

# IDAS™ dPMR™ Features

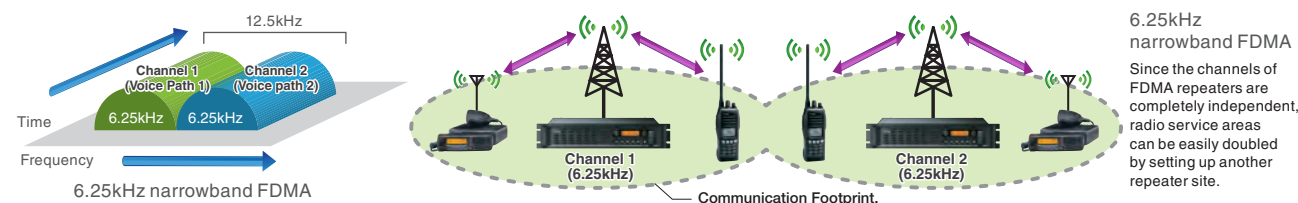


## 6.25kHz narrowband FDMA technology

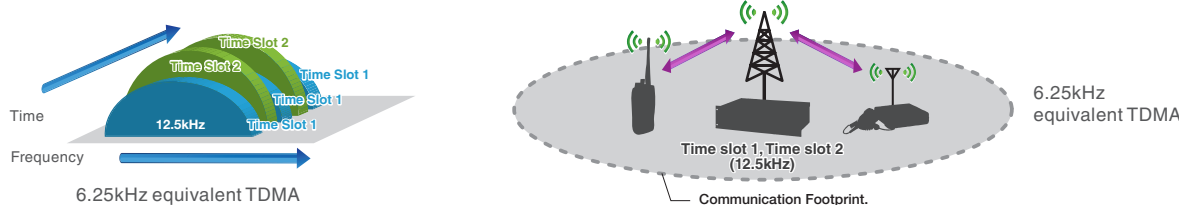
IDAS dPMR radios only use 6.25kHz per channel. In general, the narrower the channel, the better the sensitivity becomes, and longer communication ranges can be obtained. Where installation conditions allow, FDMA system can be deploy two repeater sites using two 6.25kHz channels to greater increase

the communication coverage in total, but still only using 6.25kHz spectrum. The spectrum efficiency of FDMA is maintained in direct peer-to-peer communication at 6.25kHz, where competing TDMA systems require infrastructure to achieve the same efficiency.

### FDMA

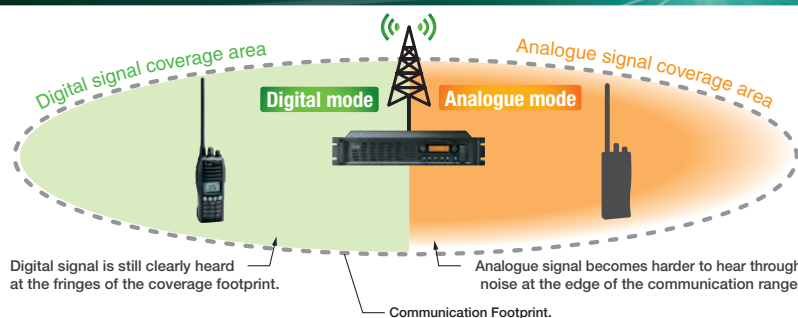


### TDMA



## Digital signal coverage

When comparing digital with analogue FM, the audio quality of analogue FM gradually deteriorates with static noise as the distance increases. On the other hand, IDAS dPMR digital audio provides static noise free, stable audio for longer until the fringes of the communication range.



## Digital / analogue mixed mode operation

IDAS dPMR radios have built-in CTCSS/DTCS, 5-Tone and BIIS 1200 signalings and are designed to coexist with analogue radio systems. IDAS dPMR radios can receive both analogue and dig-

ital mode signals on a single channel. When receives an analogue call on a channel set to "Mixed-digital", the analogue talk back function allows you to reply to the call in the analogue mode.

## Selective call and group call

IDAS dPMR radios allow you to call individual or group users. The way of call set-up is similar to the analogue BIIS 1200 system. Analogue users can introduce IDAS dPMR without hesitation or a new learning curve with these new radios.

## Data communication

IDAS dPMR radios provide status call, short data messages and GPS position data with voice communication. When IDAS dPMR radios are connected to a PC or other external equipment, the IDAS dPMR transparent data mode provides up to 3,600 bps data communication in a 6.25kHz channel.

