

DMR Tier-III Trunking

Hytera Open Standard DMR Trunking Portfolio



- ETSI DMR Open Standard Technology
- IP Based Digital Trunked System Infrastructure
- Versatile Services & Expandable Systems



Overview

Hytera DMR Tier III Trunking, developed from the ETSI DMR open standard, is an IP based Digital Trunked Platform specifically designed to provide mission critical voice, data, dispatching and management capacity across wide geographical areas. With an all-IP architecture and centralized networking, the solution utilizes infrastructure with modular design of system components in order to deliver high spectrum efficiency, fast access, advanced Security, wide coverage, flexible networking, affordable infrastructure and low maintenance costs. Because of its strong scalability, Hytera DMR III solutions support networks of different topologies, including regional networks such as single-site network, or multiple-site nationwide networks.



Transportation & Airports

Railway, Buses, Port, Airport, Logistics, Fleets Vehicles, Taxi



Enterprise & Business

Hotel, Hospital, Property Management, Retail, Events, Executives, Education



Industrial & Manufacturing

Manufacturing, Construction, Factory, Farming, Forestry, Warehouse

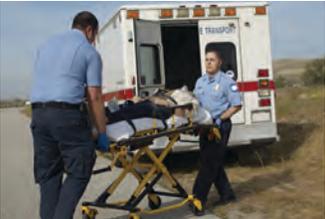


Application Industries



Security & Government

Law-enforcement, Firefighters, EMS, Government Agencies, Military, Private / Public Security, Dispatch Center



Utilities & Energy

Electricity, Waste Management, Water Treatment, Oil & Gas, Mining, Refineries



Advantages of DMR Technology

1. Digital Voice, Superior Anti-interference and Voice Quality

The digital voice compression technology of DMR terminals provides better noise reduction and preserves voice quality over a greater range than analog, especially at coverage edges, thanks to the application of narrowband encoder/decoder and digital correction technology. The digital process could filter noise and rebuild signal from degraded transmission, so that users can get better communication quality and wider coverage.

2. Improved Spectrum Efficiency, Double Channel Capacity

DMR two-slot TDMA technology reserves 12.5KHz bandwidth, and divides it into 2 alternate time slots, therefore one 12.5KHz channel could support 2 synchronized or individual calls. Each slot can operate as an individual communication channel and has equivalent bandwidth (6.25e KHz), while this 12.5KHz is still able to interconnect with other analog 12.5KHz channels.

DMR is fully compatible with already authorized PMR frequencies, so that users can get twice the channel capacity without re-configuration or buying additional frequencies.

While the first time-slot is working, the second time-slot can, in a TDMA system, be used for data transmission such as text messaging or location data in parallel with voice call, which is very useful in dispatch systems that provide both voice and visual transmission. The enhanced data capability is becoming more and more important to facilitate large amount of data transmission. Future developments of the two-slot TDMA application include temporarily integrating two time slots to double data transmission speed, and using two time slots at the same time in order to enable full-duplex call.

3. Large Coverage, Low Networking Cost

DMR Technology uses nonlinear amplifiers resulting in larger coverage and added technical advantages: In comparison with other digital technologies, the coverage of the base station is improved up to a 3:1 ratio with high operating efficiency and optimized power consumption.

4. Save Investment on Infrastructure

Another advantage of the DMR TDMA approach is that you get two channels with one repeater, one antenna, and a simple duplexer. Compared to FDMA solutions, two-slot TDMA allows you to achieve 6.25e KHz efficiency while minimizing investments on repeaters and combiner. FDMA requires a repeater for each channel, plus additional combiner and frequencies, and there's a notable loss in signal quality and coverage when combiner is used in this way.

DMR gets two stable channels with only one repeater, and does not require additional repeater or combiner, thereby investment of users on infrastructure will be greatly reduced, and the networking solutions can also be simplified.

5. More Power Saving, Battery Life Extended

Two-slot TDMA offers a optimized solution. Since an individual call uses only one of the two timeslots, it requires only half of the transmitter's activity and power consumption. The two timeslots are in use alternatively, so that the transmitter is idle half of the time. For example, in a typical duty cycle of 5 percent transmitting, 5 percent receiving, and 90 percent standby, the transmit time accounts for a high proportion of the drain on the battery. By cutting the effective transmit time in half, two-slot TDMA can enable up to 40 percent improvement in talk time in comparison with analog radios. Because of the total power consumption of every call has been reduced, working time of the battery is extended and charging time interval becomes longer. Modern digital equipment also has sleep and power management features, which could also extend the battery life.

6. Reliable Encryption Technology

Enhanced Communication Privacy. Voice communications are easily monitored on analog channel. However, the signal could not be monitored when DMR digital technology is applied, unless signaling or ID (16,776,415 in total) is matched, thus the confidentiality of your communication is ensured.

7. Smooth Migration from Analog System & Terminal

A DMR system uses constant envelope modulation similar to an MPT system, and both the terminal and system use nonlinear power amplifier, which makes it easier for MPT and DMR systems and terminals to adopt a multimode design. The DMR standard has inherited technical features of MPT, and provides a smooth migration from analog MPT systems.

DMR is compatible with both analog and digital systems. Analog and digital users could operate and be interoperable with each other in one network. DMR mobile terminals have the same coding rule, operation method and user habit with analog ones. Common application will not be impacted during the transition from analog to digital. The smooth transition includes three parts: spectrum, system and conventional terminal.

