ICOM

dPMR™ — Digital Radio Solutions for Business

dPMR digital™

6.25 kHz FDMA
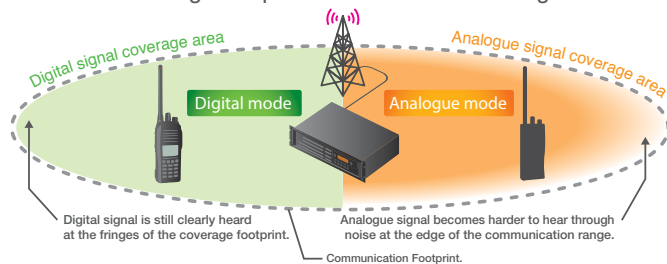*True RF Efficiency*

What is dPMR™?

dPMR is a 6.25 kHz FDMA based digital radio protocol described in the ETSI technical standards TS 102 490 and TS 102 658. The TS 102 490 standard defines dPMR 446 license-free radio and the TS 102 658 defines Mode 1 peer-to-peer mode, Mode 2 repeater mode and Mode 3 digital trunking. dPMR is specifically targeting highly functional solutions by using lower cost and less complex technology. Details of the dPMR protocol can be found on the dPMR Association website. (http://www.dpmr-mou.org)

ETSI Standards	Tier	Mode	Descriptions
TS 102 490	Tier 1	–	License-free (dPMR 446)
TS 102 658	Tier 2	Mode 1	Direct Peer-to-peer Mode
		Mode 2	Conventional Repeater Mode
		Mode 3	Digital Trunking Mode

The Digital Advantage

• Wider Communication Coverage

When compared to an analogue FM signal, digital easily out-performs analogue at the fringes of the communication range, thus providing more intelligible audio over a greater total area, even if the coverage footprint is the same as analogue FM.

Digital signal coverage area

Analogue signal coverage area

Digital mode

Analogue mode

Digital signal is still clearly heard at the fringes of the coverage footprint.

Analogue signal becomes harder to hear through noise at the edge of the communication range.

Communication Footprint.

• Better Audio Quality

dPMR radios incorporate the industry standard DVSI AMBE+2™ vocoder. The vocoder converts the analogue audio signal to a digital signal and reduces unwanted signals such as background noise and acoustic echo to deliver better voice quality and clarity.

• Secure Conversation

Using digital modulation, dPMR radios cannot be easily monitored with an analogue receiver. A 15-bit digital scrambler also adds to the enhanced security of dPMR radios.
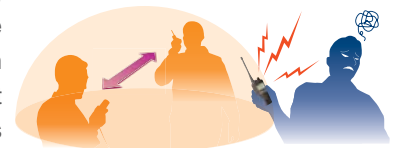
Cannot be easily monitored

• Flexible Migration and Upgrade Path

The dPMR system allows you to scale migration to a digital system at your own pace and needs, while running your existing system. If the radio users increase in the future, or you require expanded communication coverage, the dPMR conventional system can be upgraded to a multi-site system, or grow into a Mode 3 trunking system while using the same subscribers*. This provides investment protection for your communication system.
* Depending on radio model/firmware revision.

• IP Network Connectivity

Since the dPMR system uses digital signals, these can be easily converted and transferred to an IP network or IP based applications. This means an increase in communication coverage.

6.25 kHz FDMA *True* RF Efficiency

Why 6.25 kHz FDMA Narrowband?

True Narrowband: Reliable Communications for Half the Spectrum!

6.25 kHz FDMA allows you to double the capacity of your valued spectrum. The choice of two independent 6.25 kHz in 12.5 kHz, or a standalone 6.25 kHz channel is yours. This double capacity/independent channel flexibility and efficiency is only possible with 6.25 kHz FDMA.

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 realization of 6.25 kHz FDMA digital protocols that are literally ahead of their time, while keeping backward compatibility with analog FM.

dPMR™ Calling Features

Supplementary Service

Pre-emptive emergency: If all traffic channels are busy, this call service clears down the existing call and gives the highest priority. In a dPMR Mode 3 system, the network will attempt to connect this type of call as quickly as possible.

Ambience listening: The ambience listening function allows the dispatcher to turn on the PTT from a remote location and transmit anything the microphone hears for a preprogrammed period.

Remote kill: This function disables a lost or stolen radio over the air, eliminating security threats from undesired listeners.

Remote stun/revive: The remote stun function temporary locks out a radio until the revive command is received, or the user password is entered.

Call back (Radio function): Up to ten missed incoming calls can be stored to return the call later.

Call queue: If a called party or channel is busy, the call queue automatically connects the call when it becomes available.

Digital voice scrambler: A built-in digital voice scrambler provides about 32,000 codes scrambler for secure conversations.

ANI (Automatic Number Identification): The ANI function shows the alias ID number on the LCD while receiving a call, allowing the radio user to identify who is calling.

Late entry: If a group call is in progress when a member of the group turns on the radio or comes into the radio coverage area, this function shows the caller's name, and allows the user to join the conversation.

Voice Services

Individual call and group call: Radio to radio, radio to group and radio to all users calls are supported.

Broadcast call: One-way voice call to a pre-programmed talkgroup.

All call: Radio to all users calls.

Gateway call: This is any call through a gateway to or from line connected destinations such as Telephone or SIP Phones. External gateway device required.

Data Services

Short Data Message (SDM): A data service that supports a variety of standard formats – Binary Code, Text and GPS.

Status call: 32 preprogrammed status messages can be sent and received. The status call can be used as a trigger for special functions such as ambience listening, remote stun/kill/revive and GPS data delivery.

Transparent data call: This function uses a dPMR radio as a data modem allowing data communication on a 6.25 kHz channel such as for a remote telemetry system or data applications.

