Icom Web-Remote

Installation Guide

Browser remote control for IC-9700, IC-705 and IC-7300

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Website: https://df6ax.de

Project page: https://df6ax.de/en/blog/icom-web-remote.html

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Transmitting only with a valid amateur radio licence.

Icom Web-Remote lets you control an Icom IC-9700, IC-705 or IC-7300 remotely from your browser: frequency display, spectrum and waterfall, receive audio, transmitting with the browser microphone, 1750 Hz tone burst, RC-28 tuning knob and digimode reception (FT8, FT4, WSPR, RTTY, PSK, CW, SSTV, weather fax, QO-100 beacon). The program runs permanently on a small Linux computer – typically a Raspberry Pi – on the same network as the radio. You operate it from any PC, tablet or phone with an up-to-date browser.

This guide describes the installation. Operation is covered in the User Manual (in the program under `/en/icom-remote/manual.html`).

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1. Requirements

Computer

- **Raspberry Pi 3, 4 or 5** (recommended: Pi 4 with 2 GB or more) running **Raspberry Pi OS Bookworm or newer**, 32 or 64 bit. Any other computer with Debian 12 / Ubuntu 22.04 or newer works as well.
- Python 3.11 or newer (already included in the systems mentioned).
- Network (LAN or Wi-Fi) and internet access for installation and updates.
- For FT8/FT4/WSPR: accurate time (NTP; on Raspberry Pi OS automatically via `systemd-timesyncd`).

Radios

Radio	Connection	What you need
IC-9700	Network (LAN)	Network cable on the radio, network remote control enabled
IC-705	Wi-Fi	Radio on the same Wi-Fi network, network remote control enabled
IC-7300	USB	USB cable from the radio to the Pi (CI-V and audio both run over USB)

Each radio only allows **one** network session at a time. While Icom Web-Remote is connected, no other software (e.g. RS-BA1 or wfview) can log in to the same radio.

Operation

An up-to-date browser: Chrome, Edge, Firefox or Safari. Only Chrome and Edge support the RC-28 tuning knob connected to your own PC.

> **Note:** The page can transmit. Only make it available on your own network or via a VPN – never directly on the internet. This version does not yet have a password login. Transmitting is only permitted with a valid amateur radio licence.

2. Installation

Log in to the Raspberry Pi (directly or via SSH) – **as a normal user, not as root** – and enter this single line:

```
curl -fsSL https://df6ax.de/icom-remote/install.sh | bash
```

The installation script asks for your password if needed (for `sudo`) and then does everything:

1. It installs the required system packages (Python, PortAudio, HID library). On request it adds WSJT-X for FT8/FT4/WSPR (about 100 MB; confirm with Enter).
2. It gives your user access to serial ports, sound cards and the RC-28 (groups `dialout`, `audio`, `plugdev`).
3. It downloads the program from df6ax.de and **verifies the digital signature**. A modified or damaged package is not installed.
4. It copies the program to `~/icom-remote` and sets up its own Python environment there.
5. It sets up the `icom-remote` service, which starts automatically every time the Pi boots.

At the end the script shows the address of the settings page, for example:

```
Fertig: Icom Web-Remote 1.0.0 (Build 1) läuft.
  Einstellungen:  http://192.168.1.20:8090/config
```

After the first installation, reboot the Pi once (`sudo reboot`) so that the new group permissions take effect.

Different folder

If you want the program in a different location, specify the folder before the call:

```
curl -fsSL https://df6ax.de/icom-remote/install.sh | ICOM_REMOTE_DIR=/opt/icom-
remote bash
```

3. Setting up the radio

IC-9700 (network)

1. Plug a network cable into the LAN port of the IC-9700.
2. **MENU → SET → Network**: enable DHCP or assign a static IP address. Note down the address (a static address or a fixed DHCP reservation in the router is recommended).
3. Set **Network Control** to **ON**.
4. **Network User1**: set a user name and password – you will enter these in Icom Web-Remote later. Network Radio Name as you like.
5. Leave the ports at their defaults (Control 50001, Serial 50002, Audio 50003).
6. For transmitting with the browser microphone, Icom Web-Remote switches the modulation source to “LAN” itself (menu “DATA OFF MOD”, CI-V `1A 05 0115`, value 5). After 5 minutes without transmitting it restores the previous setting (e.g. MIC). Both can be changed in the settings.

IC-705 (Wi-Fi)

1. **MENU → SET → WLAN Set**: switch Wi-Fi on and connect to your home network (access point mode of the IC-705 is not supported).
2. Under **Remote Settings**: set **Network Control** to ON, create a user and password.
3. Read the IP address of the IC-705 under **WLAN Set → Connection Status**.