8. Enriched Dispatch Function

In addition to basic voice services such as individual call and group call, and basic data services such as SMS and status information, DMR has abundant dispatch functions which could meet dispatching requirements of public security, public utility, and many other industries, and set rules for various dispatching services:

9. Scalable Data Applications for Increased ROI

Featured by full digitization and IP soft-switch, DMR equipment obtains excellent scalability. DMR provides not only digital talkback function from end to end, but also data services including positioning, text message, telemetry, data transmission, radio controlling, etc. Furthermore, it provides rich secondary development interfaces for customers by proper plan and design of system software and hardware infrastructure. Users could tailor the system according to specific needs, and explore more application services by secondary development. With increasing demand on data and voice communication, the above functions and features would greatly enrich data applications of the system; therefore achieve higher return on investment (ROI).

DMR Trunking Systems

DMR Trunking Pro

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 base station and 800 carriers. A single base station supports up to 16 carriers.

MSOs in different Hytera DMR Trunking Pro are connected through network equipment to form a large scale network with multiple sites.

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



- **Open Standard**

DMR Trunking Systems comply with ETSI DMR open standard, and is an IP Based Digital Trunked System Infrastructure specifically designed to provide voice and data, dispatching and management with large capacity across various geographical areas.

DMR Trunking Lite

Hytera DMR trunking lite is a digital trunking system, which is developed from ETSI open standard and focuses on transportation, energy resource, public utilities, enterprise & business, etc.. The system is based on the RD982i-S transceiver and supports multi-mode operation and smooth migration, in order to provide professional users more choices.

DMR Trunking Lite transceiver supports a smooth migration from conventional to trunking and from analog to digital. Multi-modes provide you different choices for continued benefits.

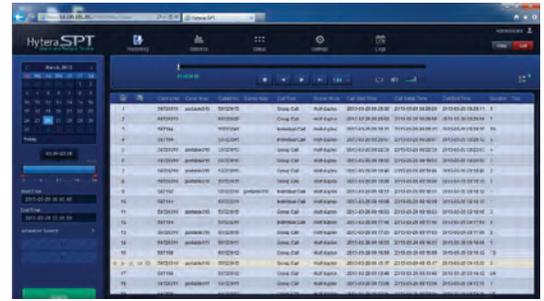


Features

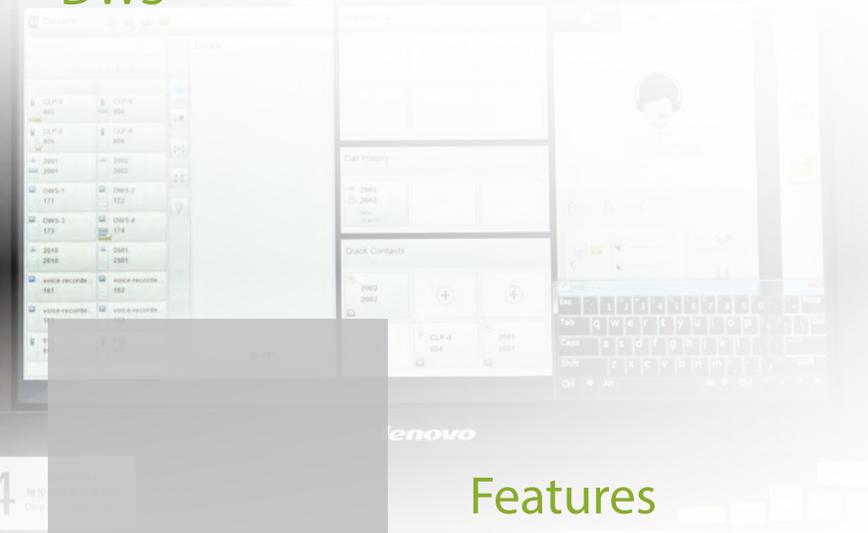
Developed on Hytera DMR Trunking Pro, DVRS is a voice recording software based on IP network. The voice recording capacity is huge, which can record the conversation of the whole network without any omission and keep high voice quality of the audio files. The access control based on the licensing mode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

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

- Main Interface



**Voice
Recording
System**



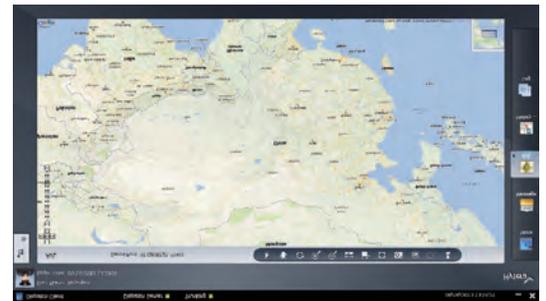
Dispatching System

Features

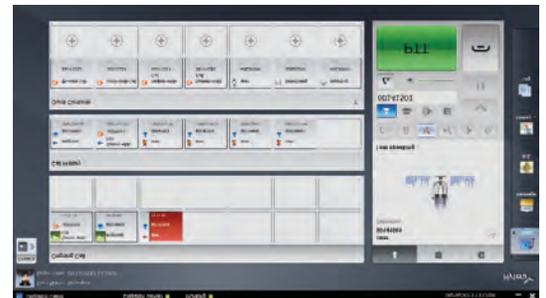
The dispatching system is composed of modules such as dispatch server, dispatch clients. As a part of the Hytera DMR Trunking, the dispatching system provides basic voice services such as individual calls and group calls. By maximizing the benefits of digital trunking and incorporating data services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

- **Voice Call**
Supports versatile voice calls, including individual 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**
Supports predefined text message, status message, text messaging group sending; message template and emergency messaging.
- **External Call**
Supports calls between dispatchers.
- **Advanced Function**
Supports DGNA, automatic voice recording, monitor, AVL.
- **Automatic Vehicle Location (AVL)**
GIS map load & display. Terminal location tracking & display. Track playback. Geo-fencing.
- **Encryption**
End-to-end encryption is supported to ensure the transmission of secure voice and data.
- **External Tools**
The system supports external tools like multi-touch touch screen, foot-tap PTT, and microphone with PTT.

