ICOM

IDAS™
ICOM DIGITAL ADVANCED SYSTEM

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Now with **Trunking**

iDAS™
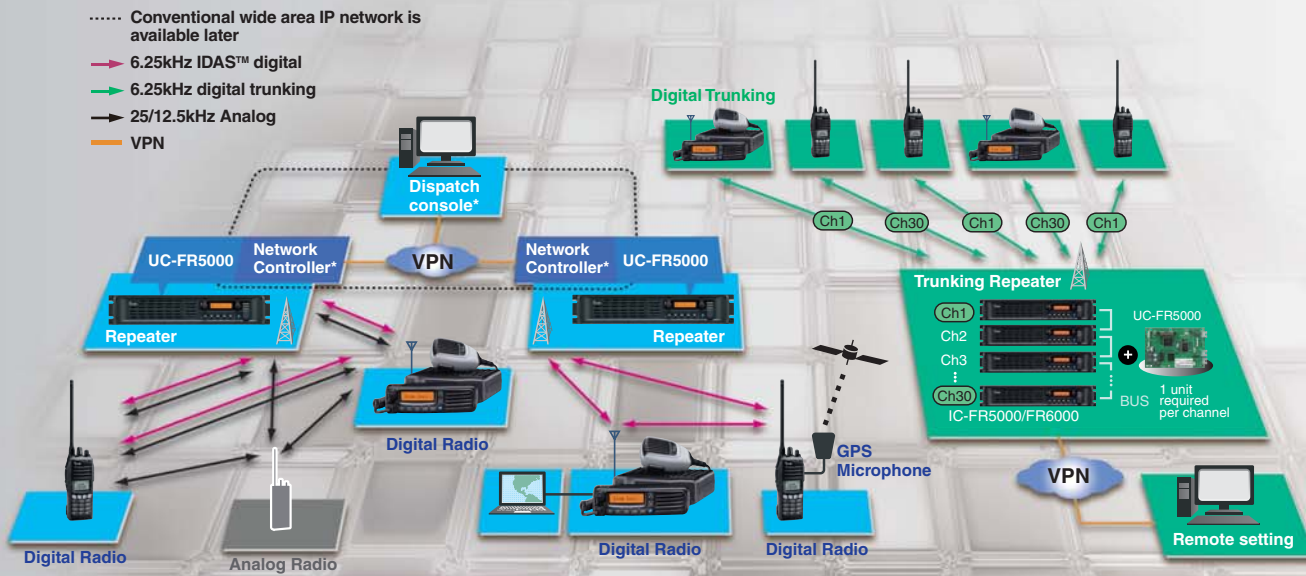## ICOM DIGITAL ADVANCED SYSTEM

The IDAS™ system bridges the gap between analog and digital

IDAS™ is Icom's digital land mobile radio system using the conventional NXDN™ common air interface. Useful calling features including selective calling, status message, radio stun/kill/revive, GPS position reporting, and more. Make the IDAS™ system ideal for business and industry users who are thinking to migrate to a digital system, and hence to future mandated narrow channel spacing.

Legend:
- ······ Conventional wide area IP network is available later
- → 6.25kHz IDAS™ digital
- → 6.25kHz digital trunking
- → 25/12.5kHz Analog
- — VPN

Diagram labels:
- Dispatch console*
- Network Controller*
- UC-FR5000
- VPN
- Repeater
- Digital Radio
- Analog Radio
- Digital Radio
- Digital Radio
- Digital Radio
- GPS Microphone
- Digital Trunking
- Ch1 Ch30 Ch1 Ch30 Ch1
- Trunking Repeater
- Ch1 Ch2 Ch3 ... Ch30
- IC-FR5000/FR6000
- UC-FR5000
- BUS 1 unit required per channel
- VPN
- Remote setting

The above is a system image only. Actual release timing and system capabilities are still to be decided.

Flexible migration path from analog to digital

The IC-FR5000 series can receive both analog and digital mode signals on a single channel. You can partially introduce IDAS™ digital radios, while still maintaining the existing analog radios in the system.

Spectrum efficiency

The IDAS™ system utilizes 6.25kHz narrow channel spacing. This system is not only spectrum efficient but meets the 2011 deadline for narrow band compliance.

Improved audio quality and coverage

Enjoy low noise audio over a greater comparable area to analog FM. The IDAS™ radio uses the AMBE+2™ codec the latest evolution in vocoding technology.

IDAS™ trunking with optional UC-FR5000

The optional UC-FR5000 offers single site digital trunking capability for effective channel management. Its distributed system (similar to analog LTR™ trunking) does not require a dedicated control channel. Up to 30 channels (RF units) per site can be set up.

