ICOM

iDAS™
ICOM DIGITAL ADVANCED SYSTEM

Type-D Trunking

Type-C Trunking

Multi-site Conventional

IDAS™

ICOM DIGITAL ADVANCED SYSTEM

DIGITAL

IDAS™ is Icom's digital land mobile radio system using the NXDN™ 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 complete digital solution that system owners or operators can grow into as their time and budgets allow.

IDAS™ SYSTEM FEATURES

Spectrum Efficiency

The IDAS system utilizes 6.25/12.5kHz narrowband FDMA technology. This system is not only spectrum efficient, but meets the FCC 2013 deadline for narrowband compliance.

NXDN™ Type-C & Type-D Trunking

IDAS trunking conforms with the NXDN Type-C or Type-D trunking protocols. Type-C trunking is centralized control channel trunking. Type-D trunking is a distributed system which does not use a dedicated control channel.

Audio Quality and Coverage

When compared to an analog FM signal, digital easily out-performs analog in audio clarity at the fringes of the communication range. This provides more reliable audio over a greater total area, even if the coverage footprint is the same as analog FM.

Flexible IP Network

IDAS repeater sites can be interlinked over an IP Network and can extend your communication coverage. When used with a VE-PG3 VoIP Gateway, the IDAS radios* can be integrated into a SIP and analog phone system and enables you to make telephone calls.
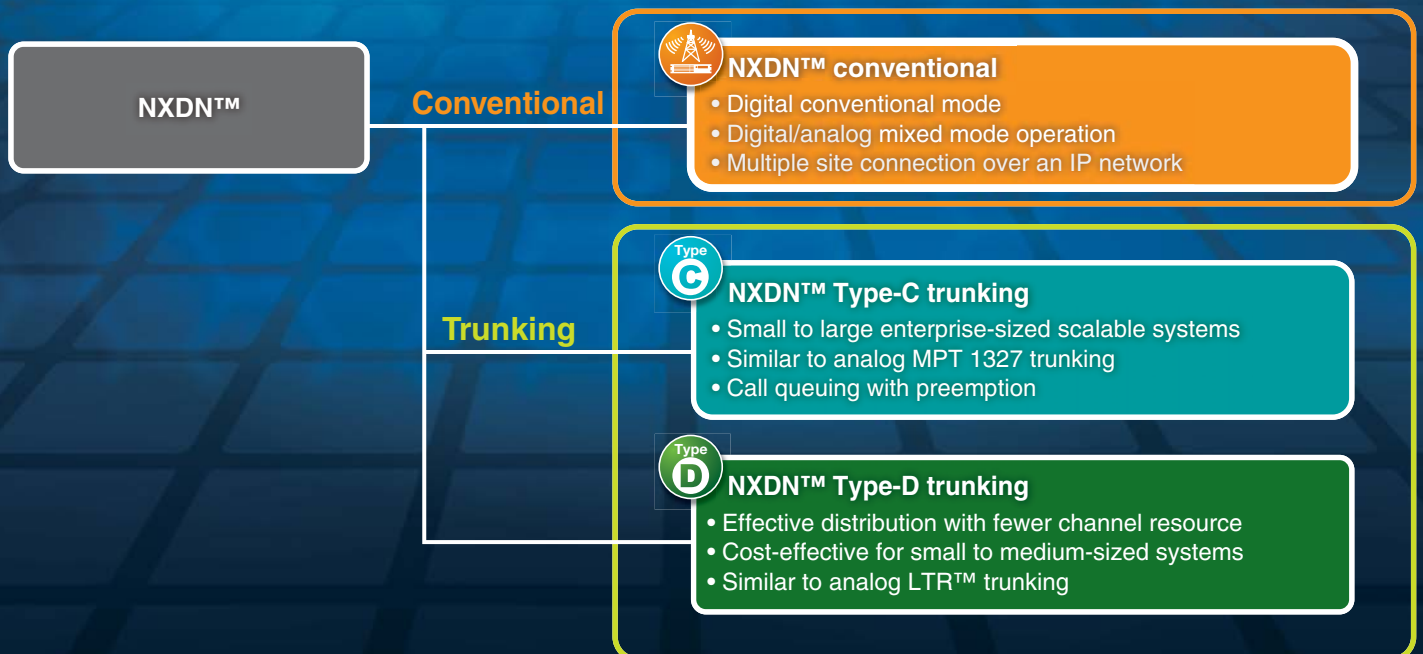* Type-D multi-site trunking and conventional using the IC-FR5200H/FR5000.

Secure Conversation

The digital modulation/demodulation makes it difficult to decode the IDAS digital signal using current scanner receivers. The digital voice scrambler adds security on your conversation.

Flexible Migration Path

The IDAS system allows you to scale migration to narrowband digital at your own pace and needs while running your existing analog system. As your future communication needs change, the IDAS system can grow to a trunking system and/or wide area (multi-site) system.
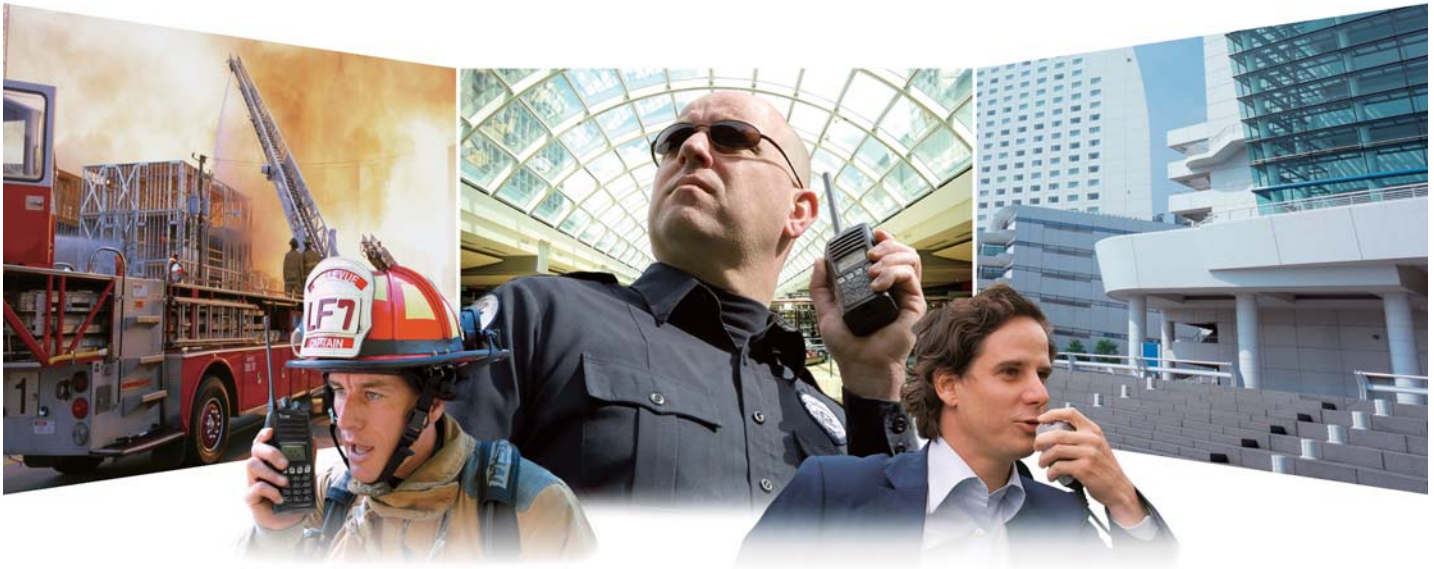
AN OUTLINE OF NXDN™

NXDN™

Conventional

NXDN™ conventional
- Digital conventional mode
- Digital/analog mixed mode operation
- Multiple site connection over an IP network

Trunking

Type C

NXDN™ Type-C trunking
- Small to large enterprise-sized scalable systems
- Similar to analog MPT 1327 trunking
- Call queuing with preemption

Type D

NXDN™ Type-D trunking
- Effective distribution with fewer channel resource
- Cost-effective for small to medium-sized systems
- Similar to analog LTR™ trunking

IDAS™ Calling Features

IDAS supports the following calling features in the digital mode

IDAS™ Calling Features

Type-D Trunking Features

Multi-site Conventional

Type-D Product Lineup

Type-C Trunking Features

Type-C Product Lineup

Digital/analog mixed mode

The digital/analog mixed mode function*1 allows you to receive both analog mode and NXDN™ conventional mode signals on a single channel, and automatically selects the call received mode to reply to the call. It's a smart way to grow into digital radio – at your own pace, as your budget and comfort level allow.

Individual/group call

The IDAS radio allows you to call individual or group users. The radio automatically sends its own ID number when the PTT button is held down. The alias name or individual/group ID is displayed on the LCD*2 while receiving a message, allowing the radio user to identify who is calling.

Emergency call functions

When the emergency button is pushed, an emergency signal will be automatically sent to the dispatcher or another radio(s). Other emergency features are a Man down feature*3 and a Lone worker function, available for automated emergency calls (in digital and analog modes). A 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.

