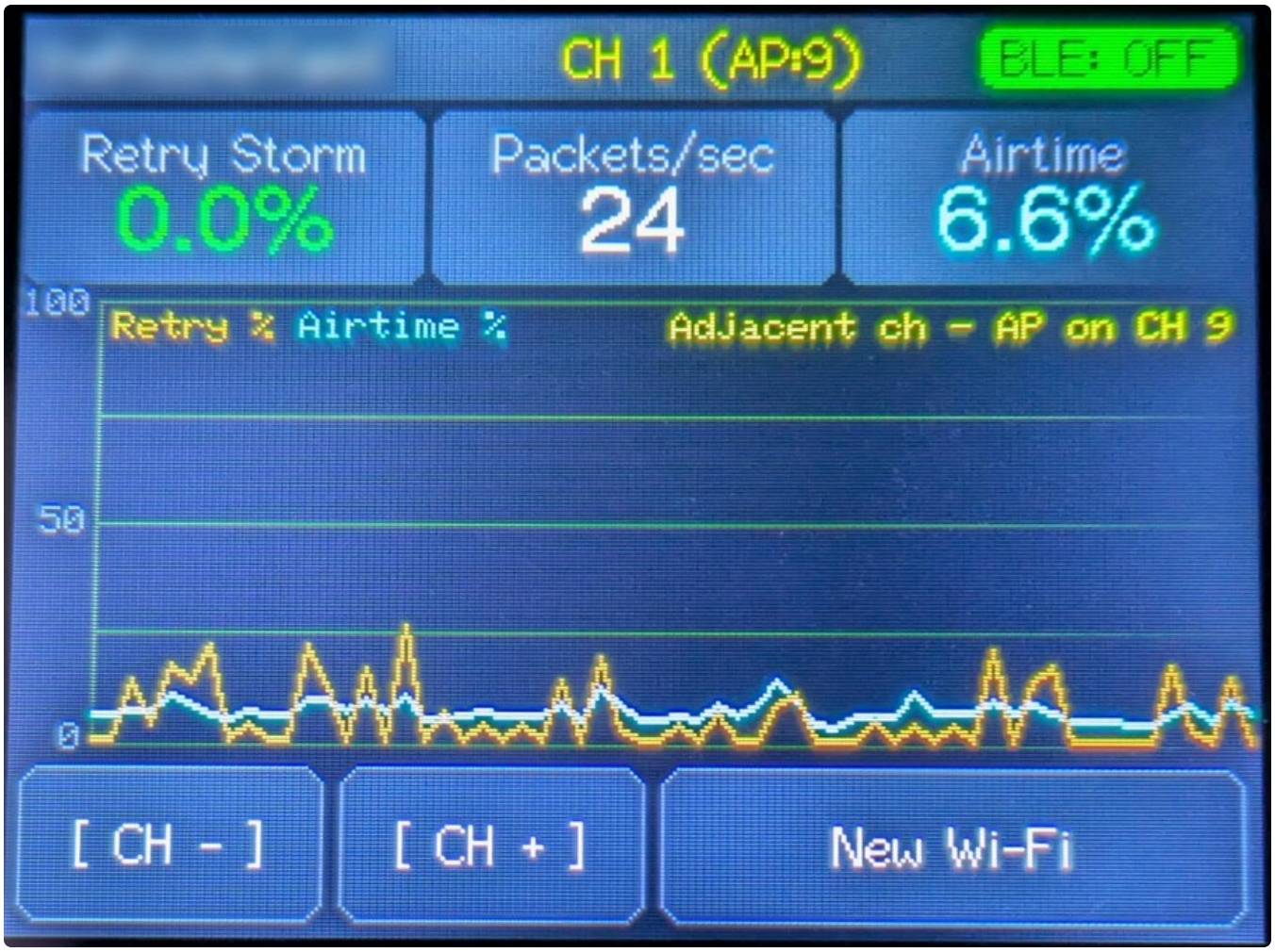
CYD Wi-Fi Monitor: Reading the Screen

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What the monitor does

The monitor listens to every Wi-Fi frame on one 2.4 GHz channel and tells you, once a second, how busy that channel is and how often devices have to resend. It doesn't join your network while it measures, so it adds no traffic of its own. It only listens.

