PT790 Ex
TETRA INTRINSICALLY SAFE PORTABLE RADIO

DESIGNED FOR THE MISSION

Hytera PT790Ex TETRA Intrinsically Safe Portable Designed to comply with the highest grade "ia".

PT790Ex works in the places which contains a variety of long-term existence explosive mixed gas even including coal mine methane. For example: coal mine, gas stations, oil platforms, chemical plants, flour mills, airport and other inflammable or explosive conditions, etc.

Whether on an oil rig, in a coal-mine, gas station or any other potentially explosive environments, safe and reliable communication is on top of everything. Hytera deeply understands the challenges for users in hazardous and harsh environments.

In order to meet these increasing requirements of Intrinsic Safety and reliable communication . Hytera brings you PT790 Ex, the first ia explosion-proof TETRA radio in the world.

Oil & Gas

The working environment of the oil& gas industries often contains flammable and explosive gas , liquid, which makes the workers at a risk. Therefore, reliable and high explosion-proof protection level radio is necessary.
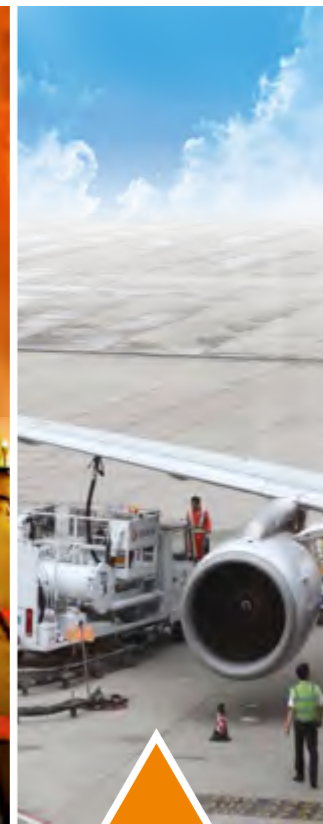
Mining

Mining industry environment is very complex, there always contain a variety of long-term existence explosive gas and dust, especially methane in coal mine, the environment is very hazardous, therefore, good and safe communication is very necessary, Hytera PT790Ex ia explosion-proof radio can satisfy all your demand.

Fire & Rescue

The scene of the fire will produce a lot of smoke, dust, even explosive and poisonous gas, it makes a big risk for the communication of the fire rescue, Hytera ATEX radios used here can provide effective and safe communication service to the firefighters .

Airport

Airports are complex facilities where effective and reliable communications are of great importance. And there is a risk of explosion because of a potential exposure to fuel. Obviously, Hytera ATEX radios are used in areas where workers and on-site fire crews are in close proximity to aviation fuel to keep them safe.

Chemical Plant

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.

