Version 1.1
June 2023

# TECHNICAL TIPS

# IC-F5330D

# IC-F6330D

## INSTALLING WITH A PoE SWITCH

# PREFACE

This document is intended for persons involved in installing IC-F5330D/IC-F6330D transceivers.
This document describes the preparations required and the precautions on the installation of IC-F5330D/IC-F6330D transceivers with a PoE (Power over Ethernet) switch.
We hope this document will help you make successful installations.

**Software versions**
The content of this document is based on the firmware and software listed below.

| MODELS | VERSION |
|---|---|
| IC-F5330D/IC-F6330D | 1.3 |
| CS-F5330D | 1.40 |

**Trademarks**
Icom and the Icom logo are registered trademarks of Icom Incorporated (Japan) in Japan, the United States, the United Kingdom, Germany, France, Spain, Russia, Australia, New Zealand, and/or other countries.
COMMANDMIC is a trademark of Icom Incorporated.
AMBE+2 is a trademark and property of Digital Voice Systems, Inc.
CISCO is a registered trademark or a trademark of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.
NETGEAR is a trademark of NETGEAR, Inc.
Microsoft and Windows are trademarks of the Microsoft group of companies.
All other products or brands are registered trademarks or trademarks of their respective holders.

**Voice coding technology**
The AMBE+2™ voice coding Technology embodied in this product is protected by intellectual property rights including patent rights, copyrights and trade secrets of Digital Voice Systems, Inc. This voice coding Technology is licensed solely for use within this Communications Equipment.
The user of this Technology is explicitly prohibited from attempting to extract, remove, decompile, reverse engineer, or disassemble the Object Code, or in any other way convert the Object Code into a humanreadable form. U.S. Patent Nos. #8,359,197, #7,970,606, and #6,912,495 B2.

Icom reserves the right to make changes to the content of this document at any time, without notice or obligation.

# TABLE OF CONTENTS

# SECTION 1 OVERVIEW

## INSTALLING WITH A PoE SWITCH

The IC-F5330D/IC-F6330D transceivers support the PoE (Power over Ethernet) switch technology. This enables you to install the transceiver main unit and the microphone in separate locations and connecting them with a PoE switch.

For example, install the transceiver main unit close to the antenna, and install the microphone in the operation room. You can shorten the length of the coaxial cable between the main unit and the antenna, and minimize the signal loss through the coaxial cable.

The following conditions apply to the equipment used for the installation described above.

Connect the microphone and a PoE switch using an Ethernet cable.
- See **2-2. LIST OF REQUIRED EQUIPMENT** through the specifications of PoE switches and Ethernet cables.

The cable length between the PoE switch and the microphone must be 100 m (328 ft) or less.
(This is due to the PoE specification regarding the electric power for the microphone through an Ethernet cable.)