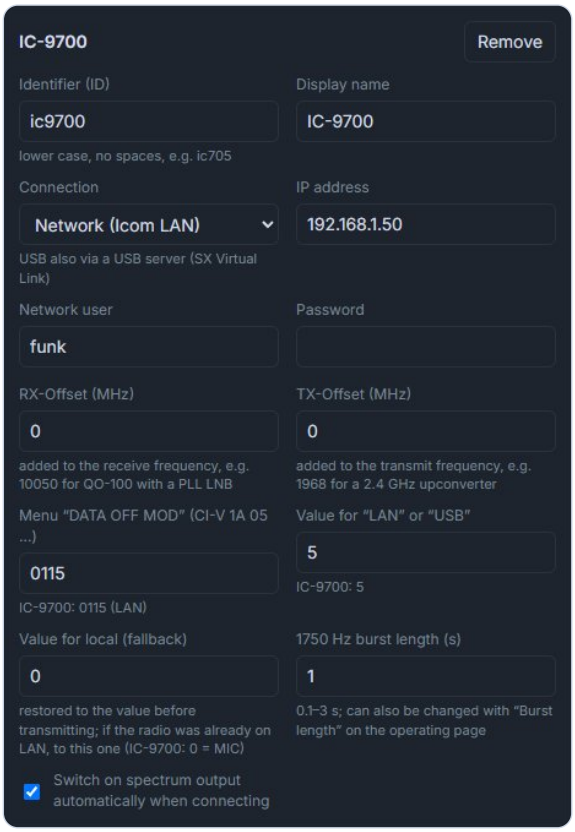
Wi-Fi occasionally loses packets. Icom Web-Remote requests missing audio packets again and fills gaps; this is sufficient for voice and the digimodes.

IC-7300 (USB)

1. Connect the IC-7300 to the Pi with a USB cable (type B).
2. **MENU → SET → Connectors → CI-V**: **CI-V USB Baud Rate** to 115200, **CI-V USB Echo Back** off. The CI-V address stays at 94h.
3. Leave **USB SEND** and **USB Keying** OFF (Icom Web-Remote transmits via CI-V).
4. For transmitting with the browser microphone: set **DATA OFF MOD** and **DATA MOD** to **USB**.
5. You can find the device name of the serial port on the Pi with `ls /dev/serial/by-id/`. Enter this fixed name, not `/dev/ttyUSB0` – that one can change after a reboot.

4. First start and settings

In your browser, open the settings page shown by the installation script: `http://<IP-of-the-Pi>:8090/config`. Enter your radios there (button “+ Add radio”), then click **Save** at the bottom.



A radio in the settings (example values)

Field	Meaning
Identifier (ID)	short name without spaces, e.g. `ic9700`
Connection	“Network (Icom LAN)” for IC-9700/IC-705, “USB” for IC-7300
IP address, Network user, Password	as set up on the radio (network only)
Serial port, Baud rate, CI-V address	USB only: `/dev/serial/by-id/…`, 115200, `94`
Sound card (part of name)	USB only: part of the name of the USB sound card, for the IC-7300 `USB Audio CODEC`
RX/TX offset	for transverters and QO-100 (e.g. RX 10050 MHz with a PLL LNB, TX 1968 MHz with an upconverter)
Menu “DATA OFF MOD”, value for LAN/USB	IC-9700: `0115` and `5`; empty = never change on the radio

Under **FT8 reception** enter your callsign and your locator (used to highlight calls to you and to show distances). Under **Web server** you find the address on which the program can be reached (`0.0.0.0` = on the whole network, port 8090, HTTPS port 8443).

Then open the operation page: `http://<IP-of-the-Pi>:8090/`. “Connected” at the top right shows that the session to the radio is up.



The operation page (here an IC-9700 on a 70 cm repeater)

5. Access from other computers (HTTPS)

Browsers only allow audio and microphone on “secure” pages – that is, via **HTTPS** or directly on the computer itself. For this, Icom Web-Remote creates its own certificate on first start and is additionally reachable at `https://<IP-of-the-Pi>:8443/`.