Intrinsic Safety (IS) is a protection technique for safe operation of electrical equipment in hazardous areas by limiting the energy available for ignition. ia is the strictest explosion-proof standard of Intrinsic Safety, it lets PT790 Ex work in every kinds of hazardous and harsh places which contains a variety of long-term existence explosive mixed gas and dust.
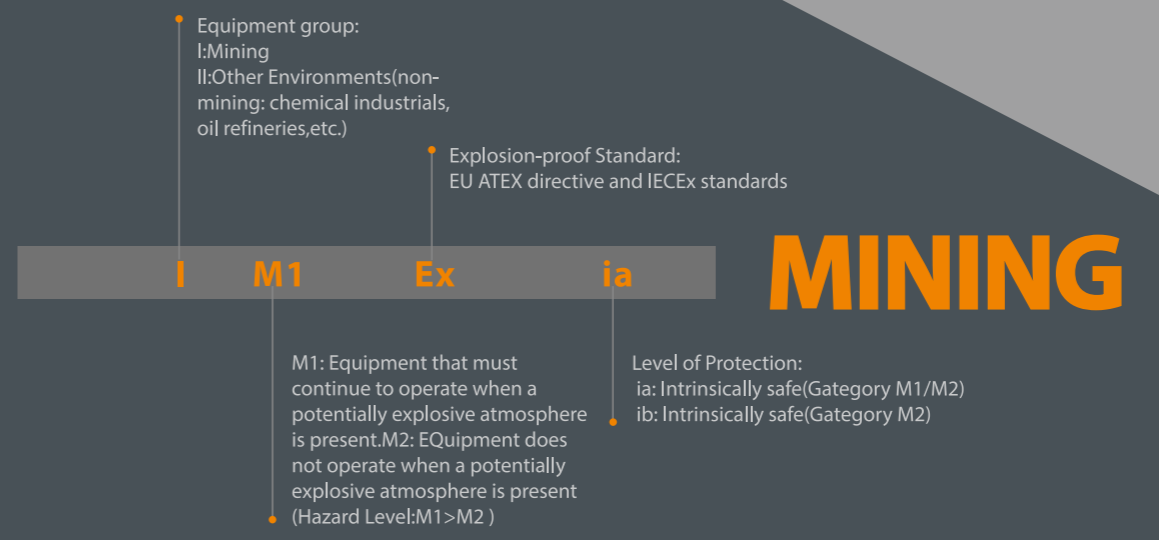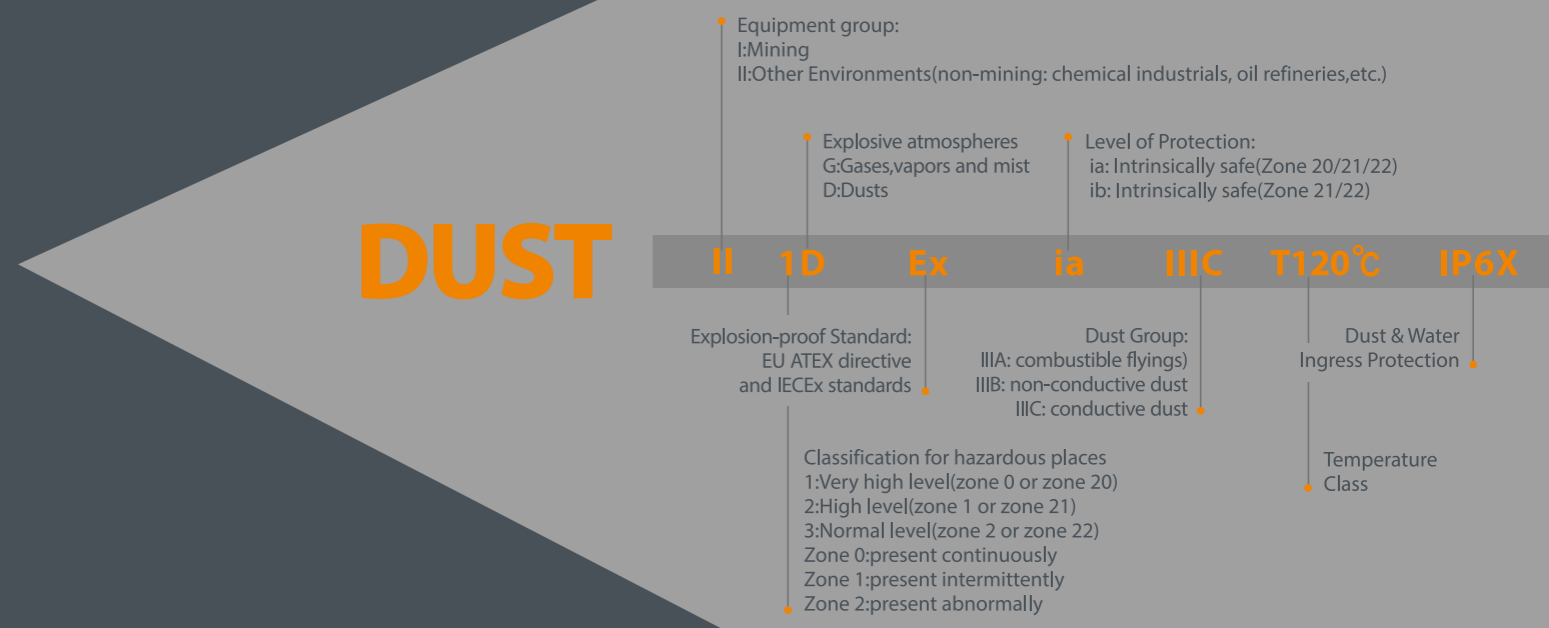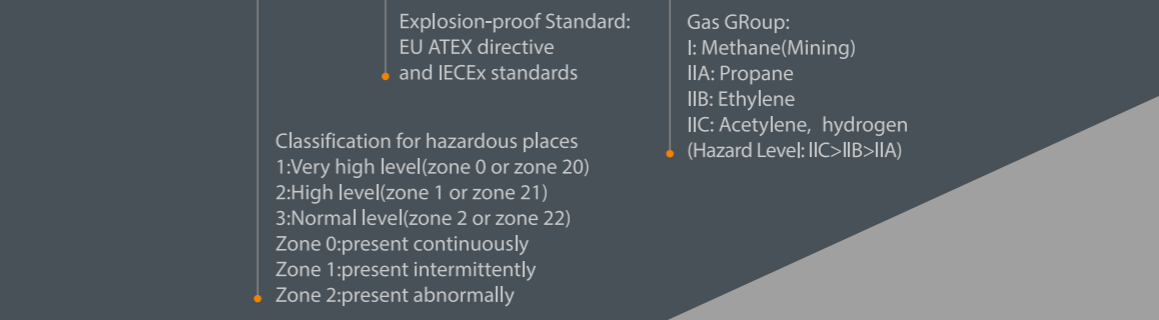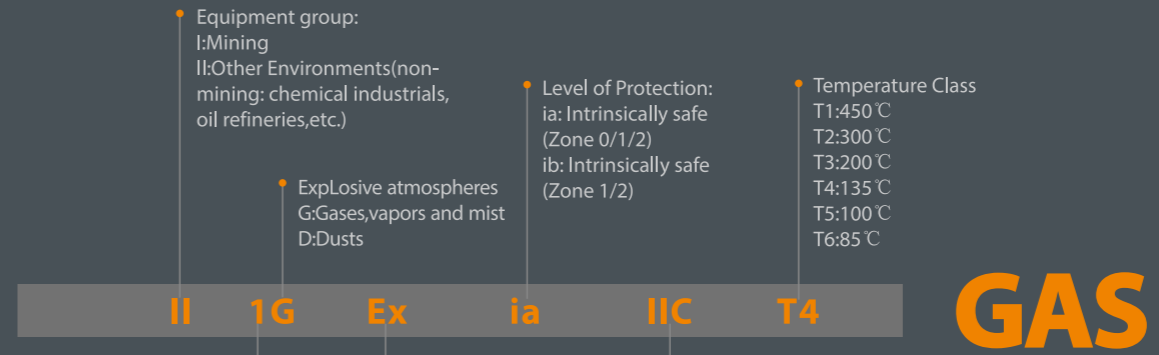
In mining industry, methane and mine powder is the main risk PT790Ex can achieve M1 protection level which has sufficient security in mining environment.
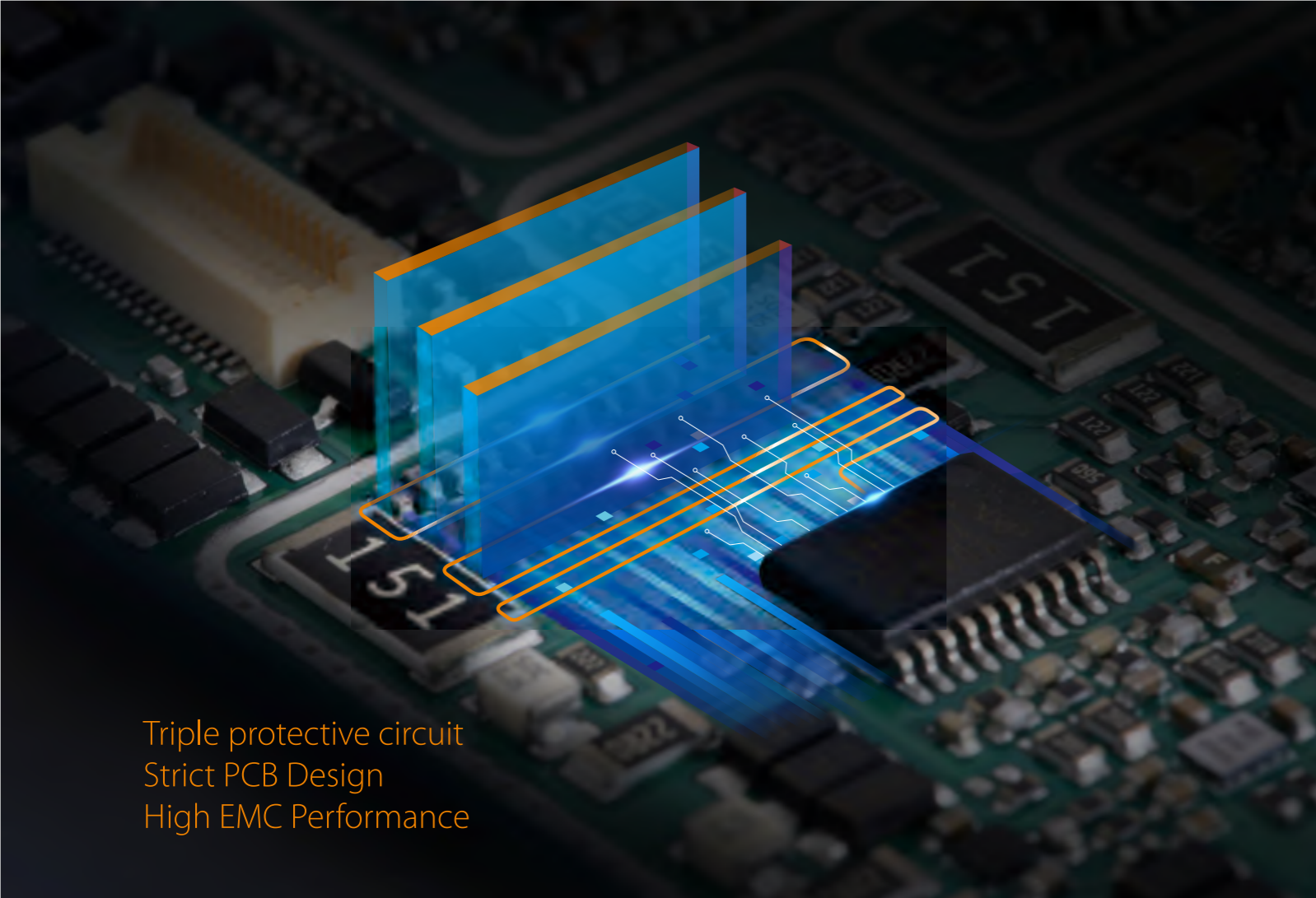
ia