**NOTE:** This installation example may not be allowed, depending on local law or regulations.

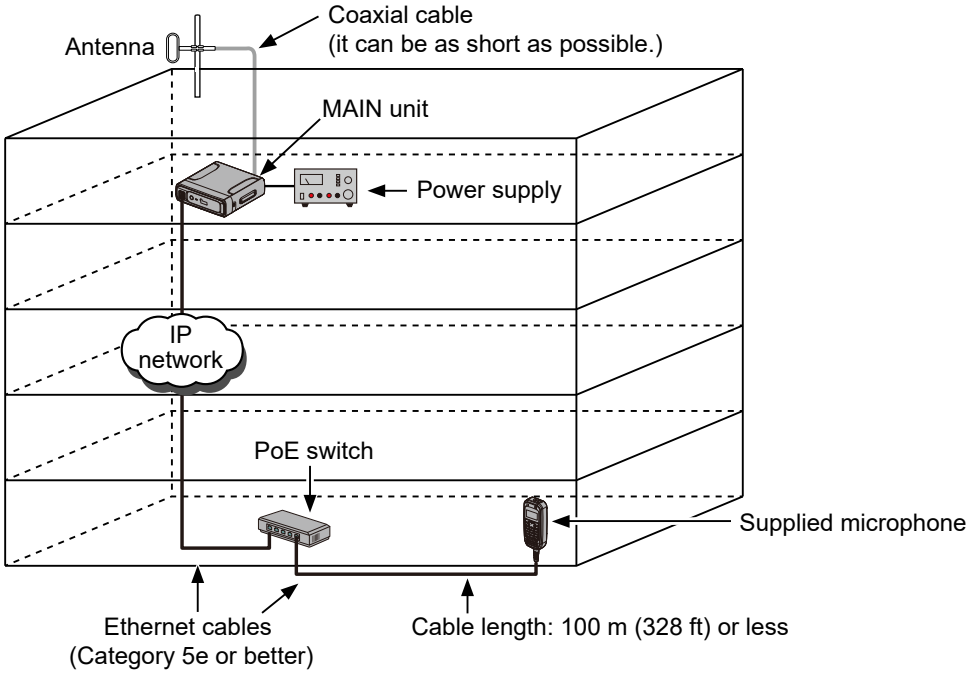



Figure 1. Installation example

**Recommendation:**
We recommend using lightning protection devices for the transceiver, power supply, and Ethernet cables. Lightning protection devices for the power supply or a power strip with a lightning protection function (commercially available) can be used to protect against lightning surges from power lines.

# SECTION 2 TEST OPERATION

## 2-1. OPERATION FLOW

Before installing the transceiver, verify that the transceiver main unit and the microphone work properly by following the procedures shown below.

1. Direct connection
   Connect the microphone directly to the transceiver main unit.
   See **2-3. CONNECTION (Direct)** on the next page.

2. PoE switch connection
   Connect the microphone and the transceiver main unit with a PoE switch.
   See **2-4. CONNECTION (With a PoE switch)** on the next page.
   (Separate network with only the transceiver and PoE switch)

3. PoE and Non-PoE switch connection
   Connect the microphone and the transceiver main unit with PoE and non-PoE switches.
   See **2-5. CONNECTION (With non-PoE and PoE switches)** on the next page.
   (Separate network with only the transceiver and network switches)

4. IP address
   Change the IP addresses, depending on the network of the location where you install the transceiver.
   See **SECTION 3 IP ADDRESS** on page 8.
   (After this procedure, you can connect the transceiver to the network.)

## 2-2. LIST OF REQUIRED EQUIPMENT

| EQUIPMENT | MODEL AND GRADE | QUANTITY |
|---|---|---|
| Transceiver 1 | IC-F5330D or IC-F6330D | 1 |
| Transceiver 2 | Transceiver that can communicate with IC-F5330D or IC-F6330D | 1 |
| DC Power supplies | Output voltage: 13.8 V<br>Rated output current: 20 A or more | 2 |
| Ethernet cables | Category 5e or better | 2 |
| Network switch 1 | PoE switch (supports IEEE802.3af standard at least)<br>*Icom has tested and verified operation with the following network switches.<br>• Model name: GS110-8P (Cisco Systems, Inc.)<br>• Model name: GC108PP (NETGEAR, Inc.) | 1 |
| Network switch 2 | Non-PoE switch (for simulation purposes)<br>See **2-5. CONNECTION** (With PoE and non-PoE switches) | 1 |
| Dummy loads | Rated input power: 50 W or more | 2 |
| Programming software | CS-F5330D (Download from the Extranet website and install to your PC.) | 1 |
| Programming cable | OPC-478UC-1 | 1 |

## 2-3. CONNECTION (Direct)

Connect the microphone directly to Transceiver 1 (IC-F5330D main unit).

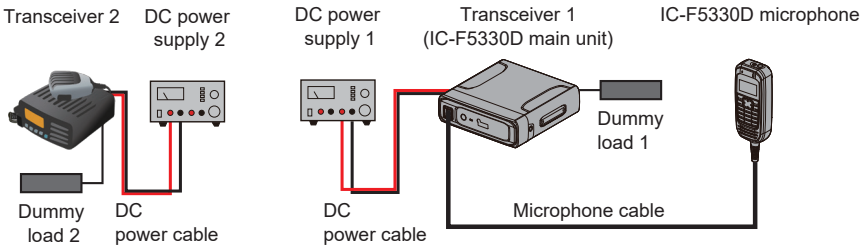



Figure 2. Direct connection

## 2-4. CONNECTION (With a PoE switch)

Connect Transceiver 1 (IC-F5330D main unit) and a PoE switch with an Ethernet cable.
Connect the microphone to the PoE switch.