Status message and short data message

Up to 100*4 status conditions can be set and sent with a voice call. Also, the status polling call requests the intended radio to send its status. When a status polling call is received, the IDAS radio automatically transmits its current status. A short data message of up to 100 characters can be sent and received.*2

Position data transmission capability

When a GPS receiver*5 is used, the IDAS radio can automatically transmit accurate position data at programmed intervals. The position data can be transmitted with a voice call, GPS request status, Status call, Short data message, Call alert, or emergency calls (depending on the programming). The position data may be used with vehicle management applications.

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 a Revive command is received or the user password is entered.

Digital voice scrambler

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

Other features

• A radio check function allows you to verify if another radio is within communication range*4
• The Call log displays the received call history*2*4
• The Call alert function notifies the receiving party that a call is coming with a beep sound and a blinking icon*4
• A RAN (Radio Access Number) code for digital code squelch
• Block decode enables the radio to monitor talkgroups that the radio doesn't belong to*4
• Late entry: IDAS radios can decode the received ID and join the conversation, even when turned ON during a call

*1 Not available for the IC-F3230D, IC-F3210D and IC-F5220D series transceivers.
*2 Not available for the IC-F3210D, IC-F3201DEX, IC-F3101D and IC-F1000D series (No-LCD) transceivers.
*3 Available for the IC-F3360D, IC-F3261D and IC-F1000D series. Man Down function may be built-in, depending on the version of the IC-F3261D series transceivers.
*4 When used with the IC-F3360D and IC-F5360D series, up to 207 status conditions are available. Radio check, Call log and Block decode functions are not available. The Paging call function is similar to the Call alert function with blinking LED indication.
*5 GPS receiver is built-in for the IC-F3360D and some versions of IC-F3261D series transceivers. Optional GPS microphone is required for the IC-F3210D, IC-F3101D and IC-F1000D series. An external GPS antenna is required for IC-F5360D series. GPS receiver is required for the IC-F5061D, IC-F5220D or IC-F5121D series mobile transceivers. When used with the IC-F3360D and IC-F5360D series, the GPS position data cannot be sent with Short data message or Call alert calls.
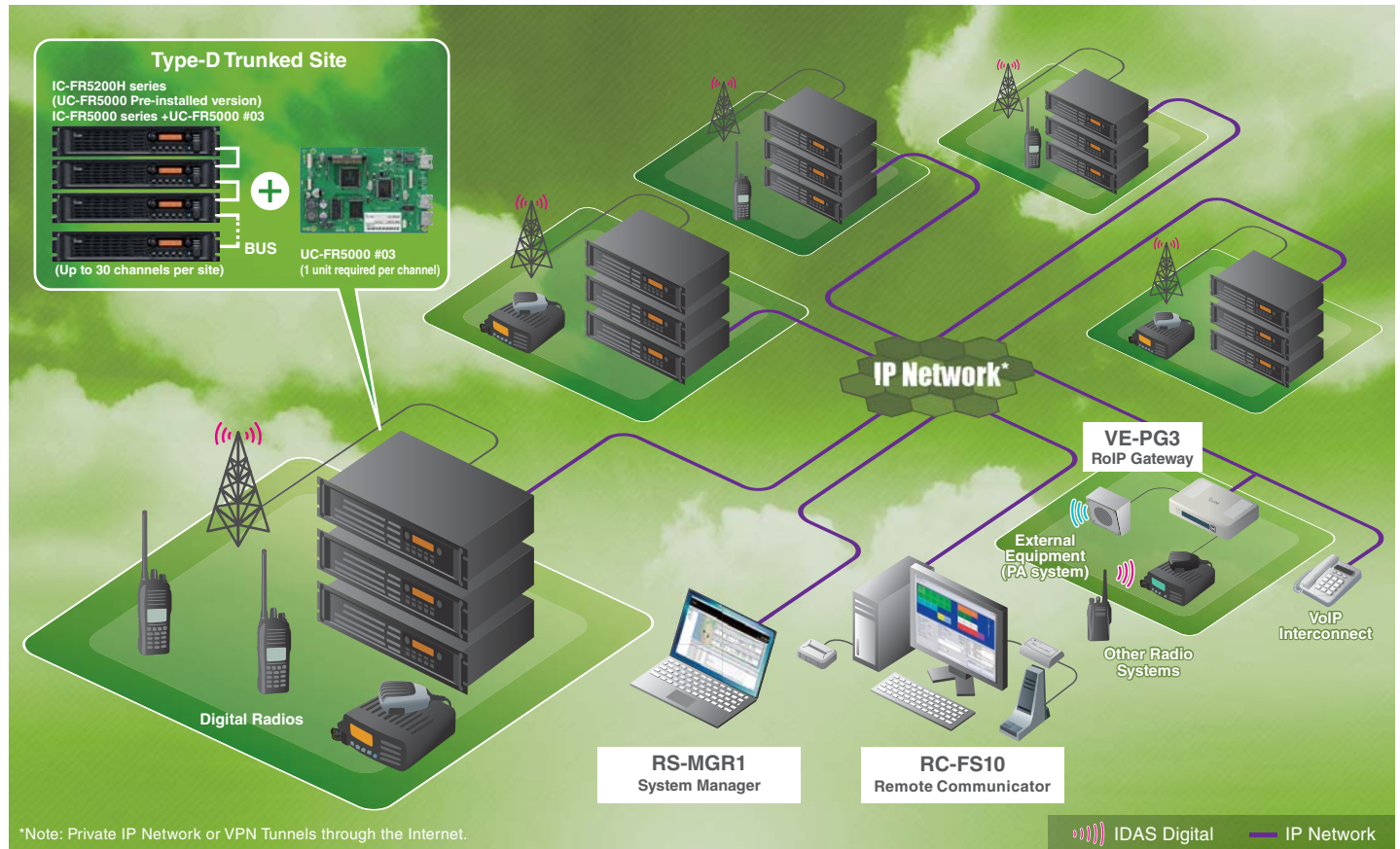
IDAS™ Calling Features

Type-D Trunking Features

Multi-site Conventional

Type-D Product Lineup

Type-C Trunking Features

Type-C Product Lineup

Type-D Multi-site Trunking Features
Type-D multi-site trunking for high volume, wide area communication

Shares up to 48 sites × 30 channels for managing large fleets

Type-D Trunked Site

IC-FR5200H series
(UC-FR5000 Pre-installed version)
IC-FR5000 series +UC-FR5000 #03

BUS

(Up to 30 channels per site)

UC-FR5000 #03
(1 unit required per channel)

Digital Radios

IP Network*

VE-PG3
RoIP Gateway

External
Equipment
(PA system)

Other Radio
Systems

VoIP
Interconnect

RS-MGR1
System Manager

RC-FS10
Remote Communicator

*Note: Private IP Network or VPN Tunnels through the Internet.

)))) IDAS Digital — IP Network

Distributed control channel

The Type-D trunking system uses a distributed logic system that does not use a dedicated control channel. All trunked channels can be used for voice traffic channels to be shared more effectively with a large number of users.

Up to 48 trunked sites connected over an IP network

The Type-D multi-site trunking can have up to 30 repeaters (RF units) per site, and up to 48 trunked sites can be interlinked over the IP network. An IDAS terminal radio user can communicate with other IDAS terminal radio users working under the interlinked trunked sites.*

* Up to 16 preprogrammed sites can be down-linked simultaneously for a group call.

Up to 60,000 individual ID and 60,000 Group ID numbers

In Type-D multi-site trunking, the combination of prefix ID and individual ID (or group ID) codes is used as a unique identifier. The Type-D multi-site trunking can have up to 30 prefix ID codes per system and up to 2,000 individual ID codes and 2,000 group ID codes per prefix ID. In total, up to 60,000 individual IDs and 60,000 group ID numbers can be used in a system.

Automatic site roaming

When a user turns on a radio, or moves from one site to another site, the radio automatically starts a hunt scan and registers their own ID information to the repeater site. No user interaction is required.

Fleet management

The fleet management function allows the system manager to control a user group in a fleet. Users can be divided in up to 5,000 fleets, and the system manager can enable or disable the use of the system for any fleet.

Fleet management examples

Fleet (1–5000)	Alias name	Prefix ID (1–30)	Individual ID (1–2000)	Group ID (1–2000)	Status
1	Security A	1	1–10,31–400	1–20	Enable
2	Taxi B	1	11–30	21–25	Enable
3	Bus C	2	1–30	1–30	Disable
4	Truck D	2	1001–1005	51–53	Enable

The system manager can enable or disable the use of the system for any fleet. (On the example above, Fleet 3 is disabled.)

Integrated system for clean and simple installation

Type-D multi-site trunking requires only the UC-FR5000 (#03) trunking controller, which can be installed into the IC-FR5200H* /FR5000 series repeater. No external server and no extra rack space are required. * The UC-FR5000 pre-installed version only.

3

ESN authentication

Type-D multi-site trunking can reject registration of an unauthorized terminal radio to the repeater site by using the electronic serial number (ESN) or individual ID of the radio.