Flexible IP network possibilities

Being digital, integration and convergence with IP technology will be possible soon to enhance the basic system.

IDAS™ Conventional Features

UC-FR5000 | Network Controller*
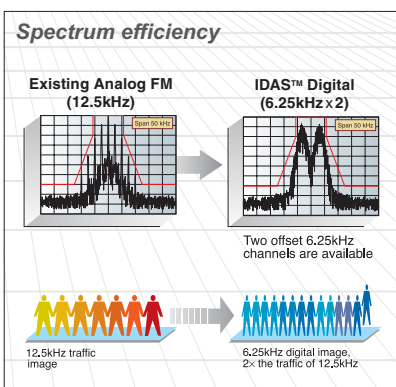
Repeater

Digital Radio | Analog Radio

Digital/analog mixed mode operation

The IDAS™ radio can receive both analog mode and digital mode signals on a single channel. You can partially introduce the IDAS™ radios, while using the existing analog radios in a system. The IDAS™ system allows you to scale migration to narrow band digital at your own pace and needs, while running your existing analog system. It is a cost efficient way to obtain the next generation in two way radio technology, while protecting your current system investment.

Digital/analog mixed mode operation

Repeater / Base station

Analog Radio

Digital Radio

Digital Radio

→ Digital
→ Analog
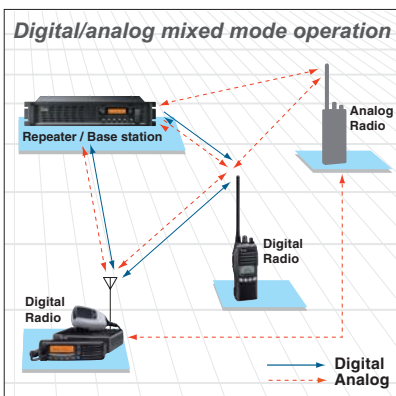
Spectrum efficiency

As explained, the IDAS™ system allows you to meet any narrow banding requirements today, and provides a solution to any future spectrum deficiency now.

Spectrum efficiency

Existing Analog FM
(12.5kHz)

IDAS™ Digital
(6.25kHz x 2)

Span 50 kHz

Span 50 kHz

Two offset 6.25kHz channels are available

12.5kHz traffic image

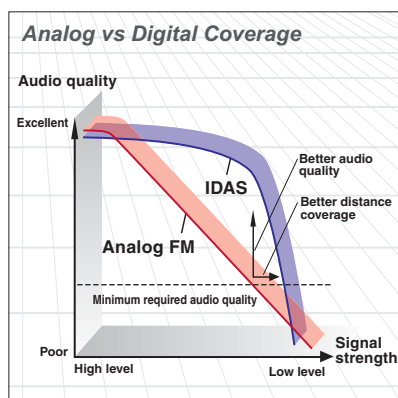6.25kHz digital image, 2× the traffic of 12.5kHz

Peer-to-peer communication with FDMA

The FDMA enables "peer to peer" communication between radios in 6.25kHz digital mode. It ensures communication with no reduction in channel capacity, even if a repeater site is not available, or goes down.

Improved audio quality and distance

Better sensitivity and a lower noise floor at the narrower bandwidth plus the latest in vocoding technology mean you have crystal clear audio over a greater coverage area than analog FM as the narrower signal travels further at the same output power.

Analog vs Digital Coverage

Audio quality

Excellent

Better audio quality

IDAS

Better distance coverage

Analog FM

Minimum required audio quality

Poor

Signal strength

High level

Low level

Selective call, group call and talk group ID

The IDAS™ system allows you to call individual or group users. The radio automatically sends its own ID number when holding the PTT button. The IDAS™ radio memorizes up to 500 of both individual/group ID numbers and alias names in the table. The alias name or individual/group ID is displayed on the LCD while receiving a message allowing you to identify who is calling.

Secure communication

When secure communication is required, the IDAS™ system provides a digital voice scrambler using a 15-bit key (about 32,000 keys) as standard. This is added security to the digital modulation/demodulation.

