

## Two Channels in One Box Repeater, Compatible with Affordable Digital Simulcast

The IC-FR5300/FR6300 is a 50 W\*, high duty cycle, 32 channel VHF/UHF repeater combining analog FM and IDAS™ digital mixed mode operation. The optional UC-FR5300 network/controller board provides IP network connectivity, and it is scalable to multi-site conventional, simulcast conventional, and Type-D trunking capabilities. The IC-FR5300/FR6300 is another addition to Icom's robust series of professional repeaters that support countless systems worldwide.

- Completely new CPU/FPGA Platform
- 50 W\* output at high duty cycle operation
- $\pm 0.1$  ppm high frequency stability with 1 pps signal
- Digital/analog mixed mode operation
- System scalable to IDAS™ digital simulcast or Type-D Trunking
- Multiple tone-group using CTCSS, DTCS and digital RAN
- VE-PG4 RoIP gateway connection for telephone interface
- IP remote maintenance

\* 25 W output power depending on the repeater version.



## FEATURES

## IC-FR5300 • IC-FR6300

**Completely New CPU/FPGA Platform**

The IC-FR5300 series is the second generation IDAS™ Repeater, keeping system compatibility with the original IC-FR5000 series and continuing its unique package. It looks the same as the IC-FR5000, but a new CPU/FPGA platform is used. The IC-FR5300 series provides digital simulcast system capability and  $\pm 0.1$  ppm high frequency stability with a 1 pps reference signal from the GNSS antenna.

**System Scalability**

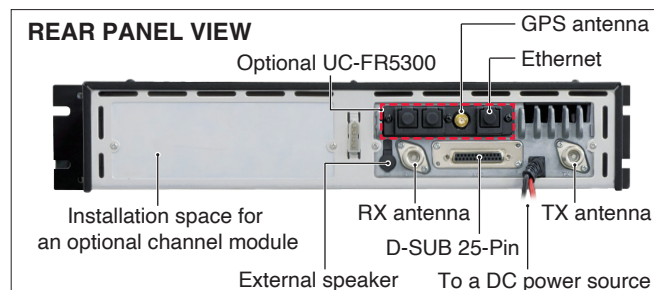
The IC-FR5300 series can be easily upgraded by installing an optional UC-FR5300 Network/controller board and software provided with a CF card. Depending on the communication density and coverage, your radio system can grow from a single site to a simulcast system or multi-site trunking\* system, to match your communication needs.

\* Compatible IDAS radio terminals are required for multi-site trunking.

| System                  | Optional Network/Controller Board                                         |
|-------------------------|---------------------------------------------------------------------------|
| Simulcast Conventional  | UC-FR5300 #14<br>(Supplied with a CF-FR5300SC)<br>and UX-241 GNSS antenna |
| Multi-site Conventional | UC-FR5300 #12<br>(Supplied with a CF-FR5000MC)                            |
| Single site Trunking    | UC-FR5300 #11                                                             |
| Multi-site Trunking     | UC-FR5300 #13<br>(Supplied with a CF-FR5000MT)                            |

**D-SUB 25-Pin Accessory Connector**

The IC-FR5300 series has a programmable D-SUB 25-pin accessory connector for connecting an external remote control devices. Also, modulation/demodulation signals can be input/output from the D-SUB connector.



Rear panel view with an optional UC-FR5300

**50 W Output at 50% Duty Cycle or 25 W 100% Duty Cycle Operation\***

Employing a high-performance power amplifier, the IC-FR5300 series provides a reliable 100% duty cycle operation at 25 W output. When operated at the high power setting of 50W, the repeater operates with a 50% duty cycle.

\* 25 W output power depending on the repeater version.  
Ambient temperature: 25°C

**Capable of Installing Two RF Modules in One Chassis**

The IC-FR5300 series has an internal space for installing another RF unit. Two RF modules\* can be installed and operated independently. LEDs on the front panel shows the status of both channel.

\* Optional UR-FR5300/UR-FR6300 required.