## SPECIFICATIONS

		IC-FR5100	IC-FR6100	IC-F3162DT/DS	IC-F4162DT/DS	IC-F5062D	IC-F6062D
		IC-FR5100	IC-FR6100	IC-F3162DT/DS	IC-F4162DT/DS	IC-F5062D	IC-F6062D
GENERAL	Frequency coverage	136-174MHz	400-470MHz	136-174MHz	400-470MHz	136-174MHz	400-470MHz
	Number of channels	Max. 32 channels		Max. 512 channels/128 zones		Max. 512 channels/128 zones	
	Type of emission	16K0F3E, 14K0F3E, 8K50F3E, 4K00F1E, 4K00F1D, 4K00F3E		16K0F3E, 14K0F3E, 8K50F3E, 4K00F1E, 4K00F1D		16K0F3E, 14K0F3E, 8K50F3E, 4K00F1E, 4K00F1D	
	Channel spacing	6.25kHz/12.5kHz/20kHz/25kHz		6.25kHz/12.5kHz/20kHz/25kHz		6.25kHz/12.5kHz/20kHz/25kHz	
	PLL channel step	2.5kHz, 3.125kHz		2.5kHz, 3.125kHz		2.5kHz, 3.125kHz	
	Power supply requirement	13.2V DC		7.2V DC (nominal)		13.2V DC	
	Current drain (approx.)						
	Tx High	8.0A	7.0A	1.5A	1.8A	7.0A	7.0A
	Rx Max. audio	1.9A	1.9A	600mA	600mA	1.2A	1.2A
	Standby	400mA (Fan, backlight off)	400mA (Fan, backlight off)	150mA	140mA	300mA	300mA
TRANSMITTER	Antenna impedance	50Ω (Type-N × 2)		50Ω		50Ω (SO-239)	
	Operating temperature range	-25°C to +55°C		-25°C to +55°C		-25°C to +55°C	
	Dimensions (W×H×D) (Projections not included)	483×88×260 mm		53×136×38.5 mm (with BP-232N)		160×45×150 mm	
	Weight (approx.)	5.6kg (approx.)		340g (approx.) (with BP-232N)		1.3kg (approx.)	
	Output power (Hi/Low2/Low1 power)	25W/10W/2.5W (adjustable to 2.5W)		5W/2W/1W		25W/10W/2.5W	
	100% duty cycle						
	Max. frequency deviation	±5.0/4.0/2.5kHz (W/M/N)		±5.0/4.0/2.5kHz (W/M/N)		±5.0/4.0/2.5kHz (W/M/N)	
	Frequency stability	±0.2kHz	±0.5kHz			±1.5kHz	
	Spurious emissions	0.25μW (≤1GHz) 1.0μW (>1GHz)		0.25μW (≤1GHz) 1.0μW (>1GHz)		0.25μW (≤1GHz) 1.0μW (>1GHz)	
	Audio harmonic distortion (AF 1kHz 40% deviation)	1% typ. (40% deviation)		3% typ. (40% deviation)		3% typ. (40% deviation)	
RECEIVER	Ext. microphone connector	8-pin modular (600Ω)		9-pin multi-connector (2.2kΩ)		8-pin modular (600Ω)	
	Sensitivity						
	FM (at 20dB SINAD)	-4dBμV typ.		-4dBμV typ.		-4dBμV typ.	
	Digital (emf, at 5% BER)	-6dBμV typ.		-8dBμV typ.		-8dBμV typ.	
	Adjacent channel selectivity	86/83/77dB typ. (W/M/N) 67dB typ. (digital)	80/78/70dB typ. (W/M/N) 45dB min. (digital)	75/75/68dB typ. (W/M/N)		85/83/75dB typ. (W/M/N)	
	Spurious response rejection	80dB typ. (W/M/N) 90dBμV typ. (digital, emf)	70dB min. (W/M/N) 70dBμV min. (digital, emf)	70dB min. (W/M/N)		90dB typ. (W/M/N)	
	Intermodulation rejection	72/72/71dB typ. (W/M/N) 76dBμV typ. (digital, emf)	70dB typ. (W/M/N) 71dBμV min. (digital, emf)	67dB typ. (W/M/N)		70dB typ. (W/M/N)	
	Audio output power (at 5% distortion)	3.5W min. with a 4Ω load		500mW typ. with an 8Ω load		4.0W typ. with a 4Ω load	
	Ext. speaker connector	2-conductor 3.5 (d) mm/4Ω		9-pin multi-connector (8Ω)		2-conductor 3.5 (d) mm/4Ω	

Measurements made in accordance with EN 300 086 (analogue), EN 301 166 (digital). All stated specifications are subject to change without notice or obligation.