- **AVL Console Interface**

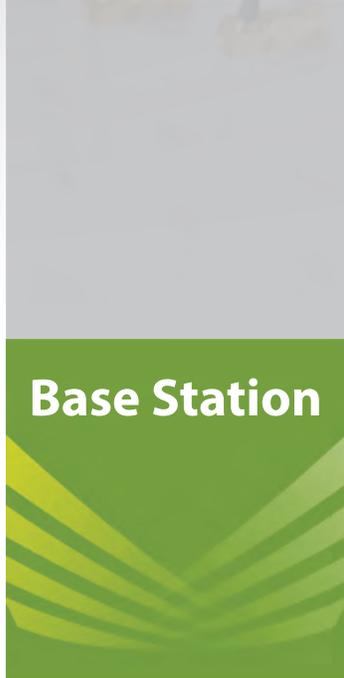


- **Dispatch Console Interface**



Comparison Charts

Item	Function	Hytera DMR Tier-III Trunking Lite	Hytera DMR Tier-III Trunking Pro
Standard	Technology Standard	DMR ETSI Open Standard	DMR ETSI Open Standard
Frequency	FB8 Required	Yes	Yes
	Frequency Range	VHF, UHF, 800/900MHz	VHF, UHF, 800/900MHz
Networking Capacity	Sites per MSO	50 Sites (Market Specific)	100 Sites
	Carrier per BS	"8 Carriers 15 Voice Channels 1 Control Channel"	"16 Carriers 31 Voice Channels 1 Control Channel"
Reliability	MSO Redundancy	Supported	Supported
	BSCU Redundancy	Supported	Supported
	Dedicated Control Channel	Supported	Supported
	Control Channel Redundancy	Supported	Supported
	Single Base Station Fallback Control	Supported	NA
	Multi-Level Fallback Mode	NA	Supported
High Level Function	Channel Unit Sleep	Supported	Supported
	Triple-diversity Receiving	NA	Supported
	Ambiance Listening	NA	Supported
	Discreet Listening	Supported	Supported
	Real Frequency Assign	Supported	Supported
	System GPS synchronization	NA	Supported
Mobility Management	OTAP	Supported	Supported
	Power-up Registration	Supported	Supported
	Group Registration	NA	Supported
	Power-off Deregistration	Supported	Supported
	Roaming	Supported	Supported
Security Services	Handover	NA	Supported
	Authentication	Optional	Supported
	End to End Encryption	NA	Supported
	ESN System Access Verification	Supported	Supported
Basic Voice Services	Individual Call	Supported	Supported
	Group Call	Supported	Supported
	PSTN Call	Optional	Supported
	MPT Call	Optional	Supported
	VOIP Call	Supported	Supported
	Including Call	Supported	Supported
	All Call	Supported	Supported
	Broadcast Call	Supported	Supported
Basic Data Services	Short Data Message	Supported	Supported
	GPS Data (Control Channel)	Optional	Supported
	GPS Data (Auxiliary Control Channel)	Optional	Supported
	Status Message	Supported	Supported
Supplementary Services	Emergency Alarm	Supported	Supported
	Emergency Call	Supported	Supported
	Recording	Optional	Supported
	Group Patch	Optional	Supported
	Packet Data Service	Optional	Supported
	System(MSO) Interconnection	NA	Supported
	Dynamic Base Station Assignment	Supported	Supported
	Call Priority	Supported (6 Priority Levels)	Supported (6 Priority Levels)
	Talkgroup / Background Group Hunt	Supported	Supported
	Dynamic Group Number Assignment	Supported	Supported
	Last LDS Notification	NA	Supported
	Late Entry	Supported	Supported
	Forced Disconnect/ Override	NA	Supported
	MS Stun/ Revive	Supported	Supported
	MS Kill	Supported	Supported
	Busy Queuing and Automatic Callback	Supported	Supported
Alert Call	Supported	Supported	
Call Forwarding	Supported	Supported	



System Components

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

Innovative Design

The system has a semi-centralized networking and modular design for fail-soft and enhanced reliability

The redundancy backup mechanism is employed to retain the integrity of some key devices, for example, base station controller redundancy and main control channel backup, as well as link backup for network elements

- Blade architecture to facilitate O&M and enhance cooling efficiency.
- Triple RX diversity technology to offset the impact of multipath fading and increase dynamic receiving sensitivity.
- Modularized design to tailor functions as required.
- The product incorporates combined control mechanism (distributed and centralized), 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 controller unit (hot standby), trunking channel unit, power supply unit, link, etc.
- Programmable functions via software, providing the capability of long-term technology development.



Network Management System

Features

The network management system is composed of the server and clients. It supports management, monitoring, operation and maintenance functions for the system. The NMS module manages and monitors the DMR system, and provides O&M capabilities to configure and monitor resources of the system.