Over-the-air update

IDAS repeater sites can update terminal radio's programmed content with new system information – like added channels and new sites – over the air without interrupting the use of the radio.

Call priorities

Terminal radios can listen to a call of higher priority, even in the middle of lower priority on-going calls, in the order below.
(1) Emergency Call   (2) Individual Call   (3) Group Call

RS-MGR1 System Manager

When used with the RS-MGR1 system manager software, air time information, network connectivity/statistics and hardware status of the Type-D multi-site trunking repeater sites can be obtained using Syslog messages.

RC-FS10 Remote Communicator for multi-site trunking

The remote communicator creates an IP-based virtual radio on a PC and works as a simple dispatch. IDAS communication features can be used with the remote communicator software.

Other features

・Load-leveling for trunk-out channels
・Restriction control can limit use (TX) from the terminal radios when there is too much traffic.
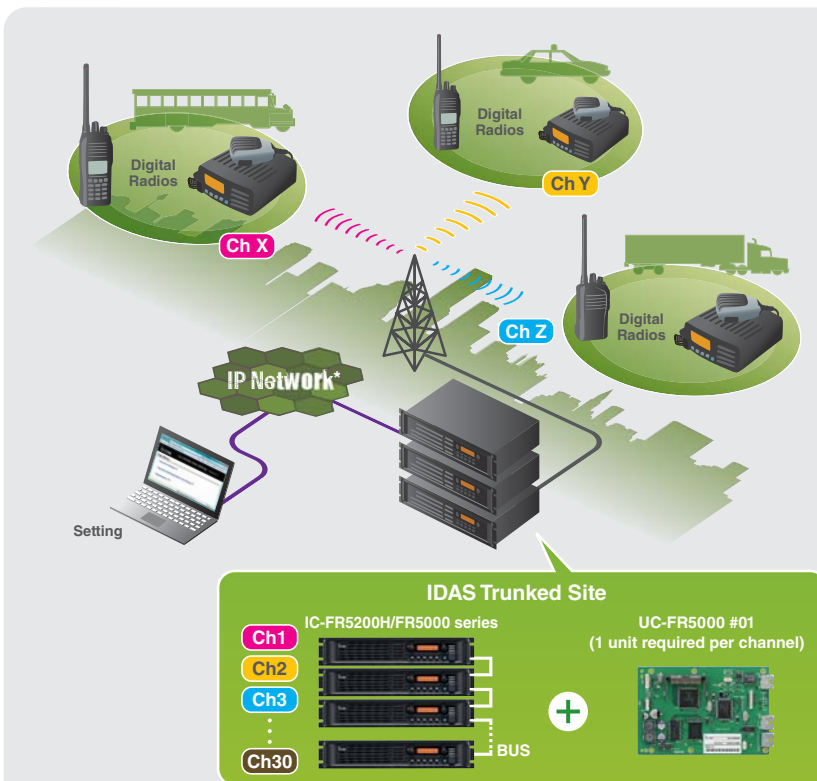

Application example — Intra-building and inter-building solution

With a Type-D multi-site trunking system, it is possible to communicate all the way from the basement to the top floor in stable digital audio. Already deployed LAN cables can be used in an in-building solution.

))))) IDAS Digital

— IP Network (LAN)

High floors

Repeater

Mid floors

Repeater

Mid floors

Dispatch

Building B

Basement

IP Network*

Repeater

Building A
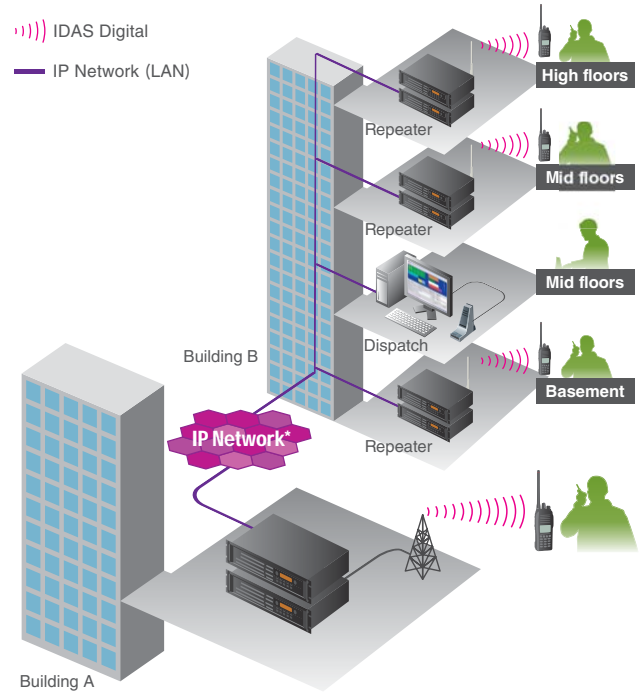
*Note: Private IP Network or VPN Tunnels through the Internet.

Type-D Single-site Trunking

Ch X

Ch Y

Ch Z

Digital Radios

Digital Radios

Digital Radios

IP Network*

Setting

IDAS Trunked Site

Ch1
Ch2
Ch3
...
Ch30

IC-FR5200H/FR5000 series

UC-FR5000 #01
(1 unit required per channel)

+

BUS

*Note: Private IP Network or VPN Tunnels through the Internet.

Distributed control channel

Type-D single-site trunking

Type-D single-site trunking provides an affordable multi-channel digital radio system. Selective call, group call, Status message and Short data message can be used over the trunking system.

Up to 30 repeaters in a system

Type-D single-site trunking can have up to 30 repeaters (RF units) per site. All of the connected repeaters can be configured from a web browser through an IP network.

Up to 2,000 IDs

The system has the ability to handle up to 2,000 individual ID codes and 2,000 group ID codes per home channel.

Other features

• Unit ID authentication

• IC-F1000D, IC-F3101D, IC-F3201DEX, IC-F3210D, IC-F3230D, IC-F3261D, IC-F5121D, IC-F5220D and IC-F5061D series can be used as Type-D trunking radios*

* Single-site trunking only for IC-F1000D, IC-F3101D, IC-F3201DEX and IC-F5121D series transceivers.
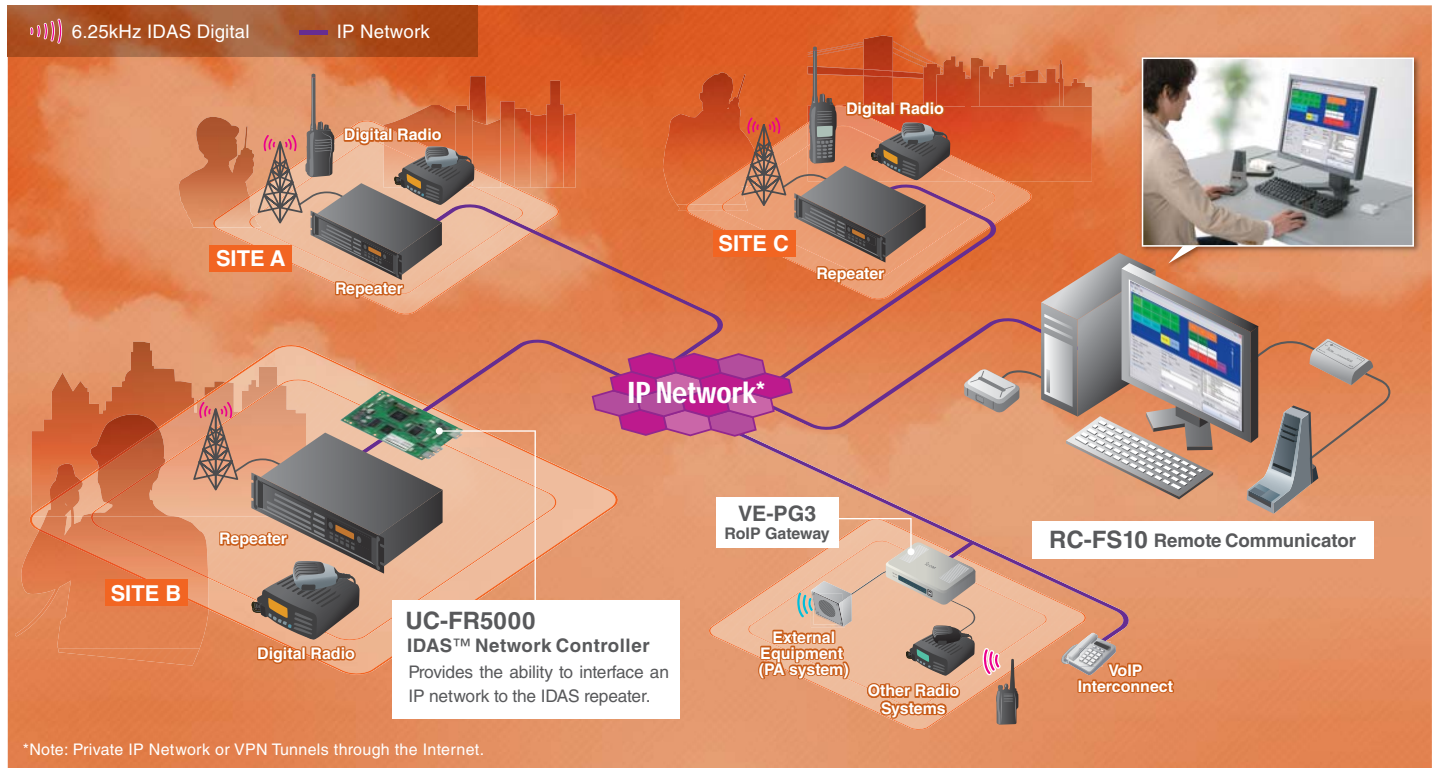
• Area bit setting

IDAS™ Calling Features

Type-D Trunking Features

Multi-site Conventional

Type–D Product Lineup

Type–C Trunking Features

Type–C Product Lineup

Multi-site Conventional
An IDAS™ conventional IP network links up to 16 repeater sites

Communication links for distant locations

6.25kHz IDAS Digital — IP Network

Digital Radio
SITE A
Repeater

Digital Radio
SITE C
Repeater

IP Network*

Repeater
SITE B
Digital Radio

UC-FR5000
IDAS™ Network Controller
Provides the ability to interface an IP network to the IDAS repeater.