GPS data delivery: Sends GPS position data with Status, SDM and emergency calls. Position data can be used for GPS-based vehicle management applications.

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. Why look at anything else?

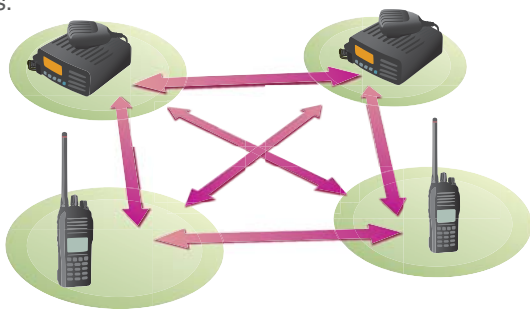| Features	Mode 3	Mode 1/2
Individual Call	✔	✔
Group Call	✔	✔
Broadcast Call	✔	✔
All Call	✔	✔
Gateway Call	✔	✔
Short Data Message (SDM)	✔	✔
Status Call	✔*	✔
Transparent Data Call	✔	✔
GPS Data Delivery	✔	✔
Emergency Call & Alert	✔	✔
Pre-emptive Emergency	✔	–
Ambience Listening	✔	✔
Remote Kill/Stun/Revive	✔	✔
Call Back* (* Radio function)	✔ (Maximum 10 stack)	–
Call Queue	✔	–
Digital Voice Scrambler* (* Radio function)	✔	✔
ANI* (* Radio function)	✔	✔
Late Entry to Group Call	✔	✔
Call Set-up	✔	✔

* Individual call only.

dPMR™ Conventional Modes
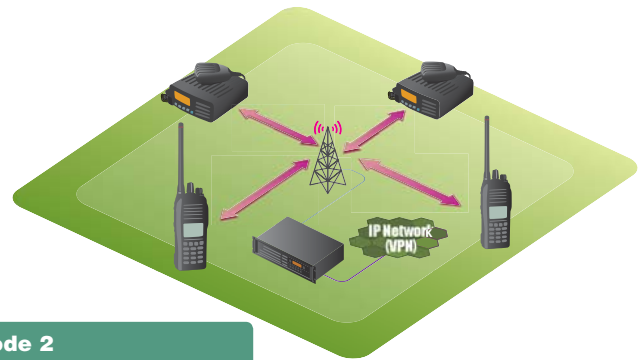
dPMR™ Conventional Mode (Mode 1/ Mode 2)

dPMR Mode 1 and Mode 2 are the digital conventional modes for small user systems and/or for low density traffic systems. Mode 1 is peer-to-peer communications and Mode 2 is repeater/infrastructure added to Mode 1.

The analogue PMR system users who are mainly running 5-Tone or BIIS signaling can easily migrate to the digital conventional mode. "Call setup and clear down" operation is implemented for familiarity for analogue users. dPMR radios are designed to coexist with analogue radio systems, and can receive both analogue and digital mode signals on a single channel.
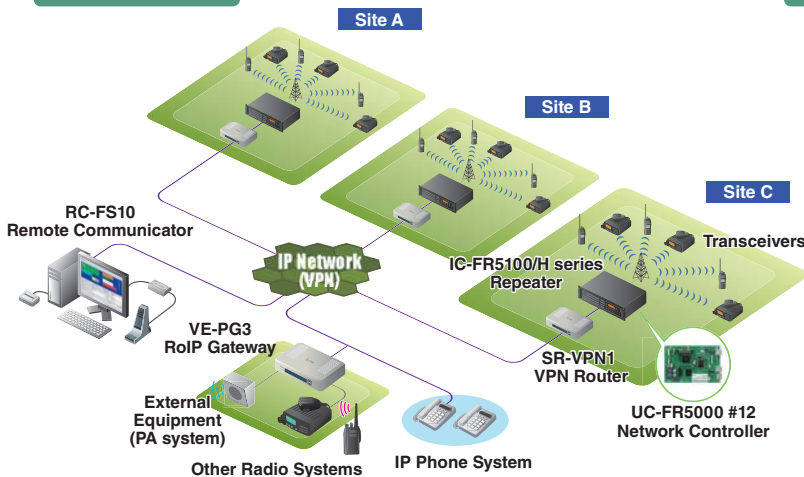
In Mode 2 conventional systems, up to 16 repeater sites can be interconnected over an IP network, and you can build low complexity multi-site systems.

Mode 1
Peer-to-peer mode

Mode 2
Conventional repeater mode

Site A

Site B

Site C

RC-FS10
Remote Communicator

IC-FR5100/H series
Repeater

Transceivers

IP Network
(VPN)

VE-PG3
RoIP Gateway

SR-VPN1
VPN Router

External
Equipment
(PA system)

Other Radio Systems

IP Phone System

UC-FR5000 #12
Network Controller

Mode 2
Conventional repeater mode with an IP network connection

Up to 16 repeater sites can be connected over an IP network.

- Flexible migration solution from analogue to digital
- Up to 16 repeater sites • Up to 60000 subscribers
- Web based system administration
   System software updates and configuration online
- Status call   • Data call (SDM)
- Transparent data call
- Digital/Analogue dual mode*
* VE-PG3 required to relay analogue voice traffic over the IP network.
- RC-FS10 creates a IP-based virtual radio station on a PC and works as a simple dispatch
- Interconnect with IP phone, analogue radio and IP advanced radio systems with the VE-PG3 RoIP gateway
- Voting scan function allows selection of a repeater from multiple repeater sites, depending on the RSSI level

Examples of dPMR™ End Users

The following are some examples of dPMR™ implementations around the world.

