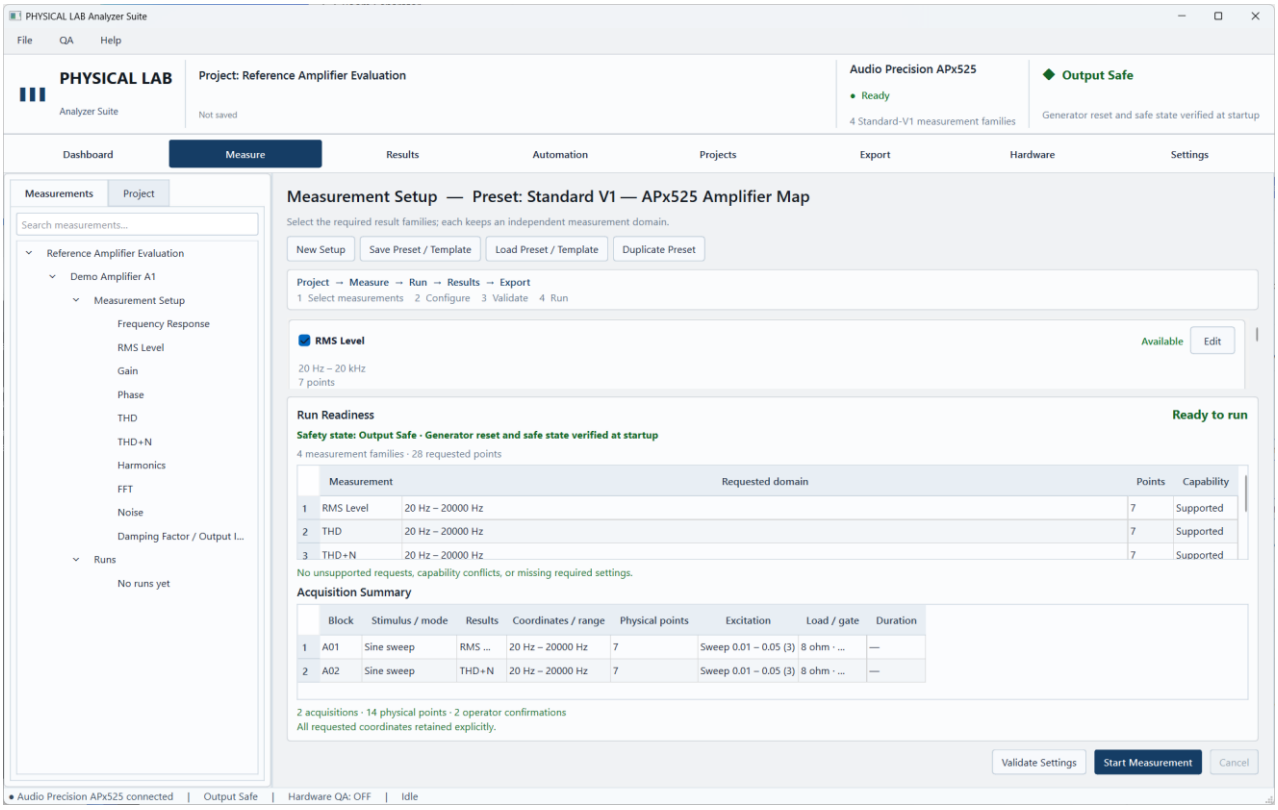
ENGINEERING PROTOTYPE AND EARLY ACCESS

PHYSICAL LAB APx Measurement Software

A higher-level engineering workflow for repeatable amplifier measurement

Audio Precision APx500 and the connected analyzer remain the underlying measurement platform. The PHYSICAL LAB Analyzer Suite adds the project structure around it: configuration, capability checks, run readiness, automation, result states, analysis and export-oriented review in one visible workflow.



Current Analyzer Suite setup workspace. The full navigation, requested measurement domains, acquisition summary and APx525 output-safe state remain visible.

