ICOM

# IDAS™ Solutions

2018





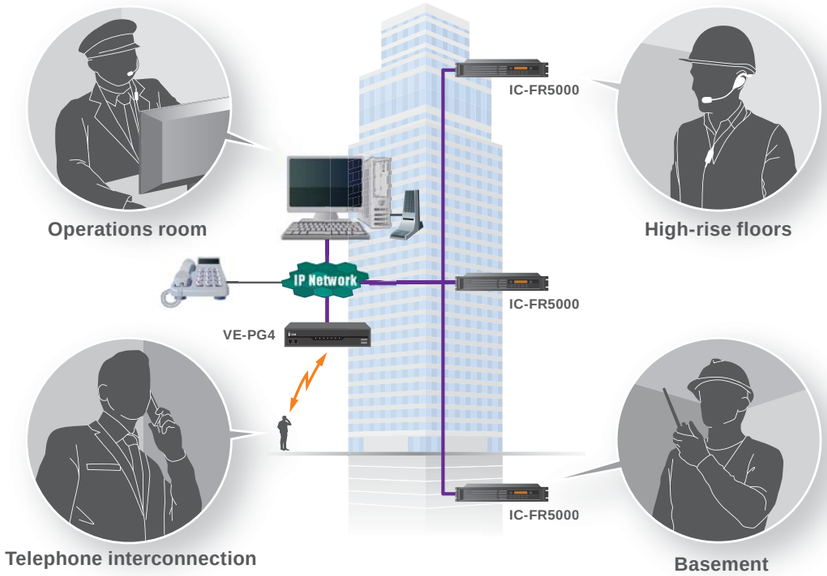
IDAS™
ICOM DIGITAL ADVANCED SYSTEM

NXDN™ dPMR™ 6.25kHz FDMA True RF Efficiency

# IDAS™ Application Examples

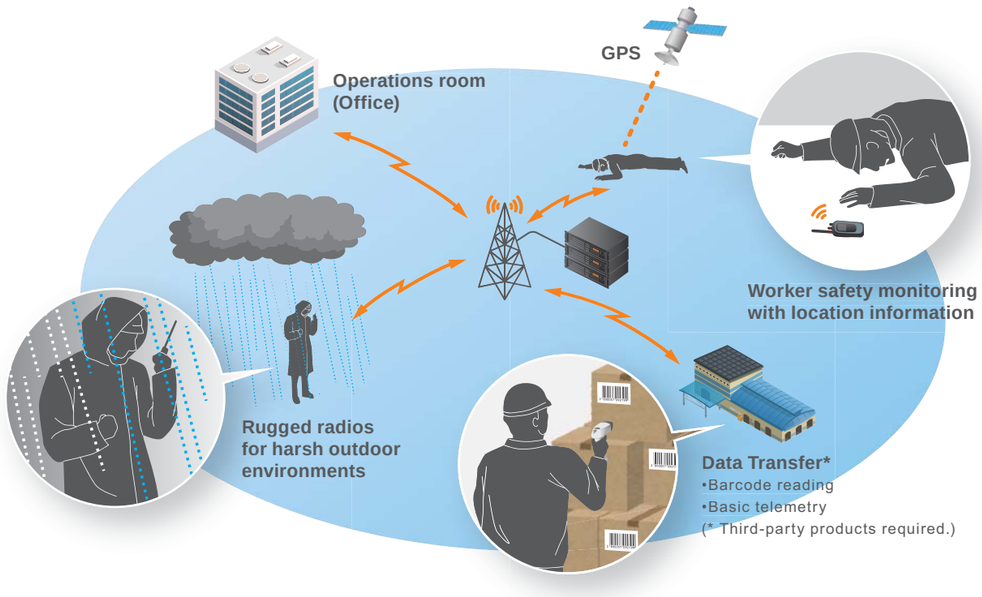
## In-building, Campus Communication System

