

THOR VIEWER

User manual — version 0.2.1

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THOR Viewer displays **boardviews** (circuit board layout files) for repair work: find a part or a net in one keystroke, follow a power rail, record your measurements, and with the Pro version work with the **PDF schematic linked** to the board, a **library** of all your schematics and **guided troubleshooting**. Everything stays on your computer: no board file, schematic or measurement is ever sent over the Internet.

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|----------------------------------|------------------------------|
| 1. Free, trial and Pro | 11. Linked PDF schematic |
| 2. Installation and first launch | 12. Library and donor boards |
| 3. Opening a board | 13. Guided troubleshooting |
| 4. Formats and decryption keys | 14. Reference values |
| 5. Moving around the board | 15. License and purchase |
| 6. Search | 16. Languages |
| 7. Parts, pins, nets | 17. Android |
| 8. Following a rail (Mycelium) | 18. Where your data lives |
| 9. Measurements and notes | 19. Common problems |
| 10. Multimeter, distance, photo | 20. Keyboard shortcuts |

1. Free, trial and Pro

One single program, free to download. Without a license it runs as **THOR Viewer Free**, with no time limit. Pro features are unlocked by the 14-day trial or by a license.

Feature	Free	Pro
Repair boardviews (BRD, BRD2, BVR, BDV, CAD, CST, GenCAD, TVW, FZ / XZZ / CAE with your own key)	✓	✓
Manufacturing files: ODB++, Fabmaster, Hyperlynx, PADS	✓	✓
Find a board on the computer, part values, grid, ghost cursor	✓	✓
Search, dual view, rotation, mirror, mini-map, pin 1 marker	✓	✓
Rail following, shared nets, measurements and notes, PNG / CSV export	✓	✓
Multimeter, board photo, distance measurement	✓	✓
OpenBoardData reference values (MacBook)	✓	✓
PDF schematic linked to the board, both ways	detected only	✓
Schematic library and donor boards	preview	✓

Guided troubleshooting (THOR database) and repair report	—	✓
Design files: KiCad, Eagle, EasyEDA Pro, Altium	—	✓

Good to know: Free already “sees” what Pro brings.

In Free, when the board's schematic is on the computer, THOR Viewer detects it and says so (“Schematic for this board found on this computer — available in Pro”). When you select a part, a  box shows the schematic page where it appears, or how many donor boards were found, without opening them. This is on purpose: users see exactly what they would gain.

2. Installation and first launch

macOS

1. Open `THOR_Viewer_Setup_v0.2.1_mac.dmg` and drag **THOR Viewer** into **Applications**.
2. First launch: **right-click** → **Open**, then confirm (the app is not signed by Apple). After that, double-click as usual.

Windows

1. Unzip `THOR_Viewer_v0.2.1_windows.zip` into a folder (for example `Documents\THOR Viewer`) and run `THOR_Viewer.exe`.
2. If SmartScreen appears: **More info** → **Run anyway**.
3. **Associate files** button in the small window: double-clicking a `.brd`, `.bvr`, `.fz` ... file then opens THOR Viewer.

How the software works on a computer

When launched, a **small THOR VIEWER window** opens (buttons *Open THOR Viewer*, *Associate files* on Windows, *Quit*), and the interface appears in your **web browser** at `http://127.0.0.1:5035/`. This is not a website: it is the program, running on your computer.

Important: your data lives in the browser.

Recent files, schematics kept with a board, measurements, photos, decryption keys and settings are stored by the browser under the address `127.0.0.1:5035`. As a result: (1) always open THOR Viewer with the **same browser**; (2) “clearing browsing data” for this site deletes them; (3) port 5035 is fixed for this reason. Export important measurements (§ 9). The license and trial are stored separately (§ 18) and are not affected.

To close the software completely, use the **Quit** button of the small window (closing the browser tab is not enough).

3. Opening a board

- **Open** (button or ) , **drag and drop** the file onto the window, or **double-click** the file (once associated).
- **Several files at once**: drop the board **and** its PDF schematic together and they stay linked.

- **Archives:** `.zip` , `.tgz` , and on a computer `.rar` and `.7z` . The boardview is extracted automatically; if there are several, a list lets you choose. In Pro, PDFs inside the archive are linked to the board.
- **Find a board on this computer** (`(K)` , `...` menu or start screen): type part of the name or number (“00165”); every matching board in Desktop, Downloads and Documents is listed, one click opens it. Computer only.
- **Recent files:** the list on the left (and on the start screen) reopens a board without looking for the file; ✕ forgets it.