- Local governments (City councils)
- Humanitarian Users
- Utilities (Power Plants)
- SMR services

- Security/Prisons
- B&I Users (Manufacturers)
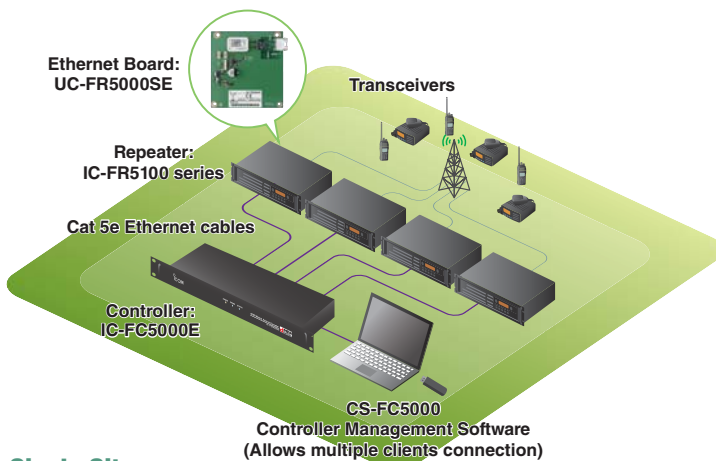- Airports/Transportation

dPMR™ Mode 3 Digital Trunking

dPMR™ Mode 3 Digital Trunking

In a dPMR Mode 3 digital trunking system, when a user requests a call through a dedicated control channel, the trunking controller automatically allocates one of the traffic channels and sets up the call. The system can accommodate a large number of users on a limited number of repeater channels with high efficiency. The System Control Software can interconnect multiple trunking controllers over an IP network, so the system can be expanded from a single site system to multiple sites and increases coverage.
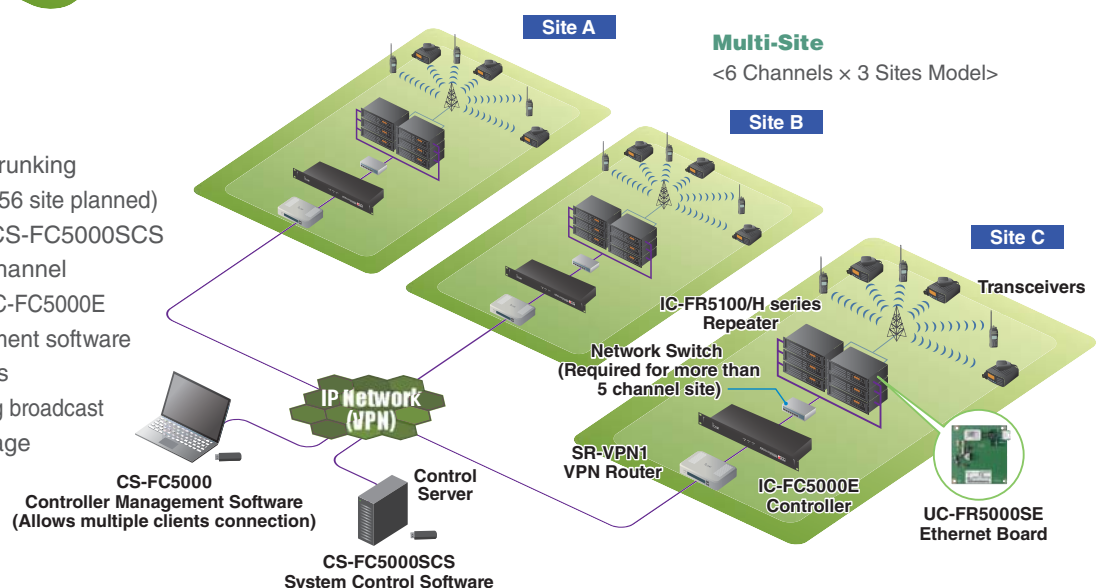
Ethernet Board:
UC-FR5000SE

Transceivers

Repeater:
IC-FR5100 series

Cat 5e Ethernet cables

Controller:
IC-FC5000E

CS-FC5000
Controller Management Software
(Allows multiple clients connection)

Single Site
<4 Channels × 1 Site Model>

- Up to 32 channels per site
- Minimum 2 channel single site trunking
- Up to 32 site multi-site trunking (256 site planned) with System Control Software, CS-FC5000SCS
- Channel license system. Four channel activation key is supplied with the IC-FC5000E
- CS-FC5000 web based management software allows to connect multiple clients
- Individual and group calls, including broadcast
- Status call   • Short data message
- Call Queuing
- Emergency Call with Pre-emption

Centralized Control Channel Trunking

The dPMR Mode 3 trunking system uses a centralized control channel system. The control channel is independent of the traffic channels and continuously transmits a control signal. The system allocates a traffic channel for the whole duration of a call and can provides quick response during a series of calls. The dPMR Mode 3 trunking system is suited to controlling a large number of users and congested traffic channels.

Site A

Multi-Site
<6 Channels × 3 Sites Model>

Site B

Site C

Transceivers

IC-FR5100/H series
Repeater

Network Switch
(Required for more than
5 channel site)

SR-VPN1
VPN Router

IC-FC5000E
Controller

UC-FR5000SE
Ethernet Board

IP Network
(VPN)

CS-FC5000
Controller Management Software
(Allows multiple clients connection)

Control
Server

CS-FC5000SCS
System Control Software

Continued Feature Enhancements (Planned)
In combination with various applications or external devices, the following services will be provided.
- Telephone interconnect   • 3rd party application interface   • Voice recording   • System administration enhancements
- 3rd party dispatcher/AVL interface and SDK

IC-F3400DPT   IC-F3400DPS   IC-F3400DP   IC-F3262DT   IC-F4262DS

VHF DIGITAL TRANSCEIVERS
IC–F3400DPT/DPS/DP (5 W)
UHF DIGITAL TRANSCEIVERS
IC–F4400DPT/DPS/DP (5 W)

