Lumengrid Record — Operator Manual

Version 1.0.4 · Vision Mix LLC · trading as **Lumengrid**

Multi-ISO NDI recorder. Native write. Ubuntu 24.04+. Names the show before REC.

Built for churches, rental houses, sports and one-person trucks — a recorder that must survive a Saturday. This manual tells you how to install it, get your first ISO recording done, and keep it healthy.

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1. What Lumengrid Record does

Lumengrid Record records up to **16 NDI sources simultaneously**, each as its own clean ISO file:

- **Native write** — High Bandwidth NDI (SpeedHQ) is written to disk as-is: no decoding, no re-encoding, **no GPU** on the record path. One or two channels work on a laptop with no NVIDIA.
- **The source's own clock** — 23.98/24, 25/50, 29.97/30/59.94/60, progressive or interlaced, up to UHD. No frame-rate conversion on the live path. 48 kHz float audio, never clipped on record.
- **High Bandwidth NDI only** — NDI HX / HX2 / HX3 sources are not supported in this build (see §12).
- **Names the show before REC** — you name the show and the cameras first; files land in tidy, predictable places.
- **Honest capacity checking** — the app measures your disk (real write probes) before it lets you record, and refuses when the disk is too slow.
- **A recorder, not a switcher** — no M/E, no keys, no multiviewer layouts as the product. It records, and it does that well.

2. Installing

Lumengrid Record runs on **Ubuntu 24.04 or newer, 64-bit (x86_64)**. There is no Windows or Mac build.

Ubuntu / Linux — AppImage or .deb

Two formats, same app. Both include the NDI 6 runtime, ffmpeg and their own Python. You do not need to install NDI separately.

Option A — AppImage (recommended; no install, runs from anywhere):

```
chmod +x LumengridRecord-1.0.4-x86_64.AppImage
./LumengridRecord-1.0.4-x86_64.AppImage
```

- Requirements: an X (or Wayland/XWayland) session, the standard GL libraries and system fonts — any desktop has them. For headless test setups use `xvfb` with `libgl1` installed.
- On first run some systems show a harmless "Cannot load library Xcursor" warning — cosmetic, ignore it.

If the system has no FUSE (common on minimal or locked-down installs), run it with:

```
./LumengridRecord-1.0.4-x86_64.AppImage --appimage-extract-and-run
```

Option B — .deb (installs into the applications menu):

```
sudo apt install ./lumengrid-record_1.0.4_amd64.deb
```

apt pulls in every dependency automatically. **Lumengrid Record** then appears in your applications menu. To start it from a terminal:

```
lumengrid-record
```

Command-line helpers (both formats): `--version` prints the app version; `--ndi-version` also proves the bundled NDI runtime loads.

