



CW-MESH

CW practice over MeshCore

User Guide • Version 1.0

CW-MESH lets club members hold a Morse code practice net over MeshCore radios, with no ham radio equipment and no license needed. Type or key a message and it goes out over the mesh as text; everyone else hears it as CW at their own chosen speed, and anyone using the ordinary MeshCore phone app can join in by text.

1. How it works

Messages travel over the mesh as plain text. CW-MESH turns your keying into text before it goes out, and turns incoming text back into CW on your PC. That means:

- **You choose how fast you hear it.** Each person sets their own receive speed, so a 5 WPM beginner and a 20 WPM operator can share the same net.
- **Nothing goes out until you press SEND.** You can check and correct your message first.
- **Stock MeshCore users can take part.** They see your messages as text, and you hear theirs as CW.

2. What you need

Item	Notes
Windows PC	Any recent Windows PC with speakers or headphones.
MeshCore radio	Running companion firmware, connected by WiFi (you need its IP address) or USB cable (you need its COM port). One radio per PC. Not needed for solo practice - see section 5.
Key (optional)	A straight key with a USB keyer adapter such as a Vail or a VBand-compatible adapter (it must send the Left Ctrl key). No key? Use the spacebar or a mouse button instead, or just type.

3. Installing

1. Unzip **CW-MESH.zip**. It contains a folder called **CW-MESH**.
2. Put that folder somewhere you can write to, such as **C:\CW-MESH** or your **Documents** folder. **Do not put it in Program Files.**
3. Double-click **CW-MESH.exe**. If Windows shows a SmartScreen warning, click **More info**, then **Run anyway**.

CW-MESH keeps two files in its own folder: **config.json** (your settings) and **CW-MESH.log** (a diagnostic log). Copy the whole folder to move CW-MESH to another PC, settings included. If the folder is not writable, CW-MESH warns you and keeps these files in %APPDATA%\CW-MESH instead.

If your antivirus blocks or removes CW-MESH.exe: some antivirus programs (AVG and Avast in particular) are suspicious of any new program they have not seen before, and may quarantine CW-MESH the first time it runs. This is a false alarm. Open your antivirus, go to its **Quarantine**, restore CW-MESH.exe, and add the CW-MESH folder to its **Exceptions** (or Exclusions) list so it is left alone in future.

4. Activating CW-MESH

The first time CW-MESH starts, it shows the **ACTIVATE** screen. Use the details from your purchase confirmation email:

Field	What to enter
Name	Exactly as shown in your purchase email. Your registration code is made from your name, so a different spelling will not match. Upper or lower case does not matter.
Phone	Your phone number, in any format.
Email	Your email address.
Registration Code	The 8-character code from your email, e.g. 5761-F956 . Case, spaces and the dash do not matter.

Zero or letter O? Registration codes only ever use the numbers **0-9** and the letters **A-F**. Any round character is a zero - and if you type a letter O anyway, CW-MESH reads it as zero.

Leave **Create a desktop shortcut** ticked to get a CW-MESH icon on your desktop, then press **ACTIVATE**. The main window opens and its title bar shows **Licensed to** your name. You will not be asked again on this PC. **EXIT** closes CW-MESH without activating.

Activation is saved in **config.json** in the CW-MESH folder, so it moves with the folder. If you install CW-MESH fresh on another computer, activate it there with the same details.

Moved the CW-MESH folder?

The desktop shortcut still points at the old place. Delete it, then right-click **CW-MESH.exe** in its new folder and choose **Send to → Desktop (create shortcut)**.

5. Practicing on your own - no radio needed

Set **LINK** to **Offline (loopback)**. Anything you send comes straight back to you a moment later as if another station had sent it, and plays as CW. Nothing is transmitted, and no radio or MeshCore setup is needed.

Loopback is the place to:

- **Learn to key** with the timing bar on (section 9), and check that what you meant is what the decoder heard.
- **Hear your own sending** played back at clean timing, then compare it with what you keyed.
- **Practice copying**: type a word or sentence, choose **CW-Reveal on click**, and see if you can copy it before revealing it.
- **Try the settings** - receive speed, Farnsworth spacing, tone, Tx Ltr Gap - before joining a net.

When you're ready for the net, switch **LINK** to MeshCore WiFi or USB and connect (section 6). Your settings carry over.

6. Connecting to your radio

Only one program can use a radio at a time. Close the MeshCore app on this PC (and disconnect your phone from this radio) before connecting CW-MESH.

Fill in the **LINK** row at the top of the window:

Field	What to enter
LINK	MeshCore WiFi or MeshCore USB . (Offline (loopback) is for solo practice - section 5.)
IP / COM	WiFi: the radio's IP address, e.g. 192.168.1.50 (port 5000 is assumed; add :port if yours differs). USB: the COM port, e.g. COM5. For USB, press the radio's RST button and let it boot before connecting.
Channel	The net's channel name, exactly as it appears on the radio, e.g. Public . Every station on the net must use the same channel.

Press **CONNECT**. The status line turns **green** and shows your radio's name and channel. From then on CW-MESH connects automatically each time it starts.