IDAS™ TAKES YOU TO A NEW LEVEL OF "SMART"

VHF DIGITAL TRANSCEIVERS
IC–F3262DT/DS (5 W)
UHF DIGITAL TRANSCEIVERS
IC–F4262DT/DS (5 W)

ADVANCED DIGITAL RADIO WITH BUILT-IN GPS AND WATERPROOF

FEATURES

- **Small, slim and stylish with custom SoC (System-on-a-Chip)**
- **High resolution transreflective colour LCD**
- **Bluetooth® module for remote and hands-free operation**
- **dPMR™ Mode 1/2 digital and Mode 3 trunking with the upgrade licence**
- **OTAP (Over-the-Air-Programming) and OAA (Over-the-Air-Alias)***
- **IP68 waterproof (1 m depth water for 1 hour) and dust-tight**
* Optional software required.

• Motion/Stationary detection, man down and lone worker functions • Vibration alert • Audio equalizer and active noise canceling • Digital voice recording to a microSD card • USB port for PC connection • AquaQuake™ function • Menu and function item localization • Internal clock • Broadcast call • Ambience listening • Status call and short data message • Call back function for Mode 3 • Transparent data • Remote kill, stun and revive • Built-in 5-Tone, 2-Tone, CTCSS and DTCS • DTMF autodial memories and decoder • MDC 1200 compatible • BIIS 1200 functions
* Some functions will be available with future firmware upgrade.

Supplied Accessories
• Battery pack, BP-283 • Belt clip, MB-133
* May differ or not supplied, depending on version.

FEATURES

- **dPMR™ Mode 1/2 digital and Mode 3 trunking**
- **Integrated GPS receiver and man down functions***
- **IP67 waterproof and dust-tight**
- **Large full dot-matrix LCD with menu driven interface**
- **Transparent data modem function**
* Functions are not installed depending on version.

• Broadcast call • Ambience listening • Status call and short data message • Call back function for Mode 3 trunking • Remote kill, stun and revive • 14-pin accessory connector with amplifier output • Built-in 5-Tone, 2-Tone, CTCSS and DTCS • BIIS 1200 functions • Eight DTMF autodial memories • Inversion voice scrambler for analogue • Audio compander for analogue

Supplied Accessories
• Battery pack, BP-232WP • Belt clip, MB-94R • Antenna

5

IC-F1000D IC-F2000D

IC-F3102D IC-F4102D

IC-F3202DEX IC-F4202DEX

VHF DIGITAL TRANSCEIVER
IC−F1000D (5 W)

UHF DIGITAL TRANSCEIVER
IC−F2000D (4 W)

COMPACT, WATERPROOF DIGITAL BUSINESS RADIO

VHF HANDHELD TRANSCEIVER
IC−F3102D (5 W)

UHF HANDHELD TRANSCEIVER
IC−F4102D (4 W)

SIMPLE OPERATION FOR INSTANT COMMUNICATION

VHF DIGITAL TRANSCEIVER
IC−F3202DEX (1 W)

UHF DIGITAL TRANSCEIVER
IC−F4202DEX (1 W)

IECEx/ATEX INTRINSICALLY SAFE DIGITAL RADIO

Feature icons (IC-F1000D/F2000D): dPMR MODE 1 MODE 2 · 5-TONE CTCSS/DTCS FOR ANALOGUE · IP67 WATERPROOF & DUST-TIGHT · Rugged MIL-STD810 · 18 HOURS BATTERY LIFE (with BP-280) · MOTION/STATIONARY SENSOR · MAN DOWN, LONE WORKER · CHANNEL ANNOUNCEMENT

Feature icons (IC-F3102D/F4102D): dPMR MODE 1 MODE 2 · 5-TONE CTCSS/DTCS FOR ANALOGUE · IP54 WATERPROOF & DUST-TIGHT · Rugged MIL-STD810 · 17.5 HOURS BATTERY LIFE (with BP-265) · LONE WORKER FUNCTION · CHANNEL ANNOUNCEMENT

Feature icons (IC-F3202DEX/F4202DEX): dPMR MODE 1 MODE 2 · 5-TONE CTCSS/DTCS FOR ANALOGUE · IECEx/ATEX INTRINSICALLY SAFE · IP67 WATERPROOF & DUST-TIGHT · 19/21.5 HOURS BATTERY LIFE (with BP-277EX) · LONE WORKER FUNCTION · CHANNEL ANNOUNCEMENT

FEATURES

- dPMR™ Mode 1/2 digital and analogue
- Slim, compact and lightweight
- IP67 waterproof and dust-tight
- Motion/stationary detection, man down and lone worker functions
- Good audio for noisy environments

• Radio stun/kill/revive (RX) • Ambience listening • Status call (TX and RX beep) • Short data message (RX notification) • Voting scan • GPS position data with optional HM-171GPW • Built-in 2-Tone, 5-Tone, CTCSS and DTCS • BIIS 1200 PTT ID and emergency call • DTMF autodial

Supplied Accessories
• Battery pack, BP-280 • Desktop charger, BC-213
• AC adapter, BC-123SE/SUK* • Belt clip, MB-133 • Antenna
* May differ or not supplied, depending on version.

FEATURES

- dPMR™ Mode 1/2 digital and analogue
- Loud and clear audio
- 111.5 mm height compact body
- IP54 water resistance and dust-protection
- Channel announcement function

• Radio stun/kill/revive (RX) • Ambience listening (RX)
• Short data message / Status (RX beep) • MIL-STD rugged construction • GPS position data with optional HM-170GP • Lone worker function • Built-in 2-Tone, 5-Tone, CTCSS and DTCS • BIIS 1200 PTT ID • DTMF autodial • Internal VOX capability

Supplied Accessories
• Battery pack, BP-265 • Desktop charger, BC-193*
• AC adapter, BC-123SE* • Belt clip, MB-124 • Antenna
* May differ or not supplied, depending on version.