Provides mobile communication in a multi-story building



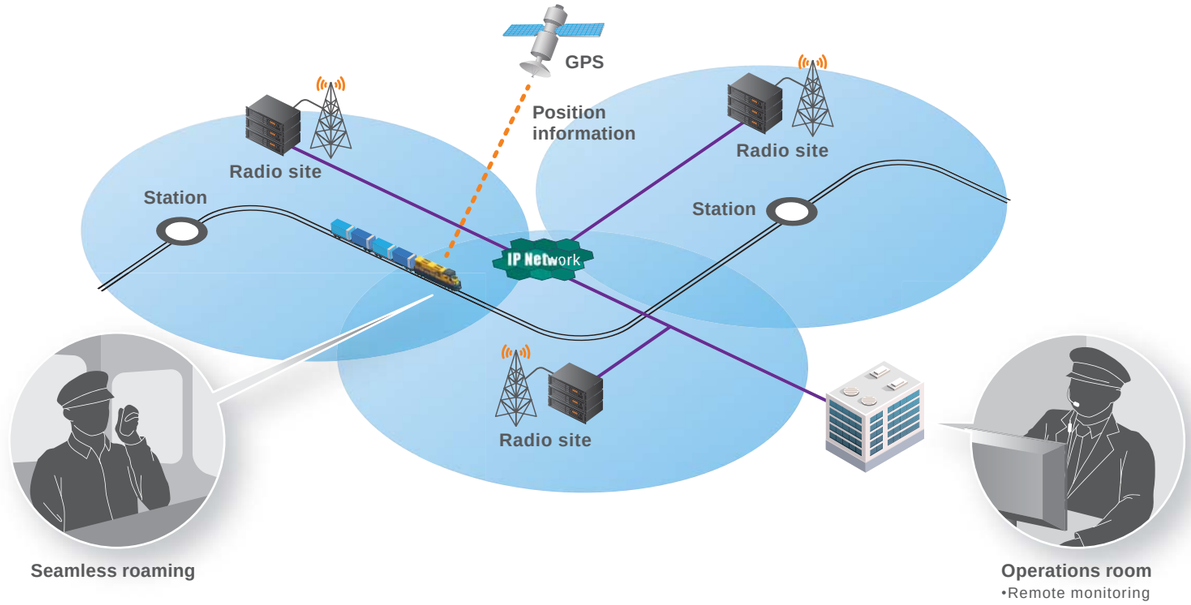

## Industry Applications for Forestry, Farming and Security (Wide area outdoor use)

Data transfer and worker safety monitoring



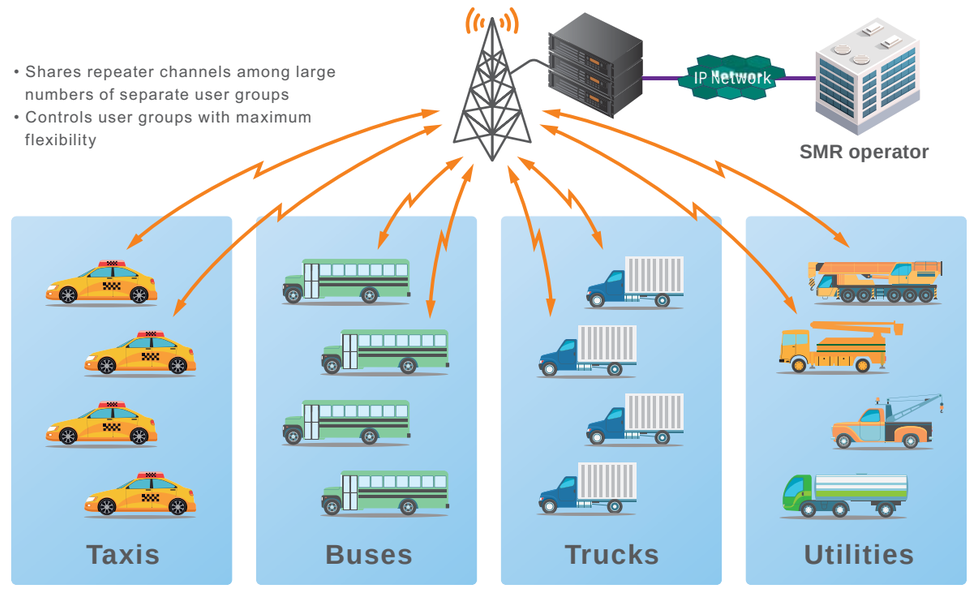

## Large Scale Multi-Site System

Wide area coverage with multi-site system




## SMR (Specialized Mobile Radio) or PAMR (Public Access Mobile Radio) Systems

Trunking system



# IDAS™ Benefits

## Flexible Digital Migration Solutions with Advanced IP Network Integration

IDAS is Icom's digital land mobile radio system using the NXDN or dPMR common air interface. IDAS offers a complete system of handheld radios, mobile radios, repeaters, network interface/trunking controller, remote communicator, system manager software and various accessories. IDAS is a total digital solution that system owners or operators can grow into as their time and budgets allow.