VE-PG3
RoIP Gateway

External Equipment (PA system)
Other Radio Systems
VoIP Interconnect

RC-FS10 Remote Communicator

*Note: Private IP Network or VPN Tunnels through the Internet.

Communication link for distant locations

An IDAS conventional IP network can extend your communication coverage. It lets you connect dispersed sites and allows you to communicate like a single site.

Up to 16 IDAS™ repeaters can be connected over an IP network

With the optional UC-FR5000 and CF-FR5000MC, up to 16 IDAS repeaters can be interlinked with each other*. An IDAS terminal radio user can communicate with other IDAS terminal radio users within the reach of each repeater site and/or a virtual dispatch station on the network.

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

Low bandwidth requirement

Required network bandwidth: 40 kbps × (number of UC-FR5000 + number of RC-FS10) or Minimum 100kbps required*.

* AMBE+2 vocoder: 13 kbps per voice path.

RC-FS10 Remote Communicator

The remote communicator creates an IP-based virtual radio on a PC and works as a simple dispatch. IDAS communication features can be used with the remote communicator software.

Application example — Receiver voting operation

IDAS receiver voting improves the talk back capability of IDAS handheld and mobile radios. The IDAS networked receivers, where IDAS repeaters' transmission is inhibited and therefore used only as receivers, are distributed in the communication area. Each receiver receives a signal from a terminal radio and transfers it to the repeater site. The repeater then relays the best signal, or transfers it to the remote dispatch. The UC-FR5000 has a built-in voting function, so an external voter device is not required.

IDAS Digital (Uplink A) IDAS Digital (Downlink) — IP Network

Downlink
Repeater (TX Only)
Downlink
Repeater (Rx only)
Uplink
IP Network*
Repeater (Rx only)
Dispatch

Receiver voting operation

*Note: Private IP Network or VPN Tunnels through the Internet.
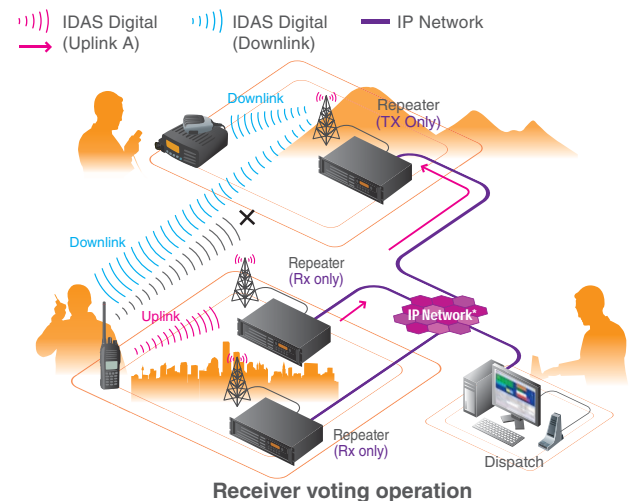
Type-D Product Lineup

VHF DIGITAL/ANALOG REPEATER
IC-FR5200H (50W, 100% duty)

UHF DIGITAL/ANALOG REPEATER
IC-FR6200H (50W, 100% duty)

Multi-site conventional
Type-D multi-site trunking
Type-D single-site trunking

Rugged MIL-STD 810

Heat Sink

Features

- 136–174MHz, 50W
- 350–400, 400–470, 450–512, 450–520MHz, 50W*1
- 50W output power at 100% duty (Ambient temperature: 20–35˚C, 24 hours)
- 32-channel capacity and 5 programmable buttons
- 12-digit dot-matrix display
- 19-inch rack mount design, 2U height low profile design
- Base station operation
- PC programmable via IP network*2
- D-SUB 25-pin accessory connector
- CW-ID transmitter • Normal and priority scan
- DTMF encode and decode • ±0.5ppm high stability oscillator
- PTT priority setting (local mic, external PTT or repeater operation)

IDAS™ Features

- IDAS multi-site conventional*2
- NXDN Type-D multi-site trunking*2
- NXDN Type-D single-site trunking*2
- IDAS conventional/FM mixed mode operation
- Digital RAN (Radio Access Number) code
- Digital voice scrambler • Individual and group selective call
- Talk back function and call mode selection
- Status message and SDM (Short Data Message)
- Radio Kill, Stun and Revive (Tx only)
- Call alert and radio check • Remote monitor (Tx only)

Analog FM Mode Features

- 5-Tone, CTCSS and DTCS built-in • Built-in audio compander
- Built-in inversion voice scrambler

*1 Some frequency ranges do not have FCC certification.
*2 UC-FR5000 pre-installed version only.

VHF DIGITAL/ANALOG REPEATER
IC-FR5000 (50W)

UHF DIGITAL/ANALOG REPEATER
IC-FR6000 (50W)

Multi-site conventional
Type-D multi-site trunking
Type-D single-site trunking

Rugged MIL-STD 810

Features

- 136–174MHz, 50W • 350–400, 400–470, 450–512, 450–520MHz, 50W*1
- 50W output power at 50% duty, 25W at 100% duty cycle operation (Ambient temperature: 25˚C)
- 19-inch rack mount design, 2U height low profile design
- Two RF modules in one unit* (* UR-FR5000 or UR-FR6000 required.)
- Optional UR-PA5000 or UR-PA6000 power amplifier provides 100W output at 50% duty, 50W at 100% duty operation* (Ambient temperature: 25˚C)
  * UR-PA5000/UR-PA6000 is not available in some countries. (Not available in the USA.)
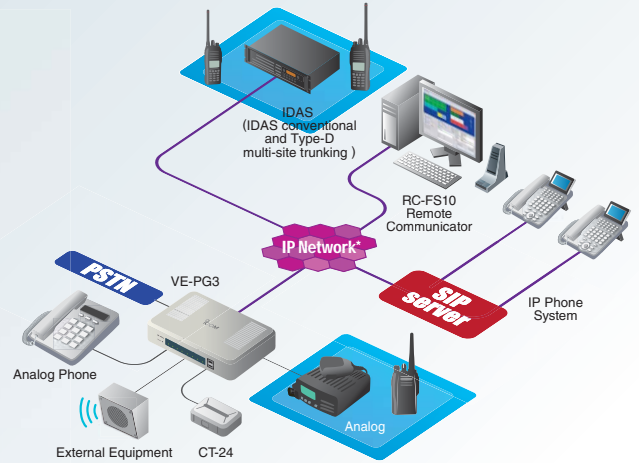
IDAS™ Features

- IDAS multi-site conventional with optional UC-FR5000 and CF-FR5000 MC/MT
- NXDN Type-D multi-site trunking with optional UC-FR5000
- NXDN Type-D single-site trunking with optional UC-FR5000
- IDAS conventional/FM mixed mode operation
- Digital RAN (Radio Access Number) code
- Digital voice scrambler • Individual and group selective call
- Talk back function and call mode selection

Analog FM Mode Features

- 5-Tone, CTCSS and DTCS built-in
- Built-in audio compander
- Optional voice scrambler UT-109R/UT-110R and built-in inversion voice scrambler
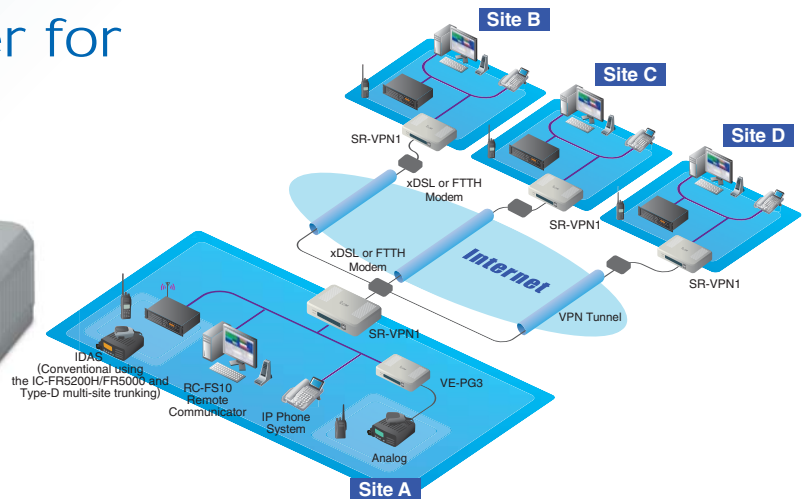
*1 Some frequency ranges do not have FCC certification.