**Digital/Analog Mixed Mode and Multiple Tone-Group Using CTCSS, DTCS Tone and RAN**

The IC-FR5300 series can receive both analog and digital modes on a channel, and transmit either mode, depending on the programming. It decodes multiple CTCSS and DTCS as well as digital RAN (Radio Access Number) codes on a per channel basis (up to 16 tones/codes) and downlinks the received signal with a specified tone/code.

**32 Channel Capacity and 5 Programmable Buttons**

The 12-digit alphanumeric display, 5 programmable buttons, 32 memory channels and internal speaker enable you to use the repeater as a simple base station, or to check repeater activity. The LCD shows a variety of text and code information.

**IP Remote Maintenance**

When the IC-FR5300 series is connected to an IP network through the optional UC-FR5300 network/controller board, PC programming and IP address setting can be made from a remote location. The SNMP traps and Syslog can be sent to your manager for remote monitoring.

**Other Features**

- 19-inch rack mount 2U height low profile
- Receiver voting function improves talkback capability of radio terminals in the field
- RC-FS10 remote communicator software works as a simple dispatch station to communicate with radio terminals through the repeater
- CW ID transmitter
- PTT priority setting (Local Microphone, external PTT or repeater operation)
- 5-Tone decoder\* (\* For analog mode only)
- DTMF encoder/decoder
- Low voltage alert