## FUNCTION COMPARISON

Features	IC-FR5100 IC-FR6100	IC-F3162DT/DS IC-F4162DT/DS	IC-F5062D IC-F6062D
Individual / Group Call	✓	✓	✓
All Group Call	✓	✓	✓
Digital & Analogue Mixed Mode Operation	✓	✓	✓
Digital & Analogue Mixed Mode Scan	✓	✓	✓
Talk Around	—	—	—
Repeater simplex use (Base station use)	✓	—	—
IP Network connection	(with UC-FR5000)	—	—
Emergency Call	Rx only	✓	✓
Radio Stun/Kill/Revive	Tx only	✓	✓
GPS position data with voice/Status/Short data message	Rx only	✓	✓

Features	IC-FR5100 IC-FR6100	IC-F3162DT/DS IC-F4162DT/DS	IC-F5062D IC-F6062D
Short Data Message (12/100-character)	✓	✓	✓
Status Message (32-Status)	✓	✓	✓
Transparent Data Mode	✓	✓	✓
Digital Colour Code (64-Code)	✓	✓	✓
Digital Voice Scrambler (15-bit key)	✓	✓	✓
Analogue Voice Scrambler			
Inversion type	✓ (built-in)	✓ (built-in)	✓ (built-in)
Rolling/Non-rolling type	✓ (with UT-110R/UT-109R)	✓ (with UT-110R/UT-109R)	✓ (with UT-110R/UT-109R)
5-TONE Encode/Decode (Analogue)	—	✓	✓
BIIS1200 Encode/Decode (Analogue)	—	✓	✓
CTCSS/DTCS Encode/Decode (Analogue)	✓	✓	✓

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**dPMR.™ It's here!**  
**IDAS™ — The ETSI dPMR™ standard**  
**<Tier II> compatible**





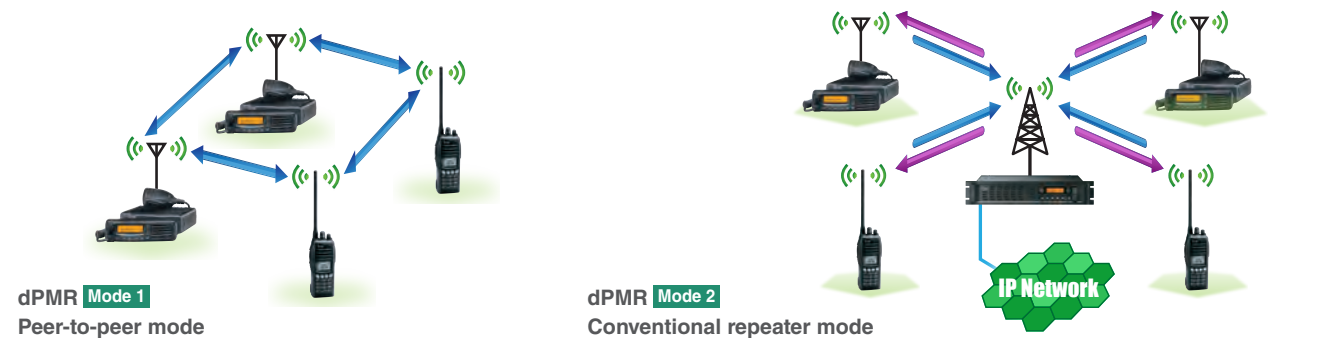


## dPMR™ Introduction and History

dPMR stands for “digital Private Mobile Radio” and it is an open standard digital radio protocol published by the European Telecommunications Standards Institute (ETSI). dPMR utilizes 6.25kHz narrowband FDMA technology with the AMBE+2™ voice codec that offers many forms of voice and data applications. The dPMR standard (TS 102 658) has three operating modes:

**Mode 1** Direct peer-to-peer mode   **Mode 2** Conventional repeater mode   **Mode 3** Centralized trunked network mode

IDAS dPMR products support basic conventional Mode 1 and Mode 2 operation at this stage.