FEATURES

- **IEC Certifications**
  Mining : Ex ib I Mb   Gas : Ex ib IIC T4 Gb
  Dust   : Ex ib IIIC T110°C Db   −20°C≤Ta≤+55°C
- **ATEX Certifications**
  Mining : I M2 Ex ib I Mb   Gas : II 2G Ex ib IIC T4 Gb
  Dust   : II 2D Ex ib IIIC T110°C Db −20°C≤Ta≤+55°C
- **dPMR™ Mode 1/2 digital and analogue**

• Power ON/OFF status call (TX) • Radio stun/kill/revive (RX) • Ambience listening (RX) • Emergency (TX)
• Voting scan • Built-in 2-Tone, 5-Tone, CTCSS and DTCS • BIIS 1200 PTT ID transmission • DTMF autodial • Optional speaker-microphone, HM-203EX

Supplied Accessories
• Battery pack, BP-277EX • Desktop charger, BC-212EX
• AC adapter, BC-123SE/SUK* • Belt clip, MB-94EX • Antenna
* May differ depending on version.

Please ask your dealer to ensure the ATEX and IECEx ratings are acceptable for the intended place of use.
The IC-F3202DEX/F4202DEX Intrinsically Safe models should only be used with the specified Intrinsically Safe approved options.

dPMR™ Digital Mobile Radios

VHF DIGITAL TRANSCEIVER
IC‒F5400DP
(25 W, Colour LCD)

UHF DIGITAL TRANSCEIVER
IC‒F6400DP
(25 W, Colour LCD)

VHF DIGITAL TRANSCEIVER
IC‒F5400DPS
(25 W, Segment LCD)

UHF DIGITAL TRANSCEIVER
IC‒F6400DPS
(25 W, Segment LCD)

IC-F5400DP

IC-F5400DPS

IDAS™ TAKES YOU TO A NEW LEVEL OF "SMART"

| dPMR MODE 1 MODE 2 | MODE 3 TRUNKING TRUNKING UPGRADE | 5-TONE CTCSS / DTCS FOR ANALOGUE | IP55 DUST-PROTECTION & JET WATER RESISTANT | MIL-STD810 | CONTROLLER SEPARATION IC-F5400DP/ IC-F6400DP only | COLOUR COLOUR LCD IC-F5400DP/ IC-F6400DP only | LONE WORKER FUNCTION | INTEGRATED GPS | VOICE ANNOUNCEMENT | AUDIO EQUALIZER | ACTIVE NOISE CANCELING | VOICE RECORDING | OTAP / OAA | BLUETOOTH® |

FEATURES

- **High resolution colour LCD** (IC-F5400DP/F6400DP only.)
- **Bluetooth® module for remote and hands-free operation**
- **dPMR™ Mode 1/2 digital and Mode 3 trunking with the upgrade licence**
- **OTAP (Over-the-Air-Programming) and OAA (Over-the-Air-Alias)***
- **IP55 jet water resistance and dust-protection**
- **Optional detached controller, dual head or COMMANDMIC™ configurations** (IC-F5400DP/IC-F6400DP only.)

* Optional software required.

• Built-in GPS receiver (UX-241 GPS antenna required separately) • Lone worker function • Audio equalizer and active noise canceling • Digital voice recording to a microSD card • USB port for PC connection • Menu and function item localization • Ignition line • D-SUB 25-pin ACC connector • 20 W audio amplifier • Broadcast call • Ambience listening • Status call and short data message • Call back function for Mode 3 • Transparent data • Remote kill, stun and revive • Built-in 5-Tone, 2-Tone, CTCSS and DTCS • DTMF autodial memories and decoder • MDC 1200 compatible • BIIS 1200 functions
* Some functions will be available with future firmware upgrade.

Supplied Accessories
• Hand microphone, HM-221 • DC power cable • Mounting bracket kit • Microphone hanger

Multiple Controller Configurations

With a combination with optional separation kits, COMMANDMIC™ and separation cables, three types of controller configurations are available to suit almost any application or installation that may be required.

Detached Controller*
Optional RMK-5
and separation cable required.

A detached controller head with the separated RF unit is a simple to install in almost any vehicle.

Dual Head Controller*
Optional RMK-7, hand microphone
and separation cables required.

Suitable for double cab vehicles. Install the controller head to front and rear seats respectively.

COMMANDMIC™ and Detached Controller*
Optional RMK-5, COMMANDMIC, HM-218
and separation cables required.

The COMMANDMIC is handy for installing a work platform on the rear part of the vehicle.

* Detached Controller, Dual head and COMMANDMIC configurations are for IC-F5400DP/IC-F6400DP only.

dPMR™ Digital Radios

VHF DIGITAL TRANSCEIVER
IC−F5062D (25 W)

UHF DIGITAL TRANSCEIVER
IC−F6062D (25 W)

VERSATILE, MULTI-FUNCTION PROFESSIONAL

dPMR MODE 1 MODE 2 | **MODE 3 TRUNKING** (Depending on Version) | **5-TONE CTCSS / DTCS FOR ANALOGUE** | **Rugged MIL-STD810 MIL-STD810** | **CONTROLLER SEPARATION** | **LONE WORKER FUNCTION**

FEATURES

- **dPMR™ Mode 1/2 digital and Mode 3 trunking**
- **Large dot-matrix LCD with menu driven interface**
- **IP54 splash resistance and dust-protection** (Controller only)
- **Detachable front panel** (Optional RMK-3 and separation cable required)
- **D-SUB 25-pin accessory connector and ignition sensing**