- Provide a complete range of management capabilities such as user management, configuration management, fault management, security management, and topology management, and performance statistics.
- Support SNMP to facilitate integration into different NMSs as required.
- Adopt client-server (C/S) structure to support multi-user operation for dispatching applications in complex and large networks, delivering robust networking capability and scalability.
- Achieve central monitoring and management of network elements (NEs) via the topology diagram.
- Easily add or modify an MSO, BS, CHU, DSS, PHSW, GWHSW, Subscriber Information, Group Information, and Group Membership.
- Use alarm notifications to alert clients to a fault and find the cause then resolve the problem promptly.
- Remotely upgrade firmware to include the latest features on the user-friendly interface.

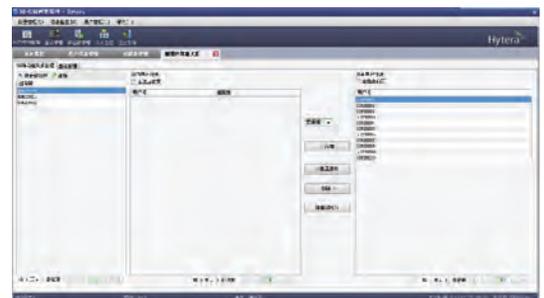
Main Interface



Frame



User Group



DMR Trunking System Software



Carrier Grade Reliability Versatile Services

- Combined control mechanism (distributed and centralized), modular 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 geographic redundancy. When one site fails, the other site can take over its services immediately.
- **Mobility Management**
Registration/deregistration, handover/roaming, group registration/deregistration, and authentication.
- **Voice Services**
Individual call, group call, emergency call, all call, dispatcher call, etc.
- **Data Services**
SMS, GPS short data polling, status message, emergency alarm.
- **Flexible Secondary Development**
Provide a wide range of interfaces for secondary development, enabling users to re-engineer the system as required and develop more data applications via API.
- **Various Supplementary Services**
Offer various supplementary services, including late entry, user level, ambient listening, discreet listening, talk-group hunt, forced disconnect / forced connect-override, stun / revive, kill, dynamic group number assignment, record, remote monitor, end-to-end encryption, include call.
- **Strong Interoperability**
Support intercommunication with PSTN/ PABX, MPT system, DMR conventional system.



Flexible Networking

- The IP-based architecture enables flexible networking and low bandwidth requirements for the system backhaul network.
- The all-IP infrastructure allows devices to be deployed anywhere in the network, which facilitates the add and removal of network nodes, increases networking flexibility and reduces equipment room costs;
- Support multiple link modes (IP and E1) and network topologies (tree, star, etc.).

System Management

- The SNMP capability allows remote monitoring and management of system components over the extended IP Network.
- The Client / Server structure ensures good networking and expanding capabilities
- The network management system (NMS) can provide centralized management over the IP network elements, and support remote upgrading for smooth capacity expansion



Product Features

MD782i

- **User Friendly Design**
The large-size color display allows good visibility even under extremely strong light. The seven programmable keys facilitate your communication and the optional keypad microphone enhances.
- **Rugged & Reliable**
Complies with MIL-STD-810 C/D/E/F/G standards and is IP54 (5: Generally protected against dust; 4: Protected against the effects of light rain or minor water splashes) ensuring outstanding performance.
- **Secure Communication**
Besides the encryption inherent to digital technology, the X1i Series radios provide enhanced encryption capabilities such as Hytera's own encryption of up to 256-bit, the DMR Association's 40-bit ARC encryption and optional AES encryption.
- **Roaming**
Automatic roaming of all sites in an IP Multi-site Connect system.
- **Data Features**
Supports data capabilities of sending Private and Group text messages. It also supports a Third Party to control the radio via Third party API (GPS, Radio Registration Services, Radio Call Control, Telemetry, Data Transfer), via Telemetry control to radio.
- **Dual Mode: Analog & Digital**
Dual mode (analog & digital) operation ensures a smooth analog to digital migration.
- **Versatile Voice Calls**
The intelligent signaling of the MD782i supports various voice call types, including Private Call, Group Call , All Call and Emergency Call.
- **GPS Positioning**
The MD782i model supports viewing of GPS positioning information and sending of GPS text message. *GPS is a built-in hardware option.
- **Expansion Ports**
This allows third parties to develop accessory and applications via front and rear port of the mobile. (Features such as channel steering, emergency footswitch can be supported via the rear port of the mobile).
- **One Touch Call/Text**
Supports One Touch features that comprise of Preprogrammed Text Messages, Voice Calls and Supplementary Features
- **Scan**
Capable of scanning of pure analog voice and signaling, pure Digital voice and data, and also mix mode scan that comprise of Analog and Digital activities.
- **Software Upgradeable**
Upgradeable software enables new features without buying a new radio; MD782i could also be switched into DMR trunking modes with corresponding trunking license applied in the same hardware.
- **Multifaceted Control Services**
The MD782i is capable of Text Message, Scan, Emergency, Channel Steering, Auto Registration, Lone Worker, Radio Check, Remote Monitor, Call Alert, Radio Enable, and Radio Disable