RoIP GATEWAY

VE-PG3

RoIP Gateway for Telephone Interconnection

IDAS (IDAS conventional and Type-D multi-site trunking)

RC-FS10 Remote Communicator

IP Network*

PSTN

VE-PG3

SIP server

IP Phone System

Analog Phone

External Equipment   CT-24

Analog

Features

- RoIP and SIP gateway functions

- Telephone interconnection with IP phone and PSTN lines. Direct dialing from an IDAS radio is possible*
  * Limited to radios with DTMF capability. Must use with a conventional system using the IC-FR5200H/FR5000 series and Type-D multi-site trunking system.

- IDAS and analog radio system cross band connection

- Converts analog audio and G.711 μ-law IP phone codec to the AMBE+2™ codec for the IDAS™ radio system*
  * CT-24 digital voice converter required.

- Public address systems, sirens, warning lights and other external equipment can be connected to the VE-PG3

- The virtual serial port function remotely controls connected radios or equipment from a PC over the IP network

- Bridge mode connection

- IP router functions: PPPoE/IPv6 bridge, NAT, Dynamic DNS, VPN pass through, IP filter, SNMP and SYSLOG

- USB flash drive connection for firmware updates and data backup

VPN ROUTER

SR-VPN1

Best Match VPN Router for IDAS™ Radio over IP

Site B
Site C
Site D

SR-VPN1
xDSL or FTTH Modem
SR-VPN1
xDSL or FTTH Modem
Internet
SR-VPN1
VPN Tunnel

IDAS (Conventional using the IC-FR5200H/FR5000 and Type-D multi-site trunking)
RC-FS10 Remote Communicator
IP Phone System
SR-VPN1
VE-PG3
Analog

Site A

Features

- Up to 32 VPN IPsec VPN tunnels

- IPsec wizard focuses on the basic setting items for a VPN connection, and provides simple step-by-step instructions

- High-speed 1000BASE-T gigabit Ethernet connection

- Four gigabit LAN ports with switch function

- Automatic MDI/MDI-X function detects the required cable types

- Dual WAN ports (main/sub) for automatic failover

- USB flash drive connection for firmware updates and data backup and restore

- Firmware updates also can be made via an Internet connection

- Supports SNMP and Syslog messages for network monitoring

- Dynamic DNS client function

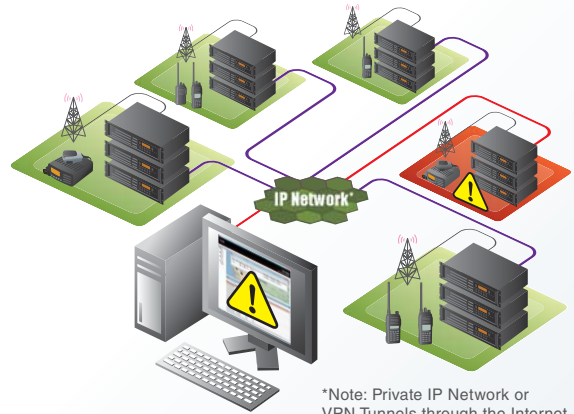An xDSL or FTTH modem is separately required for Internet connection.
* SR-VPN1 is not available in the USA and some other countries.

IDAS™ Calling Features

Type-D Trunking Features

Multi-site Conventional

Type-D Product Lineup

Type-C Trunking Features

Type-C Product Lineup

IDAS™ NXDN™ SYSTEM MANAGER

RS-MGR1

Remote System Manager Software for Type-D Multi-site Trunking Systems
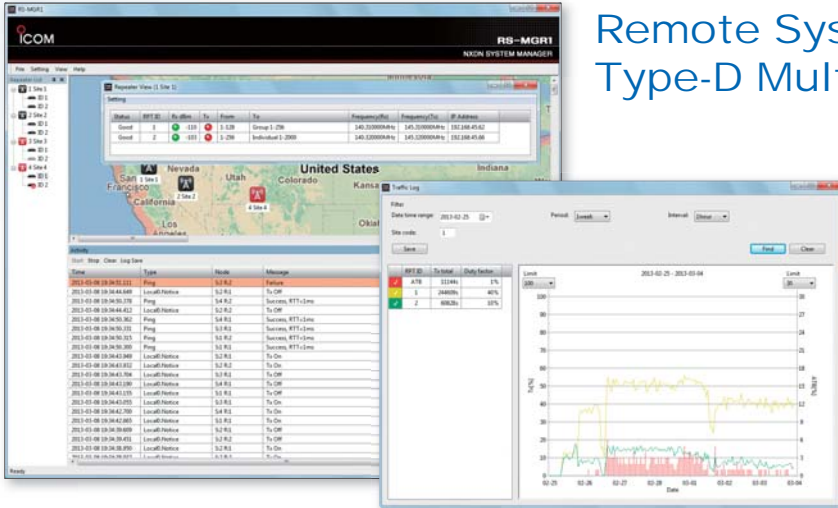
Traffic Log

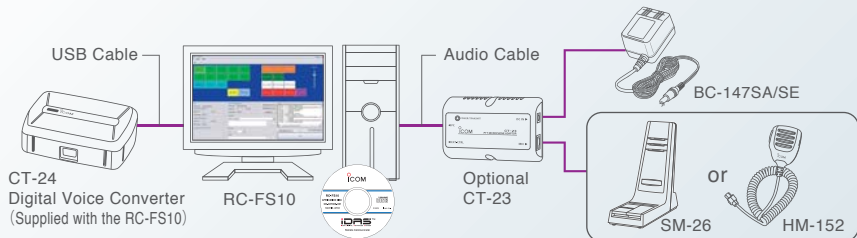*Note: Private IP Network or VPN Tunnels through the Internet.

Features

- Repeater properties show status summary, system information, interface (traffic statistics), repeater status details (TX/RX PLL unlock, power supply voltage, internal temperature and fan status) and ping status of each repeater
- Registration log, communication log, traffic log and search log can be filtered by date, user ID, call type and site code* (* Filter items differ from log types)
- E-mail alert notification can be sent to the administrator if an alarm or disconnect occurs or clears

- The "Mesh ping status" shows the connectivity by sending ping commands in all combinations of repeater sites
- The "Version list" shows the repeaters firmware version list
- The "Map window" shows repeater site icons laid out on an image file such as a map or network diagram
- USB flash drive containing the software and the hardware key protection
- SR-VPN1 VPN router can be monitored on the RS-MGR1 by Syslog

REMOTE COMMUNICATOR

RC-FS10

Virtual Radio/PC Dispatch

RC-FS10 Remote Communicator

USB Cable

CT-24 Digital Voice Converter (Supplied with the RC-FS10)

RC-FS10

Audio Cable

Optional CT-23

BC-147SA/SE

or

SM-26   HM-152

CT-24 Digital Voice Converter (Supplied with the RC-FS10)

CT-23 PTT Microphone Adapter

Features

- The RC-FS10 is a remote communicator software for use in the Type-D multi-site trunking system, a conventional system using the IC-FR5200H/FR5000 series and with the VE-PG3. It creates a virtual radio/simple dispatch station on a Windows®-based PC with the CT-24 digital voice converter and a microphone and speaker.
- Up to 8 different IDAS or VE-PG3 systems can be programmed
- Up to 40 function buttons are programmable, including individual call, group call, selective call, all call, status call, status polling, and so on
- Caller ID/alias name, called ID/alias name and call type information are displayed on the ANI area for easy recognition

- SDM (short data message), status message and DTMF code can be sent and received
- Communication log is displayed and can be stored
- The CT-24 digital voice converter is a USB device which converts microphone audio to the AMBE+2™ codec for the IDAS™ radio system. The remote communicator software will not work if the CT-24 is not connected.
- Optional CT-23 connects the HM-152 or SM-26 microphone audio (RJ-45 jack) and PTT/Monitor signals to the 3.5mm stereo jack for connection to a PC

VHF HANDHELD TRANSCEIVERS
IC-F3261DT (5W)
IC-F3261DS (5W)

UHF HANDHELD TRANSCEIVERS
IC-F4261DT (5W)
IC-F4261DS (5W)