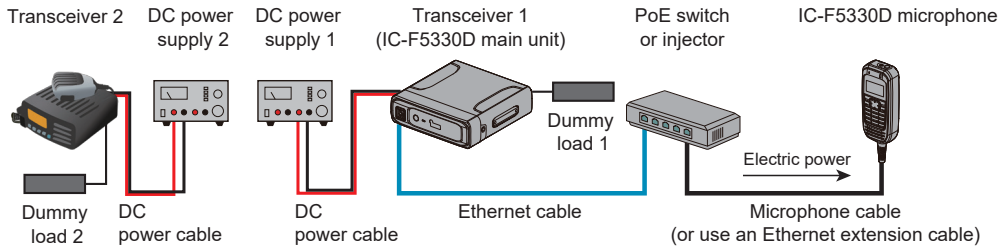



Figure 3. Connection with a PoE switch/injector

## 2-5. CONNECTION (With non-PoE and PoE switches)

Connect Transceiver 1 (IC-F5330D main unit), a non-PoE switch, and a PoE switch with Ethernet cables.
Connect the microphone to the PoE switch.

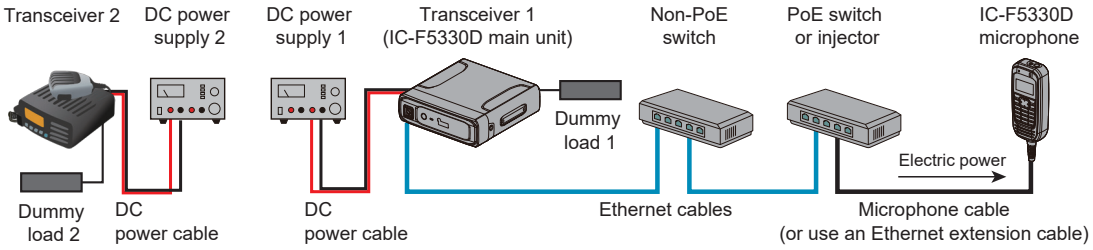
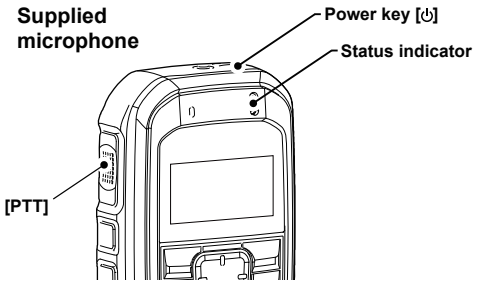



Figure 4. Connection with non-PoE and PoE switches

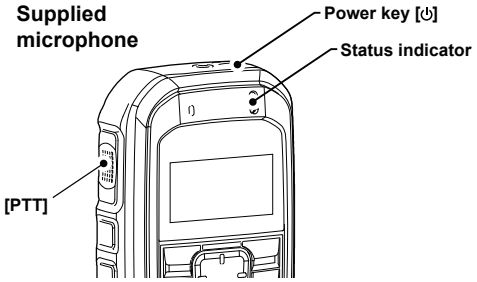
## 2-6. TEST OPERATION (With a PoE switch)

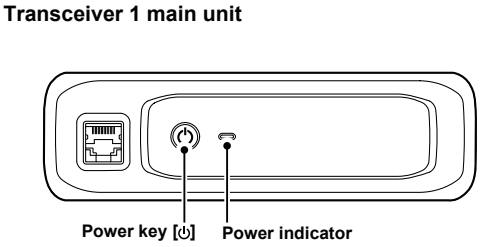
1. Preparation
Connect the transceivers and DC power supplies as shown on **2-4. CONNECTION (With a PoE Switch)** on page 6.
Turn ON DC power supplies and the PoE switch.
• When the microphone is powered by the PoE switch and communicates with the Transceiver 1 main unit, the microphone's Status indicator lights orange for approximately two seconds, then turns OFF.