PD792i-Ex



Product Features

- **Environmentally Safe and High Reliability**
Designed upon the strict requirements of European ATEX and North American FM standards. With certifications for ATEX, IECEx, the latest FM and CSA specifications, the radio works safely in most hazardous environments, even with the presence of hydrogen and dust particles. The overall design complies with the latest American Military Standard-MIL-STD-810G, which means it can bear the harshest environments like High/Low Temperature, High Humidity, Vibration, and Shock.
- **Enhanced Safety**
The PD792i-Ex Ex provides a dedicated emergency button. In case of any accident, a press on the button will trigger an alarm and initiate a pre-programmed voice call. Built-in Man-down, GPS and Lone Worker functions are also available with the digital portable.
- **High-capacity and Safe Li-Ion Battery**
Has a high-capacity Li-Ion battery of 1800mAh with long shelf life of 17 hours under 5-5-90 duty cycle. The battery charging and discharging circuits are stringently designed to prevent overcharging or discharging causing high heat, which leads to unstable battery environments. In addition the battery cells are also encapsulated to redistribute single point heat buildup and also prevent air discharge.
- **Easy of Use**
The PD792i-Ex is very easy to use. It has a tough and highly readable LCD screen and an intuitive user interface. The large PPT button and channel knobs are useful for users wearing gloves. The ergonomic design and channel annunciation enhance the user experience.
- **GPS Positioning**
The built-in GPS module in the PD792i-Ex supports GIS applications.
- **Improved PCB Circuit Layout & EMC Shielding**
To achieve such a high safety standard, Hytera PD792i-Ex adopts optimized distributed line design on PCB, minimizing the odds of circuit fault. All the key components on the PCB are covered with shield, and the space between lines, between components, between component and shield are properly separated which translates to better EMC performance and less internal interference.
- **Innovative Silicone Encapsulating**
Silicone encapsulant technology prevents the internal circuits from interface with air and liquid which effectively stops the intrusion of liquid, dust and harmful gas. The silicone encapsulating process is delicate and complicated. As a result, every single PD792i-Ex radio spends eight hours in the manufacture line.
- **Innovative Electrostatic Free Design**
Hytera applies patent on electrostatic free design and dual-material molding technology in this intrinsically safe portable. The static dispersive material (blue) minimizes static accumulation on the surface, thus reducing the probability of static discharge on the radio. Meanwhile the robust material (black) maximizes the ruggedness of the enclosure.
- **IP67 Protection**
The Ingress Protection reaches IP67 (6: Totally protected against dust; 7: Protected against the effects of immersion up to 1m for 30 minutes). It's the highest IP level for land-based wireless radio application.
- **Patent Battery Latch**
To disengage the battery from Hytera digital portables, the lock and bolt of the latch need to be moved along two different axes. Such a patented design ensures no disengagement of the battery pack from the main radio in case of dropping that might cause spark.

Trunk Pro Mobile Switch Office (MSO)

The DMR Network is scalable from a single site with one base station to a wide area network with multiple MSOs.

The MSO consists of central controller, service switching device, media translating unit, network management device and gateway. As the processing center, it is responsible for intercommunication and information exchange among the network elements in the system, realizing call control and media data exchange between base stations or between systems and providing versatile services such as mobility management, authentication, dispatch, network management and intercommunication.

- One MSO will support up to 100 base stations and 800 carriers.
- A single base station will support up to 16 carriers.
- One MSO will support up to 5000 group calls.
- One MSO will support 32 dispatcher stations, 64 network management clients.

General	Frequency Range	VHF: 136-174MHz ; UHF: 350-400MHz ; 400-470MHz ; 450-520MHz; 806-825MHz; 851-870MHz/896-902MHz; 935-941MHz
	Carrier Spacing	Cavity Combiner: ≥250KHz; Wideband Combiner: ≥25KHz (only for less than 4 carriers)
	Multi-Access Method	FDMA/TDMA
	Duplex Spacing	VHF: 5.3MHz UHF: 10MHz; 800/900: 45MHz 39MHz
	Modulation	4FSK (index: 0.27)
	Transmission Rate	9.6 kbps
	Full Load Power Consumption	≤1200W (4-carrier) ≤2400W (8-carrier)
	Operating Temperature	-22°F ~ +140°F
	Storage Temperature	-40° F ~ +185° F
	Dimensions (HxWxD) (with casters)	23.6 x 23.6 x 56.3 in (4-carrier) 23.6 x 27.6 x 78.7 in (8-carrier)
Weight (fully configured)	485 lbs (4-carrier) 772 lbs (8-carrier)	
Mean Time between System Failures (MTBF)	100,000 hours	

I/O Port	RF RX/TX Port	Four-way, N-Female
	Synchronous Port	GPS, N-Female
	Port to MSO	E1: BNC-Female/DB9-Female ; Ethernet: RJ-45
	Local Maintenance Port	RS232/Ethernet
	Power Supply Port	AC: 100~240V (50~60Hz) DC: -48V (optional)

Receiver Data	Static	≤-119dBm @ BER5% (no diversity) ; ≤-122dBm @ BER5% (diversity) ; ≤-116dBm @ BER1%
	Dynamic (no diversity, attenuated by 8km/hr and 100km/hr)	-106dBm @ BER5% (no diversity) -112dBm @ BER5% (diversity)
	Rx Path	3 RX paths per CHU, allowing the base station to receive up to third order diversities
	RX Input Level	122~-7dBm
	Blocking	84dB
	Common Channel Rejection	≥-12dB
	Adjacent Channel Selectivity	Normal: 60dB Limit: 50dB
	Intermodulation Response Rejection	≥70dB
Spurious Emission	≤-36dBm @ 100KHz @ 9.00-1.00GHz ; ≤-30dBm @ 1.0MHz @ 1.00-12.75GHz	