Multi-site conventional
Type-D multi-site trunking
Type-D single-site trunking

IP67
GPS
Rugged MIL-STD 810

General Features

• 136–174MHz, 5W
• 350–400, 400–470, 450–512, 450–520MHz, 5W*[1]
• 512 memory channels and 128 zones
• Dot-matrix, multi-function display
• IP67, dust-tight and waterproof protection
• Built-in GPS receiver*[2]
• Built-in man down function*[2]
• Large capacity Lithium-Ion battery pack
• 800mW (typical) loud audio
• Priority scan
• DTMF autodial
• Lone worker function
• Power ON password
• Surveillance function
• 14-pin accessory connector with BTL amplifier output
• Voting scan

*[1] Some frequency ranges do not have FCC certification.
(*[2] Depending on the transceiver version)

IDAS™ Features

• Type-D multi-site/single-site trunking
• Multi-site conventional
• Individual and group selective call
• Digital/analog mixed mode operation
• Talk back function and call mode selection
• Digital voice scrambler
• Status message and SDM (Short Data Message)
• Radio Kill, Stun and Revive
• Call alert and radio check
• Remote monitor
• Call log
• RAN (Radio Access Number) code

Analog FM Mode Features

• 2-Tone, 5-Tone, CTCSS and DTCS built-in
• MDC 1200 compatible
• Basic LTR™ trunking
• Built-in audio compander
• Built-in inversion voice scrambler

IC-F3261DT   IC-F4261DS

VHF MOBILE TRANSCEIVER
IC-F5061D (50W)

UHF MOBILE TRANSCEIVER
IC-F6061D (45W)

Multi-site conventional
Type-D multi-site trunking
Type-D single-site trunking

IP54
Controller and RMK-3 only.
Rugged MIL-STD 810

General Features

• 136–174MHz, 50W • 350–400, 400–470, 450–512, 450–520MHz, 45W*
• 512 memory channels and 128 zones
• Backlit dot-matrix display • Power ON password
• Detachable front panel (Optional RMK-3 and separation cable required)
• IP54 dust-protection and splash resistance (Controller only)
• DTMF autodial
• Front mounted speaker • Lone worker function
• D-SUB 25-pin accessory connector • Escalating alarm
• Ignition sensing line • Self-grounding microphone, HM-148G
• Mode dependent scan • Voting scan • Surveillance function

IDAS™ Features

• Type-D multi-site/single-site trunking
• Multi-site conventional
• Individual and group selective call • Digital/analog mixed mode operation
• Talk back function and call mode selection
• Status message and SDM (Short Data Message)
• Digital voice scrambler • Radio Kill, Stun and Revive
• Call alert and radio check • Remote monitor
• Call log • RAN (Radio Access Number) code

IC-F5061D series
The above photo includes the optional RMK-3 separation kit and OPC-609 separation cable.

Analog FM Mode Features

• 2-Tone, 5-Tone, CTCSS and DTCS built-in
• MDC 1200 compatible • Basic LTR™ trunking
• Built-in audio compander
• Built-in inversion voice scrambler
• Optional voice scrambler UT-109R/UT-110R

* Some frequency ranges do not have FCC certification.

VHF HANDHELD TRANSCEIVER
IC-F1000D (5W)

UHF HANDHELD TRANSCEIVER
IC-F2000D (4W)

Multi-site conventional
Type-D single-site trunking

IP67

Rugged
MIL-STD 810

IC-F1000D   IC-F2000D

General Features

- 136–174MHz, 5W
- 360–400, 400–470, 450–512, 450–520MHz, 4W*
- 16 memory channels with channel announcement
- IP67, dust-tight and waterproof protection
- Operating time: Approximately 18 hours* with the BP-280 battery pack
- * VHF/UHF, Tx: Rx: standby=5:5:90. Power save on.
- 52.2(W) × 111.8(H) × 30.3(D) mm compact body (with BP-280)
- Motion detection, man down and lone worker functions
- MDC 1200 functions: PTT ID, emergency call, radio check (RX) and stun/revive (RX)
- Surveillance function • DTMF autodial memories

- CTCSS and DTCS built-in (For analog FM)
- 800mW (typ.) loud companded audio

IDAS™ Features

- NXDN Type-D single-site trunking
- Multi-site conventional
- PTT ID (TX) • Individual/group calls
- Radio check (RX) • Stun/kill/revive (RX)
- Remote monitor (RX) • Emergency (TX)
- Call alert • Digital voice scrambler (15-bit)
- Status call (Power ON/OFF and GPS request)
- RX talkgroup function
- Voting Scan for multi-site conventional

* Some frequency ranges do not have FCC certification.

VHF HANDHELD TRANSCEIVERS
IC-F3230DT (5W)   IC-F3230DS (5W)

UHF HANDHELD TRANSCEIVERS
IC-F4230DT (4W)   IC-F4230DS (4W)

Multi-site conventional
Type-D multi-site trunking
Type-D single-site trunking

IP67

Rugged
MIL-STD 810

General Features

- 136–174MHz, 5W
- 350–400, 400–470, 450–512, 450–520MHz, 4W*
- 128 memory channels and 8 zones
- 8-character alphanumeric display
- IP67, dust-tight and waterproof protection
- Operating time: Approximately 20 hours* with the BP-232WP battery pack
  * Tx: Rx: standby=5:5:90. Power save on.
- 53(W) × 120(H) × 37(D) mm compact body
- Lone worker function
- Channel announcement function
- Surveillance function • Voting scan
- CTCSS and DTCS built-in (For analog FM)

IDAS™ Features

- Type-D multi-site/single-site trunking
- Multi-site conventional
- PTT ID and ANI • Block decode
- Up to 500 individual and up to 500 group ID aliases
- Status • SDM (Short Data Message)
- Stun, Kill and Revive (RX)
- Call alert and radio check (RX)
- Remote monitor (RX) • Call log
- RAN (Radio Access Number) • Emergency
- Digital voice scrambler
- ATB (All Trunks Busy) ring back
- Roaming scan (Multi-site trunking)

* Some frequency ranges do not have FCC certification.
* IC-F3230DT/F4230DT is not available in the USA or some other countries.

IC-F3230DT   IC-F4230DS

VHF HANDHELD TRANSCEIVER
IC-F3210D (5W)

UHF HANDHELD TRANSCEIVER
IC-F4210D (4W)

Multi-site conventional
Type-D multi-site trunking
Type-D single-site trunking

IP54

Rugged
MIL-STD 810

General Features

- 136–174MHz, 5W
- 400–470, 450–512, 450–520MHz, 4W
- 16 memory channels • 3-color LED
- Operating time: Approximately 16–17.5 hours* with BP-265 battery pack * Tx: Rx: standby = 5:5:90. Power save on.
- Channel announcement function
- 800mW (typical) loud speaker audio
- Internal VOX capability for hands-free operation
- IP54, dust-protection and water resistance
- Lone worker function • Surveillance function
- Voting scan • Optional GPS microphone, HM-171GP
- 58(W) × 111.5(H) × 36.5(D) mm compact body
- CTCSS and DTCS built-in (For analog FM)

IDAS™ Features

- Type-D multi-site/single-site trunking
- Multi-site conventional
- PTT ID (TX) • Individual/Group call
- Block decode • RAN (Radio Access Number)
- Radio check (RX) • Stun, Kill and Revive (RX)
- Call alert (RX) • Remote monitor (RX)
- Emergency • Digital voice scrambler
- GPS (TX with HM-171GP) • ATB ring back
- Roaming scan (Multi-site trunking)

