



PlantUnity Alarm Rationalizer User Guide

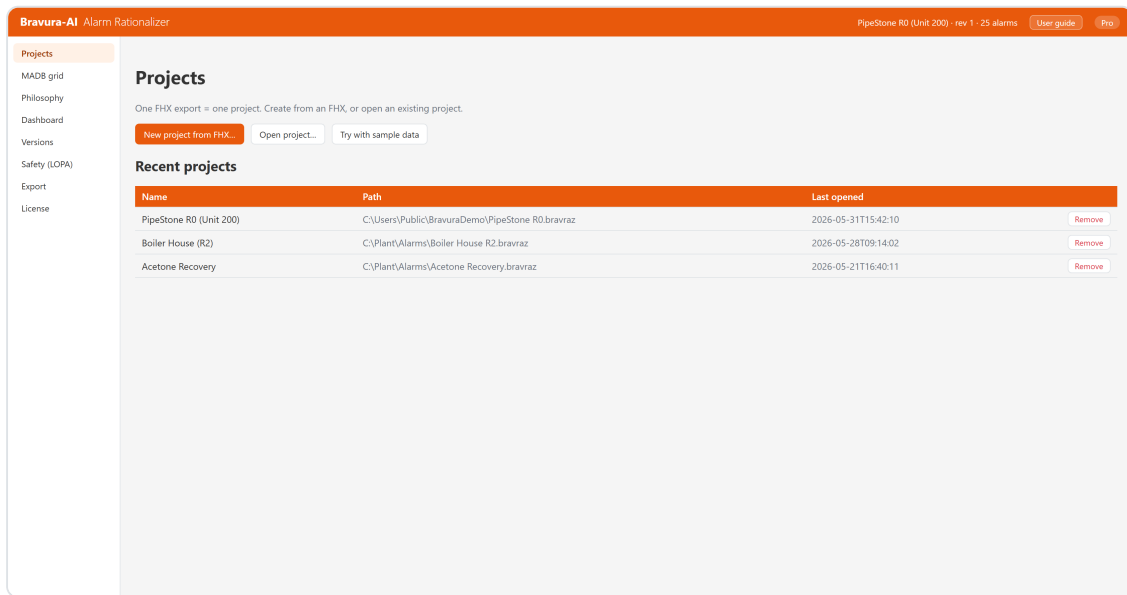
ANSI/ISA-18.2 (IEC 62682) alarm rationalization, directly from a DeltaV FHX export

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Rationalize your DeltaV alarms to ANSI/ISA-18.2 (IEC 62682) directly from an FHX export. No spreadsheets, no CSV prep, and it works offline day to day (Pro checks its licence online from time to time). This guide walks through the workflow screen by screen.

Tip: try it in 30 seconds. On first run a short welcome explains the three-step flow. Click **Try with sample data** to load a built-in demo export. Everything below works on that sample, so you can explore before importing your own FHX.

1. Projects



Projects screen

One FHX export = one project, stored as a self-contained `.bravraz` file. A first-run welcome card introduces the Import / Rationalize / Export flow; it appears once per machine.

- **New project from FHX...**: pick your DeltaV `.fhx` export and choose where to save the project. The app parses the FHX and auto-builds the Master Alarm Database (MADB): one row per alarm, per instance, with class alarms expanded onto every instance and instance overrides applied. A progress overlay shows parsing/extracting and can be cancelled.
- **Open project...**: reopen an existing `.bravraz`.
- **Try with sample data**: load the bundled demo export (no plant data needed).
- **Recent projects** are listed below; **Remove** takes a project off the list without deleting its file.

If an import finds unresolved priorities, unconfigured scales, or missing setpoints, it reports them so an incomplete MADB is never silent.