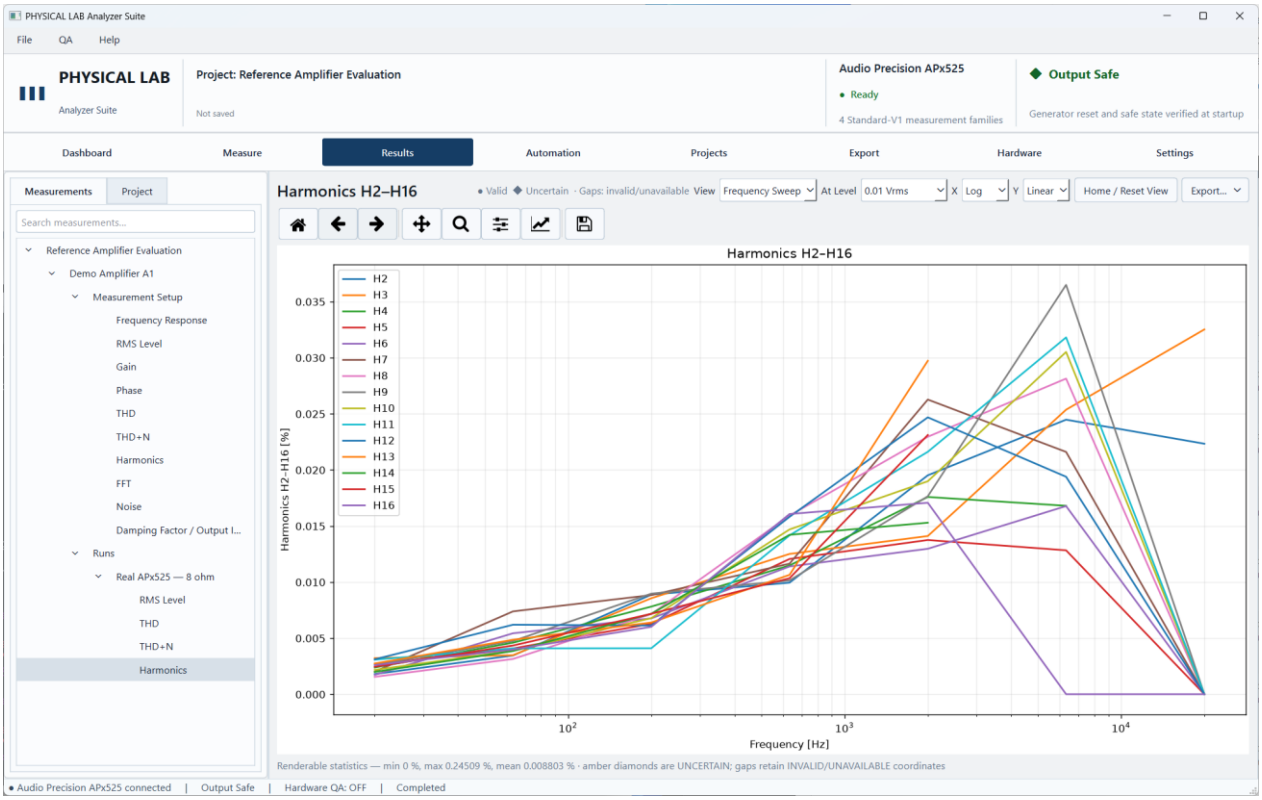
- Build a repeatable test from explicit projects, presets and measurement families.
- Expose unsupported requests, incomplete coordinates and analyzer state before they become misleading curves.
- Keep safety caps, output zeroing, readback verification and cleanup inside the acquisition path.

CURRENT BASIS	Validated development baseline: Audio Precision APx525, APx500 9.0 and Windows. The software complements APx500; it does not replace it.

Measurement workflow: from intent to evidence

The interface separates what the engineer wants to measure from what the connected analyzer can execute. Each stage leaves a visible state, so a completed run can be understood and repeated later.

Stage	Engineering purpose	Visible evidence
1 Project	Identify DUT, setup and run context	Named project and run tree
2 Setup	Choose measurement families and coordinates	Preset, domain and requested points
3 Validate	Check capability, safety and missing settings	Readiness and conflict state
4 Measure	Execute supported APx acquisition paths	Progress, analyzer identity and safe state
5 Results	Preserve valid, uncertain and unavailable coordinates	Status-aware plots and metadata
6 Export	Carry result identity into downstream review	Project/run context and provenance hooks