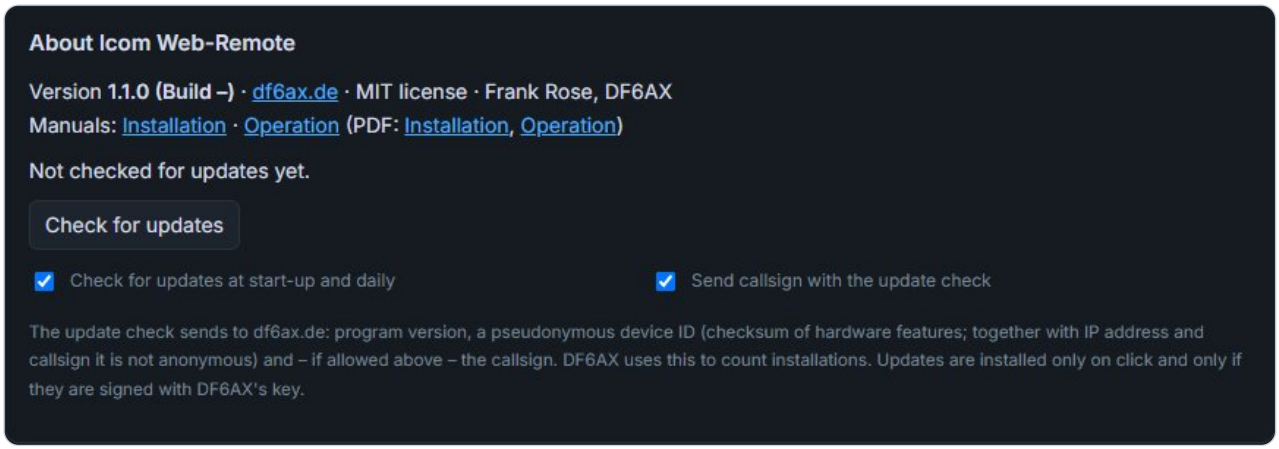
1. Open `https://<IP-of-the-Pi>:8443/`.
2. The first time, the browser shows a warning because the certificate was not issued by an official authority. Choose “Advanced” → “Proceed to …” (Chrome/Edge) or “Accept the Risk” (Firefox). This is needed once per browser.
3. When opened via HTTP, the page shows a notice at the top with a link to the HTTPS address.

If the IP address of the Pi changes, delete `tls_cert.pem` and `tls_key.pem` in the program folder and restart the service (`sudo systemctl restart icom-remote`).

For access while away from home, use a VPN (e.g. WireGuard or Tailscale). Please do not set up port forwarding in your router.

6. Updates

Icom Web-Remote checks df6ax.de for a new version at startup and once a day after that. If there is one, “Update available” appears at the top of the operation page.



Settings → “About Icom Web-Remote”

1. Open the settings and scroll to **“About Icom Web-Remote”**.
2. **“Check for updates”** checks immediately.
3. **“Install update”** and a second click to confirm download the update, verify the signature, replace the program files and restart the service. The page then reloads by itself.

- Your settings, the band memory, the FT8 data and the SSTV/weather fax images are kept.
- Updating is blocked while transmitting. Before restarting, the program logs out of the radio cleanly.
- If the new version fails to start three times, the service automatically restores the previous one and shows this in the settings.
- Alternatively, running the installation line from chapter 2 again also updates the program.

What the update check transmits

When fetching the version information, the following is sent to df6ax.de: the installed version, a pseudonymous device ID (a checksum of hardware characteristics of the computer; combined with the IP address and callsign it is not anonymous) and – if permitted – your callsign. This lets DF6AX count how many installations there are. Both can be switched off in the settings: “Check for updates at startup and daily” and “Send callsign with the update check”.

7. Uninstalling

```
sudo systemctl disable --now icom-remote
sudo rm /etc/systemd/system/icom-remote.service /etc/udev/rules.d/99-icom-
rc28.rules
sudo systemctl daemon-reload
rm -rf ~/icom-remote
```

The last command also deletes the settings and saved images. If you want to keep them, back up `config.json`, `band_memory.json`, `ft8.db` and the folder `sstv` first. The service logs out of the radio cleanly when it is stopped.

8. Troubleshooting the installation

Problem	Solution
“Bitte als normaler Benutzer starten” (please run as a normal user)	Enter the line without `sudo`.
“Python 3.11 oder neuer nötig” (Python 3.11 or newer required)	The operating system is too old; install Raspberry Pi OS Bookworm or newer.
“Signatur oder Prüfsumme ungültig” (signature or checksum invalid)	The download was incomplete or has been tampered with. Try again later; if it happens again, please let DF6AX know.
Settings page not reachable	Is the service running? `systemctl status icom-remote`. Is “Web server → Listen on” set to `0.0.0.0`?
Radio “Disconnected”, message “control: no answer”	Check IP address, user and password. After several logins/logouts in quick succession the IC-9700 refuses logins for about 60 s – the program retries by itself.
IC-7300: port not found	Check `ls /dev/serial/by-id/`; did you reboot the Pi after the installation (group `dialout`)?
IC-7300: no audio	“Sound card (part of name)” must match the name: `arecord -l` lists the sound cards.
No audio in the browser, microphone cannot be selected	Open the page via HTTPS (chapter 5).
View the log	`journalctl -u icom-remote -n 100`

Never kill the service hard (pulling the power plug, `kill -9`), otherwise the session stays stuck in the radio. The clean way: `sudo systemctl stop icom-remote` or `sudo reboot`.