### Multiple-site Configurations

IDAS systems can cover various digital radio communication needs from simple peer to peer operation between two radios, up to multi-site wide area networks. Further coverage is enhanced with IP interconnection.

### Digital Clarity

By adopting the industry standard AMBE+2™ Vocoder and advanced FEC (Forward Error Correction) coding, improved communication quality, clarity and reliability are a hallmark of IDAS systems.

### Effective System Management

Simple and efficient management is critical for systems of any size. IDAS provides effective system management with such features as OTAP and administration applications.

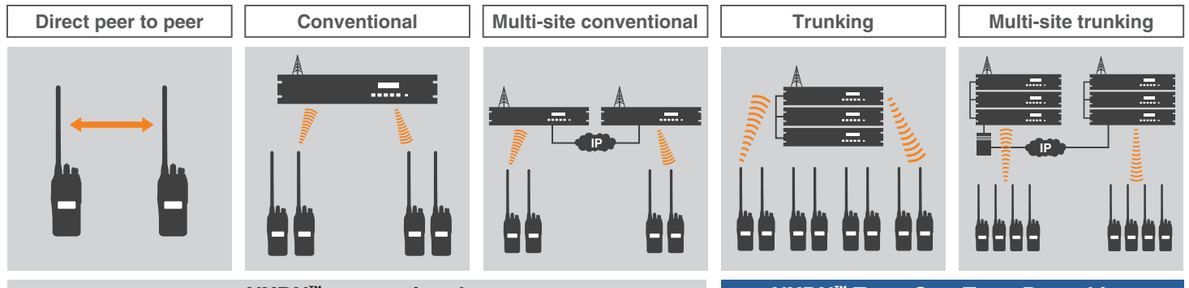
# Multiple-site Configuration

### NXDN™/dPMR™ Protocol Choice

The IDAS digital radio system has two protocol choices, NXDN or dPMR. Both protocols are open digital radio standards using 6.25 kHz FDMA narrowband technology. With this flexible choice, the IDAS radio system allows for interoperability with other manufactures equipment for seamless supply/replacement of existing NXDN and/or dPMR systems. And naturally these FDMA based protocols are a perfect match, when migrating an analogue system to digital.

### System Scalability According to Communication Traffic and Coverage

Depending on communication traffic and coverage, an IDAS radio system can be expanded from single site conventional to multi-site trunking, to match your communication needs.




#### Type-C trunking

- Dedicated Control Channel
- Up to 30 Multi-site (Local) or Up to 48 Multi-site (Regional)
- Up to 30 Ch. Per Site
- Group Call 48 Multicast
- Call Queing
- Pre-emptive Emergency
- Fail Soft Mode

#### Type-D trunking

- Distributed Channel Trunking
- Multi-site 48 Max. Sites
- Up to 30 Ch. Per Site
- Quick Response without Registration (Single-site trunking)
- Backup Repeater for System Control
- RS-MGR1 (Multi-site trunking)
- RC-FS10

#### Mode 3 trunking

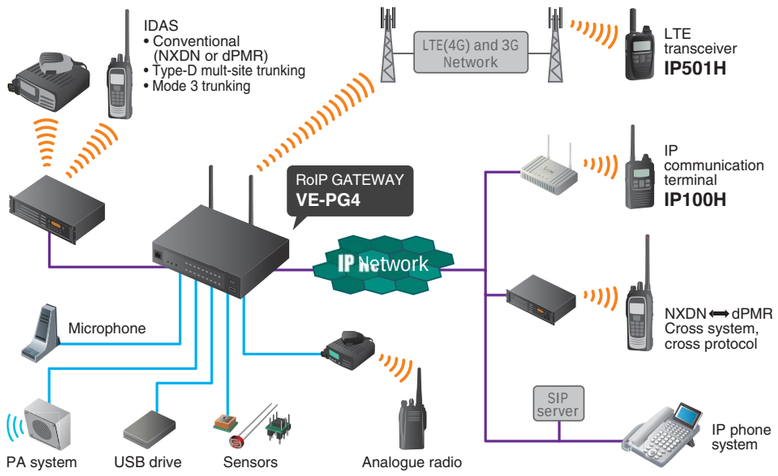
- Dedicated Control Channel
- ETSI Standard Based Protocol
- Up to 32 Multi-site with System Control Software
- Up to 256 site Multi-region Connection (8 Region × 32 Sites for example)
- Up to 32 Ch. Per Site
- Call Queing
- Pre-emptive Emergency
- RS-MGR2