Transmitter Data	TX Power	VHF, UHF: ≤50W per carrier 800/900MHz: ≤35W per carrier
	Output Power Variation Tolerance	Normal: ±1.5dB Limit: -3~+2 dB
	Power Adjustment	1~50W (step: 1W)
	Bandwidth	≤8.5kHz @ 3dB
	Modulation Accuracy	Normal: ≤5.0% Limit: ≤10.0%
	Frequency Offset	Normal: ±1.50KHz Limit: ±2.50KHz
	Intermodulation Attenuation	Normal: 60dB Limit: 50dB
	Adjacent Channel Power Rejection (ACPR)	≥60dB (12.5kHz)
	Transient Switch ACPR	±12.5kHz: ≥50dB (only for TDMA technology)
Spurious Emission	≤-36dBm @ 100KHz @ 9.00-1.00GHz ; ≤-30dBm @ 1.0MHz @ 1.00-12.75GHz	



Base Station

System Components

- 1 Power Distribution Unit
- 2 Base Station Controller
- 3 Transceiver Power Supply
- 4 Switch
- 5 2 x RD982S Transceiver Units
- 6 BS PSU
- 7 2 Channel RF System

Innovative Design

- **Overall Integration**
High level of integration allows overall delivery which is a significant saving on total cost. Complete system documentation is ready for on site installation
- **Components Assembly**
Base station components can be offered separately, and customers have alternative choice for their own cabinet or IP equipment.
- **Non-Centralized**
Non-centralized structure is only used for less than 5 base stations. It will ensure a cost-effective and flexible networking especially suits for small scale of network.
- **Versatile & Expandable**
All devices are based on IP architecture to ensure flexible networking and system expansion.
- **Space Saver**
Integrated 2-carrier RF system, significantly reduces the space and cost for divider, combiner and duplexer.
- **Rack Design**
RD982S utilizes rack design and easily installs with the standard 19" cabinet.
- **Analog & Digital**
RD982i-S supports multi-mode operation such as analog & DMR conventional mode, as well as MPT & DMR trunking mode, for the purpose of seamless system upgrade.



X1i Series

Product Features

- **Ease of Use**
Easy to use with the rugged body as thin as 18mm, professional wireless headsets or collar microphone, palm controller and flexible antenna.
- **Rugged & Reliable**
Complies with MIL-STD-810 C/D/E/F/G standards and passes HALT (Highly Accelerated Life Test).
- **Large Color Display**
X1pi has a 1.8" TFT LCD display (65536 colors), allowing good visibility even in strong sunlight.
- **Bluetooth**
X1i Series Radios can connect to Bluetooth to earpieces using the Hytera wireless PTT Accessory.
- **GPS Positioning**
The X1i series supports viewing of GPS positioning information and sending of GPS text message.
- **Advanced Signaling**
Supports multiple advanced analog signaling modes, including HDC1200, 2-Tone and 5-Tone, providing better integration into existing analog radio fleets.
- **Dual Mode: Analog & Digital**
Dual mode (analog & digital) operation ensures a smooth analog to digital migration.
- **Data Features**
The X1i Series Supports data capabilities of sending Private and Group text messages. It also supports a Third Party to control the radio via Third party API (GPS, Radio Registration Services, Radio Call Control, Telemetry, Data Transfer), via Telemetry control to radio.
- **One Touch Call/Text**
Supports One Touch features that comprise of Preprogrammed Text Messages, Voice Calls and Supplementary Features
- **Versatile Voice Calls**
The intelligent signaling of the X1i Series radios support various voice call types, including Private Call, Group Call, All Call and Emergency Call.
- **Expansion Ports**
This allows third parties to develop accessory and applications. (Features such as voice recording, encryption).
- **Software Upgradeable**
Upgradeable software enables new features without buying a new radio; X1i Series radios can also be switched into DMR trunking modes with corresponding trunking license applied in the same hardware.
- **IP67 Protection**
The Ingress Protection reaches IP67 (6: Totally protected against dust; 7: Protected against the effects of immersion up to 1m for 30 minutes). It's the highest IP level for land-based wireless radio application.
- **Scan**
Capable of scanning of pure analog voice and signaling, pure Digital voice and data, and also mix mode scan that comprise of Analog and Digital activities.
- **Multifaceted Control Services**
In addition to conventional communication services, the X1i Series radios are capable of Text Message, Emergency, Man Down, Vibration, Auto Registration, High-speed Data Transmission, Lone Worker, Radio Check, Remote Monitor, Call Alert, Radio Enable, and Radio Disable
- **Secure Communication**
Besides the encryption inherent to digital technology, the X1i Series radios provide enhanced encryption capabilities such as Hytera's own encryption of up to 256-bit, the DMR Association's 40-bit ARC encryption and optional AES encryption.