**NOTE:** If the microphone's Status indicator does not light as described, see Troubleshooting on page 9.




2. Turn ON Transceiver 1.
Hold down [ ⏻ ] on the microphone until the Status indicator or Power indicator lights.
It takes approximately 2 seconds.
• On the microphone, the Status indicator lights red, orange, and green twice in sequence, and numbers and texts appear on its LCD.
• On the Transceiver 1 main unit, the Power indicator lights green.




3. Turn ON Transceiver 2.

4. Transmitting and receiving
While holding down Transceiver 1's [PTT], speak at your normal voice level.
• While transmitting, the Status indicator lights red.
• You can hear your voice from Transceiver 2's speaker.

Release [PTT] to receive.
• While holding down Transceiver 2's [PTT], speak at your normal voice level.
• While Transceiver 1 is receiving a signal, the Status indicator lights green, and the transmitted voice from Transceiver 2 is heard.

5. Turn OFF Transceiver 1.
Hold down [ ⏻ ] on the microphone for approximately 0.5 seconds.
• On the microphone, numbers and texts on its LCD disappear.
• On the Transceiver 1 main unit, the Power indicator turns OFF.

6. Turn OFF Transceiver 2.

# SECTION 3 IP ADDRESS

## 3-1. IP ADDRESS

This page describes how to change IP addresses for microphone and the transceiver main unit.

The factory default IP addresses are as follows.

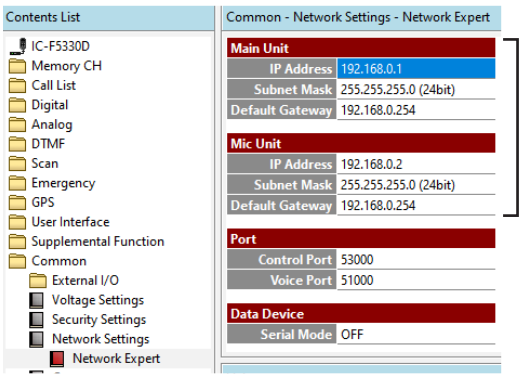
| UNIT | DEFAULT IP ADDRESS |
|---|---|
| Transceiver main unit | 192.168.0.1 |
| Microphone | 192.168.0.2 |

**NOTE:**
Never connect the IC-F5330D/IC-F6330D (with its default IP address) to the existing network unless the following condition:
- The default IP addresses of the IC-F5330D/IC-F6330D are not assigned to other devices in the network.
- Or, a dedicated network is provided for the IC-F5330D/IC-F6330D installation.

Ask the network administrator for the appropriate IP address assignment.

To change the IP addresses, use the CS-F5330D programming software.

**NOTE:**
Before changing the IP addresses of the transceiver main unit and the microphone, make sure the following points to avoid unexpected trouble.
- The microphone and the transceiver main unit are directly connected.
- Suitable IP addresses for each transceiver main unit and the microphone are specified by the network administrator.




Change IP addresses according to the network.

1. Connect the transceiver and the PC with the OPC-478UC-1 programming cable.
2. Start up the CS-F5330D programming software, read the current setting from the transceiver and save it to the desired folder of the PC.
3. Select the Network Expert item.
   CS-F5330D > Common > Network Settings > Network Expert >
4. Set the Network Expert item to “ON.”
   - The Network Expert items group appears.
5. Enter IP addresses for transceiver main unit and the microphone specified by the network administrator.
6. After changing the IP addresses, write back the programmed data to the transceiver.

## 3-2. SIMPLE TROUBLESHOOTING

If problems occur when turning ON or operating the IC-F5330D/IC-F6330D, check the network connection, network switches, IP addresses, DC power supplies, DC power cables, and fuses according to the list below.