"ia" is the highest level of Intrinsic Safety,"ia" level means the circuit has three protective measures, it can be used in zone 0/1/2 areas, and allows for the occurrence of two faults during operation.
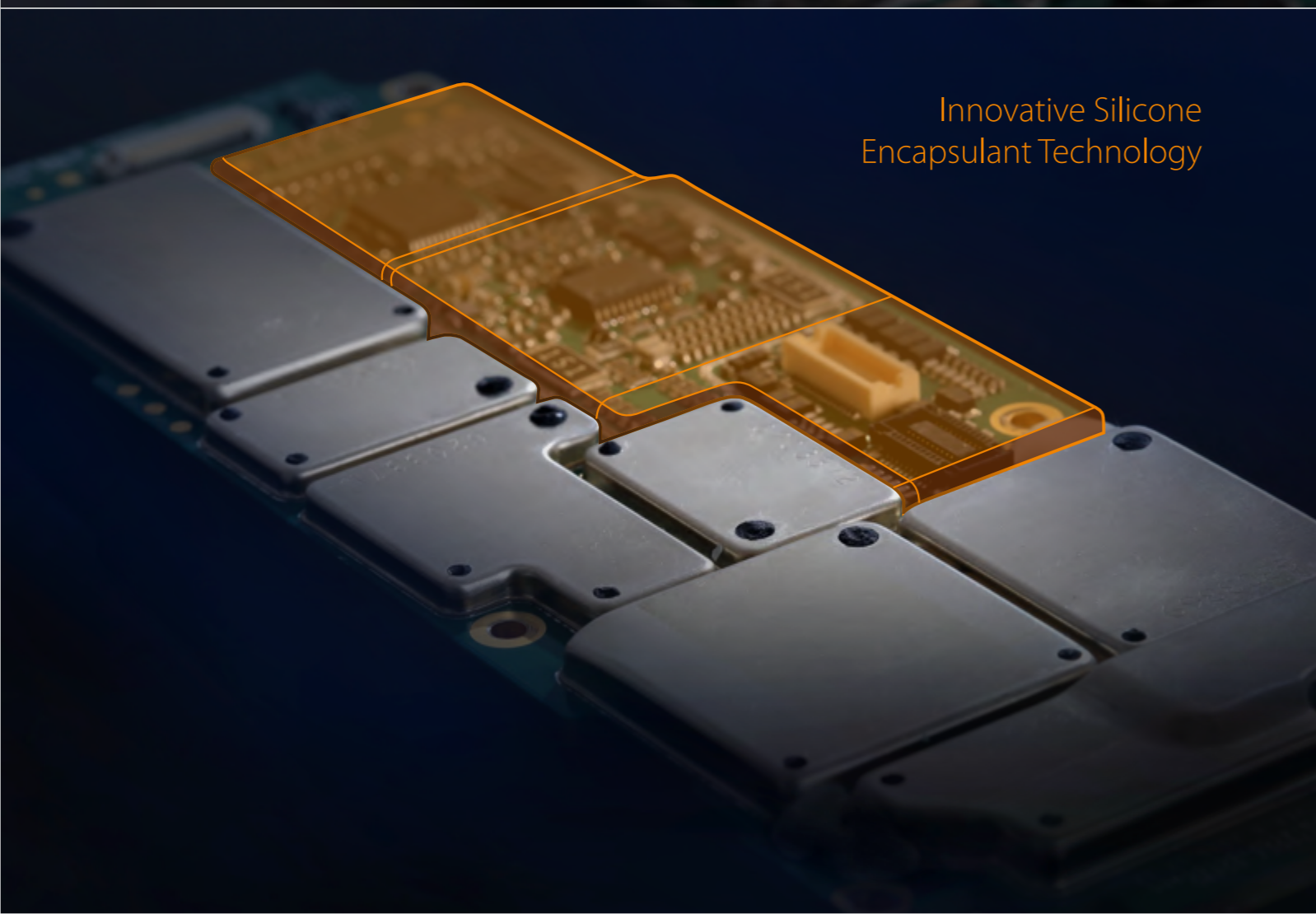
M1

