PD79X Ex
Intrinsically Safe Digital Portable Two-way Radio

- Most Completely Certified DMR IS Radio
- ATEX/IECEEx/FM/CSA/CQST IIC Certificated
- Designed for Hazardous Working Environments

www.hytera.com
Two-way radio has been a necessary device for many professionals. For those who work in environments with explosive gas and combustible dusts, safety is on top of everything and using regular radios could be unsafe.

Hytera understands what's underneath the challenges in hazardous environments and launches PD79X Ex to deliver safe communication solutions. The DMR portable radio comply with the world's strictest safety standard.
Technical Highlights

• **Improved PCB Circuit Layout & EMC Shielding**
  To achieve high safety standard, Hytera PD79X Ex adopts optimized wiring design on PCB to minimize circuit fault. All key components on the PCB are covered with shield, and the space between lines, components, component and shield are proper for better EMC performances and less internal interference.

• **Innovative Silicone Encapsulating**
  Silicone encapsulation technology prevents the internal circuits from liquid, dust and harmful gas. The silicone encapsulating process is delicate and complicated, and costs about eight hours for each PD71X Ex/PD79X Ex.

• **Innovative Electrostatic Discharge Design**
  Hytera applies electrostatic discharge design and dual-material molding technology on the radio. The electrostatic discharge material (blue) minimizes electrostatic accumulation on radio surface, while the robust material (black) maximizes ruggedness of the enclosure.

• **Patented Battery Latch**
  To remove the battery from the radio, the lock and bolt of the latch need to be moved along two different axes. Such patented design locks the battery in case of dropping which might cause a spark.
Product Highlights

- **Environmentally Safe and High Reliability**

Hytera PD79X Ex is 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 confirms it can tolerate the harshest environments like High/Low Temperature, High Humidity, Vibration and Shock.

- **Enhanced Safety**

Hytera PD79X Ex provides a dedicated emergency button. In case of any accident, a press on the button will trigger an alarm and initiate a voice call to a pre-programmed work fellow or group. Man-down, GPS and Lone Worker features are also available to further ensure the safety.

- **High-capacity and Safe Li-Ion Battery**

Hytera PD79X Ex provides high-capacity Li-Ion battery with long shift life of 17 hours under 5-5-90 duty cycle. The overcharge and over-discharge design protects the battery against instability caused by overheating. In addition, the battery cells are also encapsulated to redistribute single point heat buildup and prevent air discharge.

- **High Audio Quality and Assured Communication Based on DMR Technology**

Benefitted from DMR technology, PD79X Ex provides higher audio quality and more stable performance with 40% less battery consumption than analog radios. It provides better communication quality and enhanced privacy, and moreover reduces overall equipment costs.

- **Easy to Use**

Hytera PD79X Ex is very easy to use. It provides tough and highly readable LCD screen and intuitive user interface. The anti-skidding and ergonomic design are dedicated for easy operation. Large PTT button and channel knobs are equally useful for easy user operation.

- **Software Upgradable**

New features can be enabled via software upgrade. Moreover, PD79X Ex can switch to DMR or MPT trunking mode through license.
Certification

**ATEX** is the European Union directive to which all two-way radios must conform if used in potentially explosive environments. It replaces the Cenelec classification in all European Union member states and EFTA countries.

| II 2G Ex ib IIC T4 |
| II 2D Ex ib IIIC T120°C IP5X |
| I M2 Ex ib |

**IECEx** Scheme is the future route to global compliance certification. Its aim is to harmonize standards to allow free movement of goods by establishing a world-wide accepted standard.

| Ex ib IIC T4 |
| Ex ib IIIC T120°C IP5X |
| Ex ib I |

**FM (FM Approvals LLC)** is a member of Nationally Recognized Testing Laboratories of U.S.A. It strives to offer global services with unsurpassed technical integrity and exceptional customer satisfaction.

| Class I, Zone 1 AEx/Ex ib IIC T4 Gb |
| Class II, III Div 1, Group E, F, G T120°C |
| -20°C ≤Ta≤ 50°C |

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**ATEX Gas Protection**
- T4 = Device surface temperature will not exceed 135°C
- IIC = Protection in gas groups up to IIC
- ib = Type of intrinsic safety protection
- Ex = Explosion-proof equipment
- 2G = Device category 2 equipment (Gas)
- II = Gas group II for other environments (non-mining)