• Broadcast call • Ambience listening • Status call and short data message • Transparent data call • Emergency call and alert • Remote kill, stun and revive • Built-in 5-Tone, 2-Tone, CTCSS and DTCS • Eight DTMF autodial • Optional voice scrambler UT-109R/UT-110R and built-in inversion voice scrambler for analogue mode • Ignition line

Supplied Accessories
• Hand microphone, HM-152 • DC power cable • Microphone hanger
• Mounting bracket kit • Key assign stickers

VHF DIGITAL TRANSCEIVER
IC−F5122D (25 W)

UHF DIGITAL TRANSCEIVER
IC−F6122D (25 W)

DIGITAL STANDARD MOBILE RADIO

dPMR MODE 1 MODE 2 | **5-TONE CTCSS / DTCS FOR ANALOGUE** | **Rugged MIL-STD810 MIL-STD810** | **LONE WORKER FUNCTION**

FEATURES

- **dPMR™ Mode 1/2 digital and analogue FM mode operation**
- **Digital/analogue mixed mode operation**
- **Front mounted speaker delivers clear and loud audio**
- **Built-in 5-Tone, 2-Tone, CTCSS and DTCS** (Analogue mode)
- **External memory channel control with optional ACC cable**

• Status call and data call (Short Data Message) • Transparent data call (Xon/Xoff) (Optional OPC-1939 or OPC-2078 required) • Remote kill, stun and revive (RX) • Ambient listening (RX) • Voting scan • BIIS PTT ID transmission • Eight DTMF autodial memories • Lone worker function • Surveillance function

Supplied Accessories
• Hand microphone, HM-152 • DC power cable • Microphone hanger
• Mounting bracket kit • Key assign stickers

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dPMR™ 446 Digital Licence-Free Radios

IC-F29DR

dPMR™ 446/PMR 446 TRANSCEIVER
IC−F29DR (500 mW ERP)

PROFESSIONAL DIGITAL LICENCE-FREE RADIO

dPMR 446 LICENCE-FREE DIGITAL | **PMR 446 LICENCE-FREE ANALOGUE** | **CTCSS DTCS FOR ANALOGUE** | **IP67 WATERPROOF & DUST-TIGHT** | **Rugged MIL-STD810 MIL-STD810** | **26 HOURS BATTERY LIFE (with BP-280)** | **CHANNEL ANNOUNCEMENT**

FEATURES

- **Digital: improved resistance to interference**
- **No licence is required to use the radio**
- **Compact and slim body (30.3 mm depth)**
- **IP67 waterproof and dust-tight**
- **11 km* coverage (wide open space)**

* Communication range will vary depending on terrain and conditions.

• Outstanding audio quality • 16-position rotary channel knob with voice announcement function • Call ring tone function • Operating channels are programmable in the field • PC programmable • Digital common ID, CTCSS and DTCS codes for group call • Power on scan

Supplied Accessories
• Battery pack, BP-280 • Desktop charger, BC-213
• AC adapter, BC-123SE/SUK* • Belt clip, MB-133
* May differ or not supplied, depending on version.

VIRTUAL RADIO / PC DISPATCH

REMOTE COMMUNICATOR
RC–FS10

dPMR MODE 2 | **ANALOGUE** VE-PG3 required

FEATURES

- **Remote communicator for dPMR™ Mode 2 and analogue radio system**
  VE-PG3 is required for analogue radio system.
- **Up to eight different dPMR Mode 2 and analogue radio systems can be programmed**
- **Up to 40 buttons programmable. Short data message, status and DTMF can be sent**
- **Caller ID, called ID, name and call type information are displayed**
- **Optional HM-154 or SM-26 microphone can be used with the RC-FS10**
  Optional CT-23 PTT microphone adapter is required

Supplied Accessories
- Installation CD • USB cable
- Digital converter, CT-24

RoIP GATEWAY
VE–PG3

Transceiver + IP Network

VERSATILE RADIO OVER IP GATEWAY

IP Advanced Radio System — IP Phone — Phone — RoIP (Radio over IP) — **Converter mode**
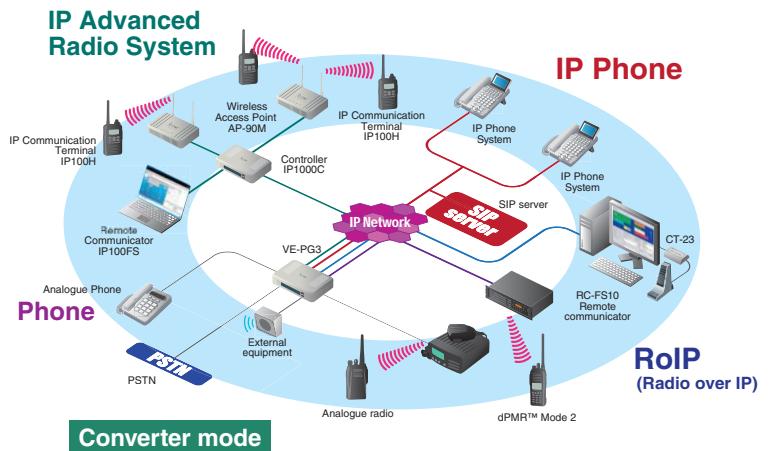
FEATURES

- **Interconnects between dPMR™ Mode 2, analogue radio and IP Advanced Radio System**
- **Telephone interconnection with IP phone and PSTN lines**
- **Cross band, cross category interconnection**
- **Public address, siren, warning light and external equipment connection**
- **Optional RC-FS10 software for virtual PC dispatch station**

