



# **Motorola Professional Series ATEX Portable Radios**

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# Professional Series ATEX Portable Agenda

- **Introduction**
  - What is ATEX?
  - Example markets served
- **Product Overview**
  - Key Features
  - Comparison vs non-ATEX
- **Accessories**
- **Sales Support**
  - What's in the box?
- **Summary**

# What Is ATEX?

## Why Is It Required?

- Many workplaces may contain (or have activities that may produce) explosive or potentially explosive atmospheres

Market Tiers	Vertical Markets	Motorola Business	Motorola Products
High Tier Professional	Emergency Services	Systems	Dimetra, ASTRO
	PAMR Public Transport		Dimetra IP Compact
Mid-tier Professional	Airports/ports	PCR	MOTOTRBO
	Local Government Transportation		Professional Series
Low-tier Professional	Petrochemical	Commercial Series	Commercial Series
	Public Utilities		Ultra-low Tier
Commercial	Taxi	CRBR	Light Industrial
	Manufacturing		DTR Series
Consumer	Construction	Consumer	Consumer
	Rental Agencies		
	Private Security		
	Warehousing		
	Retail		
	Hospitality		
	Agriculture		
	Sport		
	Family		
	Fun		

# What Is ATEX?

## ATEX Directives

- **ATEX – “ATmospheres EXplosibles”**
  - Mandatory in all EU member states & EFTA countries since July 1st 2003
  - Framework for controlling explosive atmospheres and the equipment and protective systems used in them
- **Directive 99/92/EC (“ATEX 137”) – Workplace Directive – “Use” Directive**
  - Requirements for health and safety protection of workers potentially at risk from explosive atmospheres
- **Directive 94/9/EC (“ATEX 95”) – Equipment Directive**
  - Requirements that must be met by equipment and protective systems intended to be used in potentially explosive atmospheres (flammable gases, vapours or dusts)
- **CENELEC (European Committee for Electrotechnical Standardization) has prepared the EN50XXX series of standards of harmonized standards**
  - EN50014:1997 – Electrical apparatus for potentially explosive atmospheres
    - General requirements
  - EN50020:2002 - Electrical apparatus for potentially explosive atmospheres
    - Intrinsic safety 'i'

# What Is ATEX?

## Examples of Explosive Hazards

- Many workplaces may contain (or have activities that may produce) explosive or potentially explosive atmospheres, eg

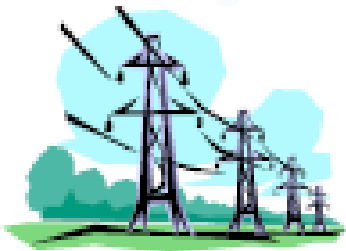


### **Chemical Industry**

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

### **Gas Pipelines and Distribution Centres**

Explosive gas/air mixtures may be formed when natural gas is released, for example by leakage

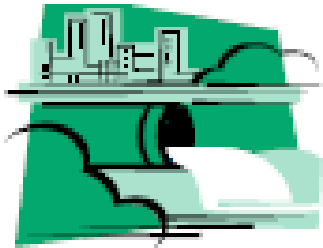


### **Power Generating Companies**

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

# What Is ATEX?

## Examples of Explosive Hazards (cont'd)



### **Sewerage Treatment Plants**

When waste waters are treated in purification plants, the gases generated may form explosive gas/air mixtures

### **Landfill Tips And Civil Engineering**

Flammable landfill gases may arise in landfill sites. 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



### **Wood-working Industry**

Wood-working gives rise to wood dusts. These can form explosive dust/air mixtures, e.g. in filters or silos

# What Is ATEX?

## Examples of Explosive Hazards (cont'd)



### Paint-spraying Operations

The overspray generated in paint spray bays and the solvent vapours released may give rise to explosive atmospheres when mixed with air

### Agriculture

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



### Metal-working Operations

When shaped parts are manufactured from metals, explosive metal dusts may be produced during grinding - this particularly applies to light metals. These metal dusts may give rise to an explosion hazard in dust collectors

