

03 — Traxcope User Guide

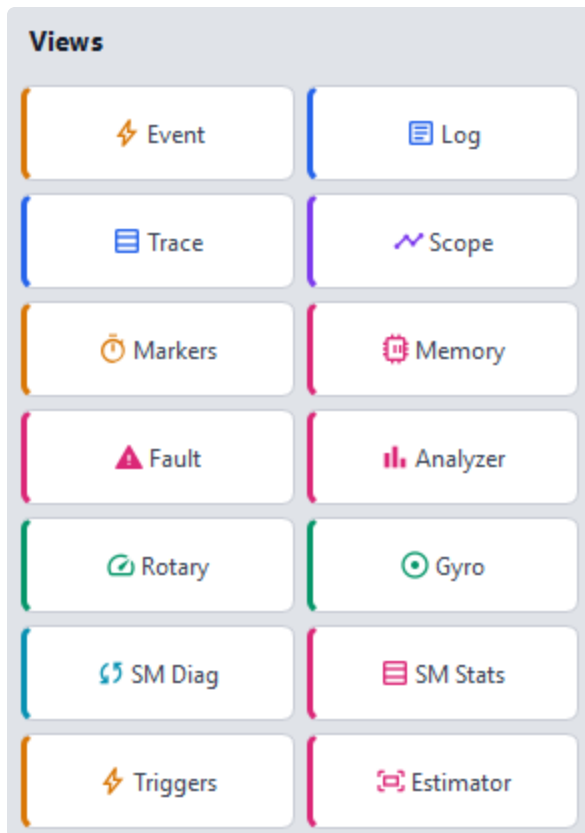
TraxProbe & Traxcope User Manual · Version 1.0.0 · Updated 2026-07-28
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This chapter covers everything on the desktop side that is *not* specific to one view: creating and configuring probes, connecting and streaming, recording and reviewing sessions, workspaces, and the concepts shared by all views (Live vs Review mode, view synchronization). The individual views are covered in the feature chapters (10–18).

1. The main window

Traxcope is built around **dockable views**. The left sidebar hosts three panels:

Panel	Purpose
Probes	Create, configure, connect, stream, and record probes
Recordings	Load and manage recorded sessions for offline review
Toolbox	Open analysis views (Log, Scope, Trace, Event, Markers, Memory, Analyzer, Rotary, SM Diagram, SM Stats, Triggers ...)



Screenshot: Toolbox panel with the full list of view types

Views can be docked, tabbed, floated, and opened in multiple instances (e.g. two Scope views watching different variable sets). The complete layout is saved in the workspace (§6).

2. Probes

A **probe** in Traxcope represents one connection to one device running TraxProbe firmware.

2.1 Creating and configuring a probe

Sidebar → **Probes** → **Add**. Or import an existing configuration file via **Import** (`.traxcfg` , a JSON file you can keep in version control and share with your team). The counterpart is right-click on a probe → **Export Config...**, which saves the probe's current configuration as a `.traxcfg` you can hand to a colleague.

The probe configuration has two tabs:

General tab

Probe Configuration

×

General

Transport

Probe Identity

Name *

EmSparkerG0

ID *

1

Description

Educational Nucleo Development Board
Based on STM32G0B0RETx

Firmware

ELF File

Path to firmware .elf file

...

Recording

Recording

Default (sessions/)

...

Time Correction

Offset

0.0

ms

Scale

0.0 ppm

Multi-Probe Sync

Sync

☐ Apply sync correction

Role

Master (reference clock)

Mapping

identity (reference clock)

Offset

0.000 ms

Scale

1.000000 (0.00 ppm)

Pulses

0

Filter delay

not reported

Filter delay

☐ Override default

0.000 μ s

Firmware Info

Version:

1.0.0

Build:

Jul 3 2026 07:01:57

Build ID:

Jul 3 2026T07:01:57

Project:

Traxcope Final Demo

Diagnostics

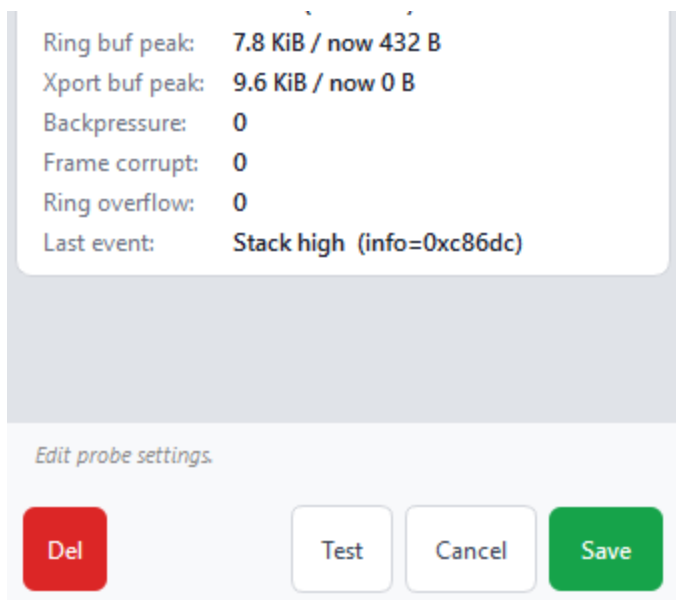
Active #43

Throughput:

821.0 kbps

Frames:

4186 (3.46 MiB)



Screenshot: Probe config General tab — name, ELF path, firmware info card, diagnostics card

- **Name / description** — how the probe appears throughout the UI.
- **ELF file** — path to the firmware `.elf`. Traxcope reads the `.trax_*` metadata sections from it: log format strings, variable names/units/colors, marker deadlines, state machine tables. Mandatory if the firmware was built with `TRAX_META_ELF_ONLY`; recommended always.
- **Recording directory** — optional override of where this probe's recordings are stored.
- **Time correction** — manual time offset and scale (ppm) applied to this probe's timestamps; changes apply live while streaming.
- **Multi-Probe Sync** — the workspace-wide sync correction toggle plus a read-only status panel (role, mapping, offset/scale, pulse count, filter delay) for this probe — see [Chapter 18](#).
- **Firmware info card** — fills in live after connection: project name, version, build ID as reported by the firmware (`TRAX_CFG_PROJECT_NAME` / `_BUILD_VERSION` / `_BUILD_ID`). Use the build ID to verify the ELF matches the running firmware.
- **Diagnostics card** — live firmware self-diagnostics (throughput, ring-buffer usage, drop/corruption counters), updated every second from the device's diagnostic reports.

Transport tab

Three transport types:

Transport	Settings	Pairs with firmware
RTT	J-Link serial (auto-detect), interface, speed, up/down channels; connection mode: <i>Telnet-only</i> (attach to a running J-Link session) or <i>Managed</i> (Traxcope manages telnet/GDB/SWO ports)	<code>TRAX_TRANSPORT_RTT</code> (library default)

Transport	Settings	Pairs with firmware
UART	COM port (refreshable list, nicknames), baud rate, data/stop bits, parity	Custom UART transport
TCP	IP address, port, timeout	Custom TCP transport
UDP	IP address, port, optional fixed local port (default: auto)	Custom UDP transport

Probe Configuration [X]

General **Transport**

Type: UART

Port *: Labs CP210x USB to UART Bridge [Refresh]

Nickname: CP210x

Baud Rate: 115200

Data Bits: 8

Stop Bits: 1

Parity: None

Direction: Bidirectional

Edit probe settings.

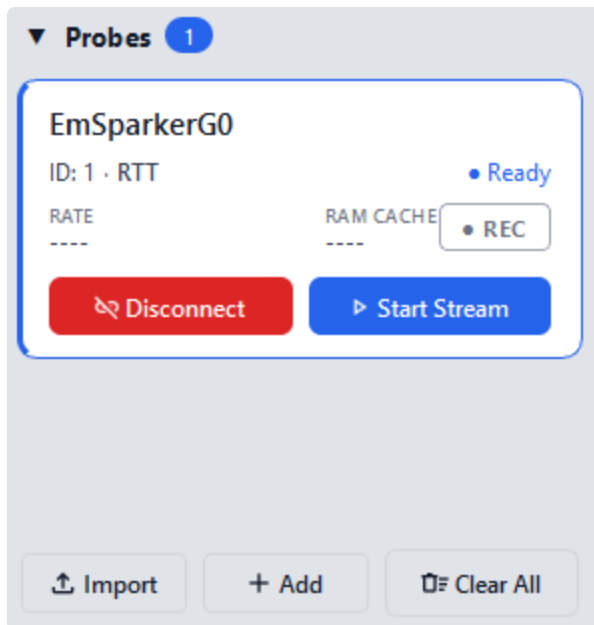
[Del] [Test] [Cancel] [Save]

Screenshot: Probe config Transport tab, UART selected, COM port list open

Test Connection verifies the transport before you save.