Emergency call functions

When the emergency button is pushed, the emergency signal will be automatically sent to the dispatcher or another radio. The man down*[1] and the lone worker functions are available for automated emergency calls (in digital and analog modes). The remote radio monitor function allows the dispatcher to turn on the PTT button from a remote location and transmit anything the microphone hears for a preprogrammed time period.
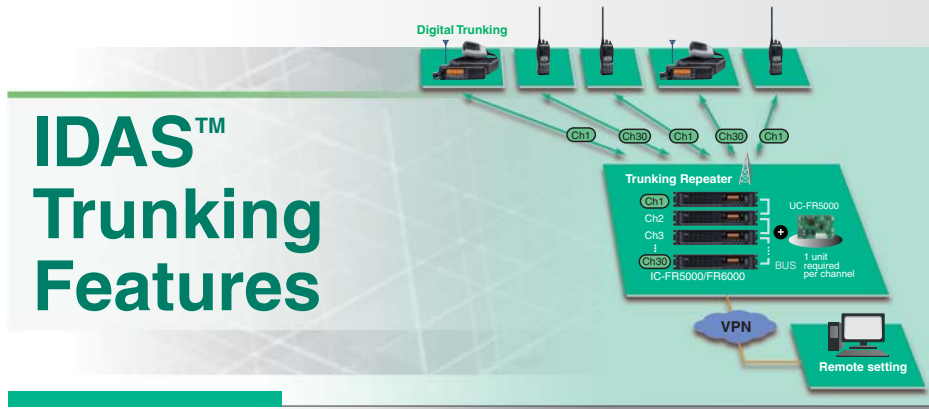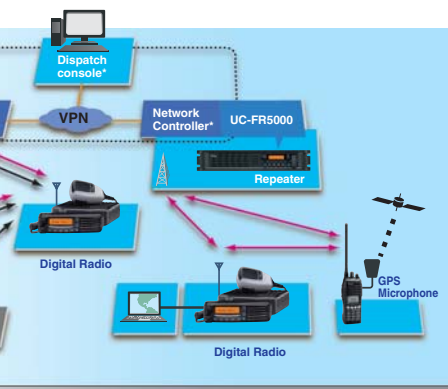*[1] Optional UT-124R required.

Status message

You can set up to 100 conditions such as "on duty", "at lunch" or "in route" and send your status to another unit or the dispatch. Also, you can request another unit to send their status and receive it.

GPS position reporting

When used with the GPS speaker microphone, HM-170GP for the handheld radio or an external GPS receiver for the mobile radio, the IDAS™ radio can send the current position information to another radio or the dispatch at certain intervals. When connected to a PC installed with a mapping software application, the dispatcher will know the real-time activity of the fleet members.

Radio kill, stun and revive

The radio kill function disables a lost or stolen radio over the air, eliminating security threats from undesired listeners. When the radio stun command is received, all functions will be temporary locked out until the revive command is received or the user password is entered. The radio can also send radio stun, kill and revive commands.

Digital Trunking

IDAS™ Trunking Features

Ch1 Ch30 Ch1 Ch30 Ch1

Trunking Repeater

Ch1
Ch2
Ch3
Ch30

IC-FR5000/FR6000

UC-FR5000

BUS 1 unit required per channel

VPN

Remote setting

Dispatch console*

VPN

Network Controller* UC-FR5000

Repeater

Digital Radio

GPS Microphone

Digital Radio

RAN for digital code squelch

The RAN (Radio Access Number) code is the digital equivalent of CTCSS for accessing an IDAS™ repeater or digital code squelch function.

Short Data Message capability

A 12-character (Max.) short data message can be sent and received between the IDAS™ radios.

Network interface*²

The optional UC-FR5000 network controller will interconnect between IDAS™ repeaters through an IP network. Communication range is vastly extended by the IP connection. When connected to a PC, you can remotely maintain the repeater configuration from your PC.
*²Available in the future.

Other features

• Radio check function allows you to verify if another radio is within the communication range
• Call log displays the received call history
• Call alert function notifies receiving party that a call is coming with a beep sound and blinking icon
• Base station operation for repeater

* Some features are planned for release in the future.

UC-FR5000

Distributed control channel

The IDAS™ trunking system distributes the IDAS™ trunking service to any requested channel, and every channel can be used for voice communications. The IDAS™ trunking system utilizes given channels more effectively than a centralized control channel system and reduces waiting time for access.

Digital Common Features

Many calling features such as selective call, data call, status call, emergency call, remote stun, remote monitor and digital voice scrambler are also available in trunking system.

Two RF modules in one unit

The IC-FR5000 series uses only 2U height and has an internal space for installing another RF unit, the optional UR-FR5000 series. Two RF modules* can be installed in the chassis to save installation space.
*For a two channel IDAS™ trunking repeater, optional UC- FR5000 is required for each channel.