# What Is ATEX?

## Examples of Explosive Hazards (cont'd)



### **Food and Feedstuffs Industry**

Explosive dusts may arise during transportation, storage and processing of grain, sugar, etc. If they are exhausted and collected by filtering, explosive atmospheres may arise

### **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



### **Oil Refineries, Rigs, Processing Plants and Filling Stations**

The hydrocarbons handled in refineries are all flammable and 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

# What Is ATEX?

## Differing Levels of Risk are Classified by Zones

Zone	Hazard	99/92/EC Definition	Device Category
0	Gas	Area in which a potentially explosive atmosphere as a mixture of air and flammable gases, vapours or mists is present either continuously, frequently or over a prolonged period	1G
1	Gas	Area in which under normal operation a potentially explosive atmosphere as a mixture of air and flammable gases, vapours or mist can occasionally form	2G
2	Gas	Area in which under normal operation a potentially explosive atmosphere as a mixture of air and flammable gases, vapours or mists is not normally present but may occur for just a short period	3G
20	Dust	Area in which a potentially explosive atmosphere in the form of a cloud of flammable air-borne dust is present either continuously, over prolonged periods or frequently	1D
21	Dust	Area in which under normal operation a potentially explosive atmosphere in the form of a cloud of flammable air-borne dust can occasionally form	2D
22	Dust	Area in which under normal operation a potentially explosive atmosphere in the form of a cloud of flammable air-borne dust is not normally present although may occur for just a short period	3D
--	Mining	Equipment intended for mining use and is required to remain functional in the presence of an explosive atmosphere	M1
--	Mining	Equipment intended for mining use but is intended to be de-energised in the event of an explosive atmosphere	M2

# What Is ATEX?

## Gas Protection Designation

### Device Group

I = mining  
II = all other areas

### Atmosphere

G = gas  
D = dust

### Type of ignition protection

ia = energy limiting (zone 0)  
ib = energy limiting (zones 1&2)

### Temperature Classes

T1 = 450°C  
T2 = 300°C  
T3 = 200°C  
T4 = 135°C  
T5 = 100°C  
T6 = 85°C



II 2 G Ex ib IIC T4

### Category

1 = zones 0 (gas) or 20 (dust)  
2 = zones 1 (gas) or 21 (dust)  
3 = zones 2 (gas) or 22 (dust)

Gas Zone 1: "Area in which under normal operation a potentially explosive atmosphere as a mixture of air and flammable gases, vapours or mist can occasionally form"

Approved in accordance with European ATEX directive and IECEx standards

### Explosion group

I = methane (mining)  
IIA = propane  
IIB = ethylene  
IIC = hydrogen (most dangerous group)  
II = no ignitability

# What Is ATEX?

## Dust Protection Designation

### Device Group

I = mining  
II = all other areas

### Atmosphere

G = gas  
D = dust

Maximum device  
surface temperature



II 2 D IP6x T1 10°C

### Category

1 = zones 0 (gas) or 20 (dust)  
2 = zones 1 (gas) or 21 (dust)  
3 = zones 2 (gas) or 22 (dust)

Dust Zone 21: "Area in which under normal operation a potentially explosive atmosphere in the form of a cloud of flammable air-borne dust can occasionally form"

### Ingress Protection Code

First digit (solid objects):

0 No protection  
4 >1mm objects  
5 Dust (limited ingress)  
6 Total dust protection

Second digit (liquids):

0 No protection  
4 Spray from all directions  
5 Jets from all directions  
6 Strong jets  
7 Temporary immersion  
8 Long term immersion

# What Is ATEX?

## Ingress Protection Code to EN60529

### Protection Against Solid Objects

- 0 No protection
- 1 Protected against solids objects over 50mm (e.g. accidental touch by hands)
- 2 Protected against solids objects over 12mm (e.g. fingers)
- 3 Protected against solids objects over 2.5mm (e.g. tools and wires)
- 4 Protected against solids objects over 1mm (e.g. tools, wires and small wires)
- 5 Protected against dust - limited ingress (no harmful deposit)
- 6 Totally protected against dust