2.2 Connect → Stream → Record

Each probe card exposes the three-stage pipeline:



Screenshot: Probe card with Connect, Stream, Record buttons

1. **Connect** — opens the transport and performs the session handshake. The firmware's `SESSION_START` header arrives, carrying firmware info, timestamp parameters, sync role, and (in `TRAX_META_IN_FLASH` mode) all static metadata.
2. **Stream** — sends the start-streaming command. The firmware gates producers, waits for the ring to go idle, then **clears the application ring and the transport TX buffer** so the new session starts empty. `SESSION_START` is sent next; live views begin updating from that point. Events that happened before you clicked are not flushed to the host.
3. **Record** — writes everything arriving from this probe to disk. You can toggle recording on and off during a live session.

Health indicators on the card warn about recording overflow, blocked drains, and similar conditions. If the firmware stops streaming on its own (buffer overflow, transport failure, heap exhaustion), Traxcope displays the stop reason reported by the device.

3. Recordings

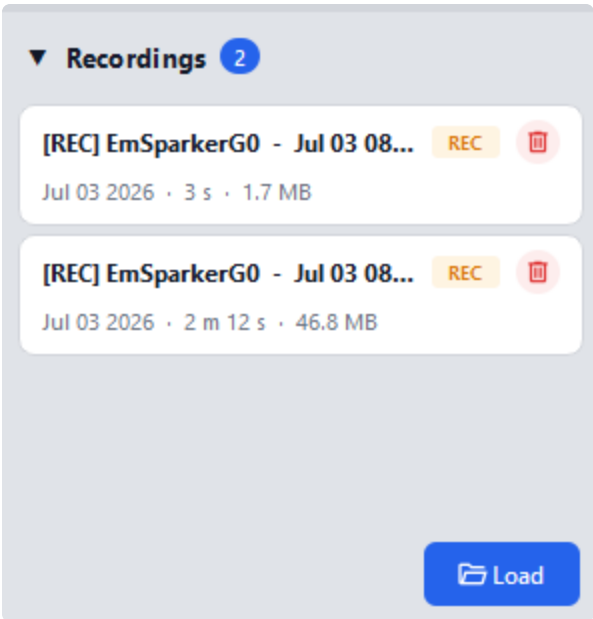
3.1 Creating a recording

Click **Record** on a connected, streaming probe. Traxcope writes chunked trace data plus multi-resolution level-of-detail (LOD) files into a per-probe session folder (default under the application data directory, configurable per probe), described by a `session.json` / `recording.json` manifest.

LOD files are what make review fast: views can render hours of data zoomed out without touching every raw sample, and progressively load detail as you zoom in.

3.2 Reviewing a recording

Sidebar → **Recordings** → **Open / Load**, then pick the recording folder. The recording is registered alongside live probes — views can display it exactly like a live probe, but in Review mode.



Screenshot: Recordings panel + detail side panel with metadata and time correction fields

The detail panel shows name, source probe, date, duration, size, chunk and LOD info, and offers:

- **Time offset (ms)** and **scale (ppm)** — manual time correction, useful to align recordings that were captured without hardware sync.
- **Remove** — unregister the recording (files stay on disk).

For multi-probe recordings, sync anchors captured during the session are persisted in the manifest, so synchronized timelines survive into offline review ([Chapter 18](#)).

4. Live vs Review — the one concept every view shares

Every data view operates in one of two modes, switchable from its toolbar:

	Live	Review
Data source	Streaming probe, follows incoming data	Frozen window into the store (live session history or a loaded recording)
Scrolling	Auto-follows latest data	Free navigation: pan, zoom, jump, search
View sync	Not participating	Fully participating

Typical workflow: watch live, spot something odd, switch that view to Review, navigate to the anomaly, then bring other views to the same instant via view sync.