Two numbers matter most. **Airtime** is how full the channel is. **Retry Storm** is how often transmissions fail and get sent again. A channel can be busy but healthy, or quiet but full of retries, and each points to a different fix.



Getting started

Setup takes about two minutes with your phone. You only do it once; the monitor remembers your network.

1. **Plug it in** with the USB cable (either port works). After a short start-up screen, the setup screen shows a device name like PROV_CYD_RF_3FA2, a QR code, and an 8-digit POP (setup code). Each monitor has its own.
2. **Install the free app** “ESP BLE Provisioning” by Espressif (iPhone or Android). Turn on Bluetooth, and allow the app's Bluetooth permission (and Location on Android).
3. **Tap Provision New Device** and scan the QR code on the monitor's screen. No camera handy? Choose “I don't have a QR code,” pick the device name shown on screen, and type the POP.
4. **Pick your Wi-Fi network** from the list and enter its password. Only 2.4 GHz networks appear; if your router uses one name for both bands, it will be listed.
5. **Wait for “Connected! BLE Disabled.”** The screen shows your network and channel for two seconds, then the monitor starts.

Changing networks: tap New Wi-Fi, then tap it again within 3 seconds. The monitor forgets the network and returns to setup.

If setup doesn't work:

- *“Wrong Wi-Fi password”:* the monitor resets itself after a few seconds. Try again in the app; no need to unplug.
- *“Network not found”:* the network may be 5 GHz only, or too far away. Move closer to the router.
- *The app can't find the monitor:* check Bluetooth and Location are on, stay within a few feet, then unplug the monitor and plug it back in.
- *Router changed or moved:* if the monitor can't join its saved network, after 20 seconds it offers “Tap screen to set up a new Wi-Fi.”
- *Taps land in the wrong place:* unplug the monitor, then hold a finger on the screen while you plug it back in. After 2 seconds it starts touch setup: tap the center of each of the 5 targets with a fingernail or stylus. Your Wi-Fi settings are kept.

Screen tour

Everything on the screen refreshes once a second. Here's each part, top to bottom.

Area	What it shows	What it means
Network name (top left)	The Wi-Fi network you set up	The network whose channel the monitor locked onto at startup.
CH 9 (top center)	The channel being measured	Your router's channel. If you step to another channel, it shows as e.g. "CH 7 (AP:9)" in yellow, so you know you're looking at a neighbor.
BLE: OFF (top right)	Bluetooth status	Bluetooth is fully shut down, so it can't interfere with the Wi-Fi measurements (both share the same radio).
Retry Storm	% of data and management frames marked as resends	The health number. Green under 10%, yellow 10–25%, red over 25%.
Packets/sec	Every frame heard per second, including tiny acknowledgments	How chatty the channel is. On its own it's context, not good or bad.
Airtime	Estimated % of each second the channel was in use	How full the channel is. Fast devices use little airtime per packet; slow or distant ones use a lot.
AP -62 dBm (chart, top right)	Signal strength of your router, as heard by the monitor	Closer to 0 is stronger. Shows "AP not heard" if no router frames arrived that second.
Chart	The last 60 seconds: Retry % (yellow) and Airtime % (cyan)	Shows whether a bad number is a brief spike or an ongoing problem. Scale is 0–100%.
[CH -] / [CH +]	Step the monitor between channels 1–11	Lets you check neighboring channels. The chart clears when you switch.
New Wi-Fi	Forget this network and restart Bluetooth setup	Needs two taps within 3 seconds, so it can't be triggered by accident.

Area	What it shows	What it means
RGB LED (back of board)	Same color code as Retry Storm	Green, yellow or red, so you can read health at a glance from across the room.

Good and bad numbers

The Retry Storm bands are the ones built into the monitor. The Airtime and signal bands are common rules of thumb, not hard limits.