2. The MADB grid

Tag	Area	Module class	Code	Alarm	Setpoint	EU	Deadband	Current	Recommended	On	Class	Status	Freq	Flags
☐ 10-FIC-110	Plant/Unit10/Feed	FIC_FLOW	CFN	COMM_ALM								Unrationalized		Ⓢ DV
☐ 10-FIC-110	Plant/Unit10/Feed	FIC_FLOW	DH	DV_HI_ALM	10 m3/h	m3/h	—	ADVISORY		Yes		Unrationalized		
☐ 10-FIC-110	Plant/Unit10/Feed	FIC_FLOW	H	HI_ALM	85 m3/h	m3/h	—	WARNING		Yes		Unrationalized		
☐ 10-FIC-110	Plant/Unit10/Feed	FIC_FLOW	L	LO_ALM	15 m3/h	m3/h	—	ADVISORY	ADVISORY	Yes		Under Review		
☐ 10-PIC-120	Plant/Unit10/Reactor	FIC_FLOW	CFN	COMM_ALM								Unrationalized		Ⓢ DV
☐ 10-PIC-120	Plant/Unit10/Reactor	FIC_FLOW	DH	DV_HI_ALM	10 barg	barg	—	ADVISORY		Yes		Unrationalized		
☐ 10-PIC-120	Plant/Unit10/Reactor	FIC_FLOW	H	HI_ALM	85 barg	barg	—	WARNING		Yes		Unrationalized		
☐ 10-PIC-120	Plant/Unit10/Reactor	FIC_FLOW	L	LO_ALM	15 barg	barg	—	ADVISORY		Yes		Unrationalized		
☐ 10-TI-101	Plant/Unit10/Reactor	AI_TEMP	H	HI_ALM	120 degC	degC	1.0	WARNING	WARNING	Yes	Process	Approved		
☐ 10-TI-101	Plant/Unit10/Reactor	AI_TEMP	HH	HI_HI_ALM	150 degC	degC	1.0	CRITICAL-PROCESS	CRITICAL	Yes	Safety	Under Review		Ⓢ priority
☐ 10-TI-101	Plant/Unit10/Reactor	AI_TEMP	L	LO_ALM	10 degC	degC	1.0	WARNING		Yes		Unrationalized		
☐ 10-TI-101	Plant/Unit10/Reactor	AI_TEMP	OTHER	SIMULATE_ALM				ADVISORY		Yes		Unrationalized		Ⓢ DV
☐ 10-TI-102	Plant/Unit10/Reactor	AI_TEMP	H	HI_ALM	95 degC	degC	—	WARNING		Yes		Unrationalized		
☐ 10-TI-102	Plant/Unit10/Reactor	AI_TEMP	HH	HI_HI_ALM	150 degC	degC	1.0	CRITICAL-PROCESS		Yes		Unrationalized		
☐ 10-TI-102	Plant/Unit10/Reactor	AI_TEMP	L	LO_ALM	10 degC	degC	1.0	WARNING		Yes		Unrationalized		
☐ 10-TI-102	Plant/Unit10/Reactor	AI_TEMP	OTHER	SIMULATE_ALM				ADVISORY		Yes		Unrationalized		Ⓢ DV
☐ 10-XV-130	Plant/Unit10/Feed		CFN	FAIL_ALM				CRITICAL-PROCESS		Yes		Unrationalized		
☐ 20-FIC-210	Plant/Unit20/Reflux	FIC_FLOW	CFN	COMM_ALM								Unrationalized		Ⓢ DV
☐ 20-FIC-210	Plant/Unit20/Reflux	FIC_FLOW	DH	DV_HI_ALM	10 m3/h	m3/h	—	ADVISORY		Yes		Unrationalized		
☐ 20-FIC-210	Plant/Unit20/Reflux	FIC_FLOW	H	HI_ALM	85 m3/h	m3/h	—	WARNING		Yes		Unrationalized		
☐ 20-FIC-210	Plant/Unit20/Reflux	FIC_FLOW	L	LO_ALM	15 m3/h	m3/h	—	ADVISORY		Yes		Unrationalized		
☐ 20-TI-201	Plant/Unit20/Column	AI_TEMP	H	HI_ALM	120 degC	degC	1.0	WARNING		Yes		Unrationalized		

MADB grid

Every alarm in one sortable, searchable grid: tag, area, module class, code, alarm attribute, **setpoint and EU units, deadband**, as-configured priority, recommended priority, enabled, rationalization status, runtime **frequency**, and flags.