Trunking controller

Channel extension module

2 channel IDAS™ trunking repeater
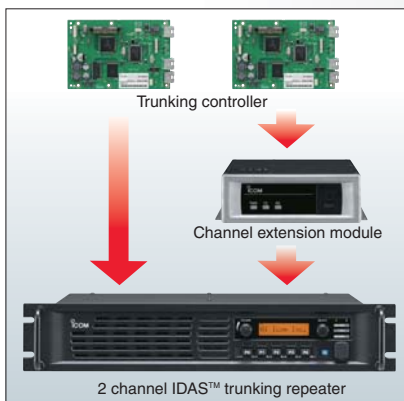
Up to 30 channels in a system

The IDAS™ trunking system can have up to 30 channels (RF units) per site. All of the repeaters must be interconnected with a data bus* (Category 5 straight cable).
*Cannot be used for multi-site connection at this time.

Number of unit ID and talkgroup ID

The IDAS™ trunking system has a potential ability to handle up to 2000 unit ID codes and 2000 talkgroup ID codes per channel. The practical number of users in any one system (site) may vary from many factors, but the IDAS™ trunking system is designed to be used by up to 100 to 200 users (radios) per channel.

Web browser configuration

Most of the UC-FR5000 configurations can be made via a web browser.

Secondary home channel

If the home repeater fails, the system automatically switches to a secondary repeater/channel for backup operation.

Area bit setting

If there are two IDAS™ trunking systems using the same frequency within a close area, the area bit setting allows the trunked radios to identify its own repeater site.

VHF Digital Transceivers
UHF Digital Transceivers

IC−F3161DT   IC−F4161DT
IC−F3161DS   IC−F4161DS

Features

- Compatibility with digital 6.25kHz NXDN™ protocol. Abundant digital functions
- 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
- Loud speaker audio with BTL amplifier and audio compander
- Built-in 2-Tone / 5-Tone / CTCSS / DTCS / MDC 1200 signaling (For analog FM mode)

Options

HM-170GP
GPS speaker-microphone

HS-95
Behind-the-head headset

VS-1SC
PTT / VOX unit

UT-124R
Man down unit

T Series
(10-Keypad Version)

S Series
(Simple Keypad Version)

VHF Digital Transceiver
UHF Digital Transceiver

IC−F5061D   IC−F6061D

Features

- Compatibility with digital 6.25kHz NXDN™ protocol. Abundant digital functions
- 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 accessory connector and ignition sensing line
- 50W (VHF), 45W (UHF) RF output power
- IP54 dust-protection and splash resistance (Front panel only)
- MIL-STD rugged construction
- Front mounted loud speaker and audio compander
- Built-in 2-Tone / 5-Tone / CTCSS / DTCS / MDC 1200 signaling (For analog FM mode)

Options

SM-25
Desktop microphone

HT-148T
DTMF microphone

RMK-3
Separation kit

Separation cables
OPC-609 (1.9m; 6.2ft)
OPC-607 (3m; 9.8ft)
OPC-726 (5m; 16.4ft)
OPC-608 (8m; 26.2ft)

VHF Digital Repeater
UHF Digital Repeater

IC−FR5000   IC−FR6000

Features

- 19-inch rack mount design, 2U height low profile design
- 12-digit dot-matrix display and 32 memory channels
- Multiple CTCSS, DTCS tone and digital RAN code decode
- 50W output power at 50% duty operation, 25W at 100% duty operation
- Two RF modules can be installed in a unit for a "2Ch in 1box configuration" (Optional UR-FR5000/UR-FR6000 required)
- 5-Tone and DTMF encoder/decoder (For analog FM mode)
- Accessory connector (D-sub 25-pin) for connecting analog trunking controllers or other external devices

Options

UC-FR5000
IDAS™ trunking / network controller

UR-FR5000 (VHF)
UR-FR6000 (UHF)
Channel module units

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

VHF Digital Transceivers	UHF Digital Transceivers
IC−F3161DT	**IC−F4161DT**
IC−F3161DS	**IC−F4161DS**

■ GENERAL

- Frequency range : 136–174MHz
  400–470MHz
  450–512MHz
- Number of channels : Max. 512 Ch./128 zones
- Channel spacing : 25.0/12.5/6.25kHz,
  30.0/15.0/7.5kHz
- Antenna impedance : 50Ω
- Power supply requirements : 7.2V DC (nominal)
- Current drain (at 7.2V DC; approx.):
  - Tx High (5W) 1.5A/1.8A (VHF/UHF)
  - Rx AF max. 600mA
  - Stand-by 100mA
  - (With UT-126H) 150mA/140mA (VHF/UHF)
- Operating Temp. range : −30˚C to +60˚C
  ; −22˚F to +140˚F
- Dimensions (W×H×D) : 53×136×38.5 mm
  (projections not included) ; $2^3/_{32} \times 5^{11}/_{32} \times 1^{17}/_{32}$ in
  (with BP-232N)
- Weight (with BP-232N) : 340g; 12.0oz (approx.)