↓

# IP64

↑

### Protection Against Liquids

- 0 No protection
- 1 Protected against vertically falling drops of water
- 2 Protected against direct sprays up to 15° from the vertical
- 3 Protected against direct sprays up to 60° from the vertical
- 4 Protected against sprays from all directions - limited ingress permitted
- 5 Protected against low pressure jets from all directions - limited ingress permitted
- 6 Protected against strong jets of water - limited ingress permitted
- 7 Protected against the effects of immersion upto 1m for 30 minutes
- 8 Protected against long periods of immersion under pressure

# What Is ATEX?

## Mining Protection Designation

### Device Group

I = mining  
II = all other areas

Approved in accordance with European ATEX directive and IECEx standards

### Explosion group

I = methane (mining)  
IIA = propane  
IIB = ethylene  
IIC = hydrogen (most dangerous)  
II = no ignitability



I M2 Ex ib I

### Category

M1 = mining (zones 0&1)  
M2 = mining (zone 2)

Mining Zone M2: "equipment is intended to be de-energized in the event of an explosive atmosphere. The means of protection relating to equipment in this category assure the requisite level of protection during normal operation and also in the case of more severe operating conditions, in particular those arising from rough handling and changing environmental conditions."

### Type of ignition protection

ia = energy limiting (zone 0)  
ib = energy limiting (zones 1&2)

# What Is ATEX?

## ATEX Limits Radio Frequency Power Levels

- Ignition limits for high-frequency sources:

Explosion Group	Maximum RF Power
IIA	6W
IIB	3.5W
IIC	2W

- **Clarification Sheet ExNB/04/160/P (11th Nov 2004) states:**
  - “Equipments having the capability of up to 3.5W output must be marked Group IIB and those having the capability of up to 6W output must be marked Group IIA. Manufacturer’s factory-setting made by hardware may be used to configure RF output for 2W max for Group IIC and 3.5W max for Group IIB versions. **Programmable/software control of output power which can be altered by suitable programming equipment of the user is not acceptable.**”

# Professional Series ATEX Portables

ATEX Certificate BVS 07 ATEX E 095 X



GP340 Ex  
5 Tone / PL



GP380 Ex  
5 Tone / PL



GP580 Ex  
SmartZone



GP680 Ex  
MPT1327

Available in VHF (136 – 174MHz) and UHF (403 – 470MHz)

# Professional Series ATEX Portables Overview

- **High audio quality**
  - X-Pand™ voice compression
  - Low level expansion
  - Whisper mode
- **Assured communication**
  - Escalart
  - Call Forwarding & Missed Calls List
  - Channel Scan
  - Talkaround mode
- **Enhanced employee safety**
  - Dedicated emergency button
  - Emergency call functionality
  - Lone worker operation



# Professional Series ATEX Portables Overview

- **Easy-to-use**
  - Intuitive user interface
  - Ergonomic design
  - Low battery alert
- **High-capacity Li-Ion battery**
  - Increased shift life (approx. 11 hours)
  - No memory or over-charge effects
  - Longer shelf-life (~1 year self-discharge)
- **High quality and reliability**
  - ATEX and IECEx Certified
  - IP64 enclosure sealing
  - MIL Spec 810F
  - Unique Motorola Accelerated Life Testing (ALT)



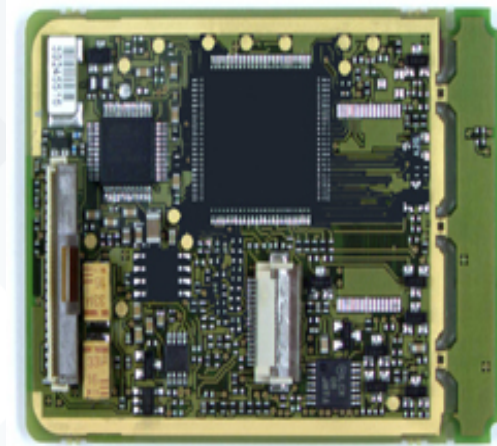
# Motorola Accelerated Life Test

- **Unique Motorola test regime to simulate over 5 years hard usage in the field**
  - Considerably beyond MIL SPEC test parameters
  - Includes extreme thermal, mechanical, electrical and environmental tests
- **Conducted during product development to detect potential problems and improve radio design**
  - Ensures extremely high quality levels
  - Provides peace of mind for users