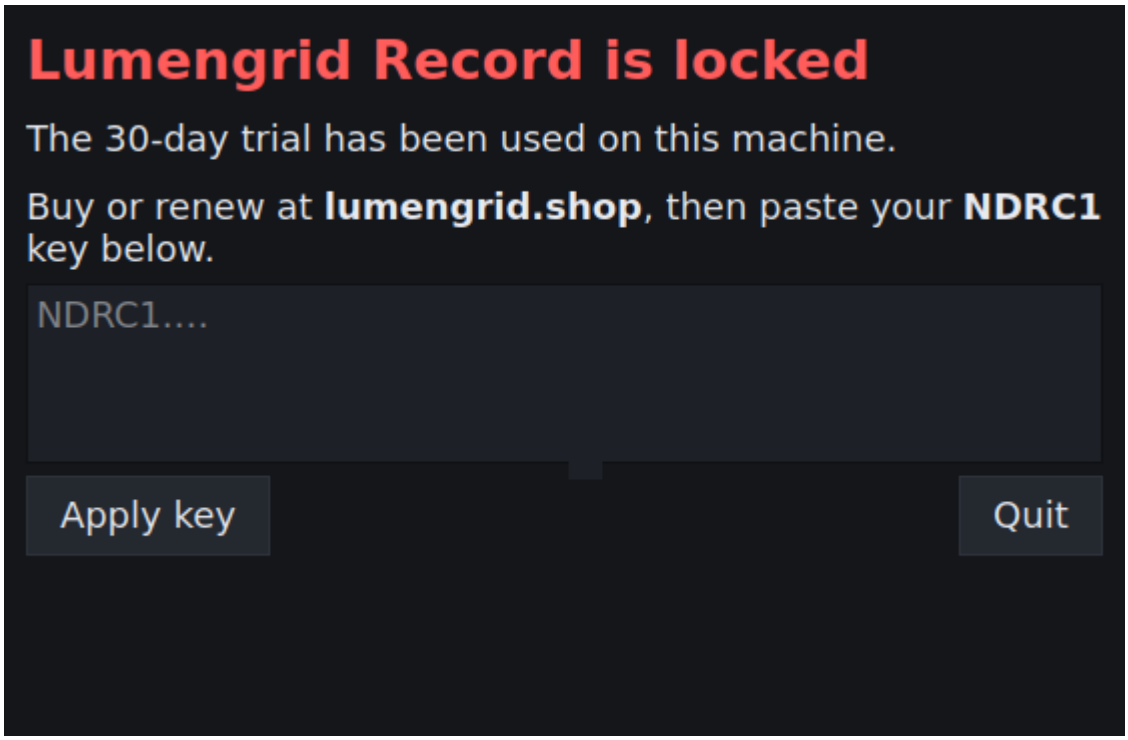
Where Linux stores things: license, trial and settings live in `~/.config/Lumengrid/Record/`; the trial marker in `~/.local/share/ndi-recorder/` (and `/var/lib/lumengrid/record/` when that folder is writable); logs in `~/.local/state/Lumengrid/Record/logs/` (see §15). Uninstalling (`sudo apt remove lumengrid-record`) or deleting the AppImage does **not** remove the trial — by design.

Note: NDI HX / HX2 / HX3 are not supported in this build (High Bandwidth sources record normally).