On opening, a message gives the number of parts, pins and nets, and the loading time. The file name and format are shown at the top.

Good to know: a board is identified by its name AND its size.

Measurements, kept schematic, photo and mirror setting are attached to the pair “file name + size”. If you **rename** the file, or open a modified copy, THOR Viewer treats it as a new board. To keep your measurements: *Measurements* → *Export* first, then *Import* on the new one.

4. Formats and decryption keys

Format	Notes	
<code>.brd</code>	Test_Link / Allegro-ZXW, including encrypted files (Apple, HP, Lenovo...)	Free
<code>.brd2</code> , <code>.bvr</code> (v1, v3), <code>.bdv</code> (Honhan), <code>.cst</code>	common repair formats	Free
<code>.cad</code> / GenCAD	GenCAD 1.4, including Apple Silicon boards (M1 → M4)	Free
<code>.tvw</code>	Tebo / TeboView (Lenovo...), silkscreen shown	Free
<code>.fz</code>	ASUS / Pegatron, with your own FZ key; manufacturer part numbers read	Free
<code>.pcb</code> (XZZ), <code>.cae</code>	phones, with your own XZZ or CAE key	Free
ODB++ (<code>.tgz</code> / <code>.zip</code>), PADS <code>.asc</code> , Hyperlynx <code>.hyp</code> , Fabmaster	manufacturing files	Free
<code>.kicad_pcb</code> , Eagle XML, <code>.epro</code> / <code>.epro2</code> , Altium ASCII	design files (designer's sources)	Pro

Not supported yet: native Allegro binary (Cadence `.brd` / `.a1g`), `.bv` , `.gr` . Allegro workaround: Fabmaster extract or ODB++ export from Allegro.

FZ, XZZ and CAE keys

Some boardviews are encrypted by their manufacturer. Like OpenBoardView, THOR Viewer **does not ship** these keys: each user pastes their own, once, in `...` → **Decryption keys**.

- **FZ** and **CAE**: 44 hexadecimal values (OpenBoardView `FZKey` / `CAEKey` format, `0x12345678` , `0x...`).
- **XZZ**: 16 hexadecimal digits (`0x0123456789ABCDEF`).
- The key is checked immediately with a **parity check**: a single mistyped value is rejected. It stays on the computer and is never sent.

- If you open an encrypted file without a key, the key window opens by itself; once the key is saved, the file opens.

Good to know:

some `.fz` files are only compressed, not encrypted: they open without a key.

5. Moving around the board

Action	Mouse / keyboard	Touch
Zoom	wheel (zooms under the pointer), + - , double-click = x2	pinch
Pan	drag, arrow keys	drag with one finger
Fit all	0 or ↵	↵
Deselect	Esc or right-click	×

- **Top / Bottom / Both:** **F** flips the side, **D** shows both sides side by side, synchronised. When you select a part, the Viewer switches to the right side by itself.
- **Rotate:** **R** (90° clockwise), **Shift** + **R** (counter-clockwise).
- **Mini-map** (bottom): click or drag inside it to move; “-” minimises it.
- Pointer **coordinates** in mm in the status bar.
- **Ghost cursor:** in dual view, a ring marks the pointer position on the other side — handy to see what lies “behind”.
- **Locator ring:** an item found (search, schematic, link) is circled by a shrinking ring.

Options in the ⋮ menu

- **Show the other side faintly;** **Dim the rest** when a net is selected; **Net ratsnest:** the net is joined by the shortest path through all its pins (“constellation” view), readable even on CPU rails.
- **Hide GND pins** (**G**): lightens dense boards.
- **Hide trivial parts:** those whose pins are all grounded or not connected.
- **Mirror view:** for a file saved mirrored. *Remembered for this board.*
- **Part values** (“1U 6.3V X5R 0402”) under their name when the file provides them (TVW, FZ, KiCad, Eagle, PADS, Altium...) and there is room; also in the tooltip.
- 1" / 0.1" **grid** and file **origin**.
- Test points, part names, silkscreen outlines, mini-map, light / dark theme, **Export view as PNG**.

6. Search

Press **/** (or **Ctrl** / **⌘** + **F**), then:

Type	Finds
U1000	the part (and parts starting with it)
PP3V8	nets containing this text

U1000.A3 (or U1000-A3 , U1000:A3)	one specific pin
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Results are tagged PART / NET / PIN; use ↑ ↓ then **Enter**. The left panel (tabs **Parts**, **Nets**, **Measurements**) also has its own filter.