IC-F3210D   IC-F4210D

IDAS™ Calling Features

Type-D Trunking Features

Multi-site Conventional

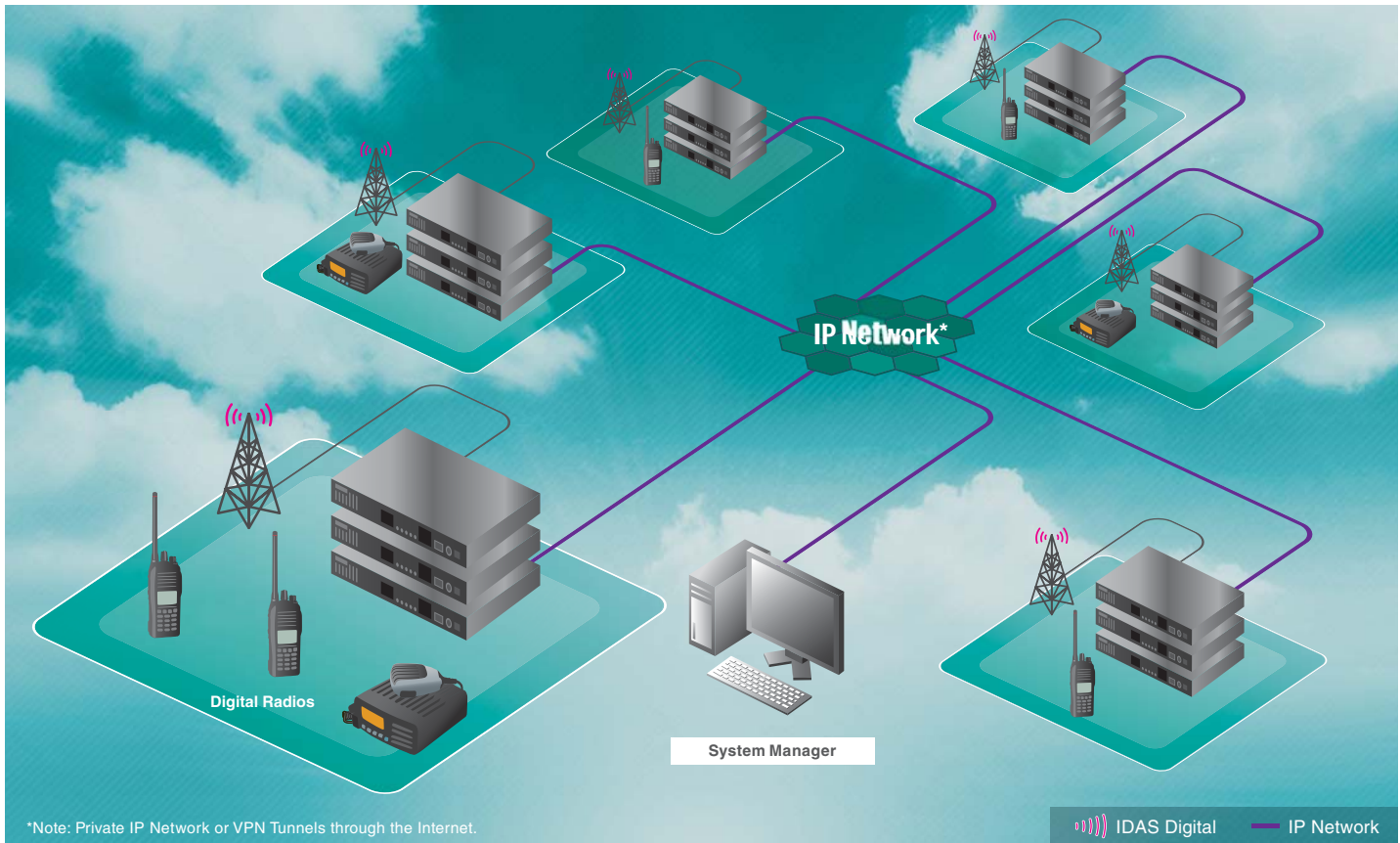Type-D Product Lineup

Type-C Trunking Features

Type-C Product Lineup

IDAS™ Calling Features
Type-D Trunking Features
Multi-site Conventional
Type-D Product Lineup
Type-C Trunking Features
Type-C Product Lineup

IECEx/ATEX INTRINSICALLY SAFE RADIO

Multi-site conventional

Type-D single-site trunking

VHF HANDHELD TRANSCEIVER
IC-F3201DEX(1W)

UHF HANDHELD TRANSCEIVER
IC-F4201DEX(1W)

IP67

Rugged MIL-STD 810

IECEx Certifications

- Mining: Ex ib I Mb
- Gas: Ex ib IIC T4 Gb
- Dust: Ex ib IIIC T110°C Db
- –20°C≤Ta≤+55°C

IEC 60079-0 (2011), IEC 60079-11 (2011)

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

EN 60079-0 (2012), EN 60079-11 (2012)

Features

- 136–174MHz, 1W • 400–470MHz, 1W
- Type-D single-site trunking
- Multi-site conventional
- Digital/analog mixed mode operation
- 16 memory channels with channel announcement
- Lone worker and Man down functions
- Low electrical resistivity body; Carrying case is not required
- IP67 dust-tight and waterproof
- Operating time: 19.5–21 hours*
  (approx. with BP-277EX battery pack)
  * Tx: Rx: Standby = 5:5:90. Power save on.
- 2-Tone, 5-Tone, CTCSS and DTCS capability
- MDC 1200 PTT ID and emergency transmission
- Optional speaker-microphone, HM-203EX

IC-F3201DEX   IC-F4201DEX

VHF MOBILE TRANSCEIVER
IC-F5220D(50W)

UHF MOBILE TRANSCEIVER
IC-F6220D(45W)

Multi-site conventional

Type-D multi-site trunking

Type-D single-site trunking

Rugged MIL-STD 810

IC-F5220D series

General Features

- 136–174MHz, 50W
- 350–400, 400–470, 450–512, 450–520MHz, 45W*
- 128 memory channels and 8 zones
- 8-character alphanumeric display
- 4W (typical) front mounted speaker
- Lone worker function
- Surveillance function
- Voting scan
- GPS receiver connection with optional ACC cable
- Channel announcement function
- Microphone hanger action programmable
- CTCSS and DTCS built-in (For analog FM)
* Some frequency ranges do not have FCC certification.

IDAS™ Features

- Type-D multi-site/single-site trunking
- Multi-site conventional
- PTT ID and ANI • Block decode
- Up to 500 individual and up to 500 group ID aliases
- Status • SDM (Short Data Message)
- Call alert • Radio check (RX)
- Stun, Kill, Revive (RX)
- RAN (Radio Access Number)
- Remote monitor (RX) • Emergency
- Digital voice scrambler
- ATB (All Trunks Busy) ring back
- Roaming scan (Multi-site trunking)

VHF & UHF HANDHELD TRANSCEIVERS
IC-F3101D (5W)
IC-F4101D (4W)

VHF & UHF MOBILE TRANSCEIVERS
IC-F5121D (50W)
IC-F6121D (45W)

Multi-site conventional

Type-D single-site trunking

IP54

Rugged MIL-STD 810

General Features

- 136–174, 350–400, 400–470, 450–512MHz coverage*
- 128 channels with 8 zones (IC-F5121D series)
  16 channels (IC-F3101D series)
- Type-D single-site trunking
- Multi-site conventional
- Digital/analog mixed mode operation
- Built-in 2-Tone, 5-Tone, CTCSS, DTCS and MDC 1200 signalling (For analog FM mode)
- Channel announcement (IC-F3101D series)
- Optional GPS microphone, HM-171GP (IC-F3101D series)
- GPS receiver connection with optional ACC cable (IC-F5121D series)
* Some frequency ranges do not have FCC certification.

IC-F3101D series   IC-F5121D series

Type-C Trunking Features
Type-C multi-site trunking for high volume, wide area communication

IDAS™ Calling Features

Type-D Trunking Features

Multi-site Conventional

Type-D Product Lineup

Type-C Trunking Features

Type-C Product Lineup

IP Network*

Digital Radios

System Manager

*Note: Private IP Network or VPN Tunnels through the Internet.

IDAS Digital   —— IP Network

Centralized control channel trunking

The Type-C trunking system uses a centralized control channel system. The control channel is independent of the traffic channels and continuously transmits a control signal. The Type-C trunking system is suitable for controlling a large number of users and congested traffic channels.

Message trunked and transmission trunked

The Type-C trunking system can set to either the message trunked or transmission trunked method. The message trunked method can provide quick response in a series of calls, while the transmission trunked method can allocate the best channel resources to all users.

Call queuing

If all traffic channels are busy, the user's call request is automatically stored in the call queuing until a traffic channel is available. The system sends a beep sound to notify when a traffic channel is available.

Eight priority levels with preemption

The Type-C trunking system can give priority levels to the users or some type of calls (such as a dispatcher or emergency call) in the call queuing. According to the priority levels, the priority user or call can use the channel prior to other non-priority users.

Four priority monitor IDs

When a call is received from a priority user (such as a dispatcher) while you are talking with another non-priority user, the system enforces you to end the call and switches the channel to the priority call. Important calls will not be missed.

Fail-soft mode

If there are any problems or failures within the system, the repeater site will try to work in the conventional mode and will continue basic communications.

Up to 48 site trunking

The Type-C trunking system can have a maximum of 30 (local) or 48* (regional) sites trunking, wide area roaming and calling service with an IP network connection. A transceiver can communicate with other transceivers registered to the interlinked trunked sites.

* Maximum number of group call sites is 16 sites for Unicast and 48 sites for multicast.

Up to 60,000 group ID and unit ID capability

The maximum 60,000 Group ID and Unit ID capacity is sufficient for large organizations and multi-user system sharing. A capacity of up to 3,000 Unit ID and group IDs provides ample unit and fleet organization capabilities for single-site trunking systems.