**ATEX Dust Protection**
- IP5X = Ingress protection level for Dust: Totally protected against dust
- T120°C = Maximum temperature of device surface
- IIIC = Protection in dust groups up to IIIC
- ib = Type of intrinsic safety protection
- Ex = Explosion-proof equipment
- 2D = Device category 2 equipment (Dust)
- II = Gas group II for other environments (non-mining)

**ATEX Mining Protection**
- ib = Type of intrinsic safety protection level
- Ex = Explosion-proof equipment
- M2 = Device category 2 equipment (Mining)
- I = Gas group I for mining
Applications

Chemical Industry
Flammable gases, liquids and solids are converted and processed in many different processes in the chemical industry. These processes may give rise to explosive mixtures.

Power Generating Companies
Lump coal, which is not explosive in mixture with air, may be converted in the conveying, grinding and drying processes into coal dusts capable of forming explosive dust/air mixtures.

Mining
The by-product of coal mining is gas. Following the coal exploiting, the gas will gather under the ground. If there is poor safety management, gas in coal mine can lead to serious gas explosion.

Fire Fighting
As for fire fighting, some task critical situations such as oil spill or natural gas leakage need high security electrical equipments.

Pharmaceutical Industry
Alcohols are often used as solvents in the production of pharmaceuticals. Agents and auxiliary materials that give rise to dust explosions, such as lactose, may also be used.

Refineries
The hydrocarbons handled in refineries are all flammable and, depending on their flash point, may give rise to explosive atmospheres even at ambient temperature. The area around oil processing plant is generally regarded as a place where explosive atmospheres may occur.
More Examples of Explosive Hazards...

**Landfill Tips and Civil Engineering**
Flammable landfill gases may arise in landfill tips. Elaborate technical arrangements are needed to avoid uncontrolled gas emission and possible ignition. Flammable gases from various sources may collect in poorly ventilated tunnels, cellars, etc.

**Paint-spraying Operations**
The overspray generated in paint spray bays and the solvent vapors released may give rise to explosive atmospheres when mixed with air.

**Gas Suppliers**
Explosive gas/air mixtures may be formed when natural gas is released, e.g. by leakage.

**Recycling Operations**
Processing of waste for recycling can give rise to explosion hazards, e.g. from cans or other containers of flammable gases and/or liquids that have not been completely emptied or from paper or plastic dusts.

**Food and Feedstuffs Industry**
Explosive dusts may arise during transport and storage of grain, sugar, etc. If they are exhausted and collected by filtering, explosive atmospheres may arise in the filter.

**Agriculture**
Biogas production plants are operated on some farms. Explosive biogas/air mixtures may arise if the gas is released, e.g. by leakage.
## Specifications