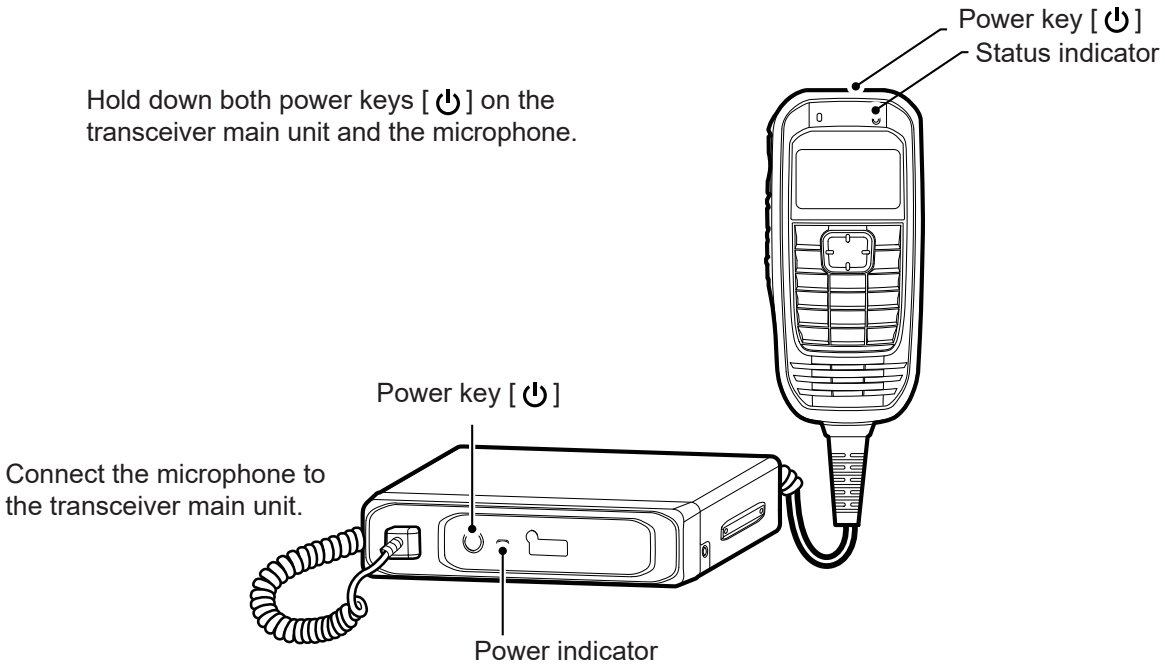
| PROBLEM | POSSIBLE CAUSE | SOLUTION EXAMPLE |
|---|---|---|
| Nothing is displayed on the microphone, and its status indicator lights orange. | The transceiver main unit was not powered.<br>- The transceiver main unit power indicator does not light. | Check the DC power supply, DC power cable, and fuses. Reconnect the cable. |
| | The connection between the transceiver main unit and the network switch fails.<br>- The transceiver main unit power indicator lights red. | Check Ethernet cables and network switches. Reconnect the cable. |
| | The microphone could not connect to the appropriate transceiver main unit.<br>- The transceiver main unit power indicator lights red. | Forcibly turn ON the transceiver and reprogram the IP addresses as described on the next page. |
| Microphone keys are not functional during operation. | Loose or poor connection between the transceiver main unit or microphone and the network switch. | Check Ethernet cables and network switches. Reconnect the cable. |
| | The transceiver is connected to the existing network, and network congestion occurs. | Wait until the network congestion is resolved, or prepare the dedicated network for the transceiver. |
| | The power supply of the transceiver main unit was cut off during operation. | Check the DC power supply, DC power cable, and fuses. Reconnect the cable. |

## 3-3. FORCE ACTIVATION PROCEDURE

When a transceiver main unit and a microphone with mismatched IP address settings are connected, the transceiver set will not turn ON. (The microphone's status indicator lights orange and the transceiver's Power indicator lights red.)
In this case, the following procedure temporarily starts up the transceiver main unit and the microphone with the factory default IP addresses.