# Multiple-site Configuration

## Telephone Interconnection

With a VE-PG4 RoIP gateway, an IDAS conventional, Type-D multi-site trunking and Mode 3 trunking* system can interconnect with an IP phone, LTE transceiver, wireless LAN transceiver and analogue radios, as well as NXDN and dPMR protocols. A radio user can initiate phone/radio calls to talk with other users using a different protocol (for example, IP radios) between different systems.

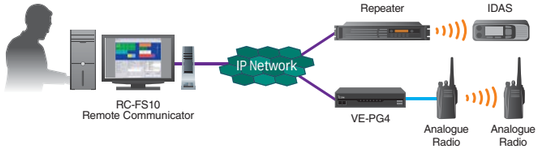
* Mode 3 trunking will be available in the future.




## Remote Communicator Software

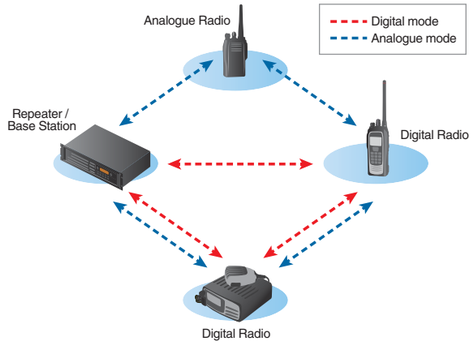
The RC-FS10 Remote Communicator software creates a virtual radio/simple dispatcher on a Windows®-based PC. It enables you to remotely access IDAS repeaters using an IP network and communicate with IDAS radios or monitor radio communications, even from outside of the radio coverage area. You can customize the RC-FS10 screen interface for more efficient use.

- RC-FS10 is available with IDAS conventional and Type-D multi-site trunking system.




## Mixed Mode Operation (Conventional)

IDAS radios can receive both analogue and digital conventional mode signals on a channel, and can reply according to the received mode.The IDAS system allows you to migrate analogue systems to narrow band digital at your own pace and need, while running your existing analogue system. It is a cost efficient way to obtain the latest digital two-way radio technology, while protecting your current system investment.

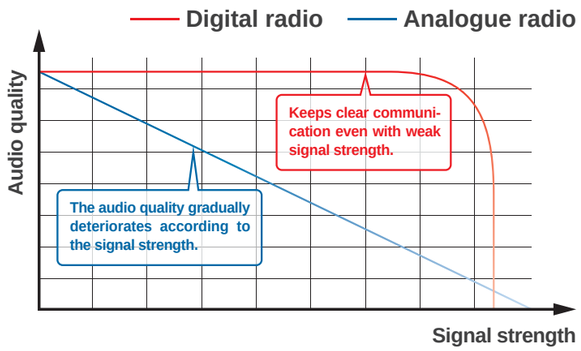


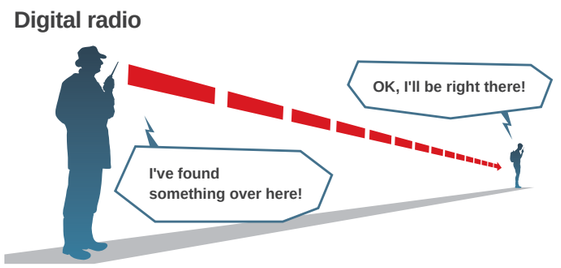



# Digital Clarity

## Intelligible Audio Over a Large Total Communication Area

In conjunction with the industry standard AMBE+2™ Vocoder and Icom's DSP expertise, maximum voice clarity and background noise suppression within the 6.25 kHz channel is achieved.




## True Narrowband: Reliable Communications for Half the Spectrum

IDAS (both NXDN and dPMR) operates at true 6.25 kHz channel efficiency. Even in urban areas, where users often experience channel congestion, narrowband digital channels offer higher communication access capability. Radio spectrum is a scarce resource, and IDAS provides a future-proof solution not only now, but also in many years ahead as 12.5 kHz channels become full over time.