Methane and mine powder is the main risk in coal mines, PT790Ex has the highest level of protection, which it is unlikely to become an ignition source in normal operation, during expected malfunctions or during rare malfunctions, and it provides you safe instant communication service even in the presence of an outbreak of gas.

GAS

| II | 1G | Ex | ia | IIC | T4 |

Equipment group:
I:Mining
II:Other Environments(non-mining: chemical industrials, oil refineries,etc.)

ExpLosive atmospheres
G:Gases,vapors and mist
D:Dusts

Level of Protection:
ia: Intrinsically safe (Zone 0/1/2)
ib: Intrinsically safe (Zone 1/2)

Temperature Class
T1:450℃
T2:300℃
T3:200℃
T4:135℃
T5:100℃
T6:85℃

Explosion-proof Standard:
EU ATEX directive
and IECEx standards

Gas GRoup:
I: Methane(Mining)
IIA: Propane
IIB: Ethylene
IIC: Acetylene, hydrogen
(Hazard Level: IIC>IIB>IIA)

Classification for hazardous places
1:Very high level(zone 0 or zone 20)
2:High level(zone 1 or zone 21)
3:Normal level(zone 2 or zone 22)
Zone 0:present continuously
Zone 1:present intermittently
Zone 2:present abnormally

DUST

| II | 1D | Ex | ia | IIIC | T120℃ | IP6X |

Equipment group:
I:Mining
II:Other Environments(non-mining: chemical industrials, oil refineries,etc.)

Explosive atmospheres
G:Gases,vapors and mist
D:Dusts

Level of Protection:
ia: Intrinsically safe(Zone 20/21/22)
ib: Intrinsically safe(Zone 21/22)

Explosion-proof Standard:
EU ATEX directive
and IECEx standards

Dust Group:
IIIA: combustible flyings)
IIIB: non-conductive dust
IIIC: conductive dust

Dust & Water
Ingress Protection

Classification for hazardous places
1:Very high level(zone 0 or zone 20)
2:High level(zone 1 or zone 21)
3:Normal level(zone 2 or zone 22)
Zone 0:present continuously
Zone 1:present intermittently
Zone 2:present abnormally

Temperature
Class

MINING

| I | M1 | Ex | ia |

Equipment group:
I:Mining
II:Other Environments(non-mining: chemical industrials, oil refineries,etc.)

