The LOCK Family

One principle runs through every LOCK technology: **evidence before action.** These processors were not built to process more — they were built to protect the natural sound by touching it only when there is proof. No proof, no touch. It is the Balance Engineer philosophy — minimal intervention, honest gain staging, a natural spectrum — turned into software.

> *"Prove it, then act. GAINLOCK acts only on a proven feedback loop. FLOORLOCK opens only for proven speech. PHASELOCK aligns only to measured phase. Everything else passes untouched."*

THE FAMILY

SOUNDLOCK™

SHIPPING · THE MARK THAT STARTED THE FAMILY

Your soundcheck, in minutes.

The self-learning engine and quality mark of the PX drum family — six PX processors and the LM-2 Latency Matcher carry it. SOUNDLOCK listens to the real instrument in the real room, derives its processing, then locks it for the show. It is the origin of the LOCK doctrine: learn from evidence, then hold.

INSIDE: **PX-KICK · PX-SNARE · PX-TOM · PX-FL TOM · PX-O.HEAD · PX-RIDE · LM-2**

GAINLOCK™

IN DEVELOPMENT · MEASUREMENT-DRIVEN

More gain, less feedback.

The next-generation feedback technology of TZ-12 TraceZero. GAINLOCK does not treat feedback as "a steady tone" — it demands **proof of a closed loop** in three stages: a spectral candidate, a jury of independent signatures (frequency lock, dB-linear exponential growth, missing harmonics, persistence), and finally **loop evidence** — sitting inside the loop, it correlates its input against its own recent output. A fan, an organ, a flute cannot produce loop evidence. They are never touched.

The bit-transparency rule: while no loop is confirmed, not one sample of the signal path changes — no broadband "auto-EQ" behavior slowly discoloring the mix. Designed modes: LIVE (0 ms, IEM-safe) and SURGICAL (3–5 ms, designed to cut a detected tone before it reaches the loudspeaker); an optional SPEECH mode applies a slight frequency shift — a method proven in the literature since 1964, inaudible on speech.

INSIDE: **TZ-12 TRACEZERO** · TODAY'S SHIPPING DETECTOR: FULL 8-OCTAVE CAPTURE, MEASURED

FLOORLOCK™

FIELD-PROVEN · VOICEKEY MEASURED

Opens for speech. Nothing else.

The channel is locked. Your voice is the key.

The channel technology of SC-16 SmartControl. A FLOORLOCK channel has two states — **LOCKED and UNLOCKED** — and its threshold is never a fixed number: it rides the room's noise floor live, floor plus margin, so when the room gets louder the threshold climbs with it. Closure is true digital zero — not "quieter", **silent**. And SC-16 stays a **zero-latency** processor: no lookahead, ever.

VoiceKey makes the unlock decision about **speech evidence**, not just level: the channel opens instantly on level — the first phoneme is preserved — and if proof of speech (voiced harmonic structure or a sibilant signature, then syllable rhythm) does not arrive within a short probation window, it locks again. In the acceptance run, **12 of 12** spoken phrases unlocked and held; applause, a table hit, a dropped microphone, a held 440 Hz note, an HVAC fan and a cough were all locked out again in well under 600 ms. Honest limits, stated plainly: a sustained harmonic source in the voice band — a low organ pedal, a held bass note — is voice to any measurement, and no technology can tell a loudspeaker playing a human voice from the real thing.

INSIDE: **SC-16 SMARTCONTROL** · COMPLEMENTS GAIN-SHARING AUTOMIXING — SHARING UPSTREAM, TRUE ZERO PER CHANNEL

PHASELOCK™ — THE FOURTH MEMBER

PHASELOCK™

BENCH-PROVEN · FIELD TESTS NEXT

See your system. Lock your phase.

Your phone becomes the measurement microphone — zero installation, a browser and a QR code. The system plays a sweep, the phone listens, and the engine extracts the impulse response: phase, group delay, arrival time in milliseconds and meters, polarity, and A/B overlay for sub/top alignment with a suggested alignment delay. Bench acceptance is passed — delay repeatability **±0.06 ms**, clock drift stable at ~8 ppm; console field tests are next. **Honest scope:** a timing, phase and alignment tool — **not** a calibrated SPL meter or an absolute EQ analyzer: a phone microphone is not flat, but timing does not care about microphone color. It replaces the 80% of alignment jobs that were never worth setting up a full measurement rig for.

MEASURED, NOT PROMISED

Every LOCK claim is a number from a measurement rig that runs in our build pipeline. A selection of current measurements:

MEASUREMENT	RESULT
FLOORLOCK V1 — FIELD-PROVEN	
Peak level of a locked channel, two noise conditions	**0.0e+00** — true digital silence
Full closure time · chatter across an 8-word sentence	539 ms · **0 events**
Loss on the first 20 ms of the first syllable	−0.89 dB
Threshold tracking, live show telemetry, floor wandering −42→−30 dB	held floor +9 dB throughout
FLOORLOCK VOICEKEY — MEASURED, ACCEPTANCE RUN	
Spoken phrases: unlock and hold	**12 / 12** · first-syllable loss unchanged at −0.89 dB
Non-speech: applause · table hit · dropped mic · 440 Hz note · HVAC fan · cough	relocked in 55–558 ms · **none open at +500 ms**
HVAC fan, total open time — level-only vs VoiceKey	2205 ms → **405 ms** (≈5.4× less)
Added analysis cost, 16 channels @ 48 kHz	0.94% of one core
PHASELOCK — BENCH ACCEPTANCE	
Alignment-delay repeatability · clock drift over a sustained run	**±0.06 ms** · ≈8 ppm, stable
TZ-12 TRACEZERO — TODAY'S SHIPPING DETECTOR	
Injected 5 kHz resonance in bass-heavy program · capture range	captured in 1.1 s · all 8 octaves
Added maximum stable gain, 4 simulated rooms (avg)	+2.11 dB — GAINLOCK targets are higher and will be published **when measured**

SIDEBAR · THE PHYSICS

Feedback is not "an audio problem" — it is closed-loop instability, the same mathematics that flutters a bridge deck, stabilizes a laser cavity and trips a power grid. Its universal signature is threefold: a locked frequency, exponential growth, and loop causality. GAINLOCK measures exactly that signature — which is why a flute holding a perfect note is safe, and a real loop is not.

WHAT LOCK IS — AND IS NOT

IS

- **Evidence-gated.** Action requires proof — a confirmed loop, confirmed speech, a measured phase. Until then, the signal passes untouched.
- **Deterministic in the show.** Locked behavior does not drift; relearning is a deliberate act by the engineer.
- **Self-contained.** No cloud, no iLok, no dongle, no account.
- **Measured in CI.** Claims are numbers from an automated rig, re-run on every build.

IS NOT

- **Not an auto-EQ.** No broadband smoothing quietly discoloring your mix.
- **Not zero-phase.** Our filters are causal; physics grants no exceptions. Phase influence is confined to notch width — we state it.
- **Not magic.** Singing is voice and opens a VoiceKey; speech through a loudspeaker is speech to any detector. We publish our limits.
- **Not promises.** Targets under development are labeled as targets — numbers appear here only after the rig has counted them.

Every LOCK product: macOS (AU/VST3) & Windows (VST3) · no iLok, no dongle, no account · perpetual licenses. Built by a live sound engineer, on real stages, for the people who mix them.