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>UHF1: 400-470MHz; UHF3: 350-400MHz; VHF: 136-174MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel Capacity</td>
<td>1024</td>
</tr>
<tr>
<td>Zone Capacity</td>
<td>64 (each with a maximum of 256 channels)</td>
</tr>
<tr>
<td>Channel Spacing</td>
<td>12.5kHz / 20kHz / 25kHz</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>7.4V (rated)</td>
</tr>
<tr>
<td>Battery Life(5-90) Duty Cycle, High TX Power)</td>
<td>1800mAh (Li-Ion)</td>
</tr>
<tr>
<td>Li-Ion Battery</td>
<td>Analogue: about 14.5 H / 13 H (GPS) Digital: about 17 H / 15 H (GPS)</td>
</tr>
<tr>
<td>Frequency Stability</td>
<td>±1.5ppm</td>
</tr>
<tr>
<td>Antenna Impedance</td>
<td>50 Ω</td>
</tr>
<tr>
<td>Dimensions (H × W × D) (without standard battery, without antenna)</td>
<td>141 x 55 x 39 mm</td>
</tr>
<tr>
<td>Weight (with antenna &amp; standard battery)</td>
<td>495g</td>
</tr>
<tr>
<td>LCD display</td>
<td>160 x 128 pixels, 65536 color, 1.8-inch</td>
</tr>
<tr>
<td>Anti-explosion levels</td>
<td>ATEX II 2G Ex ib IIC T4 II 2D Ex ib IIC T120°C IP5X I M2 Ex ib</td>
</tr>
<tr>
<td></td>
<td>IECEx Ex ib IIC T4 Ex ib IIC T120°C IP5X Ex ib I</td>
</tr>
<tr>
<td></td>
<td>FM/CSA Class I, Zone 1 AEx/Ex ib IIC T4 Gb Class II, III Div 1, Group E, F, G T120°C -20°C ≦ Ta ≦ 50°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20°C ~ +50°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40°C ~ +85°C</td>
</tr>
<tr>
<td>ESD</td>
<td>IEC 61000-4-2 (level 4) ± 8kV (contact) ± 15kV (air)</td>
</tr>
<tr>
<td>American Military Standard</td>
<td>MIL-STD-810 C/D/E/F/G</td>
</tr>
<tr>
<td>Dust &amp; Water Protection</td>
<td>IP67</td>
</tr>
<tr>
<td>Humidity</td>
<td>Per MIL-STD-810 C/D/E/F/G</td>
</tr>
<tr>
<td>Shock &amp; Vibration</td>
<td>Per MIL-STD-810 C/D/E/F/G</td>
</tr>
<tr>
<td>TTFF (Time To First Fix) Cold Start</td>
<td>&lt;1 minute</td>
</tr>
<tr>
<td>TTFF (Time To First Fix) Hot Start</td>
<td>&lt;10 seconds</td>
</tr>
<tr>
<td>Horizontal Accuracy</td>
<td>&lt;5m (50% probable) &lt;10m (95% probable)</td>
</tr>
</tbody>
</table>

## Accessories

### Standard
- Li-Ion Battery
- MCU Rapid-rate Charger
- Power Adapter
- Antenna
- Belt Clip
- Leather Strap

### Optional
- Intrinsically Safe Remote Speaker Microphone (IP57) SM18N4-Ex
- Carrying Case with (Leather) (swivel) LCY005
- Programming Cable (USB Port) PC38
- Intrinsically Safe Bone Conduction Headset (IP57) EBN10-Ex
- Intrinsically Safe Noise-cancelling Headset ECN20-Ex
- Intrinsically Safe Throat-vibrating Earpiece (IP57) ELN09-Ex

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**Specifications**

- **RF Power Output**: UHF: 1/4W; VHF: 1/2W
- **FM Modulation**: 11K0F3E @ 12.5 kHz 14K0F3E @ 20 kHz 16K0F3E @ 25 kHz
- **4FSK Digital Modulation**: 12.5kHz Data Only: 7K60FXD 12.5kHz Data & Voice: 7K60FXW
- **Conducted/Radiated Emission**: -36dBm ≤ 1GHz -30dBm > 1GHz
- **Modulation Limiting**: ± 2.5 kHz @ 12.5 kHz ± 4.0 kHz @ 20 kHz ± 5.0 kHz @ 25 kHz
- **Adjacent Channel Power**: 60dB @ 12.5 kHz, 70dB @ 20/25 kHz
- **Audio Response**: +1 ~ -3dB
- **Audio Distortion**: ≤ 3%
- **Digital Vocoder Type**: AMBE+2 or SELP
- **Digital Protocol**: ETSI-TS102 361-1,-2,-3
- **Sensitivity**: Analog 0.3μV (12dB SINAD) 0.22μV (typical) (12dB SINAD) 0.4μV (20dB SINAD) Digital 0.3μV/BERS%
- **Selectivity**: TIA-603 60dB @ 12.5 kHz/70dB @ 20 & 25 kHz 60dB @ 12.5 kHz/70dB @ 20 & 25 kHz
- **Intermodulation**: 70dB @ 12.5/20/25 kHz 65dB @ 12.5/20/25 kHz
- **Spurious Response Rejection**: 70dB @ 12.5/20/25 kHz 70dB @ 12.5/20/25 kHz
- **Hum and Noise**: 40dB @ 12.5kHz 43dB @ 20kHz 45dB @ 25kHz
- **Rated Audio Power Output**: 0.5W
- **Rated Audio Distortion**: ≤ 3%
- **Audio Response**: +1 ~ -3dB
- **Conducted Spurious Emission**: ≤ -57dBm

*This frequency band will be available soon.

**GPS Accuracy**: 5 satellites visible at nominal -130dBm

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

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