Explosion-proof Standard:
EU ATEX directive and IECEx standards

M1: Equipment that must continue to operate when a potentially explosive atmosphere is present.M2: EQuipment does not operate when a potentially explosive atmosphere is present
(Hazard Level:M1>M2)

Level of Protection:
ia: Intrinsically safe(Gategory M1/M2)
ib: Intrinsically safe(Gategory M2)

Triple protective circuit
Strict PCB Design
High EMC Performance

Innovative Silicone
Encapsulant Technology

PT790 Ex
TETRA INTRINSICALLY SAFE PORTABLE RADIO

Patented antenna design

Dedicated orange
Emergency key

Easy accessible rotary
volume knob and channel
selection knob

New design of accessory
connector ensuring easy
accessory connection
/ disconnection

Friendly UI, easy-to-use menu

II 1G Ex ia IIC T4
II 1D Ex ia IIIC T120℃ IP6X
I M1 Ex ia

Screen & keypad protection

Unique covert speaker
design, compact & better
audio quality

Double color PTT,
noticeable
& enhanced safety

WORK SAFER
WORK, PROTECT & ENABLE
WORK ANYWHERE & ANYTIME

//////////

WORK SAFER

ia Protection Classification
The whole radio with battery is designed to comply with the highest grade 'ia'. It can work in the places which contains a variety of long-term existence explosive mixed gas and dust, it has passed ATEX, FM, IECEX certification.

II 1G Ex ia IIC T4
II 1D Ex ia IIIC T120℃ IP6X
I M1 Ex ia

Strict PCB Design and High EMC Performance
To achieve the high explosion proof safety level, Hytera PT790Ex adopts optimal PCB layout design, all the key components of PCB are covered with shield which will minimize the circuit fault probability and has better performance of EMC.

Innovative Silicone Encapsulant Technology
Silicone encapsulant technology can prevent the internal circuits from interface with air and liquid which effectively stops the intrusion of liquid, inflammable dust and explosive gas.

Light metal design
PT790Ex shell is made of light metal to ensure no mechanical spark, it can effectively maximize reliability in explosive environment.

Innovative Antistatic Design
PT790Ex display adopts antistatic material, and shell adopts antistatic patent design of dual material molding technology, it can reduce the possibility of static discharge on the radio.

Patented Battery Latch Design
To disengage the battery from the radio, you need to move the lock and bolt of the latch 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.

Screen
PT790Ex screen is made of tough and crack-proof material.

Structure design of screw internal trapping
Screw of the belt clip is designed as internal trapping, it is to ensure no contact between the metal and the ground in case of drop, and avoid discharge.

WORK, PROTECT & ENABLE ////////

GNSS Positioning
The built-in GNSS module supports GPS, GLONASS, Beidou, Tracking sensitivity is up to -164dBm, Accuracy is within 2 meters.

Man Down
When a user falls down, the radio can automatically alert others.

Lone Worker
To ensure the safety of the terminal user, the emergency function will be triggered automatically when there is no operation on the terminal during the predefined time period.

Innovative Ergonomic Design
Separated by the antenna, channel knob and volume knob stand apart from each other, different size design is to enhance the accuracy of operation, greatly reduce accidental operation with gloves or in dark environment.

PT790EX compact and large textured keys provide an excellent tactile feeling.

Friendly User Interface
Hytera PT790Ex provides 1.8 Inch 65536 color LCD screen, it can be clearly displayed under bright sunlight.

As many as 20 programmable keys are flexibly configurable for quick access through one button operations.

Long Cycle Life
Hytera PT790EX provides 1800mAh/2400mAh large capacity Li-ion battery, it can last for more than 20 hours under 5-5-90 duty cycle. Strict overcharge and over discharge protection design ensure 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 as well.

Ex Li-ion Battery (1800mAh)BL1813-Ex/ (2400mAh)BL2413-Ex	Anti-explosion ajustable earhook earbud EHN12-Ex	Anti-explosion Remote Speaker Microphone（IP67）SM18N8-Ex	Anti-static Leather case (standard battery) LCY005	Vehicle adapter for charger CHV09	Dual Pocket MCU Charger Kit CH10A06 (It should be charged in the safe area)

WORK ANYWHERE & ANYTIME

Rugged and Reliable

PT790Ex is designed to comply to MIL-STD- 810 C/D/E/ F/G and IP67 Dust & Water Protection, which ensure its best performance even in the toughest conditions and environment.

Patented Antenna Design

PT790Ex has a globally patented industrial design with antenna in the middle position, providing Omnidirectional.
Antenna pattern for better coverage performance. Antenna used in PT790Ex is a patented design which is short in length and having GPS antenna integrated.

MIL-STD 810G
IP67
IOP

IOP

Hytera PT790Ex enables quick access to TETRA network and roaming, brings safe and efficient communication service. It also provides powerful interoperability with base stations and terminals of different manufacturers.