• RoIP and SIP gateway functions • Direct dialing from radio user* (* Limited to radios with DTMF capability) • Optional CT-24 digital voice converter converts analog radio and G.711 μ-law codec to the AMBE+2™ codec for the IDAS radio system • The virtual serial port function for remote control connected analogue radios or equipment from a PC over the IP network • IP router function: PPPoE/IPv6 bridge, NAT, dynamic DNS, VPN pass through, IP filter, SNMP and SYSLOG • USB flash drive connection for firmware updates and data backup • Site-to-site bridge mode communication over the IP network • Site-to-multisite bridge mode communication using IP multicast network • Mixing audio function for bridge mode

Bridge mode
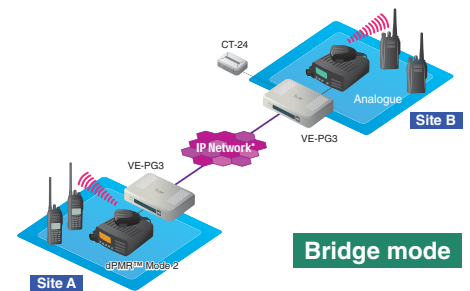
Supplied Accessories
- AC adapter, BC-207S • Ferrite core
- Spare quick connectors • Utility software CD

SIMPLE VPN ROUTER FOR RADIO OVER IP

VPN ROUTER
SR–VPN1

Transceiver + IP Network

SR-VPN1

Internet (VPN) — IDAS Site — SR-VPN1

FEATURES

- **Up to 32 IPsec VPN tunnels with 1000BASE-T gigabit Ethernet**
  Broadband IP connection is separately required for Internet connection.
- **3DES, AES-128, AES-192 or AES-256 encryption**
- **IPsec wizard provides simple step-by-step instructions**
- **IPv4 multicast routing for VE-PG3** • **Dynamic DNS client function**
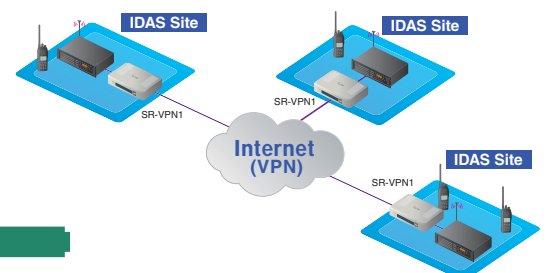
Supplied Accessory
- AC adapter, BC-207S

VHF REPEATERS
IC−FR5100 (25 W, 100% duty)
IC−FR5100H (50 W, 100% duty)

UHF REPEATERS
IC−FR6100 (25 W, 100% duty)
IC−FR6100H (50 W, 100% duty)

| dPMR MODE 1 MODE 2 | MODE 3 TRUNKING WITH IC-FC5000E | 5-TONE CTCSS/DTCS FOR ANALOGUE | 2U 2U RACK MOUNT | MIL-STD810 |

VALUE, PERFORMANCE AND FLEXIBILITY

FEATURES

- **dPMR™ Mode 2 digital and analogue FM with auto selection**
- **dPMR™ Mode 3 repeater for use with IC-FC5000E controller**
  Optional UC-FR5000SE required.
- **100% duty cycle operation**
  At 25°C ambient temperature.
- **"Two channels in one box" configuration for IC-FR5000/FR6000**
  Optional UR-FR5100/UR-FR6100 required.

• 32 channel capacity • 2U height rack mount design • Base station operation for Analogue and dPMR Mode 2 operation • D-SUB 25-pin accessory connector • CW-ID transmission • Built-in 5-tone, CTCSS and DTCS • Optional voice scrambler UT-109R/UT-110R and built-in voice scrambler • DTMF encode and decode • IC-FR6200H: high power, full duty repeater with heatsink chassis version (Export version)

Supplied Accessories
• DC power cable • Key assign stickers

Options

UR-FR5100 (136–174MHz, 25 W)
UR-FR6100 (400–470MHz, 25 W)
CHANNEL MODULES

UR-PA5000 (VHF 50 W, 100% duty),
UR-PA6000 (UHF 50 W, 100% duty)
POWER AMPLIFIERS
(Already built-in to IC-FR5100H/IC-FR6100H)

OPC-2202 CONNECTION CABLE
Connect between the repeater and the PA unit.

UC-FR5000 (#12)
NETWORK CONTROLLER
For dPMR Mode 2 multi-site networking
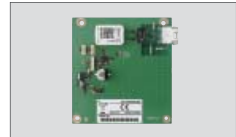
UC-FR5000SE
ETHERNET BOARD
Required for each repeater to connect with IC-FC5000E

dPMR™ MODE 3 EXTERNAL CONTROLLER
IC−FC5000E

dPMR™ MODE 3 TRUNKING CONTROLLER

| MODE 3 TRUNKING | 1U 1U RACK MOUNT |

FEATURES

- **Spectrum efficient centralized control channel trunking**
- **Up to 32 channels per site**
  (One control channel, up to 31 traffic channels)
- **Up to 32 site multi-site trunking (256 site planned) with CS-FC5000SCS system control software**
- **Four Channel licence activation key is supplied with the controller**
  Additional channel activation key is required when deploying five or more channels in a site
- **Call queuing and emergency call with pre-emption**

• CS-FC5000 web based management software • Firmware update over an IP network • Remote reboot of the trunking controller over an IP network • Repeater anomaly detection and alert • A traffic channel can be configured as a secondary control channel • 1U (44 mm) rack mount