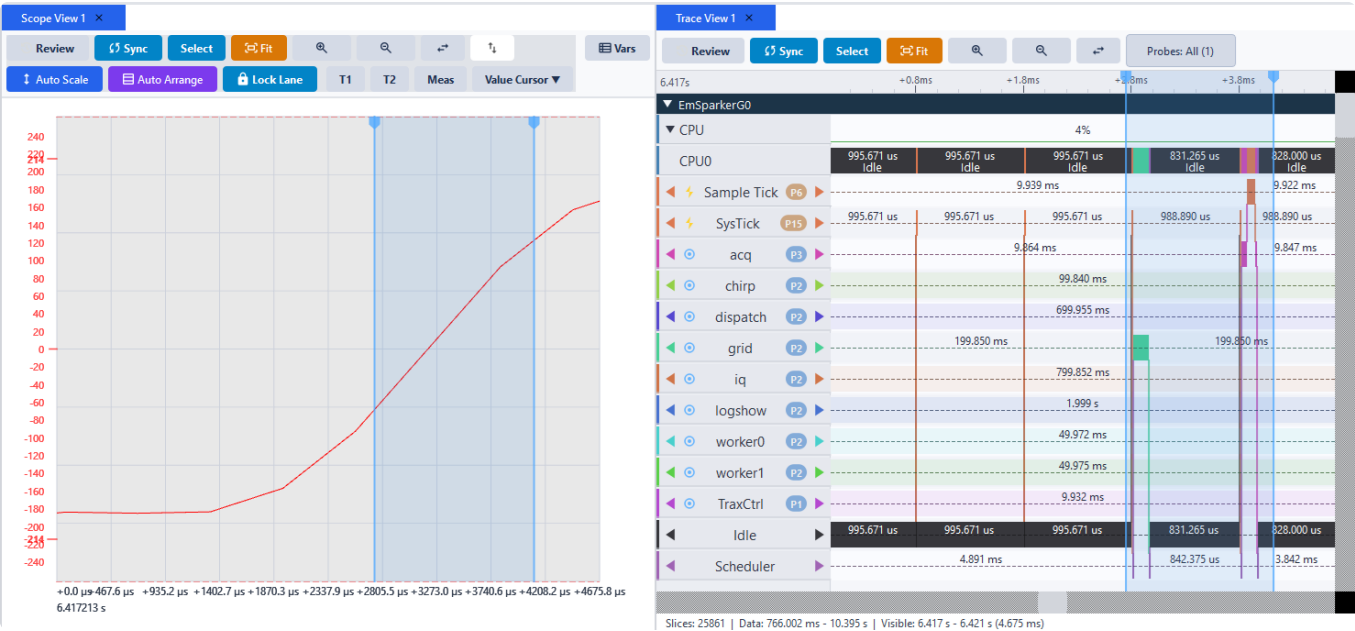
In the Trace View a **trigger firing** automatically drops the view out of live mode and centers on the trigger point ([Chapter 17](#)).

5. View synchronization (ViewSync)

Views that show time-based data (Scope, Trace, Log, Event, Marker Stats, SM Diagram, Spectrum Analyzer...) can share their navigation through the sync bus. Each view has a **Sync** toggle in its toolbar.

What is shared between synced views in Review mode:

Shared item	Meaning
Time selection	A single instant (light-blue marker line). Click in one view, every synced view jumps to and marks the same instant
Range selection	A light-blue highlighted range (e.g. T1–T2 cursors in Scope, a selected interval in Marker Stats)
Hover cursor	Live mouse-position tracking across views
Visible range	Pan/zoom one view, the others follow



Screenshot: Scope and Trace views side by side, same light-blue time selection in both

Row-based views participate too: selecting a log line or an event row broadcasts that timestamp to the bus, so you can click a suspicious error log and instantly see what every task was doing at that moment in the Trace View.

Live-mode views neither send nor receive sync — switch to Review to join the conversation.

Per-view **probe filters** (the probe selector popup in each view's toolbar) control which probes' data a particular view instance shows — so two Trace Views can watch two different boards while staying time-synchronized.

6. Workspaces

Traxcope automatically saves your entire working environment on exit and restores it on the next launch:

- All probe configurations
- The dock layout and all open views with their per-view settings (Scope channels, filters, sync state, ...)
- Sidebar state and window geometry

You always come back to exactly where you left off — no manual saving required. To share a setup with a colleague, export the probe configurations (§2.1) and hand over the `.traxcfg` /ELF files.

7. Exports

Export capabilities are view-specific:

View	Export
Marker Statistics	HTML report, PDF report, CSV verdicts, JUnit XML (CI integration), stats table CSV — see Chapter 15
State Machine Statistics	CSV — see Chapter 16

JUnit XML deserves a special mention: it turns marker deadline compliance into a test report your CI can consume, making "the control loop must finish in 600 µs" a regression-tested property.

8. Preferences, license, AI assistant

- **Preferences** — application-level settings (theme, behavior).
- **License** — streaming live data is license-gated; the License dialog manages activation.
- **AI assistant** — an in-app chat that can inspect the current session (e.g. summarize RTOS behavior) and help you interpret captures. Still in progress...