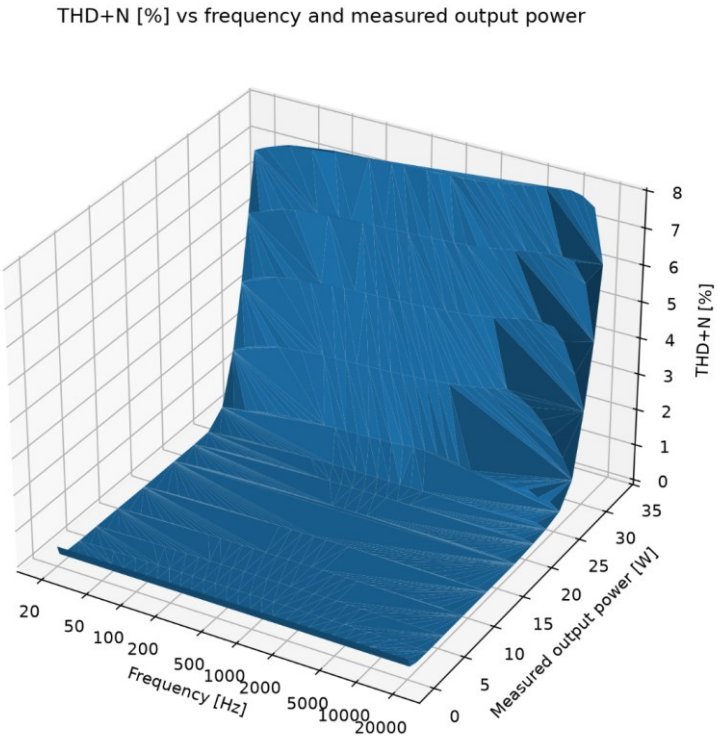


Current Results workspace with the full left navigation, APx525 identity, output-safe state and fully labelled frequency axis.

Validated V1 measurement core

- Runtime analyzer discovery and read-only capability profiling.
- Continuous Log Chirp and Fast Sweep backend paths with explicit Vrms settings.
- RMS level, THD, THD+N, distortion-product and H2-H20 result handling in the current project state.
- Controlled generator zeroing, readback and cleanup on normal completion or abort.

Visualization & analysis beyond a single trace



Authentic project dataset shown as THD+N across frequency, measured output power and distortion. All three axes and units are fully visible; the figure demonstrates the analysis view, not a DUT performance specification.

A conventional distortion-versus-frequency curve shows one operating level. A multidimensional view can reveal where nonlinear behaviour begins, whether it is frequency dependent and which operating regions deserve a closer cross-section or repeat measurement.

Visible dimension	Question it helps answer
Frequency [Hz]	Where in the audio band does the behaviour occur?
Measured output power [W]	How does the result change with operating level?
THD+N [%]	Where does the selected distortion metric rise or transition?

Current analysis layer

The read-only Visualization & Analysis V1 prototype supports raw-point-aware wireframe and interpolated-surface views, axis and visible-Z controls, cross-sections, masking of unavailable values, and provenance-aware export. Interpolation or smoothing is display-only; source values remain unchanged. This layer is separate from the validated APx acquisition core.

INTERPRETATION	Surfaces reveal relationships and candidate operating boundaries. Engineering conclusions still require the underlying raw points, measurement states and repeatability checks.

From APx-centred V1 to a broader measurement platform

The APx name describes today's controlled development environment: PHYSICAL LAB develops and validates the current backend on its own APx system. The software architecture is intended to grow beyond one fixed analyzer path, but broad hardware independence is not yet a current capability.

Status	Capability layer	Scope
CURRENT	APx-based V1 core	APx525 / APx500 9.0 workflow, core result families, explicit measurement state and safe analyzer handling
CURRENT	Read-only analysis V1	Multidimensional result viewing, raw-data preservation, masking, cross-sections and provenance-aware export
ARCHITECTURE-READY	Generic data and analysis model	Multidimensional axes, metric registry, complex values, comparison/difference and flexible line/grid/surface/heatmap infrastructure
PLANNED	Broader APx paths	Capability-based adapters for additional APx models/versions and APx Flex or software-based acquisition where validated
PLANNED	Advanced measurements	Complex impedance, damping/output impedance, noise, IMD, maximum-output and dataset/amplifier comparison workflows
NEXT HARDWARE LAYER	Protected load automation	Measurement/protection front end, feedback-verified Load Box, break-before-make switching and multi-load campaigns
FUTURE	Hardware-independent acquisition	Other analyzers and suitable audio interfaces through validated acquisition adapters

Why the roadmap matters

The commercial goal is not a one-off automation script. It is a traceable measurement environment in which analyzer capabilities, external hardware, multidimensional data and reporting can evolve without hiding what has, and has not, been validated.

Development status: roadmap items are engineering targets. They are not represented as enabled V1 functions, and each hardware or measurement extension requires its own safety and validation evidence.

NEXT STEP

Request Early Access

Discuss your analyzer, DUT and required measurement sequence | physical-lab.com/contact