Reading	Healthy	Watch it	Problem
Retry Storm	Under 10%	10–25%	Over 25% sustained
Airtime	Under 30%	30–50%	Over 50%; over 70% means the channel is saturated
AP signal	-30 to -67 dBm	-67 to -75 dBm	Weaker than -75 dBm

Short spikes are normal: a phone waking up or a big download can push either line up for a second or two. Judge by what the chart does over a minute, not by one reading.

Reading the example screen

Two real readings from the same house: the router's own channel, and a neighbor channel checked with CH ±. The network name is blurred in both pictures.

Home channel (CH 9): healthy and quiet



No action needed here.

- **Retry Storm 0.0% (green):** no resends this second. The link quality is good.
- **Packets/sec 34:** a light load. Most devices are idle or using the 5 GHz band.
- **Airtime 8.5%:** the channel is almost empty, with lots of room for more traffic.
- **AP -39 dBm:** a very strong signal; the monitor is close to the router.
- **The chart:** airtime (blue) stays flat around 5–15%. Retries (orange) sit near zero with two spikes to about 40% near the end. With so little traffic, a handful of resends makes a big percentage, so brief spikes like these are normal. If they grew more frequent or stopped dropping back, that would be worth chasing.

Neighbor channel (CH 1): quiet

The first picture in this guide shows channel 1. The yellow "CH 1 (AP:9)" and "Adjacent ch – AP on CH 9" labels are the reminder that this isn't your router's channel.

- **Retry Storm 0.0%, Packets/sec 24, Airtime 6.6%:** very little traffic. Channel 1 has few competing networks right now.
- **The yellow spikes up to about 25%:** with only ~24 frames a second, a single resend is a big share, so the retry line jumps around. Retry % is only meaningful when there's real traffic on the channel.
- **What it tells you:** channel 1 carries very little competing traffic. That makes it a good candidate if channel 9 ever gets congested. Your own devices would move with the router and add their load, so check channels 6 and 11 too before deciding.

How it helps

The two main numbers point to different fixes. Match what you see to a row.

You see	Likely cause	What to try
High airtime, low retries	Channel is crowded but working: your own devices or neighbors' networks	Check channels 1, 6 and 11 with CH ± and move the router to the one with the lowest airtime. Old 802.11b devices or very slow links also eat airtime.
Low airtime, high retries	Interference or a weak link, not congestion	Look for microwaves, baby monitors, wireless cameras or Bluetooth gear near the router. Check for a device far from the router.
High airtime and high retries	A retry storm: resends are filling the channel, which causes more collisions	Change channel first, then look for a struggling far-away device or an interference source.
Retries spike at the same time each day	A scheduled source: a microwave at mealtimes, backups or cloud syncs	Note the time, then switch off suspects one at a time while watching the chart.
AP signal weaker than -75 dBm where you need Wi-Fi	Too far from the router, or walls in the way	Move the router or add a mesh node or access point.

Three practical ways to use it:

1. **Pick the best channel.** Spend about 30 seconds on each of channels 1, 6 and 11 and note the airtime. Lowest airtime wins. Stick to 1, 6 and 11 because they don't overlap each other.
2. **Find dead spots.** Walk the monitor around the house and watch the AP signal and Retry Storm. Rooms where the signal falls below -75 dBm or retries climb are where devices will struggle.
3. **Catch intermittent problems.** When Wi-Fi feels slow, glance at the monitor or its LED. A red LED or tall yellow spikes confirm it's a radio problem rather than your internet provider.

Limits

The monitor is a quick-look tool, not lab equipment. Keep these in mind:

- **2.4 GHz only.** It can't see 5 GHz or 6 GHz traffic, so a dual-band router's 5 GHz side is invisible to it.
- **Airtime is an estimate.** It adds up the time of every frame it could decode. Non-Wi-Fi noise, like a microwave, doesn't show as airtime directly; it shows up as extra retries instead.
- **It hears what reaches it.** Readings are from the monitor's spot in the room. A device two rooms away may see different conditions, and frames too weak for the monitor to decode aren't counted.
- **One channel at a time.** It measures only the channel shown in the top bar, and each channel switch clears the chart.