- **Sort** by clicking any column header (priority sorts by severity, not alphabetically).
- **Find-as-you-type** search; filter by code, origin, priority, or status.
- **Multi-select + bulk edit:** tick rows to set priority / class / status across many alarms at once (locked or incomplete rows are skipped, not aborted).
- **Import frequencies...** loads a runtime alarm-frequency CSV (a tag column plus a count/occurrences column) so you can sort by **Freq** and rationalize the worst actors first; high-count alarms can be flagged ★ **Bad actor**.
- **Flags column:** ★ marks a bad actor and Ⓢ marks an alarm whose annunciation MASK is non-default (partially suppressed), so suppression gets a deliberate review.
- A ⚙ in the EU column marks a loop whose instance scale was unconfigured (the EU range shown is from the class template). A ⌛ badge marks an alarm that needs re-review after an FHX re-import changed its as-built.

Click any row to rationalize it.

3. Rationalize an alarm

The screenshot shows the Bravura-AI Alarm Rationalizer interface. The left sidebar contains navigation links: Projects, MADB grid, Philosophy, Dashboard, Versions, Safety (LOPA), Export, and License. The main area is divided into two panels. The left panel, titled 'As built from FHX', displays the current configuration for alarm 10-TI-101-HI_ALM. The right panel, titled 'Rationalization (Approved, read-only)', shows the rationalization form with tabs for Normal, Startup, Shutdown, and Maintenance. The form includes fields for alarm type, setpoint/condition, consequence of inaction, corrective operator action, time to respond, safety matrix, and recommended response time and identification method.

As built from FHX	
TYPE	High Alarm
ORIGIN	module - Class Default
CONFIGURED PRIORITY	WARNING
ENABLED	Yes
SETPPOINT	120 degC
EU RANGE	0 ... 200 degC
DEADBAND / DELAYS	1.0 / — / —
SUPPRESSION	—
MODULE CLASS	AI_TEMP
PLANT AREA	Plant/Unit10/Reactor

Rationalization (Approved, read-only)

Normal Startup Shutdown Maintenance

REQUIRED ISA-18.2 §9.2.1

Alarm type: High Alarm Setpoint / condition: PV > 120 degC

Consequence of inaction: Reactor overtemperature, possible runaway

Corrective operator action: Reduce feed; verify cooling-water flow

Time to respond: > 30 min

Safety: Minimal Health: Minimal Environmental: Minimal Assets: Minimal Financial: Minimal

Matrix recommends: LOG Apply

Rationalized priority: WARNING Alarm class:

RECOMMENDED §9.2.2

Max response time: Identification method:

Probable cause: Setpoint rationale:

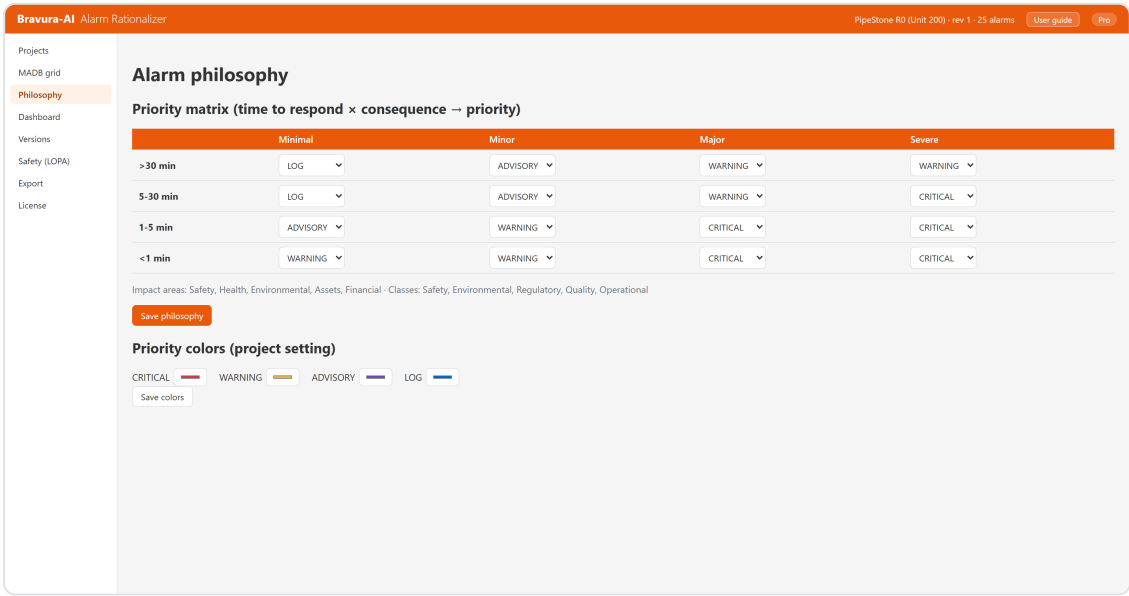
Rationalization form

The left panel shows the **as-built configuration from the FHX** (read-only): type, origin/inheritance, configured priority, enabled, setpoint and EU range, deadband/delays, and the annunciation **Suppression** state (default vs how many conditions are masked). The right panel is the ISA-18.2 rationalization, grouped to match the standard:

- **Required (§9.2.1):** alarm type, rationalized priority, alarm class, setpoint/condition, corrective operator action, consequence of inaction.
- **Priority matrix:** choose the time-to-respond band and the consequence severity per impact area; the matrix recommends a priority; click **Apply** to accept it. Your matrix inputs are saved with the alarm.
- **Recommended (§9.2.2):** max response time, identification method, probable cause, setpoint rationale, advanced-alarming need.
- **Plant-state tabs:** rationalize an alarm differently per operating state (Normal, Startup, Shutdown, Maintenance). Each state keeps its own answers; a marker shows which states already have a saved rationalization.

Enter **Your name** (remembered per machine); it is recorded as the reviewer/approver. **Approve** is enabled only when the six required fields are complete, and it records the approver and timestamp. Approved alarms become read-only until reopened. **Copy to class** applies a rationalization to the other instances of the same module class, with a preview and a fill-blanks-vs-overwrite choice (Approved targets are skipped).