### Communications Reliability When You Most Need It

No need to allow for TDMA time slot synchronization. Instant communications in emergencies and critical situations. FDMA is the fail safe mode of choice in land mobile radio. Nothing else compares.

### FDMA: Proven History Like No Other Radio Technology

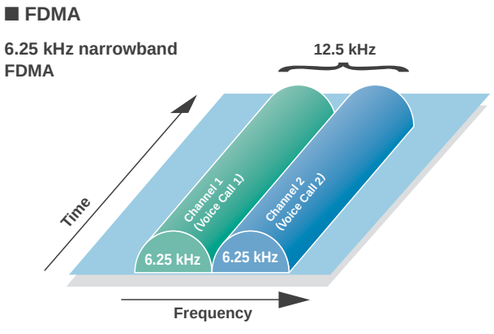
For over 50 years, FDMA has been the backbone of two-way radio communication. Generational enhancements have culminated in the realisation of 6.25 kHz FDMA digital protocols that are literally ahead of their time, while keeping backward compatibility with analogue FM radios.

### 6.25 kHz Channels: The Current and Future Trend

6.25 kHz channel plans and standards are used in North America, Europe, Japan, Oceania, and the list goes on. 6.25 kHz provides an answer to the worldwide problem of spectrum shortage and efficient use.

### 6.25 kHz Fundamental Excellence

Narrower bandwidth FDMA provides technical excellence in sensitivity, interference resistance, increased coverage, audio quality, spectrum efficiency and more.



# Digital Clarity

## Customizing Audio Quality

IDAS radios also implement audio features and settings to compliment the performance of the vocoder.

| | |
|---|---|
| **Active noise canceller** | This function suppresses background noise and improves both transmitted voice and incoming calls. |
| **Equalizer effect** | This function can improve the audio readability by increasing or decreasing particular audio frequency components. |
| **Voice recording** | This function records incoming and outgoing calls in the WAV format. Various communication data is embedded in the WAV file, such as User IDs, GPS position, frequency, and so on. The IC-F3400D/F5400D series can record to a microSD card for long hours of recording. |

## Position Data Transmission Capability

When the GPS feature is used, IDAS radios can automatically transmit accurate position data at programmed intervals. The position data can be sent with a voice call or a status call, and can be used with a third-party AVL (Automatic Vehicle Location) system. The GPS log functions logs user position data onto a microSD card memory.

## Transparent Data Modem

IDAS radios can be used as a transparent data modem, which transmits the serial data received from a PC or various devices*. IDAS radios can interface with other Bluetooth® devices for easy data entry.

* Third-party products required.


## Emergency Call and Alert

To ensure workers safety, IDAS handheld radios have the following four emergency related functions. If one of these functions are activated, the radio automatically sends an emergency signal.

| | |
|---|---|
| **Man down function** | When the radio is tilted at a particular angle for a specified time period, the radio enters the Emergency mode. |
| **Lone worker function** | When no operation is performed, or when the user does not move for the specified time period, the radio enters the Emergency mode. |
| **Stationary detection** | When the user does not move, and the stationary detection does not detect motion for the specified time period, the radio enters the Emergency mode. |
| **Motion detection** | When the user continuously moves the radio, and the motion detection sensor exceeds the setting for the specified time period, the radio enters the Emergency mode. |

## Remote Monitor (NXDN™)/ Ambience Listening (dPMR™)

A Remote monitor call or Ambience listening call* remotely controls the receive radio to automatically transmit its microphone audio, for a specified timer period. You can remotely activate the radio's microphone and listen into the environment surrounding the user to help identify if an emergency exists, or what is occurring near the user.

* The Remote monitor call or Ambience listening call can be made from designated IDAS radios.

## Radio Kill, Stun and Revive

If a radio is lost or stolen, the radio Kill function disables the radio over the air, to reduce any security threat. When the radio Stun command is received, all functions will be temporarily locked out until a Revive command is received, or the user password is entered*.

* The radio Kill, Stun and Revive commands can be made from designated IDAS radios.