# Professional Series ATEX Portables Man-down Protection Option



- **ATEX-approved plug-in module**
- **Installed and supported by Motorola**
- **Compatible with GP340Ex, GP380Ex & GP680Ex**
- **Motion sensor**
  - Alarm raised when radio has not moved for a programmable time period
- **Man-down detector**
  - Alarm raised when radio tilted off vertical (angle programmable)
- **Programmable alarm delay time to help eliminate nuisance alarms**



# Professional Series ATEX Portables Comparison With Non-ATEX

Feature	 Non-ATEX Radio	 ATEX radio	Comments
Maximum RF Power	4W / 5W	1W	Limited by ATEX regulations
Colour	Black	Blue	Easy to distinguish & ensure only ATEX radios brought into explosive environments
Carry Case	Optional	Optional	Greater flexibility and customer choice
ATEX Dust Rating	n/a	II 2D Ex tD A21 IP6x ib D21 T110°C (for dust zones 21 & 22)	ATEX models are rated for both gas and dust
IP Rating	IP54	IP64	Higher rating allows use in more dusty areas
ATEX Gas Rating	n/a	II 2G Ex ib IIC T4	ATEX models can be used with highest explosive group (IIC)
ATEX Mine Rating	n/a	I M2 Ex ib I	ATEX models suitable for use in mining zones M2

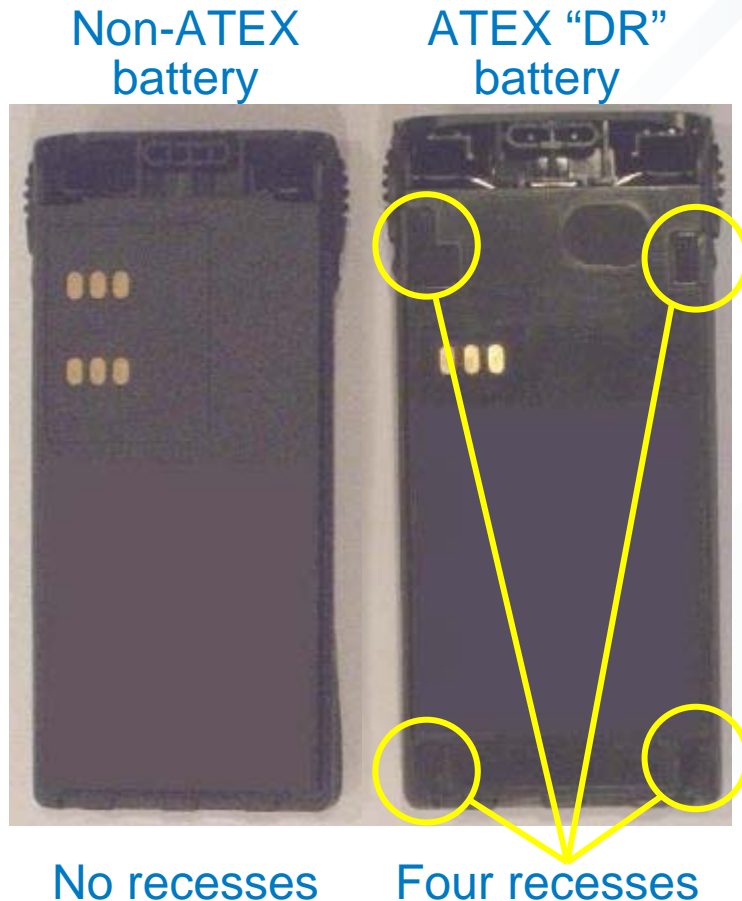
# Professional Series ATEX Portables Comparison With Non-ATEX

