

# ***IP ADVANCED RADIO SYSTEM FAQ***



# PREFACE

## Preface

This document is designed to answer common questions about the IP ADVANCED RADIO SYSTEM IP1000C, IP100H, and IP100FS. For further reference, refer to their Instruction manuals, catalogs or other related documents.

This document is based on the firmware version 2.04 for the IP1000C. Visit the ICOM Support page <http://www.icom.co.jp/world/support/> to get the latest firmware and update history.

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## Document history

Version	Date	Description
1.0	May 2016	First release
2.0	June 2017	Update corresponding to the firmware version 2.04

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## QUESTIONS

	Mainly related to					
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**Bold: New on version 2.0**

## QUESTIONS AND ANSWERS

Q1. How much bandwidth is required?

A1. About 150 (precisely 144) kbps for one voice path. This means in Simplex 150 kbps per radio in use, in Duplex 300 kbps per radio in use, nearly zero while in standby.

Q2. How many terminals (IP100H, IP100FS) can run in a system?

A2. 20 or 100 terminals per one IP1000C, depending on the version of the IP1000C. Up to a maximum of 1100 terminals can run in one system by connecting 11 IP1000Cs using the additional controller function. (The number of concurrent calls through the additional controller function is limited to 10 calls.)

Q3. How many IP100Hs can co-exist per AP (access point)?

A3. It is recommended that no more than twelve concurrent full-duplex calls be active on an AP. (Use of APs working in 802.11b is not considered.)

Q4. Which encryption types on WLAN network are supported?

A4. The IP100H can handle WPA/WPA2 Personal (TKIP/AES) and WEP.

Q5. Which call types are supported?

A5. Individual call, Group call (Talkgroup call), All call and Telephone call. They can be prioritized with several ways (see Q43), localized by the APs (Area call).

Q6. How many call destinations (Individual, Group and Telephone) are configurable?

A6. A total of 990 call destinations can be defined on one IP1000C in its destination list (All call is available as a default.) One IP100H can have 50 destinations in its ID list (contact list). The usable ID range is 0 to 9999 for both Individual and Group calls.

Q7. What protocol is used?

A7. The protocol used between IP100H and IP1000C is Icom proprietary. G.711 is used for voice codec.

Q8. Does the IP100H Support hidden SSID?

A8. Yes, on the 2.4 GHz band, but not on the 5 GHz band. (This is a limitation of the WLAN chip used in the IP100H.)

Q9. Is it possible to make the IP1000C act as a DHCP server?

A9. Yes, the IP1000C has a DHCP server function.

Q10. Is it possible to get priority for the IP100H traffic in a network?

A10. Yes, it is possible in a network that can handle ToS based QoS or WMM.

Q11. Does all traffic go through the IP1000C?

A11. Yes. The talker's packets are sent to the IP1000C and the IP1000C delivers them to all destinations.

Q12. Can the IP1000C be connected to an existing network?

A12. Yes.

Q13. What happens if the bandwidth is reduced?

A13. Insufficient bandwidth will cause unstable communications like dropping audio, too much delay, failed calls, and so on.

Q14. Is the Emergency function like on a Land Mobile Transceiver available?

A14. Yes, Emergency Call (by key and lone worker) can be made.

Q15. Is it possible to limit a call by the area (APs)?

A15. Yes, it is possible using the Area Call function. The IP100H can make a Group call or All call only to the area the caller is currently located in. And the IP100FS can make a Group call or All call to a specific area. The area is formed by the coverage of each AP or predefined APs.

Q16. What are main features of the IP100FS?

A16. ·Desktop dispatcher with Windows® PCs  
·Various types of call: Individual Call, Group Call, All Call  
·Remote management of the IP100H: STUN, KILL, REVIVE, REMOTE MONITOR  
·Area Call to limit the Group or All call to specific APs  
·Up to a 50 character free text message to IP100Hs  
·Location display: Displays up to 100 locations, and 1 location can have up to 10 APs  
·Manage a maximum of 16 IP-1000Cs  
·The SM-26 desktop microphone can be used with the optional CT-23 PTT MICROPHONE ADAPTER  
·120 programmable keys (buttons)

Q17. Does the IP100H support IEEE802.1x enterprise authentication?

A17. No.

Q18. Do the IP1000C and IP100H need to be on the same network segment?

A18. The IP1000C and the IP100H can be on different network segments as long as they can communicate with the proper routing (Example: through a layer 3 switch). Using the IP Masquerade or Network Address Translation (NAT) is not recommended.

Q19. What type of network communication protocol is used for the IP100H system?

A19. UDP unicast RTP based original protocol.

Q20. What about security for the IP1000C?

A20. The IP1000C has the same level of security as the LAN side of general routers on the market. There is no security threat directly from the Internet since the IP1000C doesn't have a WAN port.

Q21. What about the password level of the IP1000C?

A21. The IP1000C can have single password to log in that can be composed of up to 31 characters (0–9, a–z, and A–Z).

Q22. What OS is used on the IP1000C?

A22. The information is not disclosed.

Q23. What about the Load of the Network?

A23. See answer 1.

Q24. What about the Port Protection against a DDoS attack?