Available features written here may vary, depending on the model. (See page 9–11)

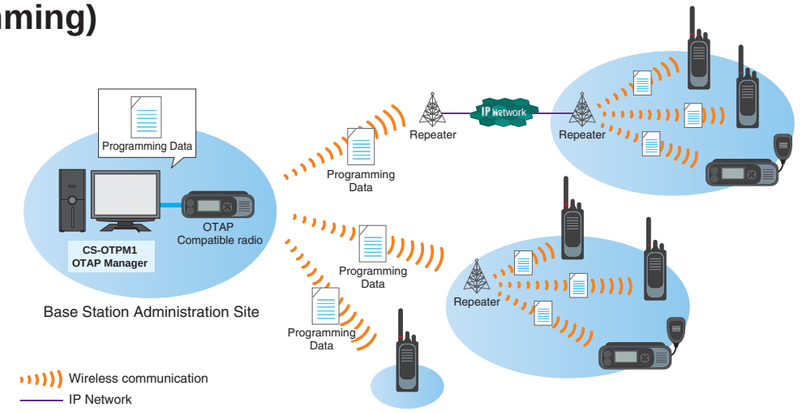


# Effective System Management

## OTAP (Over-the-Air Programming)

The OTAP function enables you to distribute a radio configuration file over-the-air, and remotely reconfigure radios while in the field. The system operator can edit channels, call lists, status message lists, and more, and can schedule the updating from Specified time, Next power-up, Auto restart and Reactivation key. This saves considerable time, and eliminates the need to return the radio for reprogramming.

- CS-OTPM1 for IC-F3400D/F4400D, IC-F5400D/F6400D and IC-F52D/F62D

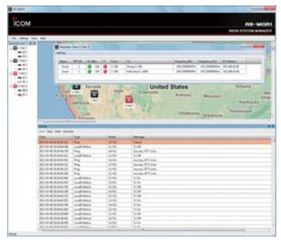



## System Manager Software

(Type-D multi-site trunking and dPMR Mode 3)

The system management software remotely monitors multiple repeater conditions and traffic statistics over an IP network. If it detects abnormal conditions, the software can send an e-mail alert to the system administrator.

- RS-MGR1 for Type-D multi-site trunking
- RS-MGR2 for dPMR Mode 3 trunking



RS-MGR1

## Secure Communication

In addition to digital modulation and demodulation, the digital voice scrambler gives your voice and data calls privacy against casual eavesdropping by a scanner receiver. When higher grade security is required, AES and DES encryption* can be added. The OTAR (Over-the-Air Rekeying) function allows secure updating of encryption keys over the radio channel.

- AES/DES for IC-F3400D/F4400D and IC-F5400D/F6400D

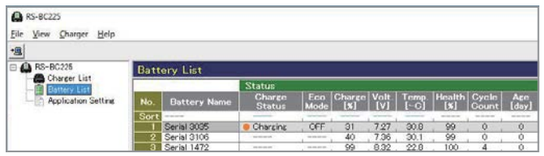
| | Key Length | Security Level |
|---|---|---|
| **AES** | 256 bit ($1.1 \times 10^{77}$) | **High level security** |
| **DES** | 56 bit ($7.2 \times 10^{16}$) | **Mid level security** |
| **Voice scrambler** | 15 bit (32000) | **Standard security** |

* IC-F3400D, F5400D series can store 4-keys for DES encryption as standard. Up to 64-keys for DES encryption are available with the optional UT-134. The optional UT-134 and ISL-AKAES license are required for AES encryption. The CS-OTAR1 or CS-KLD2 is required for OTAR.

## Intelligent Battery Management

The intelligent battery charger software checks the battery health, battery age and battery cycle count whenever a battery is inserted into an intelligent charger. The Eco Mode stops charging at approximately 80–90% to extend the battery's life. The batteries can be optimally maintained, and an indication of timing for battery replacement is given.