3. First launch: trial and licensing

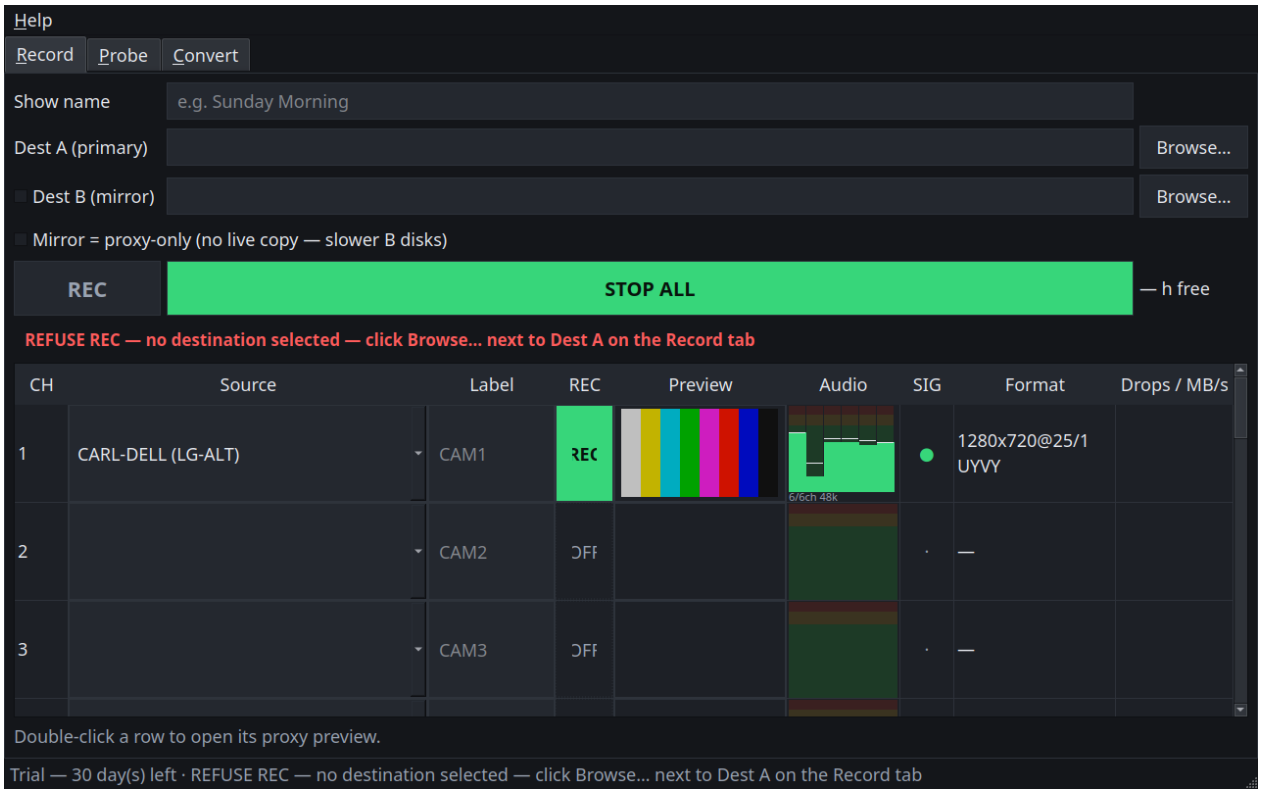
On first launch you get a **30-day full-feature trial** — no account, no card, no online activation. The status bar shows the days remaining.

When the trial ends (or a key expires), the **lock wall** appears: the app blocks until you paste a valid key.



- Buy or renew at **lumengrid.shop**, then paste the `NDRC1…` key into the wall, or later via **Help → License**.
- Plans: **$19/month** or **$149/year**. A key works until the end of its paid period (the expiry date in the key). Paste the renewal key when you get it; a key with a later expiry replaces the older one.
- Reinstalling the app, updating it, or wiping the program folder **never** resets the trial — the trial state lives outside the install, in your user profile plus a trial marker (paths in §15).
- Rolling the system clock back more than a day locks the app until the clock is right again. Fix the clock; that is the cure.
- Recorder keys do not work in other Lumengrid products and vice versa.

4. The main window tour



The window is dark with large controls, made to be read from two metres.

Top row (Record tab):

- **Show name** — the name of today's production. Required before REC.
- **Dest A (primary)** — the disk that receives the masters.
- **Dest B (mirror)** — optional second disk (see §10).
- **REC** — starts the take on all enabled channels. It is dim while the disk verdict refuses, and green when recording is allowed.
- **STOP ALL** — ends the take and reports exactly where the files landed, with an **Open folder** button.
- **Verdict line** — one line that says everything about disk readiness:

```
1 × 720p25 HB · need ~7 MB/s · disk 3956 MB/s · NIC unknown · 0.2 h free · REC OK
REFUSE REC — multi-file probe 10 MB/s, need 30
```

Channel rows (16): each row is one ISO channel — source picker, label, the REC button (your record lamp), live preview, audio meters, signal lamp, format, and throughput (see §7).

Probe tab: the capacity dashboard with speed gauges (§8). **Convert tab:** what happens to the takes after STOP (§11).

5. GPU or CPU previews

On launch the app asks how to handle previews:

- **GPU — inline channel previews.** Every selected channel shows a small live picture in its row, updated about once a second, plus audio meters. Previews come from NDI's

low-bandwidth proxy stream — they are never on the record path and may drop frames without any effect on recordings.
- **CPU — no inline previews.** Zero preview cost; every core stays available for recording. Audio meters still run.