Skid-proof design

The rear part of the terminal battery and both sides of the shell are skid-proof designed to prevent dropping and ensure easy grab.

Enhanced Speech Processing Technology

Hytera PT790Ex adopts state of the art speech processing technology to remove environment noise (ambient noise) and echo (acoustic& echo), which provides users with clear voice communication even under a noisy environment, meanwhile it shows better performance when using hands-free mode in full duplex call.

| Bone Conduction Headset(RoHS) POA34-Ex* | Throat Conduction Headset(RoHS) POA61-Ex* | Noise cancellation headset(RoHS) POA62-Ex* | Explosion-proof PTT POA63-Ex* | Explosion-proof PTT SM24N1-Ex* | Explosion-proof PTT SM24N2-Ex* |

*: ib grade

FEATURES & SPECIFICATION

GENERAL

Frequency Bands	380-430MHz / 806-870MHz
Dimensions(HxWxD)	141 x 55 x 39mm
Weight	505 (with 1800mA battery antenna)
Battery	1800mAh Li-Ion (STD BATT)
Battery Life (5/5/90 Duty Cycle)	14hours
Operating Voltage	7.4V
Audio Power Output	>1W

RF

RF Channel Bandwidth	25KHz
RF Power Output	1W
RF Power Level Accuracy	±2dB
Receiver Class	ETSI EN 392-2/396-2 Class A
RX Static Sensitivity	-112dBm(typical-116dBm)
RX Dynamic Sensitivity	-103dBm(typical-105dBm)

GNSS (GPS / GLONASS / BeiDou)

Sensitivity	≤-144 dBm acquisition sensitivity
	≤-157dBm tracking sensitivity
Accuracy	≤10m
Cold Start (Time to First Fix)	< 50s
Hot Start (Time to First Fix)	< 1s

ENVIRONMENTAL

Operating Temperature	-30℃ ~ + 60℃ (non-hazardous environment)
	-20℃ ~ +55℃ (hazardous environment)
Storage Temperature	-40℃ ~ +85℃
Humidity	ETS 300 019 (95%)
Water and Dust Protection	IEC60529, IP67
Drop, Shock & Vibration	MIL-STD- 810 F/G

SECURITY SERVICE

Authentication	MS Authentication by SwMI
	Mutual Authentication
Package Data User Authentication	
Air Interface Encryption	TEA1, TEA3, TEA4
Security Class	Class 1: Clear
	Class 2: SCK
	Class 3: DCK and CCK (Via OTAR)
DMO SCK	
End to End Encryption	By Software (AES128, AES256*)
	By SIM card
	Voice Service / SDS Service
Temporarily Disable/Enable	
Permanently Disable	
PIN/PUK Code Access	

VOICE SERVICE

Fallback Operation	
Energy Economy	
Seamless Cell Re-selection	
Half-Duplex	
Full-Duplex	
Emergency Call	DGNA
	Callout
	CAD(Call Authorized by Dispatcher)*

USER INTERFACE

LCD Color Display	1.8inch, 160*128pixels, 65536colors
Talk Groups - TMO	3000
Talk Groups - DMO	2000
Phonebook	1000
Missed Calls	20
Received Calls	20
Dialed Calls	20
Inbox	400
Outbox	50
Drafts	50
Folder	TMO: 200 floders, 200 groups per floder
	DMO: 50 floders, 200 groups per floder
Multi-language	
Java Platform 2.0	

USER SECURITY

One-key Emergency Call
Man-down
Ambience Listening
Radio User Assignment(RUA)
Transmit Inhibit
Lone Worker
Protect User Configuration Data
Keypad Lock
Alert for out of Network Coverage
Alert for Low Battary
Cover Mode

LOCATION SERVICE

GPS	
Control Center Authentication by MS	
Lip Protocol Trigger Conditions (Configured via Air or CPS)	Emergency Call
	Interval
	Distance
	Power On/Off
	Status Message
	Positioning Loss/Regain
NMEA Location Reporting	

DATA SERVICE

Short Data Service	SDS-1, 2, 3, 4, TL
	Status message
	Immediate text message (TMO)
	Long text message (TMO)
Package Data	
Peripheral Equipment Interface (PEI)	
AT command	
OTAP(Over The Air Programming)	
Status Solution	
WAP	
Circuit Mode Data	

All specifications are subject to change without notice due to continuous development.