- BC-225 intelligent charger and RS-BC225 reader software for IC-F3400D/F4400D and IC-F52D/F62D



# Features for Handheld Radios

| | | IC-F3400D, IC-F4400D series (for USA, EUR and others) | IC-F52D, IC-F62D (for USA, EUR and others) | IC-F3261D, IC-F4261D series (for USA) IC-F3262D, IC-F4262D series (for EUR) IC-F3263D, IC-F4263D series (for others) | IC-F3261D-UL, IC-F4261D-UL (for USA) IC-F3263D-UL, IC-F4263D-UL (for others) | | IC-F3360D, IC-F4360D series (for USA and others) | IC-F3230D, IC-F4230D series (for USA and others) | IC-F3210D, IC-F4210D (for USA and others) | IC-F1100D, IC-F2100D series (for USA, EUR and others) | IC-F3201DEX, IC-F4201DEX (for USA) IC-F3202DEX, IC-F4202DEX (for EUR) IC-F3203DEX, IC-F4203DEX (for others) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | |  |  |  |  | |  |  |  |  |  |
| NXDN*1 | Conventional | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ |
| | Multi-site conventional | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ |
| | Type-D trunking | ✔ (ISL-UGMTR required) | ✔ (ISL-UGMTR required) | ✔ | ✔ | | – | ✔ | ✔ | ✔ (Single-site) | ✔ (Single-site) |
| | Type-C trunking | – | – | – | – | | ✔ | – | – | – | – |
| dPMR*1 | Mode 1/Mode 2 conventional | ✔ | ✔ | ✔ | ✔ | | – | – | – | ✔ | ✔ |
| | Multi-site conventional | ✔ | ✔ | ✔ | ✔ | | – | – | – | ✔ | ✔ |
| | Mode 3 trunking | ✔ (ISL-UGMD3 required) | ✔ (ISL-UGMD3 required) | ✔ | ✔ | | – | – | – | – | – |
| Digital/analogue mixed mode | | ✔ | ✔ | ✔ | ✔ | | ✔ | – | – | ✔ | ✔ |
| 6.25 kHz FDMA (Digital Very Narrow) | | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ |
| 12.5 kHz FDMA (Digital Narrow) | | ✔ (NXDN) | ✔ (NXDN) | – | – | | ✔ | – | – | – | – |
| Digital voice | Equalizer | ✔ | ✔ | – | – | | ✔ | – | – | – | – |
| | Noise canceller | ✔ | ✔ | – | – | | – | – | – | – | – |
| | Recording | ✔ (microSD card) | ✔ (Internal) | – | – | | – | – | – | – | – |
| Data | PTT ID | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ |
| | Over-the-Air Alias (OAA) | ✔ (DT/DS) | ✔ | – | – | | ✔ | – | – | ✔ (DT/DS versions) | – |
| | GPS | ✔ | ✔ (HM-233GP required) | ✔ (Depending on versions) | – | | ✔ | – | ✔ (HM-171GP required) | ✔ (HM-171GPW required) | – |
| | Short Data Message (SDM) | ✔ (Limited functions for Non-display versions) | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ (Limited functions) | ✔ (PC command only for Non-display versions) | ✔ (TX only) |
| | Status | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ (Limited functions) | ✔ (Limited functions) | ✔ (Limited functions) |
| Data modem (Transparent) | | ✔ | ✔ | – | – | | ✔ | – | – | – | – |
| Encryption | AES | ✔ (UT-134 & ISL-AKAES required) | – | – | – | | – | – | – | – | – |
| | DES | ✔ (4-key DES standard, UT-134 required for 64-key) | – | – | – | | – | – | – | – | – |
| | Over-the-Air Rekeying (OTAR) | ✔ (CS-OTAR1 or CS-KLD2 required) | – | – | – | | – | – | – | – | – |
| Digital voice scrambler | | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ |
| Over-the-Air Programming (OTAP) | | ✔ (CS-OTPM1 required) | ✔ (CS-OTPM1 required) | – | – | | – | – | – | – | – |
| Emergency | Emergency button | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ (No ACK TX) | ✔ (No ACK TX) |
| | Lone worker | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ |
| | Man down | ✔ | ✔ | ✔ | ✔ | | ✔ | – | – | ✔ | – |
| | Motion/stationary detection | ✔ | ✔ | – | – | | – | – | – | ✔ | – |
| Remote monitor/Ambience listening | | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ (RX only) | ✔ (RX only) | ✔ (RX only) | ✔ (RX only) |
| Radio security | Radio Kill/Stun/Revive | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ (RX only) | ✔ (RX only) | ✔ (RX only) | ✔ (RX only) |
| | Power ON password | ✔ | ✔ | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ | ✔ |
| Intelligent charger | | ✔ (BC-225 and RS-BC225 required) | ✔ (BC-225 and RS-BC225 required) | – | – | | – | – | – | – | – |
| Hazardous locations | | – | – | – | ✔ (UL non-incendive) | | – | – | – | – | ✔ (IEC/ATEX intrinsically safe) |

*1 Default factory setting (Protocol) differs, depending on radio model.