Feature	 <b>Non-ATEX Radio</b>	 <b>ATEX radio</b>	Comments
<b>Standard Battery Time (5:5:90)</b>	8 hours	11 hours	Longer time due to lower power usage
<b>Batteries</b>	Wide range of batteries	Specific battery: NNTN5510DR	Battery specified by ATEX certification
<b>DTMF Live Dial</b>	Yes	No	Max current allowed is limited by ATEX regulations
<b>PROIS interface</b>	Full	Mandown Option Board	ATEX requirements mean interface had to be reduced
<b>Channel spacing</b>	12.5/20/25kHz programmable	12.5kHz and 20/25kHz versions	ATEX has different models for 12.5kHz and 20/25kHz
<b>Side/Alert Tones &amp; Backlight</b>	Yes	GP340/380/680Ex: Not supported when in tx mode GP580Ex: Yes	Max current allowed is limited by ATEX regulations
<b>Charger</b>	Same SUCs & MUCs for all (must be used outside explosive zones)		Chargers not ATEX rated (not to be used in ATEX zones)
<b>CPS</b>	Same CPS used for all		Common programming and functionality

# Professional Series ATEX Portables

## Additional ATEX Battery Safety Factor

- Unique battery mechanics help eliminate operator error
- Peg on radio chassis keys into recess in battery housing



Professional Series Radio Battery Compatibility	
Non-ATEX GP radios	Wide range of batteries
Black ATEX radio	NNTN5510DR
Blue ATEX radios (blue)	NNTN5510DR

# Professional Series ATEX Portables

## Fully-tested Chargers

- **Existing Professional Series chargers**
  - ATEX exempt as not used within the explosive area
  - 115V SUC (US Plug) MDHTN3000
  - 230V SUC (Euro Plug) MDHTN3001
  - 230V Single Unit Charger (UK Plug) MDHTN3002
  - 115V IMPRES Single Unit Charger (US Plug) WPLN4182
  - 230V IMPRES SUC (Euro Plug) WPLN4184
  - 230V IMPRES SUC (UK Plug) WPLN4183
  - 115V IMPRES Multi Unit Charger Display (US Plug) WPLN4192
  - 230V IMPRES Display (Euro Plug) WPLN4194
  - 230V IMPRES Display MUC (UK Plug) WPLN4193
  - 115V IMPRES Multi Unit Charger Non-Display (US Plug) WPLN4187
  - 230V IMPRES Display (Euro Plug) WPLN4189
  - 230V IMPRES Display MUC (UK Plug) WPLN4188



**Same chargers as existing Professional Series radios**

# Professional Series ATEX Portables Carry Cases



- Soft leather case
  - **Keypad** GMLN1112
  - **Non-keypad** GMLN1113



- Heavy-duty leather case with D-Rings
  - **Keypad** GMLN1110
  - **Non-keypad** GMLN1111
  - **Carrying Strap** NTN5243

- ATEX Chest Pack
  - MDHLN6602



- ATEX Radio Pack
  - MDRLN4815



**Note:** use with or without a carry case is optional

# Professional Series ATEX Portables

## ATEX-approved Remote Speaker Microphone

- Superior protection
  - ATEX gas protection  $\text{Ex}$  II 2 G EEx ib IIC T4
  - ATEX dust protection  $\text{Ex}$  II 3 D IP5x T60°C
  - ATEX mining  $\text{Ex}$  I M2 EEx ib I
  - Exceeds IP54 sealing
- Advanced functionality
  - Emergency button
  - Volume controls
  - Easy to operate with gloves



**Notes:** 1) Radio ATEX dust rating reduced to 3D with above accessory attached  
2) All accessories & radio side-plate have tamper-proof screw

GMMN1111

# Professional Series ATEX Portables

## ATEX-approved Audio Accessories

- **These Motorola ATEX-approved audio accessories offer high quality and performance**
- **Intended for use in noisy environments**
- **Headsets provide privacy and noise isolation**
- **ATEX rating**
  - II 2G Ex ib IIC T4
  - I M2 Ex ib I

# Professional Series ATEX Portables

## ATEX-approved Headsets



- **Over the Head Heavy Duty Headset PMLN5151**
  - **For use in high noise environments**
  - **Includes:**
    - Flexible Noise-Cancelling boom microphone
    - Large in line PTT button
    - Over the head Headpiece