Type-C Product Lineup

VHF DIGITAL REPEATER

IC-FR5000C (5W)

UHF DIGITAL REPEATER

IC-FR6000C (5W)

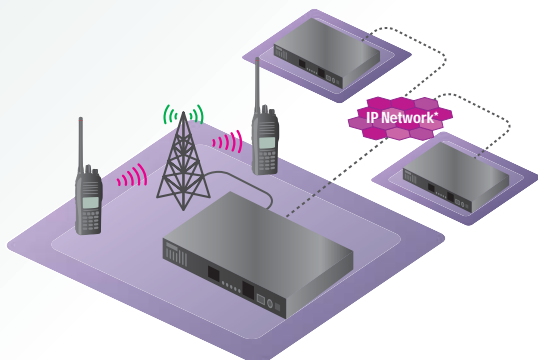| Multi-site conventional |
| Type-C trunking |

General Features

- 146–174, 400–430, 450–480MHz
- 5W output power (100% duty cycle)
- Repeater or base operation
- 1U 19-inch rack mountable
- 6 programmable function keys
- Two-digit LED display
- 30 channel sanning base (conventional mode)
- 3W external speaker audio
- Program/modem interface
- Remote terminal interface
- DTMF AUX output control
- DTMF AUX input monitoring
- Programmable AUX I/O's
- Flash firmware upgrading
- 16 CTCSS and DTCS built-in

IDAS™ Features*

- Digital conventional mode
- Multi-site conventional
- Type-C trunking
- Digital/analog mixed mode operation (conventional)
- 15-bit digital scrambler
- 6.25 & 12.5 kHz channels
- UID & GID validation Unit ID & Group ID validation
- Optional OCXO unit for 6.25kHz channel spacing
- Up to 48-site trunked IP network
- IP network connectivity
- Compact flash memory expansion

* Some features require activation licenses.

Digital Conventional System

Digital/analog mixed channel

The digital/analog mixed channel allows you to receive both analog mode and conventional mode signals on a single channel, and automatically selects the received mode to reply to a received call.

Multi-site conventional using the IC-FR5000C

With the IC-FR5000C series, up to 16 or 48 repeaters can be interlinked with each other*. An IDAS terminal radio user can roam through the network and communicate with other IDAS terminal radio users. (Digital mode only)

*Certain routing type required [16 (unicast) / 48 (multicast)] for maximum no. of repeaters per network.

Please note: IP linking for multi-site conventional systems must use the following: only IC-FR5000C series repeaters, or only IC-FR5200H/FR5000 series repeaters.

VHF HANDHELD TRANSCEIVERS
IC-F3360DT (5W)
IC-F3360DS (5W)

UHF HANDHELD TRANSCEIVERS
IC-F4360DT (5W)
IC-F4360DS (5W)

Multi-site conventional

Type-C trunking

IP67

GPS

Rugged MIL-STD 810

General Features

- 136–174MHz, 5W
- 400–470MHz, 5W
- 512 memory channels and 128 zones
- Dot-matrix, multi-function display
- Menu-driven user interface
- IP67 dust-tight and waterproof protection
- Built-in GPS receiver
- Built-in man down function
- Lone worker function
- Large capacity Lithium-Ion battery pack
- 800mW (typical) loud audio
- Priority scan • DTMF autodial
- Power ON password
- 14-pin accessory connector with BTL amplifier output

IDAS™ Features

- Type-C trunking
- Multi-site Conventional
- Individual and group selective call
- Digital/analog mixed mode operation
- Paging call • Broadcast call
- All call • Status call
- Text message • Emergency call
- Stun, Kill and Revive (RX)
- Radio check (RX) • Over-the-air alias
- 15-bit digital scrambler • GPS
- RAN (Radio Access Number)
- Transparent data
- 6.25 and 12.5 kHz channel spacing

Analog FM Mode Features

- CTCSS and DTCS built-in
- Built-in inversion voice scrambler
- Built-in audio compander
- MDC 1200 PTT ID transmission

IC-F3360DT   IC-F4360DS

VHF MOBILE TRANSCEIVER
IC-F5360D (50W)

UHF MOBILE TRANSCEIVER
IC-F6360D (45W)

Multi-site conventional

Type-C trunking

Rugged MIL-STD 810

GPS

General Features

- 136–174MHz, 50W • 400–470MHz, 45W
- 512 memory channels and 128 zones
- Dot-matrix, multi-function display • Menu-driven user interface
- Power ON password • DTMF autodial
- Built-in GPS receiver* (* External GPS antenna required.)
- Front mounted speaker • Lone worker function
- D-SUB 15-pin accessory connector • Ignition sensing line
- Self-grounding microphone, HM-148G • Priority scan

IDAS™ Features

- Type-C trunking • Multi-site convention
- Digital/analog mixed mode operation
- Paging call • Broadcast call • All call
- Group call • Individual call • Status call
- Text message • Emergency call • Stun, Kill and Revive (RX)
- Radio check (RX) • Over-the-air alias • GPS
- 15-bit digital scrambler • RAN (Radio Access Number) code
- Transparent data • 6.25 and 12.5 kHz channel spacing

IC-F5360D series

Analog FM Mode Features

- CTCSS and DTCS built-in
- Built-in inversion voice scrambler
- Built-in audio compander
- MDC 1200 PTT ID transmission

IDAS Type-C Features

	IC-F3360DT/DS IC-F4360DT/DS series	IC-F5360D IC-F6360D series		IC-F3360DT/DS IC-F4360DT/DS series	IC-F5360D IC-F6360D series
Channel Spacing	6.25/12.5kHz	6.25/12.5kHz	Broadcast Call	Compatible	Compatible
Conventional			All Call	Compatible	Compatible
Mixed Mode Operation	Compatible	Compatible	Group Call	Compatible	Compatible
Multi-Site Conventional	Compatible	Compatible	Individual Call	Compatible	Compatible
Type-C Trunking			Status Call	Compatible	Compatible
Automatic Roaming	Compatible	Compatible	Text Message	Compatible	Compatible
Call Queuing with Priority	Compatible	Compatible	Emergency Call	Compatible	Compatible
Priority Call (4 IDs)	Compatible	Compatible	Stun/Kill/Revive (RX)	Compatible	Compatible
Remote Group Add	Compatible	Compatible	Radio Check (RX)	Compatible	Compatible
Failsoft Mode	Compatible	Compatible	Over-the-Air Alias	Compatible	Compatible
Transmission Trunking Mode	Compatible	Compatible	Digital Scrambler (15-bit)	Compatible	Compatible
Message Trunking Mode	Compatible	Compatible	Lone Worker	Compatible	Compatible
Signaling			Man Down	Compatible	N/A
RAN (Radio Access Number) Code	Compatible	Compatible	GPS	Available	Available[*1]
Paging Call	Compatible	Compatible	Transparent Data	Compatible	Compatible

Compatible= Compatible with other Type-C NXDN radios.

[*1] External GPS antenna required.

IDAS Type-D Features

	IC-F3261DT/DS IC-F4261DT/DS series	IC-F5061D IC-F6061D series	IC-F3230DT/DS IC-F4230DT/DS series	IC-F3210D IC-F4210D series	IC-F5220D IC-F6220D series	IC-F1000D IC-F2000D series	IC-F3201DEX IC-F4201DEX series	IC-F3101D IC-F4101D series	IC-F5121D IC-F6121D series	RC-FS10
Multi-Site Conventional	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Type-D Single-Site Trunking	✔	✔	✔	✔	✔	✔	✔	✔	✔	—
Type-D Multi-Site Trunking	✔	✔	✔	✔	✔	—	—	—	—	✔(Ver. #15 or #25)
Digital/Analog Mixed Mode	✔	✔	—	—	—	✔	✔	✔	✔	—
PTT ID	✔	✔	✔	TX only	✔	TX only	TX only	TX only	✔	✔
Individual List	✔(Max. 500 ID)	✔(Max. 500 ID)	✔(Max. 500 ID)	—	✔(Max. 500 ID)	—	—	—	✔(Max. 500 ID)	✔(Max. 500 ID)
Talkgroup List	✔(Max. 500 ID)	✔(Max. 500 ID)	✔(Max. 500 ID)	—	✔(Max. 500 ID)	—	—	—	✔(Max. 500 ID)	✔(Max. 500 ID)
Log for Individual	✔	✔	✔	—	✔	—	—	—	✔	✔
Block Decode	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
RAN (Radio Access Number) Code	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Status	✔	✔	✔	TX only [*1]	✔	TX only [*5]	TX only [*1]	TX only [*1]	✔	✔
SDM (Short Data Message)	✔	✔	✔	—	✔	—	—	—	✔	✔
Call Alert	✔	✔	✔	✔	✔	✔	RX only	RX only	✔	✔
Radio Check	✔	✔	RX only	RX only	RX only	RX only	RX only	RX only	RX only	✔
Stun/Revive/Kill	✔	✔	RX only	RX only	RX only	RX only	RX only	RX only	RX only	TX only
Emergency	✔	✔	✔	✔	✔	✔(No ACK TX)	✔(No ACK TX)	✔(No ACK TX)	✔(No ACK TX)	✔
Remote Monitor	✔	✔	RX only	RX only	RX only	RX only	RX only	RX only	RX only	TX only
Digital Voice Scrambler	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
DTMF Autodial	✔	✔	— [*3]	—	— [*4]	✔	✔	✔	✔	—
GPS	✔ [*2]	✔	✔	TX only	✔	TX only	—	TX only	✔	RX only
GPS Microphone	—	—	—	HM-171GP	—	HM-171GPW	—	HM-171GP	—	—

[*1] Power ON/OFF status only. [*2] GPS built-in, depending on version. [*3] DTMF dialing is possible with IC-F3230DT/F4230DT.
[*4] DTMF dialing is possible with optional DTMF microphone. [*5] Power ON/OFF status and GPS request. TX: Transmit, RX: Receive