PD7i Series

Product Features

- **User Friendly Design**
The large-size color display allows good visibility even under extremely strong light. The globally patented industrial design and antenna design ensure convenient operation and remarkable GPS performance.
- **Rugged & Reliable**
Complies with MIL-STD-810 C/D/E/F/G standards. The Ingress Protection reaches IP67 (6: Totally protected against dust; 7: Protected against the effects of immersion up to 1m for 30 minutes). It's the highest IP level for land-based wireless radio application.
- **UL913 Intrinsically Safe Option**
The PD7i Series also is available as a UL913 certified Intrinsically Safe option. This version of the radio is full power. Contact your Hytera Dealer for more info.
- **Scan**
Capable of scanning of pure analog voice and signaling, pure Digital voice and data, and also mix mode scan that comprise of Analog and Digital activities.
- **GPS Positioning**
The PD7i series *GPS model supports viewing of GPS positioning information and sending of GPS text message. *GPS is a built-in hardware option.
- **Advanced Signaling**
Supports multiple advanced analog signaling modes, including HDC1200, 2-Tone and 5-Tone, providing better integration into existing analog radio fleets.
- **Secure Communication**
Besides the encryption inherent to digital technology, the PD7i Series radios provide enhanced encryption capabilities such as Hytera's own encryption of up to 256-bit, the DMR Association's 40-bit ARC encryption and optional AES encryption.
- **Dual Mode: Analog & Digital**
Dual mode (analog & digital) operation ensures a smooth analog to digital migration.
- **Roaming**
Automatic roaming of all sites in an IP Multi-site Connect system.
- **Versatile Voice Calls**
The intelligent signaling of the PD7i Series radios support various voice call types, including Private Call, Group Call, All Call and Emergency Call.
- **Multifaceted Control Services**
In addition to conventional communication services, the PD7i Series radios are capable of Text Message, Emergency, Man Down (optional), Vibration, Auto Registration, High-speed Data Transmission, Lone Worker, Radio Check, Remote Monitor, Call Alert, Radio Enable, and Radio Disable
- **Software Upgradeable**
Upgradeable software enables new features without buying a new radio; The PD7i Series radios can also be switched into DMR trunking modes with corresponding trunking license applied in the same hardware.
- **Expansion Ports**
This allows third parties to develop accessory and applications. (Features such as voice recording, encryption).
- **One Touch Call/Text**
Supports One Touch features that comprise of Preprogrammed Text Messages, Voice Calls and Supplementary Features
- **Data Features**
The PD7i Series Supports data capabilities of sending Private and Group text messages. It also supports a Third Party to control the radio via Third party API (GPS, Radio Registration Services, Radio Call Control, Telemetry, Data Transfer), via Telemetry control to radio.



Carrier Grade Reliability Versatile Services

- Combined control mechanism (distributed and centralized), modular 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.
- **Open Standard**
DMR Trunking Lite is based on DMR tier III standard, defined by ETSI, which is a digital radio standard for professional radio users. With dedicated control channel, DMR Trunking Lite can achieve versatile functions.
- **Open API**
Open API satisfies further development based on different customers' need, such as billing system, e-mail gateway, etc..
- **Interconnection with Different Systems**
Different gateways can be achieved the interconnection between DMR trunking and other standard, such as PSTN gateway, analog conventional gateway, MPT gateway, DMR conventional gateway, etc..
- **Voice / Data Features**
Voice services, data services, priority, late entry, call back, recording, PSTN call, ESN check, authentication, kill, GPS, emergency alarm.
* Some features are optional and require additional upgrades.
- **Smooth Migration**
DMR Trunking Lite transceiver supports smooth migration from analog to digital, from conventional to trunking. Multi-modes provide you different choices for continual investment.



Flexible Networking

- **Non-centralized Networking**
Non-centralized network can operate independently in trunking mode without MSO. This structure can support up to 4 base stations or 32 carriers. Each base station can support up to 8 carriers (15 traffic channels)

NMC (Network Management Client) and dispatcher connect to the BS through IP backbone.

- **Centralized Networking**
Has a wider coverage area and intercommunication.

Multiple BS's connect via E1 or IP Network to achieve large scale coverage.

Supports up to 10 BS at maximum and each BS support 8 carriers, local & remote NMS and dispatcher.

System interconnection can be realized by different networking solutions.

System Management

- The SNMP Capability allows remote management of devices over the network.
 - The Client / Server structure ensures good networking and expansion capabilities
 - With user friendly operating interface and versatile functions, the network management system can provide centralized management over the network elements, and support remote upgrading and smooth capacity expansion.
- 

Trunk Lite Mobile Switch Office (MSO)

The DMR Network is scalable from a single site with one base station to a wide area network.