Tick **Remember my choice** to stop the app asking. If no usable graphics context is found, GPU mode is offered as disabled. You still get a full preview window any time by **double-clicking a channel row**.

6. Your first recording — step by step

1. **Name the show** (e.g. `Sunday Morning`). It cannot be changed while a take is running.
2. **Pick Dest A** — a folder on a fast local disk (ext4, XFS or Btrfs). Click **Browse…**.
3. On each channel you want: **choose a source** from the dropdown and type a **label** (`CAM1`, `PULPIT`, `ISO-WIDE`…). Choosing a source lights that channel's REC button automatically.
4. Watch the **verdict line**. It must end in **REC OK** (or **TIGHT — type YES to REC**, which you may override by typing YES). If it says **REFUSE REC**, fix the disk first — the app will not record to a disk it measured as too slow.
5. Press **REC**. Each recording channel's REC button turns **red and blinks** while frames are being written. The Drops/MB/s column shows live throughput.
6. Press **STOP ALL**. A dialog tells you the folder the take landed in, with an **Open folder** button. Any enabled convert presets start automatically.

Files land as:

```
<Dest>/<ShowName>/<YYYY-MM-DD>/<ShowName>_<LABEL>_<YYYYMMDD>_<HHMMSS>_segNNN.mov
```

Characters that are unsafe in file names are stripped; the date is your local date.

7. Channels: REC buttons, previews and audio meters

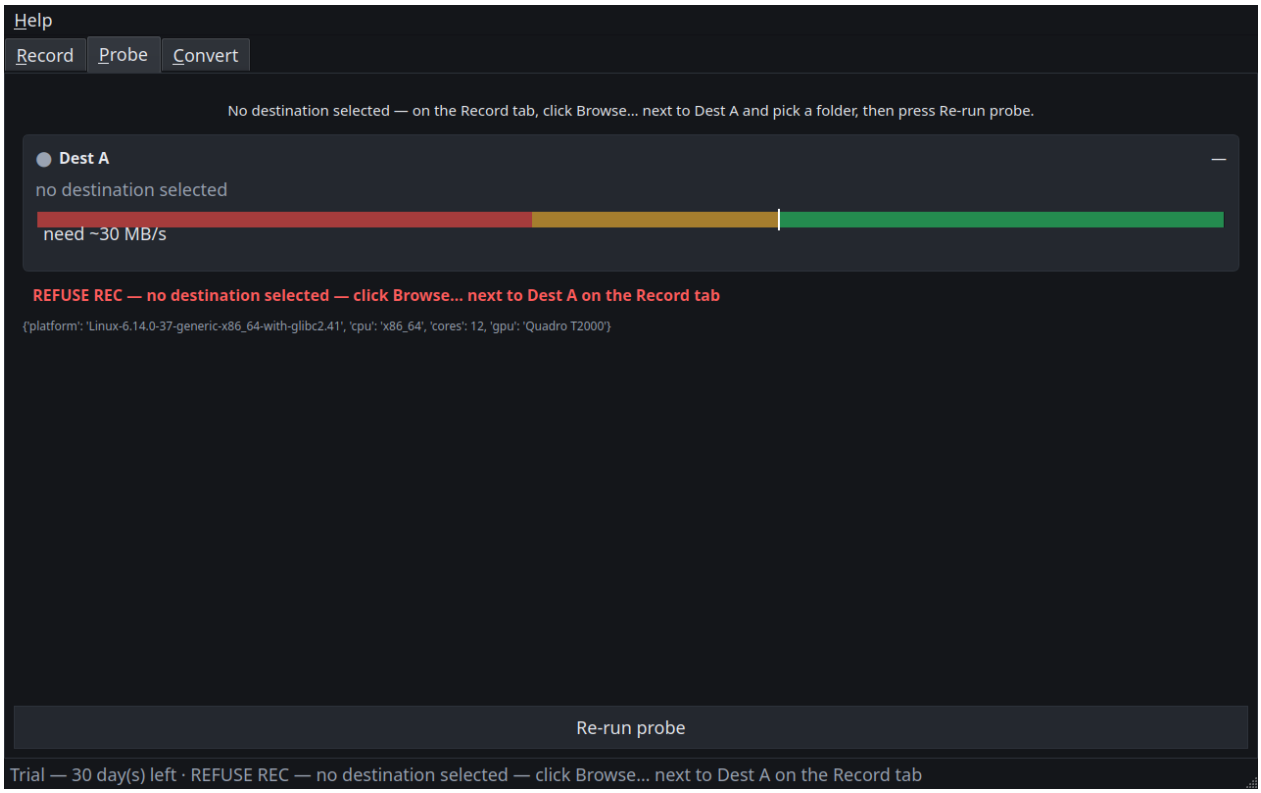
Each channel row, left to right:

Element	Meaning
CH	channel number
Source	NDI source dropdown (sources on your network appear automatically)
Label	the camera name used in file names
REC button	the channel's record-enable **and** its record lamp: green = enabled with source, **red blinking = recording**, dashed grey **OFF** = will not record, **ERR** = channel problem
Preview	16:9 live thumbnail (GPU mode only)
Audio	live level meters — one **vertical bar per audio channel (1–8)**, side by side, green/amber/red zones with a white peak-hold line, `n/mch 48k` underneath
SIG	green dot = signal present (with the true incoming format shown in the Format column until you record)
Format	`1280x720@25/1 UYVY · 2ch 48kHz` — the actual incoming video and audio, before and during the take

Element	Meaning
Drops / MB/s	dropped-frame counter and write throughput, live

- Picking a source switches the channel **on**; click REC/OFF to enable or disable channels individually. **REC records only enabled channels.**
- Changing a source swaps the preview, meters and format to the new feed.
- While a take runs, the channel set is locked (buttons stay lit but stop toggling) so nobody accidentally drops an ISO mid-show.

8. Disks and the capacity probe



On launch — and whenever you change the destination or channel count — the app **measures**; it never guesses:

- filesystem check: ext4/XFS/Btrfs allowed, **FAT32 refused**, network shares flagged as risky;
- free space, converted to **hours remaining** for your current channel count × format;
- a real sequential **write probe** (several hundred MB), run with **N parallel writers when you enable N channels** — matching the load REC will actually put on the disk.

The dashboard shows one card per destination with a **speed gauge**: the measured write rate as a fill against red/yellow/green budget zones, with a white marker at the required rate.

- **Green** (`REC OK`): disk comfortably fast enough.
- **Yellow** (`TIGHT — type YES to REC`): workable but tight; you may override by typing YES.
- **Red** (`REFUSE REC`): never — a too-slow disk, a vanished destination, FAT32, or a failed probe.

OS-level RAID under a destination is your choice; the app sees one volume and does not build its own RAID.