### dPMR™ MoU (Memorandum of Understanding) Group

The dPMR standard is delivered by the initial responsibility of the dPMR MoU group under the mandate of ETSI. The dPMR MoU group selected the standard vocoder and will perform interoperability and conformance testing using ETSI standards.

Through the evaluation testing, dPMR equipments will interoperate with each other, ensuring longevity of the system and a good return on investment.

### dPMR™ history and evolution

December 2005	dPMR 446 Tier 1 standard (TS 102 490) was published by ETSI based on the output of their TG-DMR working group
February 2006	The first dPMR446 compatible radio, IC-F4029SDR released
March 2007	dPMR MoU group was founded with the first member companies
September 2008	Four new members joined the dPMR MoU group for a total of nine members
December 2008	dPMR standard (TS 102 658) was published
November 2009	dPMR interoperability and conformance testing standards (TS 102 726) were published
July 2010	The first dPMR Tier 2 standard radios, IDAS dPMR radios released

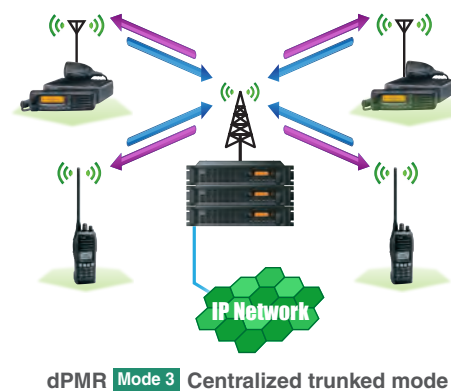
### dPMR™ mode 3

The dPMR standard also defines a centralized trunked network mode (Mode 3) similar to the analogue MPT 1327 trunking in configuration and operation. \*

#### dPMR mode 3 will support

- Multi-channel, multi-site digital radio networks managed by centralized control channels
- Call queue management using priority call and emergency call
- Call diversion to another radio
- Radio authentication service

\*IDAS dPMR products support basic conventional Mode 1 and Mode 2 operation at this stage.



### VHF DIGITAL/ANALOGUE REPEATER IC-FR5100

### UHF DIGITAL/ANALOGUE REPEATER IC-FR6100



25W

#### Features

- Frequency coverage : 136–174MHz, 400–470MHz
- Number of channels : Max. 32 channels
- 19-inch rack mount design, 2U height low profile design
- 12-digit dot-matrix display and 32 memory channels
- IDAS dPMR mode and analog FM mode, mixed mode operation
- Multiple CTCSS, DTCS tone and digital Colour code decode
- 25W output power at 100% duty operation
- ±0.5ppm high stability oscillator
- “2 channel in 1 box” configuration (Optional UR-FR5100/UR-FR6100 required)
- 5-Tone and DTMF encoder/decoder (5-Tone is for analogue FM mode)
- D-Sub 25-pin accessory connector for connecting analogue trunking controllers or other external devices
- Audio compander (For analogue FM mode)
- Built-in inversion type voice scrambler and optional UT-109R/UT-110R for higher security (For analogue FM mode)
- CW ID transmitter

#### Options



UC-FR5000 (#12)  
IDAS dPMR Network Controller  
For IDAS dPMR IP networking



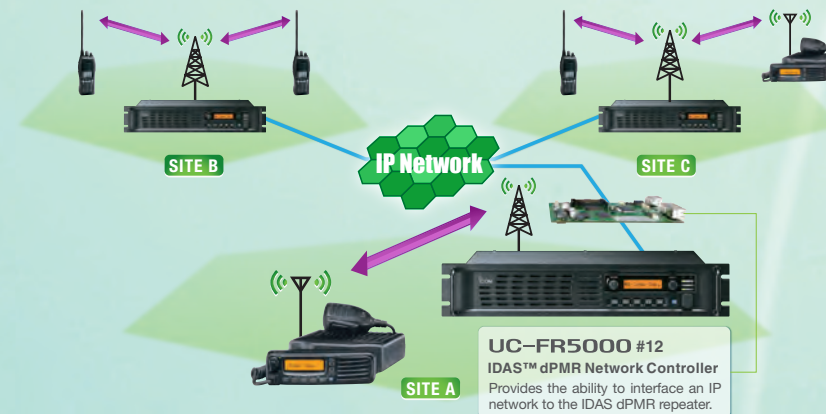
UR-FR5100 (136–174MHz)  
UR-FR6100 (400–470MHz)  
Channel Modules



Two RF units can be installed in the unit. (Left side is an option.)