# Features for Mobile Radios

| | | IC-F5400D, IC-F6400D series (for USA, EUR and others) | IC-F5061D, IC-F6061D (for USA) IC-F5062D, IC-F6062D (for EUR) IC-F5063D, IC-F6063D (for others) | IC-F5360D, IC-F6360D (for USA and others) | IC-F5220D, IC-F6220D (for USA and others) | IC-F5121D, IC-F6121D (for USA) IC-F5122D, IC-F6122D (for EUR) IC-F5123D, IC-F6123D (for others) |
|---|---|---|---|---|---|---|
| | |  |  |  |  |  |
| **NXDN**[*2] | **Conventional** | ✔ | ✔ | ✔ | ✔ | ✔ |
| | **Multi-site conventional** | ✔ | ✔ | ✔ | ✔ | ✔ |
| | **Type-D trunking** | ✔ (ISL-UGMTR required) | ✔ | – | ✔ | ✔ (Single-site) |
| | **Type-C trunking** | – | – | ✔ | – | – |
| **dPMR**[*2] | **Mode 1/Mode 2 conventional** | ✔ | ✔ | – | – | ✔ |
| | **Multi-site conventional** | ✔ | ✔ | – | – | ✔ |
| | **Mode 3 trunking** | ✔ (ISL-UGMD3 required) | ✔ | – | – | – |
| **Digital/analogue mixed mode** | | ✔ | ✔ | ✔ | – | ✔ |
| **6.25 kHz FDMA** (Digital Very Narrow) | | ✔ | ✔ | ✔ | ✔ | ✔ |
| **12.5 kHz FDMA** (Digital Narrow) | | ✔ | – | ✔ | – | – |
| **Digital voice** | **Equalizer** | ✔ | – | ✔ | – | – |
| | **Noise canceller** | ✔ | ✔ (HM-211 required) | ✔ (HM-211 required) | – | ✔ (HM-211 required) |
| | **Recording** | ✔ (microSD card) | – | – | – | – |
| **Data** | **PTT ID** | ✔ | ✔ | ✔ | ✔ | ✔ |
| | **Over-the-Air Alias** (OAA) | ✔ | – | ✔ | – | – |
| | **GPS** | ✔ (UX-241 required) | – | ✔ (UX-241 required) | – | – |
| | **Short Data Message** (SDM) | ✔ | ✔ | ✔ | ✔ | ✔ |
| | **Status** | ✔ | ✔ | ✔ | ✔ | ✔ |
| **Data modem** (Transparent) | | ✔ | ✔ (dPMR only) | ✔ | – | ✔ (dPMR only) |
| **Encryption** | **AES** | ✔ (UT-134 & ISL-AKAES required) | – | – | – | – |
| | **DES** | ✔ (4-key DES standard, UT-134 required for 64-key) | – | – | – | – |
| | **Over-the-Air Rekeying** (OTAR) | ✔ (CS-OTAR1 or CS-KLD2 required) | – | – | – | – |
| **Digital voice scrambler** | | ✔ | ✔ | ✔ | ✔ | ✔ |
| **Over-the-Air Programming** (OTAP) | | ✔ (CS-OTPM1 required) | – | – | – | – |
| **Emergency** | **Emergency button** | ✔ | ✔ | ✔ | ✔ | ✔ (No ACK TX) |
| | **Lone worker** | ✔ | ✔ | ✔ | ✔ | ✔ |
| | **Power OFF emergency** | ✔ | ✔ | ✔ | ✔ | ✔ |
| **Remote monitor/ Ambience listening** | | ✔ | ✔ | ✔ | ✔ (RX only) | ✔ (RX only) |
| **Radio security** | **Radio Kill/Stun/Revive** | ✔ | ✔ | ✔ | ✔ (RX only) | ✔ (RX only) |
| | **Power ON password** | ✔ | ✔ | ✔ | ✔ | ✔ |
| **Controller separation** | | ✔[*3] (RMK-5 or RMK-7 required) | ✔ (RMK-3 required) | – | – | – |

[*2] Default factory setting (protocol) differs, depending on radio model. [*3] IC-F5400D/F6400D (LCD version) only.



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