- **Behind The Head Heavy Duty Headset PMLN5152**
  - **For use in high noise environments**
  - **Includes:**
    - Flexible Noise-Cancelling boom microphone
    - Large in-line PTT button
    - Behind the head support band
    - Cloth strap over the head for additional support



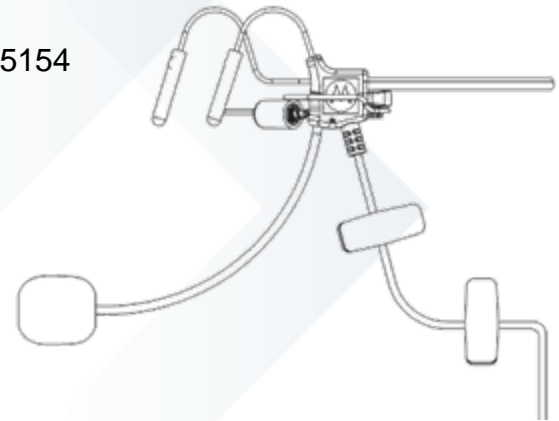
# Professional Series ATEX Portables

## ATEX-approved Headsets



- Over the Head Lightweight Headset PMLN5153
  - For use in moderate noise environments
  - Includes:
    - In-line PTT button
    - Adjustable headband
    - Speaker with cover
    - Flexible microphone boom
    - Omni-directional microphone
    - Microphone windscreen

- Behind The Head Lightweight Headset PMLN5154
  - For use in moderate noise environments
  - Includes:
    - Flexible Noise Cancelling boom mic
    - Large in-line PTT button
    - Dual ear inserts



# Professional Series ATEX Portables

## ATEX-approved Headsets



- **ATEX Throat Microphone System** PMMN4055

- **For use in high noise environments**

- **Includes:**

- An adjustable elastic neckband for a comfortable fit
- Single snap closure on neckband
- Large 80mm PTT with belt clip
- Acoustic tube with standard ear tips and optional flexible open ear inserts or noise attenuating plugs

- **ATEX Skull Microphone** PMMN4056

- **For use in high noise environments**







- **Includes:**

- Velcro strap and snap for easy attachment to helmet
- Large 80mm PTT with belt clip
- Over the ear ear-cup, with adjustable strap size



# Professional Series ATEX Portables

## ATEX-approved Headsets – Feature Summary

Accessory kit	Description	Over the Head headpiece	Behind the head headpiece	Flexible, rotating Boom Mic with noise cancelling electret mic (3dB)	Bone Conduction Mic	Cloth covered ear seals	Moulded rubber ear cup	Large in line PTT	Straight Cord	24dB Noise Reduction Rating	Adjustable elastic strap
1 	ATEX Over the Head Heavy Duty Headset	○		○		○		○	○	○	
2 	ATEX Skull Microphone with 80mm PTT				○		○	○ (80mm)	○		
3 	ATEX Behind the Head Heavy Duty Headset		○	○		○		○	○	○	
4 	ATEX Throat Microphone with 80mm PTT				○			○ (80mm)	○		○
5 	ATEX Behind the Head Lightweight Headset		○	○				○	○	○	
6 	ATEX Over the Head Lightweight Headset	○		○		○ (optional)		○	○	○	

# Professional Series ATEX Portables

## What's In the Box?

- **Standard configuration includes:**
  - Radio chassis (blue)
  - 1480mAh Li-Ion battery (black)
  - Antenna
  - Accessory Connector Cover
  - Belt Clip
  - One year warranty



# Professional Series ATEX Portables

## The Motorola ATEX Advantage

- **SAFE**
  - Highest ATEX gas protection
  - Unique ATEX dust protection
  - Man-down option (available soon)
- **RELIABLE**
  - Fully-tested, proven platform
  - MIL 810F (all 11 categories)
  - Unique Accelerated Life Testing
- **EFFECTIVE**
  - Superior audio quality
  - Sophisticated functionality
  - Value-add accessories