## SPECIFICATIONS

## IC-FR5300 • IC-FR6300

|                                                     |                      | IC-FR5300                                                                                                                | IC-FR6300                                                                                              |
|-----------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| GENERAL                                             |                      |                                                                                                                          |                                                                                                        |
| Frequency coverage*<br>(* Depending on the version) |                      | 136–174 MHz (USA, EXP, EUR, CAN, AUS)                                                                                    | 330–400 MHz (EXP),<br>400–470 MHz (USA, EXP, EUR, CAN)<br>450–512 MHz (USA),<br>450–520 MHz (EXP, AUS) |
| Number of channels                                  |                      | 32 channels /1 zone                                                                                                      |                                                                                                        |
| Type of emission*<br>(* Depending on the version)   |                      | 16K0F3E* <sup>1</sup> (25 kHz), 14K0F3E (20 kHz, EUR), 11K0F3E (15 kHz, USA), 8K50F3E (12.5 kHz), 4K00F1E/F1D (6.25 kHz) |                                                                                                        |
| Power supply requirement                            |                      | 13.6 V DC nominal (USA, EXP, CAN)<br>13.2 V DC nominal (EUR, AUS)                                                        |                                                                                                        |
| Current drain (approx.)                             | TX                   | 15.0 A maximum (at 50 W)<br>8.0 A maximum (at 25 W)                                                                      |                                                                                                        |
|                                                     | RX                   | 1.9 A /500 mA (Maximum audio /Standby (Fan OFF))                                                                         |                                                                                                        |
| Antenna impedance                                   |                      | 50 Ω                                                                                                                     |                                                                                                        |
| Operating temperature range                         |                      | –30 °C to +60 °C, –22 °F to +140 °F (USA, EXP, CAN)<br>–25 °C to +55 °C, –13 °F to +131 °F (EUR, AUS)                    |                                                                                                        |
| Dimensions (Projections not included)               | IC-FR5300/FR6300     | 483 × 88 × 260 mm, 19.0 × 3.5 × 10.2 in (W × H × D)                                                                      |                                                                                                        |
|                                                     | UR-FR5300/FR6300     | 176 × 60 × 194 mm, 6.9 × 2.4 × 7.6 in (W × H × D)                                                                        |                                                                                                        |
| Weight (approx.)                                    | IC-FR5300/FR6300     | 5.78 kg, 12.7 lb                                                                                                         |                                                                                                        |
|                                                     | UR-FR5300/FR6300     | 2.1 kg, 4.6 lb                                                                                                           |                                                                                                        |
| TRANSMITTER                                         |                      |                                                                                                                          |                                                                                                        |
| Output power (Hi, L2, L1)                           |                      | 50 W, 25 W, 5 W (USA, EXP, CAN, AUS Versions)<br>25 W, 10 W, 5.8 W (EUR, EXP Versions)                                   |                                                                                                        |
| Frequency stability                                 |                      | ±1.0 ppm or less<br>±0.1 ppm or less (corrected using GNSS)                                                              |                                                                                                        |
| Spurious emissions                                  |                      | 80 dB typ. (TIA-603)<br>0.25 μW (≤ 1 GHz), 1.00 μW (> 1 GHz) (EN301 166, EN300 086)                                      |                                                                                                        |
| Maximum frequency deviation                         | Digital              | ±1.203 kHz– 1.471kHz (EN301 166)                                                                                         |                                                                                                        |
|                                                     | Analog               | ±5.0 kHz/±2.5 kHz (25 kHz/12.5 kHz)(TIA-603)<br>±5.0 kHz/±4.0 kHz/±2.5 kHz (25 kHz/20 kHz/12.5 kHz)(EN300 086)           |                                                                                                        |
| FM hum and noise                                    |                      | 83/77 dB typ. (25/12.5 kHz)(TIA-603)                                                                                     | 72/67 dB typ. (25/12.5 kHz)(TIA-603)                                                                   |
| Residual modulation (With CCITT filter)             |                      | 82/82/79 dB typ. (25/20/12.5 kHz)(EN300 086)                                                                             | 76/74/71 dB typ. (25/20/12.5 kHz)(EN300 086)                                                           |
| Audio harmonic distortion                           |                      | 0.9% typ. (AF 1kHz 40% deviation)(TIA-603)<br>1.1% typ. (AF 1kHz 40% deviation)(EN 300 086)                              | 0.8% typ. (AF 1kHz 40% deviation)(TIA-603)<br>0.8% typ. (AF 1kHz 40% deviation)(EN 300 086)            |
| FSK error                                           |                      | 0.6% typ. (EN301 166)                                                                                                    |                                                                                                        |
| RECEIVER                                            |                      |                                                                                                                          |                                                                                                        |
| Sensitivity                                         | Digital (1% BER)     | –4.0 dBμV (0.32 μV) emf typ. (EN301 166)                                                                                 | –3.5 dBμV (0.33 μV) emf typ. (EN301 166)                                                               |
|                                                     | Analog (12 dB SINAD) | –119 dBm, (0.25 μV) typ. (TIA-603)                                                                                       | –117 dBm, (0.32 μV) typ. (TIA-603)                                                                     |
|                                                     | Analog (20 dB SINAD) | –4.0/–4.0/–1.0 dBμV emf typ. (25/20/12.5 kHz)(EN300 086)                                                                 | –3.0/–3.0/0.0 dBμV emf typ. (25/20/12.5 kHz)(EN300 086)                                                |
| Adjacent channel selectivity                        | Digital              | 66 dB typ. (EN301 166)                                                                                                   | 63 dB typ. (EN301 166)                                                                                 |
|                                                     | Analog               | 85/80 dB typ. (25/12.5 kHz)(TIA-603)<br>84/83/78 dB typ. (25/20/12.5 kHz)(EN300 086)                                     | 80/56 dB typ. (25/12.5 kHz)(TIA-603)<br>78/78/74 dB typ. (25/20/12.5 kHz)(EN300 086)                   |
| Spurious response rejection                         | Digital              | 87 dBμV emf typ. (EN301 166)                                                                                             | 85 dBμV emf typ. (EN301 166)                                                                           |
|                                                     | Analog               | 85 dB typ.(TIA-603)<br>81 dB typ. (EN300 086)                                                                            | 84 dB typ.(TIA-603)<br>81 dB typ. (EN300 086)                                                          |
| Intermodulation rejection                           | Digital              | 78 dBμV emf typ. (EN301 166)                                                                                             | 78 dBμV emf typ. (EN301 166)                                                                           |
|                                                     | Analog               | 81/81 dB typ. (25/12.5 kHz)(TIA-603)<br>75/74/73 dB typ. (25/20/12.5 kHz)(EN300 086)                                     | 80/80 dB typ. (25/12.5 kHz)(TIA-603)<br>74/74/73 dB typ. (25/20/12.5 kHz)(EN300 086)                   |
| Audio output power                                  |                      | 3.9 W typ. (at 5% distortion with 4 Ω load)                                                                              |                                                                                                        |

Measurements made in accordance with TIA-603, EN300 086 and EN301 166.