This procedure is also useful when temporarily connecting a microphone of another transceiver to the transceiver main unit for testing purposes.

1. Connect the microphone to the transceiver main unit.
2. Hold down both [ ⏻ ] on the transceiver main unit and the microphone until the Status indicator on the microphone lights orange and the Power indicator on the transceiver main unit lights green.
   - It takes approximately 10 seconds.
   - The number and text appear on the microphone's LCD.
3. Release [ ⏻ ] on both the transceiver main unit and the microphone.
4. Using the programming software, read the setting and reprogram the appropriate IP addresses for the transceiver main unit and the microphone as described on page 8.



# SECTION 4 QUESTIONS AND ANSWERS

The questions and answers at the “IC-F5330D/IC-F6330D PoE connection Technical Webinar” conducted on April 26 (JST), 2022, are shown below.

**Questions and answers related to the PoE connection**

Q1: Does this model support only lower power operation such as in 10 watts or so?
A1: The IEEE802.3af compliance has nothing to do with the RF output power of the transceivers. The transmit output power of the IC-F5330D is 50 watts, and the IC-F6330D is 45 watts.

Q2: Does the transceiver main unit need the DC power supply wherever it is installed?
A2: Yes. The transceiver main unit needs the DC power supply.

Q3: Do I need a PoE switch for a simple installation?
A3: No. A PoE switch is not necessary when you connect the microphone directly to the transceiver main unit. When installing the microphone in a remote location, the microphone must be powered by a PoE switch. See connection examples on page 6.

Q4: Can I use the IC-F5330D/IC-F6330D without connecting it to the network?
A4: Yes. Connect the microphone directly to the transceiver main unit.
See **2-3. CONNECTION (Direct)** on page 6.

Q5: If only the microphone is broken, can I replace only the microphone?
A5: Yes. The IC-F5330D/IC-F6330D transceivers work even if you replace only the microphone. (Program the IP address of the new/replacement microhone.)

Q6: Can you route through a router into another subnet without issues? Is the networking Layer 2 or 3 between the microphone and the transceiver main unit?
A6: No. The IC-F5330D/IC-F6330D transceivers support the Layer 2 network. The microphone and the transceiver main unit are intended to be installed in the same Local Area Network. We cannot guarantee the operation when using a router between the transceiver main unit and the microphone.

Q7: Are there any limitation in the network latency or jitter? (I assume it uses a high bit rate vocoder for high-quality audio between the transceiver main unit and the microphone.)
A7: We have no clear provisions for network latency or jitter. However, if the network latency or jitter is extremely high, slow responses from the transceiver main unit to the microphone keys/buttons operation or voice delay may occur.

Q8: Does this model work if I use a router between the microphone and the transceiver main unit?
A8: No. The microphone and the transceiver main unit are intended to be installed in the same Local Area Network. We cannot guarantee the operation when using a router between the transceiver main unit and the microphone.

Q9: Can I use two microphones and one transceiver main unit, and/or two transceiver main units with one microphone?
A9: No. The working combination is one microphone and one transceiver main unit.

Q10: What is the voltage and wattage of the port I should use?
I want to know if the PoE switch I already have will work.
A10: The microphone requires at least five to six watts of electric power. Please use PoE equipment that supports IEEE 802.3af at least.

Q11: Does the microphone have its own IP address?
A11: Yes. Both the transceiver main unit and the microphone have their own IP addresses.

Q12: Can the microphone and the transceiver main unit be installed in separate LANs and connected using routers?
A12: No. The microphone and the transceiver main unit are intended to be installed in the same Local Area Network.

Q13: May we recommend that the customer use PoE injectors instead of PoE switches?
A13: Yes. PoE injectors must support IEEE802.3af at least. Before offering the use of a PoE injector to your customer, you must confirm proper operation of equipment that Icom has not tested.