Status line colors

Status	Meaning
Green CONNECTED	Ready.
Orange WARNING	Connected, but the channel you entered is not on the radio. Add the channel to the radio with the MeshCore app, then reconnect.
Red, flashing, 3 beeps	The connection was lost (radio rebooted, out of WiFi range, battery flat) or could not be made at startup. Fix the radio and press CONNECT.

WiFi radios at a meeting place: guest and public WiFi often stop devices from talking to each other, so the PC cannot reach the radio even though both are online. Use a phone hotspot for the PC and radio, or a USB radio.

Your on-air name

Other stations see you by your **radio's** name, not the call sign box. To use your call sign: type it in **Call sign**, press **SET RADIO NAME**, and confirm. The radio keeps the new name until it is changed again.

7. Sending

Typing

Type in the send box at the bottom and press **SEND** or **Enter**.

Keying

Choose your key under **TX Settings** → **Key**:

Key setting	How to use it
Vail (Left Ctrl)	For a USB keyer adapter. Key anywhere while the CW-MESH window is active. The adapter's own buzzer gives your sidetone.
Spacebar	Click the gray KEY PAD (it turns green), then key with the spacebar. CW-MESH plays the sidetone.

Key setting	How to use it
Mouse	Hold the left mouse button down on the KEY PAD . Tip: a real key wired across a cheap mouse's left button makes a good adapter.

As you key, decoded letters appear in the send box. Nothing is sent until you press **SEND**, so you can correct mistakes by typing first. Newly keyed letters always go on the **end** of the text, wherever the cursor is. A pause long enough to count as a word gap adds a space.

Correcting while keying

Key the standard error signal, **8 dits** (6 or more works), and the last word is erased from the send box. Then key the word again.

BREAK and long messages

While a message is being sent, **CLEAR** becomes **BREAK**. Press it to cancel any part not yet sent. Messages longer than about 130 characters go out in pieces; on the mesh a short message is sent within a second, so BREAK mainly matters for long ones.

8. Receiving

Incoming messages appear in the **Net** window under the sender's radio name. How they are presented is set by **RX Settings** → **Receive**:

Receive mode	What happens
CW-Reveal on click	You hear the CW; the text stays hidden until you click it. Best for copy practice.
CW-Reveal after RX	You hear the CW; the text appears when it finishes.
Both	You hear the CW and see the text at once.
Text	Text only, no sound.

RX setting	Purpose
WPM	Character speed for received CW.
Farnsworth WPM	Set lower than WPM to send characters at full speed with extra space between them. Set equal to WPM for normal spacing.
Tone Hz / Volume	Pitch and loudness of received CW (and of the spacebar/mouse sidetone).

Double-click any message to hear it again. **STOP AUDIO** stops whatever is playing and anything queued.

9. Improving your sending

The timing bar

Turn on **TX Settings** → **Timing bar**. Each element of the letter you are keying is drawn to scale, one row per element:

- **Green** bar = dit, **blue** bar = dah, **orange** = too close to call.
- Green dotted line: your average dit. Blue dotted line: the ideal dah (3 dits). **Red** dashed line: the **threshold** - shorter is a dit, longer is a dah.
- The decoded letter appears large on the right.

CW-MESH learns your speed as you send. Good keying has dahs three times as long as dits. A very common habit is holding the **last dit** of a letter too long, which turns C (-.-) into Y (-.-): watch for a final bar that crosses the red line.

Tx Ltr Gap

If letters break apart in the middle, or spaces appear inside words (*H I* instead of *HI*), raise **Tx Ltr Gap** (try 3.0 to 3.5). If letters run together, lower it.

10. Troubleshooting

Problem	Try this
"The name and registration code don't match"	Enter your name exactly as it appears in your purchase email - same spelling, same middle initial or none. Check the code against the email (0-9 and A-F only).
"CW-MESH is already running"	It is open already - look for it on the taskbar. CW-MESH runs one copy at a time.
CW-MESH.exe disappeared or will not start	Your antivirus may have quarantined it. Restore it and add an exception (see section 3).
Can't connect over WiFi	Check the IP address; make sure the PC and radio are on the same network; close the MeshCore app; avoid guest WiFi (see section 6).
Can't connect over USB	Check the COM port in Device Manager; press RST on the radio, wait for it to boot, then CONNECT.
I receive but others don't see my messages	Make sure no other program is connected to your radio, and that everyone uses the same channel. Disconnect and CONNECT again.
Status flashing red	The radio stopped answering. Check its power and WiFi, then press CONNECT.
Wrong letters when keying	Watch the timing bar; adjust Tx Ltr Gap.
No sound	Check Volume, the PC's sound output, and that Receive is not set to Text.

For anything else, send **CW-MESH.log** from the CW-MESH folder to your net organizer.

Quick reference

SEND / Enter	Send the message in the send box
CLEAR	Empty the send box
BREAK	Cancel a message being sent
STOP AUDIO	Stop received CW
8 dits	Erase the last word while keying
Click a hidden message	Reveal its text
Double-click a message	Play it again
SET RADIO NAME	Make your call sign your on-air name
LINK: Offline (loopback)	Practice alone - no radio needed