7. Parts, pins, nets

Clicking the board selects the pin, part or net under the pointer; the information panel opens on the right (at the bottom on a phone).

A part

- Number of pins, side, and the **manufacturer part number** when the file provides it (FZ in particular).
- ★ **Favorite** (marks the part on the board), **Center**, **Show in schematic** (Pro).
- **Shared nets**: type another part (U7000) or several (U7000 Q7030) to list the nets they share with the selected part, grounds last. Ideal to understand how two circuits talk to each other.
- **Pins**: each pin with its net and, if you recorded one, its measurement.

A pin

Part, pin number, side, coordinates in mm, net; **Show the part** button; the whole net listed below.

A net

- Number of pins and test points; “ground” is flagged.
- All parts on the net with their pins; **Show the net** (frames the whole net) and **Highlight all**.
- On the board: the net lights up, ratsnest lines join its pins, everything else fades.
- 📖 **This net in the library** (Pro).

Boardview limitation:

most boardviews give neither the value nor the package of components (a capacitor stays “C7230”). For values you need the schematic.

8. Following a rail (Mycelium)

In the panel of a net or pin: **Follow the rail** — *off, 1, 2 or 3 levels*. THOR Viewer crosses linking parts and gives each net it reaches its own colour; crossed parts are marked with a **diamond**.

- Parts crossed: **inductors**, **fuses**, **ferrites**, **jumpers** (XW, PJ...) and **resistors $\leq 1\ \Omega$** .
- A resistor value is only used when the format provides it; otherwise the part name decides.
- Grounds and unconnected pins are never followed.
- Each net found is clickable; the row says through which part and at which level.

Typical use:

a short on PPBUS_G3H ? Follow it 2 levels deep to see every net connected through inductors and fuses, then look for suspect capacitors across all of them.

9. Measurements and notes

Each pin, part or net has its own **Measurement / note** box:

- **Value** (comma or dot) and **unit**: V, Ω , diode, mA, A.
- **Status**: **OK**, **Check**, **KO** — recorded pins are circled in green, orange or red on the board.
- Free-text **note**.

Everything is saved immediately, with the board. The **Measurements** tab (left) lists everything recorded; from there: **Export** (JSON, to re-import), **CSV** (spreadsheet, “,” separator), **Import**.

Diode mode:

if the board is known to OpenBoardData (§ 14) and you enter a value in **diode** unit without choosing a status, THOR Viewer suggests OK or KO itself by comparing with the reference ($\pm 10\%$, at least 0.03). If you already chose a status, it leaves it alone.

10. Multimeter, distance, photo

Live multimeter reading computer

If your multimeter (or its PC / Bluetooth software) writes its readings to a **text file**, THOR Viewer shows the latest one live. Menu $\cdots$ → **Multimeter**: tick *Read the multimeter*, choose the file (default Documents/THOR_Multimetre/mmdata.txt), **Test**, **Save**.

- One reading per line; only the **last line** counts. Accepted forms: 0.512 V, 512mV, 4.7k, 12,6, 350 mA ... (no unit = volts).
- The badge shows **✓ stable** when the last 3 or more readings vary by less than 1 %.
- **E** key (or *Record on ...* button): the value is recorded on the selected pin or net. If that note was already in “diode”, the diode unit is kept.

Measuring a distance

M or , then two clicks: distance in **mm** and **mil**. **Esc** or right-click to leave.

Board photo

$\cdots$ → **Board photo** places a photo under the layout for the side shown (one photo for the top, one for the bottom). The bottom photo is flipped automatically. The alignment bar lets you rotate, flip, shift, resize, set transparency, hide, replace or delete it. The photo and its alignment are kept with the board.

11. Linked PDF schematic Pro

Finding the schematic

On a computer, THOR Viewer looks for the board's schematic by itself:

- in the **same folder** as the board;
- by **shared board number** (820-02098 ...) in Desktop, Desktop/schema, Downloads, Documents (up to 3 sub-folder levels).

A PDF that is merely nearby, without a shared number, is marked (*probable*). Otherwise drop the PDF onto the window, or use **+ PDF**. An added PDF is **kept with the board** (up to 120 MB): no need to link it twice. **– PDF** removes it from this board. Several schematics can be linked; the list at the top of the panel switches between them.

Put the board number in your schematic file names

(820-02098 schematic.pdf) and keep them in Desktop/schema, Downloads or Documents: everything links without a click.