A24. The IP1000C has an advantage against DDoS attacks since most of the attacking methods target the weakness of other OSs.

Q25. What is the URL of the Update server, and what about its security?

A25. The URL is not open to the public. IP1000C firmly identifies the original firmware and has a strong fake firmware proof function.

Q26. What about the type of communication protocol?

A26. See answer 19.

Q27. What about the routing limits?

A27. See answer 18.

Q28. Are there any restrictions in setting up a firewall?

A28. Neither IP Masquerade nor Network Address Translation (NAT) are recommended for an IP100H to IP1000C connection or an IP1000C to IP1000C (additional controller) connection.

Q29. What about the load of the network during communication, and in standby?

A29. See answer 1.

Q30. What is the maximum length for the password for WLAN?

A30. Up to 5 ASCII\* characters, or 10 hexadecimal digits for the Encryption Type "WEP RC4 64 (40)."  
Up to 13 ASCII\* characters, or 26 hexadecimal digits for the encryption Type "WEP RC4 128 (104)."  
From 8 to 63 ASCII\* characters or 64 hexadecimal digits for the encryption Type "WPA-PSK/WPA2-PSK."

\*ASCII Code 0x20(space) to 0x7E(~)

Q31. Is VoIP priority necessary for the system?

A31. It depends on your actual use. See answer 10.

Q32. Is special routing necessary?

A32. No. Special routing is not required as long as the system is used in a LAN.

Q33. What is the requirement for hand over or roaming?

A33. The operating area must be appropriately covered by the WLAN signal without gaps or blank spots with proper WLAN channel allocation. Fine tuning of the Roaming Threshold setting on the CS-IP100H may be required, depending on the actual WLAN condition.

Q34. What about the security of the IP100FS?

A34. A USB key is needed to run the IP100FS and the configuration files can be protected with a password.

Q35. What are the OS and hardware requirement for the IP100FS?

A35. A PC with a Speaker and a Microphone running on one of the OSs listed below.

- Microsoft® Windows® 10
- Microsoft® Windows® 8/8.1 (Except for Windows RT)
- Microsoft® Windows® 7 (SP1 or later)
- Microsoft® Windows Vista® (SP2 or later)

Q36. Is there any limitation on the number of the APs in the IP100H system?

A36. There is no limit on the number of APs.

Q37. Is there any way to have redundancy for the IP1000C?

A37. The IP1000C itself does not have such a function, but it is possible, for example, by using an HSRP or VRRP capable network switch.

Q38. Can WLAN extenders or WLAN repeaters be used?

A38. There is no particular limit on the number of WLAN extenders or WLAN repeaters. However, the throughput of the network will be decreased by using such devices, and it may cause degradation of the system performance, like delayed voice or a longer gap while roaming.

Q39. Does the IP100H support both 2.4 GHz and 5 GHz WLAN?

A39. Yes.

Q40. Can the IP100H handle more than one SSID for WLAN connection?

A40. Yes, the IP100H can handle up to ten SSIDs.

Q41. Is the IP100H usable from outside of the network where the IP1000C is located, through a router?

A41. Although this could not be generally recommended as answered in the Q18 or Q28, the way to do this has become technically possible under certain condition by having appropriate port forwarding on the router. The UDP 69 (for Provisioning) and the connection ports (UDP) used for the TRXs need to be forwarded to the IP1000C on the router. Set the WAN IP address of the router as the Provisioning Server on the CS-IP100H, and as the "Controller IP Address Notify" on the IP1000C "profile". Note that some functions like firmware update, or rebooting in the Transceiver Management, may not work in this kind of network.

Q42. What communication range can be expected from an AP?

A42. This depends very much on the condition of your WLAN network, so it is not possible to say this exactly. However, the chart below could be an example of some WLAN network.

Frequency band	Internal antenna	External antenna
2.4 GHz band	90 m (295 ft)	160 m (525 ft)
5 GHz band		190 m (623 ft)

Q43. What kind of prioritization is possible?

A43. You can prioritize by the caller (call initiator), by the call type, and by the Group ID.

Q44. Can the IP100H scan the Talkgroup calls?

A44. IP100H doesn't have scan function like a traditional transceiver. But by using a Multiplex Talkgroup ID that is linked to several Talkgroups, the IP100H can simultaneously listen and talk to more than one Talkgroup.



Q45. Is any performance degradation expected while roaming through APs that have different SSIDs, compared to the same SSID?

A45. When an IP100H moves during a conversation between APs that have different SSIDs, you may notice a slightly longer audio gap, compared to when moving between APs with the same SSID.

Q46. How can I see more detailed information about the current WLAN condition on the IP100H?

A46. Follow the steps below.

1. Power ON while holding down the “Log” and “CLR” keys (the both bottom corner keys), and keep holding them down until you see “D” on the display.
2. Push the “Option” key (under the PTT) to see the RSSI and data speed.
3. Push the “UP” or “DOWN” key to see the BSSID SSID and WLAN CH.
4. In addition, you can check the MAC address and Firmware revision of the IP100H by pushing the “ID list” or “FUNC” key (one of the upper corner keys).
5. Push the “CLR” key to return to the normal screen.

Note: Use this function only for survey or troubleshooting purposes.

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