■ TRANSMITTER

- Output power : 5.0W (VHF/UHF)
- Frequency error : ±1.0ppm
- Spurious emissions : 75dB typ.
- FM hum and noise : 46/40dB typ. (Wide/Narrow)
- Audio harmonic distortion : 3% typ. (40% deviation)
- External MIC connector : 9-pin multi connector/2.2kΩ

■ RECEIVER

- Intermediate frequencies : 46.35MHz/450kHz (1st/2nd)
- Sensitivity FM (W, N) : 0.25μV typ. (at 12dB SINAD)
  Digital : 0.20μV typ.(at 5% BER)
- Spurious response : 70dB min. (Wide/narrow)
- Intermodulation : 74dB typ. (Wide/narrow)
- Audio output power : 0.5W typical at 5% distortion
  with an 8Ω load
- External SP connector : 9-pin multi connector/8Ω

VHF Digital Transceiver	UHF Digital Transceiver
IC−F5061D	**IC−F6061D**

■ GENERAL

- Frequency coverage : 136–174MHz
  400–470MHz
  450–512MHz
- Number of channels : Max. 512 Ch./128 zones
- Channel spacing : 25.0/12.5/6.25kHz,
  30.0/15.0/7.5kHz
- Antenna impedance : 50Ω (SO-239)
- Power supply requirements : 13.6V DC
- Current drain (approx.) :
  - Tx 50W/45W 14.0A
  - Rx Max. audio 1.2A
  - Standby 300mA
- Operating Temp. range : −30˚C to +60˚C
  ; −22˚F to +140˚F
- Dimensions (W×H×D) : 160×45×150 mm
  ; $6^5/_{16} \times 1^{25}/_{32} \times 5^{29}/_{32}$ in
- Weight : 1310g; 2.9lb (approx.)

■ TRANSMITTER

- Output power : 50W (VHF), 45W (UHF)
- Frequency error : ±1.0ppm
- Spurious emissions : 75dB typ.
- FM hum and noise : 46/40dB typ. (Wide/Narrow)
- Audio harmonic distortion : 3% typ. (40% deviation)

■ RECEIVER

- Intermediate frequencies : 46.35MHz/450kHz (1st/2nd)
- Sensitivity FM (W, N) : 0.25μV typ. (at 12dB SINAD)
  Digital 0.20μV typ. (at 5% BER)
- Spurious response : 90dB typ. (Wide/narrow)
- Intermodulation : 77dB typ. (Wide/narrow)
- Audio output power : 4.0W typ. at 5% distortion
  with a 4Ω load

VHF Digital Repeater	UHF Digital Repeater
IC−FR5000	**IC−FR6000**

■ GENERAL

- Frequency coverage : 136–174MHz
  400–470MHz
  450–520MHz
- Number of channels : Max. 32 channels
- Channel spacing : 25.0/12.5/6.25kHz,
  30.0/15.0/7.5kHz
- Antenna impedance : 50Ω (Type-N × 2)
- Power supply requirements : 13.6V DC
- Current drain (approx.) :
  - Tx 50W 15.0A
  - Rx Max. audio 1.9A
  - Standby 500mA
  - 400mA (FAN off)
- Operating Temp. range : −30°C to +60°C
  ; −22°F to +140°F
- Dimensions (W×H×D) : 483×88×260 mm
  ; $19^1/_{32} \times 3^{15}/_{32} \times 10^1/_4$ in
- Weight : 5.6kg; 12.3lb (approx.)

■ TRANSMITTER

- Output power : 50W (adjustable to 5W)
- Frequency error : ±0.5ppm
- Spurious emissions : 80dB typ.
- FM hum and noise : 50/45dB typ. (Wide/Narrow)
- Audio harmonic distortion : 1% typ. (40% deviation)

■ RECEIVER

- Intermediate frequencies : 46.35MHz/450kHz (1st/2nd)
- Sensitivity FM (W, N) : 0.30μV typ. (at 12dB SINAD)
  Digital 0.25μV typ. (at 5% BER)
- Spurious response : 90dB typ. (Wide/Narrow)
- Intermodulation : 78dB typ. (Wide/Narrow)
- Audio output power : 4.0W typ. at 5% distortion
  with a 4Ω load

All stated specifications are subject to change without notice or obligation.
Measurements made in accordance with TIA-603 (Analog FM).

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