Board → schematic

Selecting a part or net opens the right page of the schematic, highlighted. The pages where it appears are listed (p. 26 x2 , p. 62 x4): one click takes you there. For a pin, two chips let you search for the part or the net.

Schematic → board

Clicking a reference (U7700) or a net (PP3V8_A0N) in the PDF selects it on the board.

In the schematic panel

- Search inside: **Enter** goes to the next match, **↑ ↓** as well.
- **< >** pages, **– +** zoom, **↗** fit width, **🌑 inverted colours** (comfortable in dark mode, remembered).
- The divider between board and schematic can be **dragged** to resize (width remembered).
- **S** opens / closes the schematic.

Scanned PDFs:

a schematic that is only an image (no text) is displayed, but cannot be linked to the board or searched (no character recognition).

Sister board:

for some boards with no public schematic (e.g. MacBook Pro M4 Pro), the troubleshooting sheet names a sister board; if its schematic is on the computer, it is offered automatically.

12. Library and donor boards Pro

B or  **Library**: search a **chip part number** (ISL95828), a **reference** (U7000) or a **net** (PP3V3_S5) across **all** PDF schematics on the computer. Every schematic containing it is listed with its pages; one click opens the schematic at the right page, highlighted.

- PDFs included: Desktop/schema, Downloads, Documents, board folders, and PDFs kept with a board.
- **Indexing**: each PDF is read only once (about 4 s per PDF), in the background, a few seconds after start-up. The first pass over hundreds of schematics can take half an hour; after that, search is instant and offline. *Pause / Index now / Refresh* button.
- Results are marked **this board** or **donor?**. When that board's boardview is on the computer, a  **Open board** button opens it directly.
- **Compound search**: several words (“1uF 16V 0201”); pages containing **all terms** (★) come first. The  **Terms close together** button checks on those pages that the terms sit side by side on the schematic (within

50 points): the way to find a part by its characteristics.

Donor boards

When you select a part, THOR Viewer reads its **manufacturer part number** — in the boardview (FZ) or in the schematic, next to the reference (e.g. U7100 → ISL95828HRTZ). One click on the  chip searches the whole library: every other board using it is a potential donor.

13. Guided troubleshooting Pro

P or the  **Diag** button. The button lights up when the board is recognised in the THOR database. Recognition uses the **board number in the file name** (820-02098) or an alias (A2442).

Sheets available (45): 15 written Apple boards (MacBook Air 2012 to M1, MacBook M2, MacBook Pro 2010 to 2021, iMac 2012); 23 **provisional** MacBook boards generated from their schematic (MacBook 12", MacBook Pro 2014 to 2020, Apple Silicon boards...); 3 iMac 2019/2020; MacBook Pro 14" M4 Pro; iPhone 11, 12, 13 and 14 (provisional, workshop method). A provisional sheet shows a notice: it reuses a sister board's architecture and still needs validating in the workshop.

Coverage:

guided troubleshooting currently covers these Apple boards, many of them provisional. On another board, the panel lets you pick a close sheet (same family), but rails and guides will only partly match. All other features work on every board.

Guide tab

Choose the **symptom**: steps to tick (kept with the board), **probable causes** ranked by weight, **measurement points**. Every net or part mentioned is a link to the board.

Rails tab

- Rails in **power-on order** (input → always-on → powered on), with their nominal voltage.
- Enter the measured voltage; **Enter** moves to the next rail. Each rail is judged: missing, too low, too high or within tolerance; its pins are coloured on the board.
- THOR Viewer points to the **first faulty rail**: faulty while its upstream is healthy. For it: advice, expected source component and enable signal, parts to inspect, capacitors to check for a short, direct access to the schematic.
- Rails named in the sheet but named differently in the file are flagged ("nearby nets"): this also helps check the database.
- ◇ 0.48: OpenBoardData diode-mode reference, when available.

Report tab

Customer, device, technician, findings → **A4 repair report** in THOR colours, to print or save as PDF, with the measured voltages.

Lifetime license and updates:

the lifetime license includes 1 year of fault-database updates. A THOR Viewer version whose database is newer than the end of your updates does not open guided troubleshooting (“Updates ended” message): renew the updates, or keep the previous version.

14. Reference values (OpenBoardData) Free

For 41 MacBook boards (2012 → M2), each net shows the values measured on a healthy board: **diode mode**, resistance, voltage. In **green**: same board; in **amber**: sister board. Open data from OpenBoardData (openboarddata.org), ODbL license, available in every version.