### Communication link for distant locations

An IDAS dPMR IP network can extend your communication coverage and allows you to communicate like a single site. It lets you connect dispersed sites or different bands over the IP network. In a building all the way from the basement to the top floor, radio communication can be covered using already deployed LAN cables.



### Up to 16 IDAS™ dPMR™ repeater connection

With the optional UC-FR5000 (#12), up to 16 IDAS repeaters can be interlinked with each other. An IDAS terminal radio user can communicate with other IDAS terminal radio users using the inter-linked repeater sites on the network.

\*The IDAS conventional IP network cannot relay voice traffic over the IP network if the uplink is analogue.

### Low bandwidth requirement

By using the AMBE+2™ vocoder compression, an IDAS dPMR IP network requires only about 13kbps bandwidth per one voice path in theory. It means a DSL class line is sufficient for the IDAS

### Integrated system for clean and simple installation

The IDAS dPMR IP network requires only the UC-FR5000 (#12) network controller which can be installed into the IC-FR5100 series repeater – no control server and no extra rack space is required. In addition, the repeater and network controller settings can be remotely maintained and monitored over an IP connected PC.

dPMR IP network in terms of the Internet connection speed. A fixed IP address is required for each networked repeater.

### VHF DIGITAL/ANALOGUE TRANSCEIVERS

### IC-F3162DT IC-F3162DS

### UHF DIGITAL/ANALOGUE TRANSCEIVERS

### IC-F4162DT IC-F4162DS

#### Features

- Frequency coverage: 136–174MHz, 400–470MHz
- Compatibility with dPMR mode 1/2
- IDAS dPMR and analog FM mixed mode operations
- 512 memory channels with 128 zones
- Dot matrix, multi-function LCD
- Large capacity Lithium-Ion battery pack
- Dust-protection and waterjet resistance equivalent to IP55
- MIL-STD rugged construction
- 5W RF output power (VHF and UHF)
- Operating time: 14 hours\* (approx. with BP-232N battery pack)  
\* Tx: Rx: standby=5:5:90. Power save on. (at 20°C)
- Loud speaker audio with BTL amplifier
- Audio compander (For analogue FM mode)
- 32 status message memories with ambience listening, radio stun/kill/revive functions (For IDAS dPMR mode)
- Up to 100 characters short data message memories (For IDAS dPMR mode)
- Built-in 5-Tone/CTCSS/DTCS/BISS 1200 signaling (For analogue FM mode)
- 8 DTMF autodial memories
- Built-in inversion type voice scrambler and optional UT-109R/ UT-110R for higher security (For analogue FM mode)
- Optional GPS speaker-microphone for sending position data
- Voting scan automatically selects the strongest station or the first station to exceed the preset signal level



### VHF DIGITAL/ANALOGUE TRANSCEIVER

### IC-F5062D

### UHF DIGITAL/ANALOGUE TRANSCEIVER

### IC-F6062D

#### Features

- Frequency coverage: 136–174MHz, 400–470MHz
- Compatibility with dPMR mode 1/2
- IDAS dPMR and analog FM mixed mode operations
- 512 memory channels with 128 zones
- Large dot matrix display and multi-function LCD
- Detachable front panel with optional RMK-3 and separation cable
- D-Sub 25-pin accessory connector and ignition sensing line
- 25W RF output power
- IP54 dust-protection and splash resistance (Front panel only)
- MIL-STD rugged construction
- Front mounted loud speaker and audio compander for analogue FM mode
- 32 status message memories with ambience listening, radio stun/kill/revive functions (For IDAS dPMR mode)
- Up to 100 characters short data message memories (For IDAS dPMR mode)
- Built-in 5-Tone/CTCSS/DTCS/BISS 1200 signaling (For analogue FM mode)
- 8 DTMF autodial memories
- Built-in inversion type voice scrambler and optional UT-109R/UT-110R for higher security (For analogue FM mode)
- Voting scan automatically selects the strongest station or the first station to exceed the preset signal level

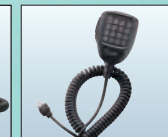


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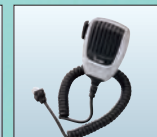
Some options may not be available in some countries.



SM-26  
Desktop Microphone



HM-152T  
DTMF Microphone



HM-148G  
Hand Microphone



SP-30  
External Speaker



RMK-3  
Separation Kit



OPC-609  
Separation Cable  
(1.9m)