Q14: Please advise if we can connect two microphones to the PoE switch, and that these two microphones can connect and control the transceiver main unit independently.
A14: Only one microphone can control one transceiver main unit.
When you install two or more IC-F5330D/IC-F6330D transceivers on the same network, assign different IP addresses to each transceiver main unit and microphone so that an IP address conflict does not occur.

Q15: Is there any way or indication on the microphone that alerts if there is an appropriate IP address assignment (such as IP address conflict)?
A15: If the IP addresses of a different subnet are assigned, you cannot turn ON the transceiver. The microphone's status indicator keeps lighting orange, and the channel display stays turned OFF.
The power indicator of the transceiver main unit lights red.
Try the **Force activation procedure** shown on page 9 and rewrite the appropriate IP addresses to the transceiver.

**Questions and answers related to other than the PoE connection**

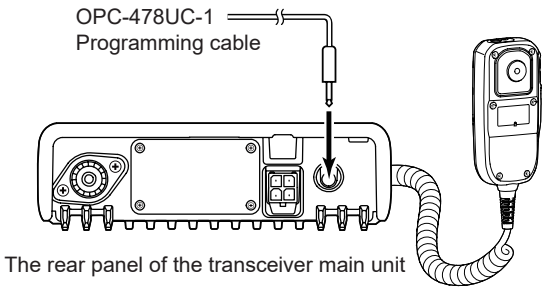
Q16: Is the display of this model a segment type (not dot-matrix)?
A16: The IC-F5330D/IC-F6330D transceivers displays are segment type and not dot-matrix type.

Q17: What is the purpose of the plate with four screws on the rear panel?
A17: This plate covers an opening in the chassis. This is just a cover.

Q18: Can I connect external speakers, microphones, or PTT to the microphone?
A18: No. The microphone does not have any jack or terminal to connect external speakers, microphones, or PTTs.

Q19: What is the difference between the OPC-478UC and the OPC-478UC-1 programming cables?
A19: The OPC-478UC-1 supports Windows 11. The functionality is the same for use on Windows 10.

Q20: Where is the OPC-478UC-1 programming cable connected to the transceiver main unit?
A20: Connect the programming cable to the speaker jack on the rear panel of the transceiver main unit, as illustrated below.



Q21: Can I program the transceiver over the network (LAN)?
A21: Yes. You can program the IC-F5330D/IC-F6330D over the network when the transceiver main unit, the microphone, and the PC with the programming software installed are in the same subnet.

Q22: Do the IC-F5330D/IC-F6330D have a port like a D-sub 9-pin or D-sub 25-pin connector?
A22: Yes. You can install the optional OPC-1939 (D-sub 15-pin connector) or OPC-2078 (D-sub 25-pin connector) adapter cables to the transceiver main unit.

| **OPC-1939** | **OPC-2078** |
|---|---|
| Cable with D-Sub 15-pin connector<br>Cable length: Approximate 200 mm/7.9 in<br>  | Cable with D-Sub 25-pin connector<br>Cable length: Approximate 360 mm/14.1 in<br>  |

Q23: What kinds of data communication do the IC-F5330D/IC-F6330D support?
Is the data transmission mode compatible with the IC-F5122DD?
For the data transmission mode, can the transceivers work without connecting the microphone?
A23: The IC-F5330D/IC-F6330D transceivers do not have data transmission modes and are not compatible with the IC-F5122DD/IC-F6122DD data transceivers.

Q24: Will the TCP/UDP COMMANDMIC™ protocol be released to third parties for virtual radio development purposes?
A24: Sorry, we have no plans to release the protocol at this time.

Q25: Will you use the SNMP interface for status and programming in next generation transceivers?
A25: Sorry, we have no information about future use at this time.

Revision record

| Version | Month/Year | The revised contents |
|---|---|---|
| Version 1.0 | May 2022 | First issue. |
| Version 1.1 | June 2023 | Updated **3-2. SIMPLE TROUBLESHOOTING** on page 9.<br>Added **3-3. FORCE ACTIVATION PROCEDURE**. |

How the World Communicates

Icom Inc.
1-1-32 Kamiminami, Hirano-ku, Osaka 547-0003, Japan https://www.icomjapan.com/