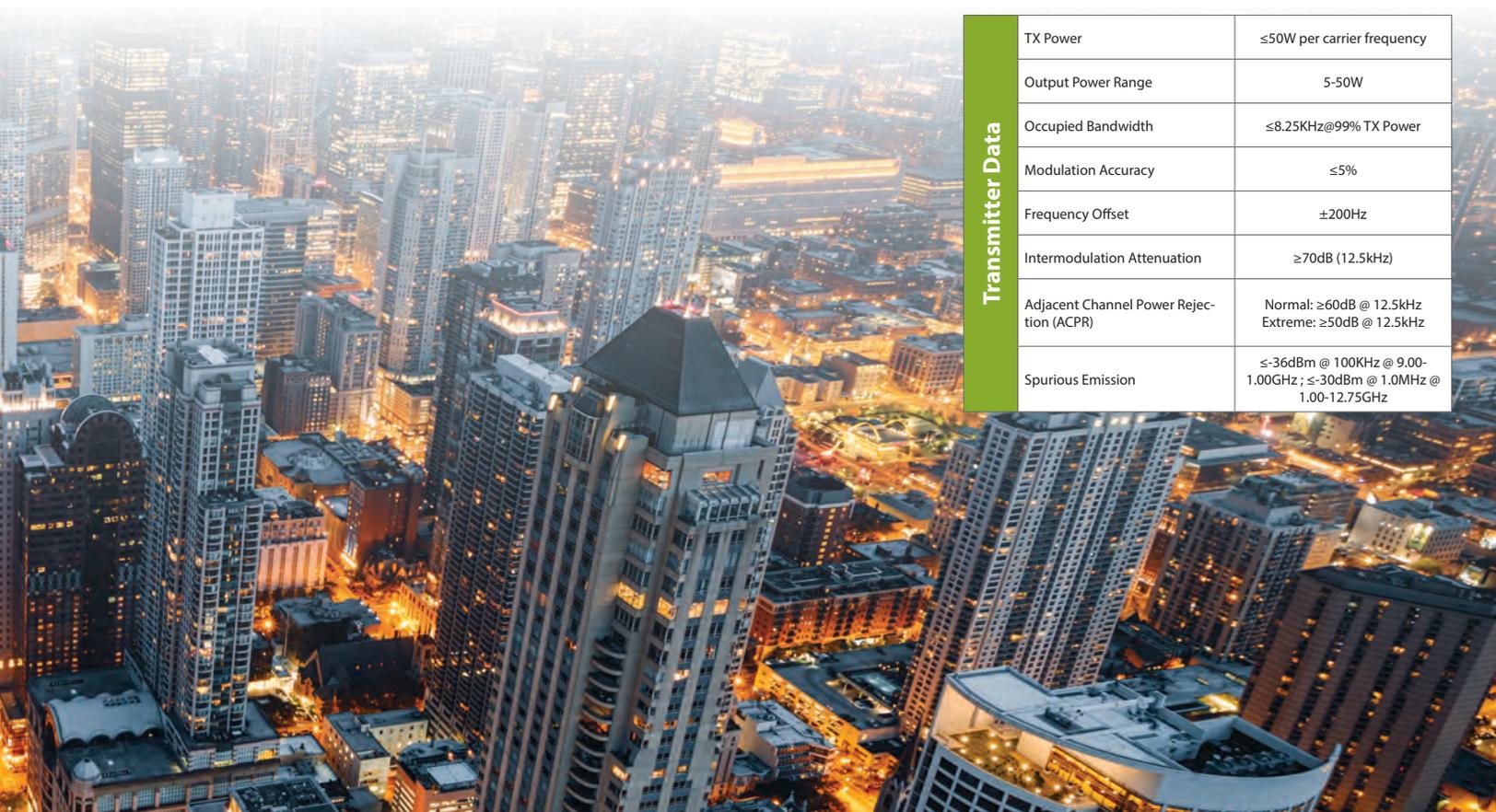
The MSO consists of central controller, service switching device, media translating unit, network management device and gateway. As the processing center, it is responsible for intercommunication and information exchange among the network elements in the system, realizing call control and media data exchange between base stations or between systems and providing versatile services such as mobility management, authentication, dispatch, network management and intercommunication.

- One MSO will support up to 10 base stations and 80 carriers.
- A single base station will support up to 8 carriers.
- Multi-sites provide wider coverage through inter-site communication, multiple base stations are IP networked to allow communication over a larger area.

General	Frequency Range	VHF: 136-174MHz UHF 400 - 470MHz , 806 - 941MHz
	Full Load Power Consumption	2-carrier: ≤ 625W 4-carrier: ≤ 950W
	Operating Temperature	Standard: +59° F ~ +95° F Extreme: -22° F ~ +140° F
	Storage Temperature	-40° F ~ +185° F
	Dimensions (HxWxD) (with casters)	23.6 x 23.6 x 26.6 in (2-carrier) 23.6 x 27.6 x 68.9 in (4-carrier)
	Weight (fully configured)	243 lbs (2-carrier) 441 lbs (4-carrier)
	Mean Time between System Failures (MTBF)	100,000 hours
	Humidity	Normal: 20%~75% RH Extreme: 5%~95% RH
	Altitude	-400 to 2000m
	BS Capacity	8 carrier per BS
	Network capacity	Non-centralized ≤5 BS and ≤32 carrier
		Centralized ≤50 BS or ≤200 carriers
	LDS Capacity	5 in Non-centralized 20 in Centralized
NMS Capacity	5 in Non-centralized 20 in Centralized	
PSTN/PABX Gateway	1	
Group Call Setup Time	≤90ms in one BS ≤360ms in one MSO	

Receiver Data	Static	-118dBm@BER5%
	Dynamic	-112dBm@BER5%
	Blocking	84dB
	Common Channel Rejection	≥-12dB
	Adjacent Channel Selectivity	≥60dB
	Intermodulation Response Rejection	≥70dB
	Spurious Emission	≤-57dBm@100kHz@0.9-1.00GHz ≤-47dB @1.0MHz@1.00-12.75GHz

Transmitter Data	TX Power	≤50W per carrier frequency
	Output Power Range	5-50W
	Occupied Bandwidth	≤8.25KHz@99% TX Power
	Modulation Accuracy	≤5%
	Frequency Offset	±200Hz
	Intermodulation Attenuation	≥70dB (12.5kHz)
	Adjacent Channel Power Rejection (ACPR)	Normal: ≥60dB @ 12.5kHz Extreme: ≥50dB @ 12.5kHz
	Spurious Emission	≤-36dBm @ 100KHz @ 9.00-1.00GHz ; ≤-30dBm @ 1.0MHz @ 1.00-12.75GHz





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20KHz / 25KHz will not be available on new equipment in the U.S. after January 1st, 2011
Hytera reserves the right to change product designs or specifications at any time. If you have any questions regarding the accuracy of this information please contact your local sales representative or Hytera directly. Some System options and features are not available to all markets.

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