All stated specifications are subject to change without notice or obligation.

\*1 25 kHz bandwidth is not available for FCC Part 90 licensees for USA versions. Ask your dealer if you need 25 kHz bandwidth.

## Applicable U.S. Military Specifications

| Standard          | MIL 810G |           |
|-------------------|----------|-----------|
|                   | Method   | Procedure |
| Low Pressure      | 500.5    | I, II     |
| High Temperature  | 501.5    | I, II     |
| Low Temperature   | 502.5    | I, II     |
| Temperature Shock | 503.5    | I-C       |
| Solar Radiation   | 505.5    | I         |
| Humidity          | 507.5    | II        |
| Dust Blowing      | 510.5    | I         |
| Vibration         | 514.6    | I         |
| Shock             | 516.6    | I         |

Also meets equivalent MIL-STD-810-C, -D, -E and -F.

**Supplied accessories:** (May differ depending on the repeater version)

- DC power cable
- Handle kits

## OPTIONAL ACCESSORIES

## IC-FR5300 • IC-FR6300

## ■ CHANNEL MODULES

**UR-FR5300:** 136–174 MHz, 50/25 W\*

**UR-FR6300:** 400–470, 450–512, 450–520, 330–400 MHz, 50/25 W\*

\* 25W output power depending on the channel module version.



UR-FR5300

## ■ IDAS™ NETWORK/CONTROLLER BOARD AND SOFTWARE

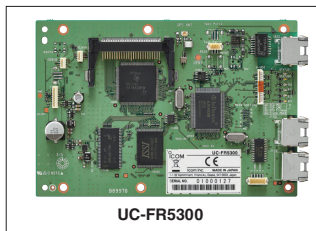
**UC-FR5300:** Network/controller board. Software (CF card) may be supplied, depending on UC-FR5300 version.

**CF-FR5300SC:** Simulcast software. Same as supplied with UC-FR5300 #14.

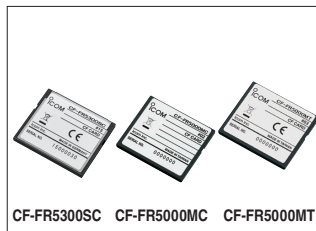
**CF-FR5000MC:** Multi-site conventional software. Same as supplied with UC-FR5300 #12.

**CF-FR5000MT:** Multi-site trunking software. Same as supplied with UC-FR5300 #13.

|                                         | Conventional |            | Type-D Trunking |             |
|-----------------------------------------|--------------|------------|-----------------|-------------|
|                                         | Simulcast    | Multi-site | Multi-site      | Single site |
| UC-FR5300 #14<br>(Includes CF-FR5300SC) | ✓            | ✓          | –               | ✓           |
| UC-FR5300 #12<br>(Includes CF-FR5000MC) | –            | ✓          | –               | ✓           |
| UC-FR5300 #13<br>(Includes CF-FR5000MT) | –            | ✓          | ✓               | ✓           |
| UC-FR5300 #11<br>(CF card not supplied) | –            | –          | –               | ✓           |



UC-FR5300



CF-FR5300SC CF-FR5000MC CF-FR5000MT

## ■ GNSS ANTENNA

**UX-241:** External GNSS antenna. Cable length 5 m, 16.4 ft.



UX-241

## ■ EXTERNAL SPEAKERS

**SP-35/L:** Compact external speaker.

SP-35 cable length: 2 m, 6.6 ft.

SP-35L cable length: 6 m, 19.7 ft.



SP-35/SP-35L

## ■ HAND MICROPHONE AND DESKTOP MICROPHONE

**HM-152:** Hand microphone (for base station operation)

**SM-26:** Desktop microphone with monitor and monitor lock buttons (for base station operation).



HM-152



SM-26

## ■ RoIP GATEWAY

**VE-PG4:** RoIP gateway. Provides an interconnection with an IP phone, LTE radio, WLAN radio or an analog radio.



VE-PG4

Some options may not be available in some countries. Please ask your dealer for details.

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