHz 39MHz (U5)
Modulation	4FSK (index: 0.27)
Transmission Rate	9.6 kbps
Full Load Power Consumption	4-carrier: ≤1000W; 8-carrier: ≤2000W
Operating Temperature	-30~+60℃
Storage Temperature	-40~+85℃
Dimensions (W×D×H)	Without casters: 600×600×1430mm; With casters: 600×600×1520mm (4-carrier (29U)) Without casters: 600×700×2000mm; With casters: 600×700×2090mm (8-carrier (42U))
Weight (fully configured)	4-carrier: 230kg; 8-carrier: 314kg
The Number of MSO	16
The Number of Base Stations	100
Maximum Number of Single-station Carrier	16
User Capacity	322000
Group Call Capacity	70000
Dispatcher Capacity	128
Network Management Terminal	32
Calls per PSTN Gateway	60
Calls per MPT Gateway	16
Group Call Set-up Duration (ms)	＜300 singe MSO
Receiver	
Static Sensitivity	≤-118dBm @ BER5% (no diversity); ≤-122dBm @ BER5% (diversity)
Dynamic Sensitivity (no diversity, attenuated by 8km/hr and 100km/hr)	-108dBm @ BER5% (no diversity) -112dBm @ BER5% (diversity)
Rx Path	3 RX paths per CHU, allowing the base station to receive via 3 diversities at most
RX Input Level	-122~-7dBm
Blocking	≥84dB
Common Channel Rejection	-12dB~0
Adjacent Channel Selectivity	Normal:≥60dB @12.5KHz; Limit:≥50dB @12.5KHz
Intermodulation Response Rejection	≥70dB
Spurious Emission	≤-57dBm @ 100KHz @ 9.00~1.00GHz; ≤-47dBm @ 1.0MHz @ 1.00~12.75GHz
Transmitter	
TX Power	VHF, UHF1, UHF3: ≤50W per carrier frequency; UHF5: ≤35W per carrier frequency
Output Power Variation Tolerance	Normal: ±1.5dB; Limit: -3~+2 dB
Bandwidth	≤8.5kHz @ 3dB
Modulation Accuracy	Normal: ≤5.0%; Limit: ≤10.0%
Frequency Offset	≤±100Hz
Intermodulation Attenuation	Normal: ≤-60dBc; Limit: ≤-50dBc
Adjacent Channel Power Rejection (ACPR)	≥60dB (12.5KHz)
Transient Switch ACPR	±12.5KHz: ≥50dB (only for devices adopting the TDMA technology)
Spurious Emission	≤-36dBm @ 100KHz @ 9.00~1.00GHz; ≤-30dBm @ 1.0MHz @ 1.00~12.75GHz
Reliability	
Mean Time between System Failures (MTBF)	100,000 hours
Mean Time to Repair (MTTR)	30 minutes

All Specifications are tested according to applicable standards, and subject to change without notice due to continuous development.

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