9. Segments and crash safety

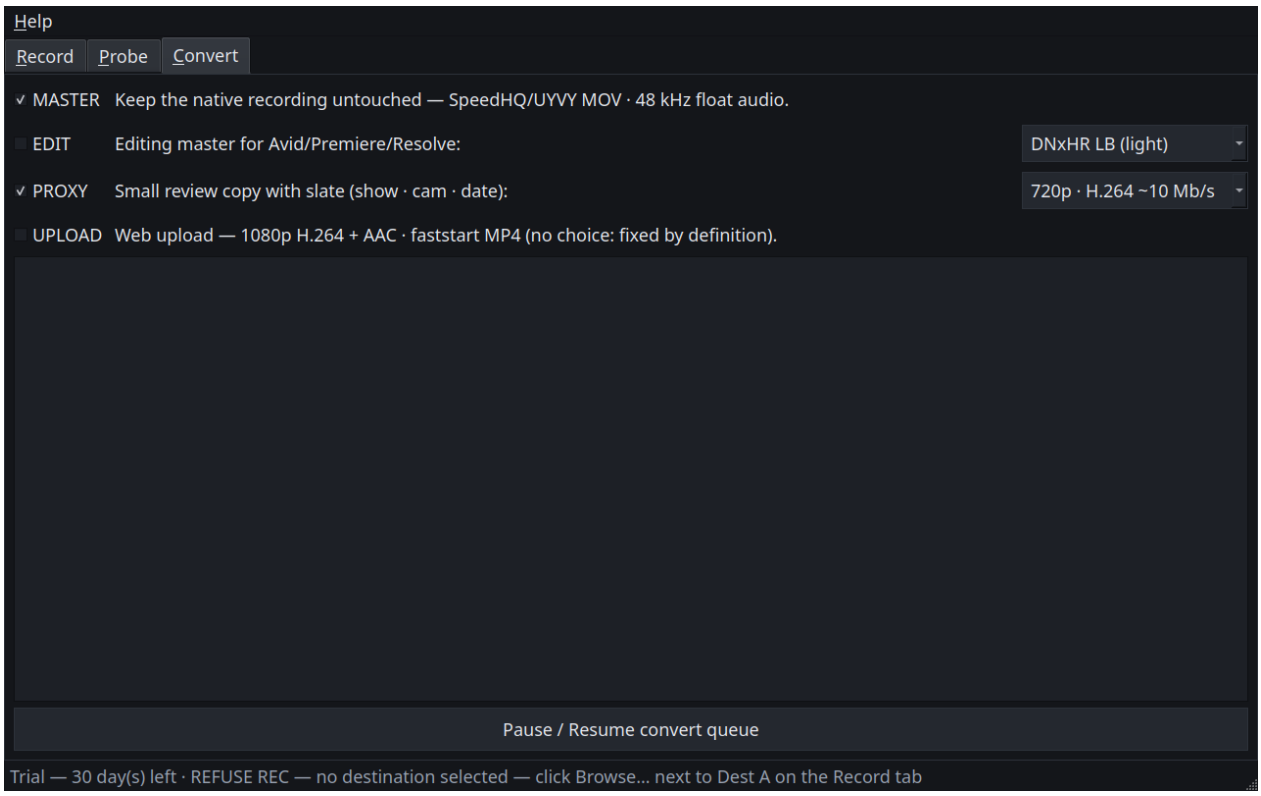
- Segments rotate every **20 minutes and/or 16 GB** (configurable 15–30 minutes, 4–64 GB). Each is a complete, playable file numbered `seg001`, `seg002`, …
- If a source **changes resolution or frame rate mid-record**, the current file is closed cleanly and a new segment continues — never a corrupt hybrid file. An alarm tells you it happened.
- If a channel falls behind, the segment is rotated rather than letting a bad file grow.
- **Kill the app, pull the power, crash the machine:** completed segments survive — you lose at most the current slice, not the night. Each segment's header is flushed to disk every second while recording.

10. Mirror destination

Tick **Dest B (mirror)** to write the same masters to a second disk simultaneously. If Dest B is too slow for masters, tick **Mirror = proxy-only** instead: no live copy on B, converted files are placed there after STOP (the UI says so).

If a destination's volume vanishes mid-record (unplugged cable, drive dropped): **that destination stops, an alarm fires, and the other destination keeps recording.** The app never freezes, and the take is always safe on the surviving disk.