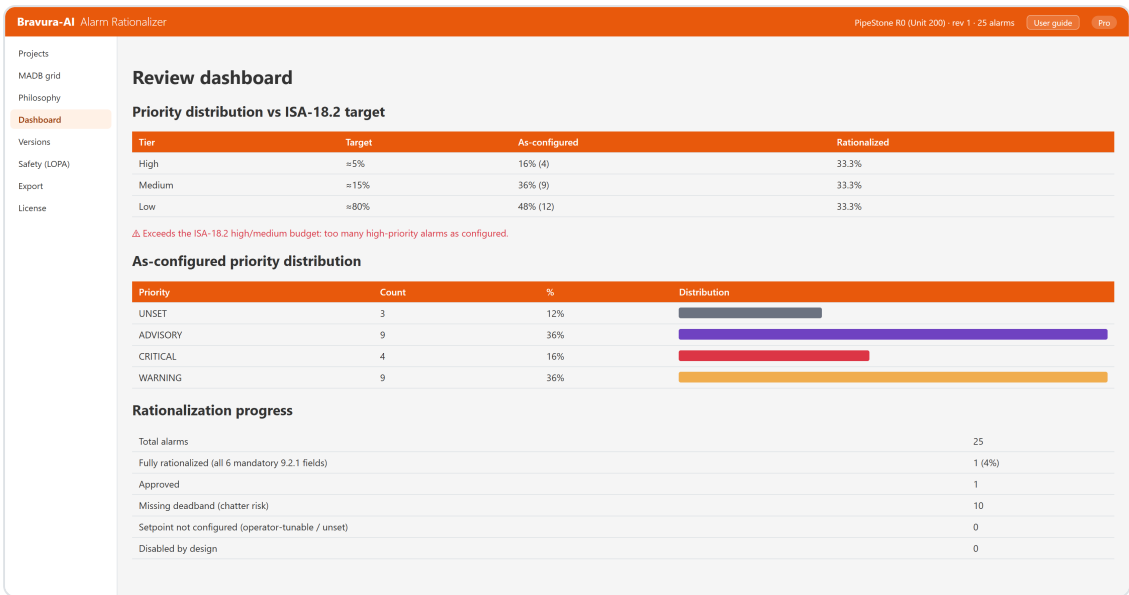
4. Philosophy & settings



Philosophy

Edit the priority matrix (time-to-respond × consequence severity), impact areas, alarm classes, and the per-project **priority colours**. Ships an EEMUA-191 generic 4×4 default.

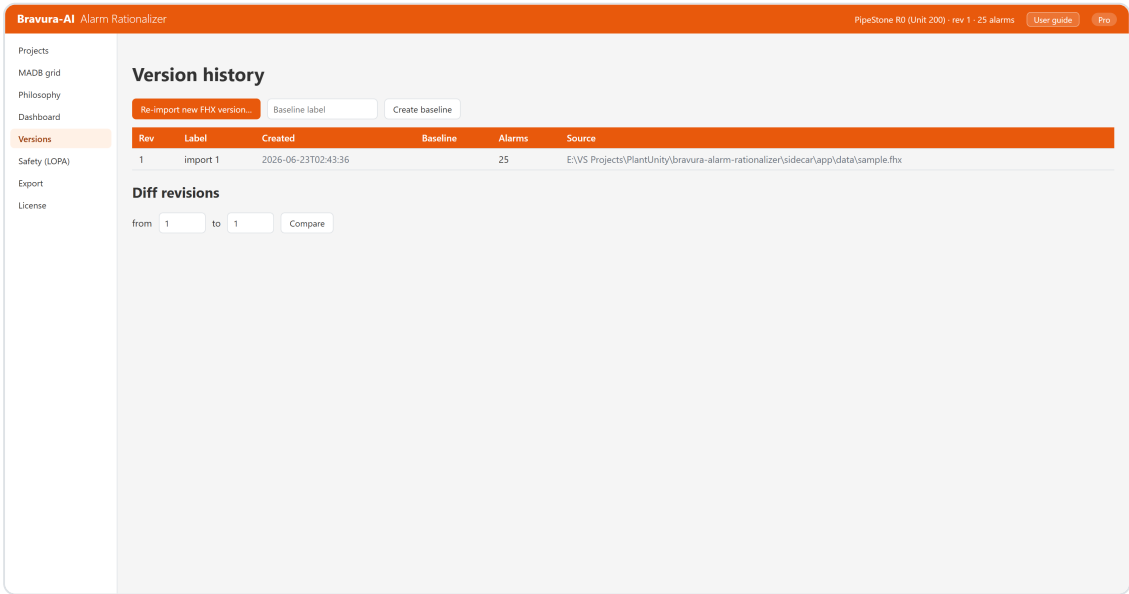
5. Review dashboard



Dashboard

The dashboard maps your priority distribution onto the **ISA-18.2 Table-6 benchmark** (as-configured vs rationalized, with a within-budget verdict) and shows configuration proxies: missing deadband (chatter risk), unconfigured setpoints, disabled-by-design, and rationalization completeness (all six mandatory fields) plus approved count.