15. License and purchase

14-day Pro trial

- Start it with the ► **Try Pro for free — 14 days** button, offered as soon as you touch a Pro feature (or in ... → License...). No payment, no card.
- Once per computer. Setting the computer clock back does not extend it.
- When it ends, the software automatically returns to Free: **nothing is lost** (measurements, kept schematics, photos stay).
- The action you were doing resumes after the trial starts (the schematic opens, the design file opens...).

Buying

... → **License...**, buttons **1 month**, **1 year**, **Lifetime**: the payment page opens with the **machine code** (computer fingerprint) already filled in. Or at licence.thor-technologie.com.

Payment methods (through PayDunya): **credit card** (Visa, Mastercard), including from abroad, and Wave, Orange Money, MTN, Moov in West Africa. The amount is always charged in **FCFA** (West African CFA franc, pegged to the euro); your bank converts it, hence the “≈” equivalents. The PayDunya payment step is in French: choose “Carte bancaire”.

Plan	FCFA (amount charged)	Equivalent
Pro 1 month	6,500	≈ €9.90 · ≈ \$11.50
Pro 1 year	39,000	≈ €59 · ≈ \$69
Pro lifetime (database updated for 1 year)	85,000	≈ €129 · ≈ \$150
1 year of updates (for the lifetime license)	25,000	≈ €39 · ≈ \$44

Activating

After payment, the `THOR-LIC-...` key is shown on screen and sent by email. Paste it in ... → **License...** → **Activate**. Verification is done **offline** (RSA signature): no connection is needed afterwards. **Remove** takes the license off the computer.

One license, one person, 3 devices.

The license is tied to the fingerprint shown in the License window. One person may use it on 3 devices (computers or phones): send their fingerprints to THOR TECHNOLOGIE. To change a device (failure, replacement), same procedure, with your shop name and purchase date.

16. Languages

French, English, Spanish, German: menu $\cdots \rightarrow$ . A new installation uses the computer's language; an existing installation stays in French until changed. The small launcher window follows the chosen language. The fault database is translated into all four languages.

17. Android

- Install the `.apk` (allow unknown sources). Open a board with the **Open** button or “**Open with THOR Viewer**” from a file manager or WhatsApp.
- The schematic is not found automatically: open the board, then **+ PDF**.
- The library only contains the PDFs kept with your boards.
- No multimeter, no `.rar` / `.7z` (use a `.zip` or extract first).
- The information panel opens at the bottom of the screen; pinch to zoom.

18. Where your data lives

Data	Location
License, trial, launcher language, log	macOS: <code>~/Library/Application Support/THOR Viewer</code> · Windows: <code>%APPDATA%\THOR Viewer</code>
Recent files, kept schematics, measurements, photos, keys, settings, library index	in the browser, under <code>127.0.0.1:5035</code> (§ 2)

What leaves the computer: only the new-version check (a small file read from `licence.thor-technologie.com`, at most every 6 hours) and the payment page when you click Buy. When a new version exists, a **↑ Version ... available** badge appears in the status bar; clicking it opens the download page.

19. Common problems

Symptom	Solution
“Port 5035 is used by another program”	THOR Viewer is already running (small window open elsewhere): use <i>Open THOR Viewer</i> , or <i>Quit</i> the old one and relaunch. Right after quitting, wait a few seconds.
Mac: “cannot be opened, unidentified developer”	Right-click $\rightarrow$ Open $\rightarrow$ Open.

Encrypted file: key requested	Paste your FZ / XZZ / CAE key (§ 4). “Parity check” refusal = one value mistyped.
Measurements, schematic or photo gone	The file was renamed (§ 3), opened in another browser, or the site data was cleared (§ 2).
The schematic does not link by itself	Put the board number in the PDF name and keep it in Desktop/schema, Downloads or Documents; or use + PDF .
Clicking in the schematic finds nothing	Scanned PDF (image): no text to link.
The Diag button stays off	Board not in the database (§ 13), or board number missing from the file name.
Nothing shows in the browser	Reopen from the small window → <i>Open THOR Viewer</i> . A firewall (Little Snitch...) may ask you to allow the program.

20. Keyboard shortcuts

Key	Action	Key	Action
O	open a file	/ Ctrl + F	search
F	top / bottom	D	dual view
R / Shift + R	rotate right / left	0	fit all
+ - arrows	zoom, pan	G	hide GND
M	measure a distance	S	PDF schematic
B	library	P	guided troubleshooting
E	record the multimeter reading	Esc	deselect / leave
K	find a board on the computer		