11. Converting after the show



The live path never transcodes. When a take stops, its files are queued for every preset you ticked — with real choices where they matter:

Preset	Output
MASTER	keep the native recording untouched (SpeedHQ/UYVY MOV · 48 kHz float)
EDIT	editing master: **choose** DNxHR LB (light) / DNxHR SQ (standard) / ProRes 422 — 48 kHz PCM
PROXY	review copy with slate (show · cam · date): **choose** 720p ~10 Mb/s / 1080p ~12 Mb/s H.264
UPLOAD	web upload: 1080p H.264 + AAC, faststart MP4 (fixed by definition)

- Converted files land in a `convert` subfolder next to the masters.
- If you **REC again while converts are running**, the queue pauses (a running job is stopped and re-queued) and resumes after STOP — converts never compete with recording.
- The job list shows each job's state and progress; a **Pause/Resume** button is right there.

12. HX cameras and phone apps (not supported)

NDI **HX / HX2 / HX3** sources (H.264/HEVC — many cameras and phone apps) are **not supported in this build**. Lumengrid Record records High Bandwidth NDI (SpeedHQ) with native write. If you select an HX source, the channel reports an error — it does not hang or crash, and your other channels are unaffected.

13. License keys in detail

Help → License shows your current state, days remaining, and a paste box for a new key.

- Keys look like `NDRC1.<payload>.<signature>` — offline Ed25519-signed, verified entirely on your machine. No phone-home, ever.
- A valid **monthly** or **yearly** key unlocks until its expiry date; after that the lock wall returns until you paste a renewal key. A key with a later expiry replaces the installed one; an older key never replaces a newer one.
- Wrong-product keys (e.g. a Multiviewer key), bad signatures, unknown plans and not-yet-valid keys are rejected with a plain-language reason.
- A licence never interrupts a running take: re-checks happen on a 15-minute timer, at REC, and when you apply a key — never mid-record.
- There is **no seat lock** in v1: one key may be pasted on several machines, intentionally.
- Trial resets are a Support action only — the trial state lives in the license store **plus** trial markers (paths in §15). Deleting only the store does not grant a new trial.

14. Support: the Report bundle

Help → Report bundle writes a zip containing the app version, OS, GPU, NDI runtime version, the last probe snapshot and the last 200 log lines. Attach that file to any support request — it usually answers the question before we ask it.

15. Where everything is stored

What	Location
License + trial	`~/.config/Lumengrid/Record/license.json`

What	Location
Trial markers	`~/.local/share/ndi-recorder/` (and `/var/lib/lumengrid/record/` when writable)
Settings	`~/.config/Lumengrid/Record/config.json`
Logs	`~/.local/state/Lumengrid/Record/logs/`
Report bundles	`~/.local/state/Lumengrid/Record/`
Recordings	wherever you pointed Dest A

16. Troubleshooting

Symptom	Meaning / cure
`REFUSE REC — no destination selected`	Pick Dest A (Browse…) on the Record tab
`REFUSE REC — multi-file probe N MB/s, need M`	The disk measured too slow for that many channels. Fewer channels, faster disk, or a lower-rate format
FAT32 refused	Reformat the destination as ext4, XFS or Btrfs
"network share — risky" warning	Recording to a network share is allowed but flagged; prefer local disks
Channel shows `ERR` / "cannot natively record fourcc"	The source delivers a format this build cannot write; hover the Format column, send us the Report bundle
HX source shows an error	NDI HX / HX2 / HX3 are not supported in this build; use a High Bandwidth NDI source
No sources in the dropdown	Check the camera/app is on the same network and sending; NDI discovery needs mDNS traffic
Trial "used" after reinstall	By design — one trial per machine. Paste a key
Locked: "clock was moved back"	Set the correct date/time, then reopen
Convert job failed	Open the Convert tab — the ffmpeg error line is shown; the master MOV is untouched

17. Known limits

- FAT32 destinations are refused; network shares are warned, not blocked.
- NDI HX / HX2 / HX3 are not supported in this build (High Bandwidth records fine).
- Ubuntu 24.04 or newer, 64-bit only; no Windows or Mac build.
- Interlaced masters carry correct cadence but no field-order metadata yet.
- No seat lock in v1 — one key may be used on multiple machines.

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