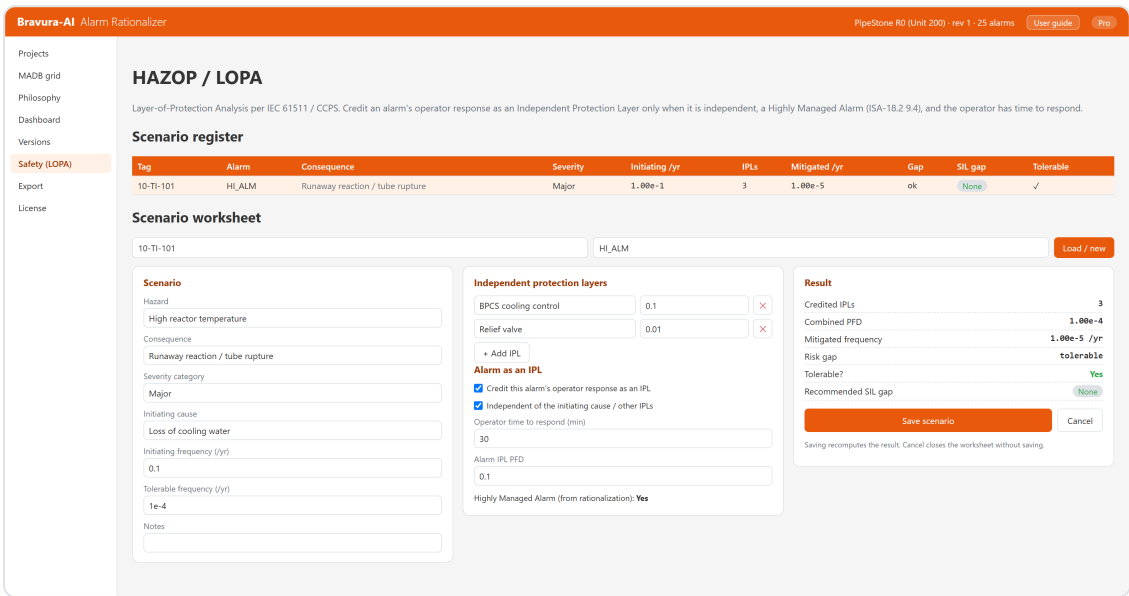
6. Versions & re-import



Versions

Every import is a revision. **Re-import new FHX version** ingests an updated export as a new revision; your rationalization carries forward by tag + alarm, and any alarm whose as-built **setpoint, priority, deadband, EU scale, or enable changed** is flagged for re-review. Create **baselines** and **diff** any two revisions to see exactly what changed.

7. Safety (LOPA)

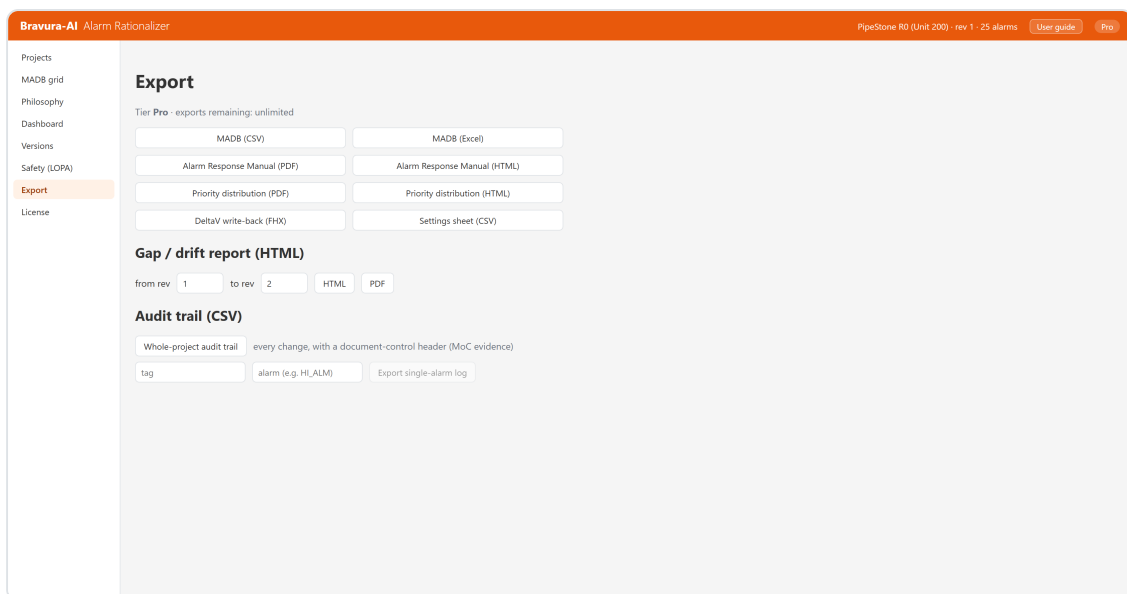


HAZOP / LOPA

For alarms that act as a safeguard, the **Safety (LOPA)** screen runs a Layer-of-Protection Analysis per IEC 61511 / CCPS and links it to the alarm rationalization.