Supplied Accessories
• DC power cable

Function Comparison Chart

	IC-F3400DPT/DPS/DP IC-F4400DPT/DPS/DP	IC-F3262DT/DS IC-F4262DT/DS	IC-F1000D IC-F2000D	IC-F3202DEX IC-F4202DEX	IC-F3102D IC-F4102D	IC-F5400DP/DPS IC-F6400DP/DPS	IC-F5062D IC-F6062D	IC-F5122D IC-F6122D	RC-FS10
Frequency coverage	136–174 MHz	136–174 MHz	136–174 MHz	136–174 MHz	136–174 MHz	136–174 MHz	136–174 MHz	136–174 MHz	–
	380–470 MHz	400–470 MHz	400–470 MHz	400–470 MHz	400–470 MHz	380–470 MHz	400–470 MHz	400–470 MHz	–
Number of channels	4000/1024 channels*1 128 zones	512 channels 128 zones	128 channels*2	16 channels	16 channels	4000/1024 channels*3 128 zones	512 channels 128 zones	128 channels 8 zones	–
Dimensions (W × H × D; Projections are not included)	53.6 × 123.5 × 29.3 mm (with BP-283)	53.5 × 142.7 × 39.5 mm (with BP-232WP)	52.2 × 111.8 × 30.3 mm (with BP-280)	63 × 144 × 50 mm (with BP-277EX)	58 × 111.5 × 36.5 mm (with BP-265)	174 × 55 × 150 mm	160 × 45 × 150 mm	150 × 40 × 117.5 mm	
Weight (approx.)	300 g (With BP-283, belt clip & FA-S81US)	410 g (VHF) 400 g (UHF) (with BP-232WP, belt clip & ant.)	260 g (with BP-280 & belt clip)	466 g (VHF) 460 g (UHF) (with BP-277EX, belt clip & ant.)	320 g (VHF) 310 g (UHF) (with BP-265, belt clip & ant.)	1.5 kg	1.3 kg	800 g	
RF output power (High)	5 W	5 W	5 W (VHF), 4 W (UHF)	1 W	5 W (VHF), 4 W (UHF)	25 W	25 W	25 W	–
dPMR™ Mode 1/ Mode 2	✔	✔	✔	✔	✔	✔	✔	✔	✔
Mode 2 Multi-site	✔	✔	✔	✔	✔	✔	✔	✔	✔
Mode 3	✔ (Upgrade licence required)	✔ (Depending on version)	–	–	–	✔ (Upgrade licence required)	✔ (Depending on version)	–	–
Digital/Analog Mixed Mode (Mode1/2)	✔	✔	✔	✔	✔	✔	✔	✔	–
OTAP	✔	–	–	–	–	✔	–	–	–
OAA	✔	–	–	–	–	✔	–	–	–
Number of Call ID List	✔ (Max. 1000 ID)	✔ (Max. 500 ID)	✔ (Max. 500 ID)	✔ (Max. 500 ID)	✔ (Max. 500 ID)	✔ (Max. 1000 ID)	✔ (Max. 500 ID)	✔ (Max. 500 ID)	✔ (Max. 1000 ID)
Group call	✔	✔	✔	✔	✔	✔	✔	✔	✔
Individual call	✔	✔	✔	✔	✔	✔	✔	✔	✔
All call	✔	✔	✔	✔	✔	✔	✔	✔	✔
ANI	✔	✔	TX only	TX only	TX only	✔	✔	✔	✔
Data call	✔	✔	✔	✔	✔	✔	✔	✔	✔
SDM (Short Data Message)	✔	✔	–	–	–	✔	✔	✔	✔
Transparent modem	✔	✔	–	–	–	✔	✔	✔	–
GPS	✔	✔	✔	–	✔	✔	✔	✔	RX only
Status call	✔	✔	TX only	TX only	TX only	✔	✔	✔	✔
Power ON/OFF status call	✔	✔	✔	✔	✔	✔	✔	✔	–
GPS request status	✔	✔	RX only	RX only	RX only	✔	✔	✔	TX only
Status poll	✔	✔	✔	✔	✔	✔	✔	✔	✔
Emergency call & alert	✔	✔	✔ (No ACK TX)	✔ (No ACK TX)	✔ (No ACK TX)	✔	✔	✔ (No ACK TX)	✔
Emergency type	Emergency, Lone worker, Man Down, Stationary, Motion	Emergency, Lone worker, Man Down	Emergency, Lone worker, Man Down, Stationary, Motion	Emergency, Lone worker	Emergency, Lone worker	Emergency, Lone worker	Emergency, Lone worker	Emergency, Lone worker	Emergency
Pre-emptive emergency (Mode 3)	✔	✔	–	–	–	✔	✔	–	–
Ambience Listening	✔	✔	RX only	RX only	RX only	✔	✔	RX only	TX only
Remote Stun/Revive/Kill	✔	✔	RX only	RX only	RX only	✔	✔	RX only	TX only
DTMF dialling call	✔	✔	✔	✔	✔	✔	✔	✔	✔
Late Entry	✔	✔	✔	✔	✔	✔	✔	✔	✔
Call back (Mode 3)	✔	✔	–	–	–	✔	✔	–	–
Digital Voice Scrambler	✔	✔	✔	✔	✔	✔	✔	✔	✔
Call log	✔	✔	–	–	–	✔	✔	✔	✔
Incoming history	10	5	–	–	–	10	5	–	50
Outgoing history	10	5	–	–	–	10	5	–	50
GPS receiver	Built-in	Built-in (Depending on version)	HM-171GPW required	–	HM-171GP required	Built-in (UX-241 GPS antenna required)	External GPS receiver required	External GPS receiver required	–

*1 Upgrade licence required to enable 4000 channel capacity. IC-F3400DP/F4400DP (Non-LCD type): Up to 32 selected channels out of 1024 can be allocated to the channel knob.
*2 Up to 16 selected channels out of 128 can be allocated to the channel knob.
*3 Upgrade licence required to enable 4000 channel capacity. IC-F5400DPS/F6400DPS (Segment type display): Channel indication is possible for up to 99 selected channels out of 1024.