- **Scenario register** lists every LOPA scenario with its computed mitigated frequency, risk gap, recommended SIL gap, and a tolerable verdict. Click a row to open it.
- **Scenario worksheet:** capture the hazard, consequence, severity, initiating cause and frequency, and the tolerable target frequency.
- **Independent protection layers (IPLs):** list each layer with its PFD (probability of failure on demand). Credit the alarm's operator response as an IPL only when it is **independent**, a **Highly Managed Alarm** (pulled from the rationalization), and the operator has **time to respond**; the screen lists any unmet criteria.
- **Result:** the app computes the combined PFD, the mitigated event frequency, the risk gap versus the tolerable target, and the SIL a safety instrumented function would need to close any remaining gap. Warnings flag an over-target residual risk or an alarm credited without meeting the IPL criteria.

8. Export



Export

- **MADB (CSV / Excel):** full per-alarm record; the Excel file is a real workbook with a Document-Control sheet, typed numbers, AutoFilter, and priority colouring.
- **Alarm Response Manual (HTML / PDF):** one section per alarm flagged for the manual.
- **Priority distribution report (HTML / PDF):** distribution vs ISA-18.2 targets.
- **DeltaV write-back (FHX):** a partial FHX of the rationalized changes for re-import: priority changes, and **disabling alarms you rejected**. Per-plant-state variants collapse to the single canonical (Normal) edit, and the emitted FHX is round-trip validated.
- **Settings sheet (CSV) and Gap / drift report (HTML / PDF)** between two revisions.
- **Audit trail (CSV):** the whole project's change log with a document-control header (project, revision, source FHX + SHA-256) for MoC / PSM evidence; or a single-alarm log.

Reports carry a document-control footer and can show per-project branding.

9. Licensing

Free needs no account: one CSV export on this computer, and each session of the app lasts up to 15 minutes (restart to continue). **Pro** (all export formats, unlimited exports, SQL ingest and advanced export) is a monthly subscription that you activate online. Prices are on the Bravura-AI pricing page, not in the app.

Licensing is online. The **License** screen shows an **Online licence** section where you buy, accept the licence agreement and activate.

1. Open **License** and choose **Buy licence** in the **Buy a licence** section. Your browser opens the Bravura-AI purchase page, where you choose the plan and pay; the app then activates this computer by itself and the header shows **Pro** (no key to type). If you bought on the Bravura-AI website instead, the website shows your activation key once after payment and also e-mails it to you: paste that key in **Online licence** and choose **Activate**. Either way the computer needs internet access for this step. In a build that has no purchase page configured the app says so; subscribe on the Bravura-AI website and use the key.
2. The **License agreement** block shows the agreement text inside the app. Scroll through it, tick the box and choose **Accept** first (the box is enabled once the text is on screen). You are asked again when the agreement changes; if the screen says to update the app, the new text is not in your version yet. *The agreement is currently the Historian Explorer User License Agreement v1.1, until an Alarm Rationalizer text is published.* A purchase made before you accept is kept and finishes by itself after you accept.

The app renews its licence in the background about every four hours and keeps working offline for up to seven days after the last successful check; **Refresh now** checks immediately. If the subscription payment does not arrive, Pro continues for 14 more days with a notice, then the app runs as Free. Your projects and data are never touched. To move Pro to another computer choose **Release this computer**, then activate the other computer with the activation key from your purchase e-mail.

The **About** section shows the version, standards, and the diagnostics log path for field support. See `LICENSING.md` for the details.