



ERIN

ELECTRICAL RELIABILITY INTELLIGENCE

ERIN CONTINUOUS INTELLIGENCE

Your plant, understood by a model that **proves** **itself.**

Your Class A meter keeps sending its files. ERIN turns them into a **validated digital twin** of your plant, a **standards verdict every day**, a **full study every week** — and now, from short waveform snapshots, a **ground-return current indicator** that shows what the neutral isn't carrying.

Weekly

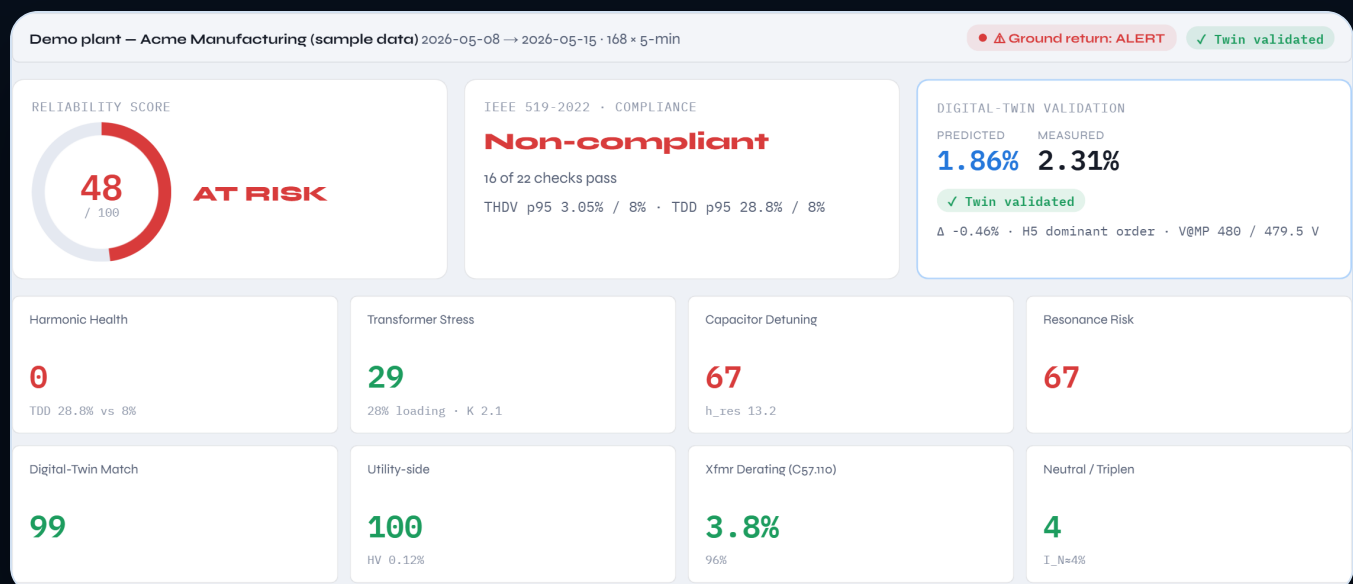
Validated study and drift check — the model re-proves itself against your meter

Daily

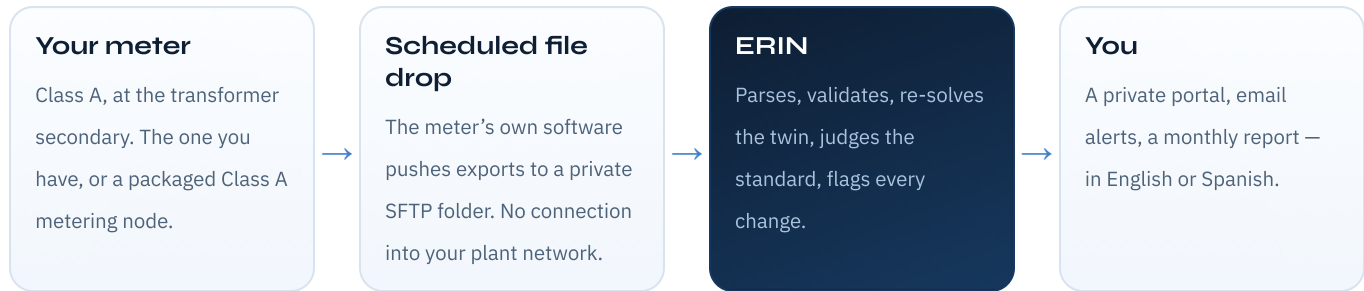
IEEE 519-2022 or IEC 61000-2-4 verdict, computed as the standard is written

4x / day

Waveform captures: harmonic phase, zero sequence, ground return



Nothing to operate. Everything to see.



The rhythm

As it happens	Alerts: power-factor penalty crossings, voltage events, data gaps, ground return
A few times a day	Waveform captures analysed — harmonic phase, sequence content, ground-return indicator
Every day	Rolling seven-day compliance verdict, 95th percentile, per phase
Every week	Full validated study + a trend snapshot for drift detection
Every month	Reliability report, ready to forward — EN · ES

Your meter, or ours

Interval data, validated today

AEMC 8336, Hioki PQ3198 and Elspec exports read and checked against real plants. Another family is added from one week of sample files.

Waveform captures

Elspec exports today; other formats are added from a sample capture of your meter.

No suitable meter?

A packaged Class A metering node with flexible Rogowski sensors — installed live, without a shutdown.

Built to be trusted

Your data stays yours

Full history export at any time, in an open format. No lock-in.

No passwords to lose

Sign-in by single-use email link; sessions can be revoked.

Encrypted backups

Nightly, sealed with a key that never sits on the server.

Engineering stays deterministic

Every number comes from the validated engine — reviewed and stamped by a licensed engineer.

A model you can take to the utility.

Validated, every week

The model must reproduce what your meter recorded — voltage and distortion — before it earns a recommendation. The proof sits on the dashboard, harmonic by harmonic.

Standards, as written

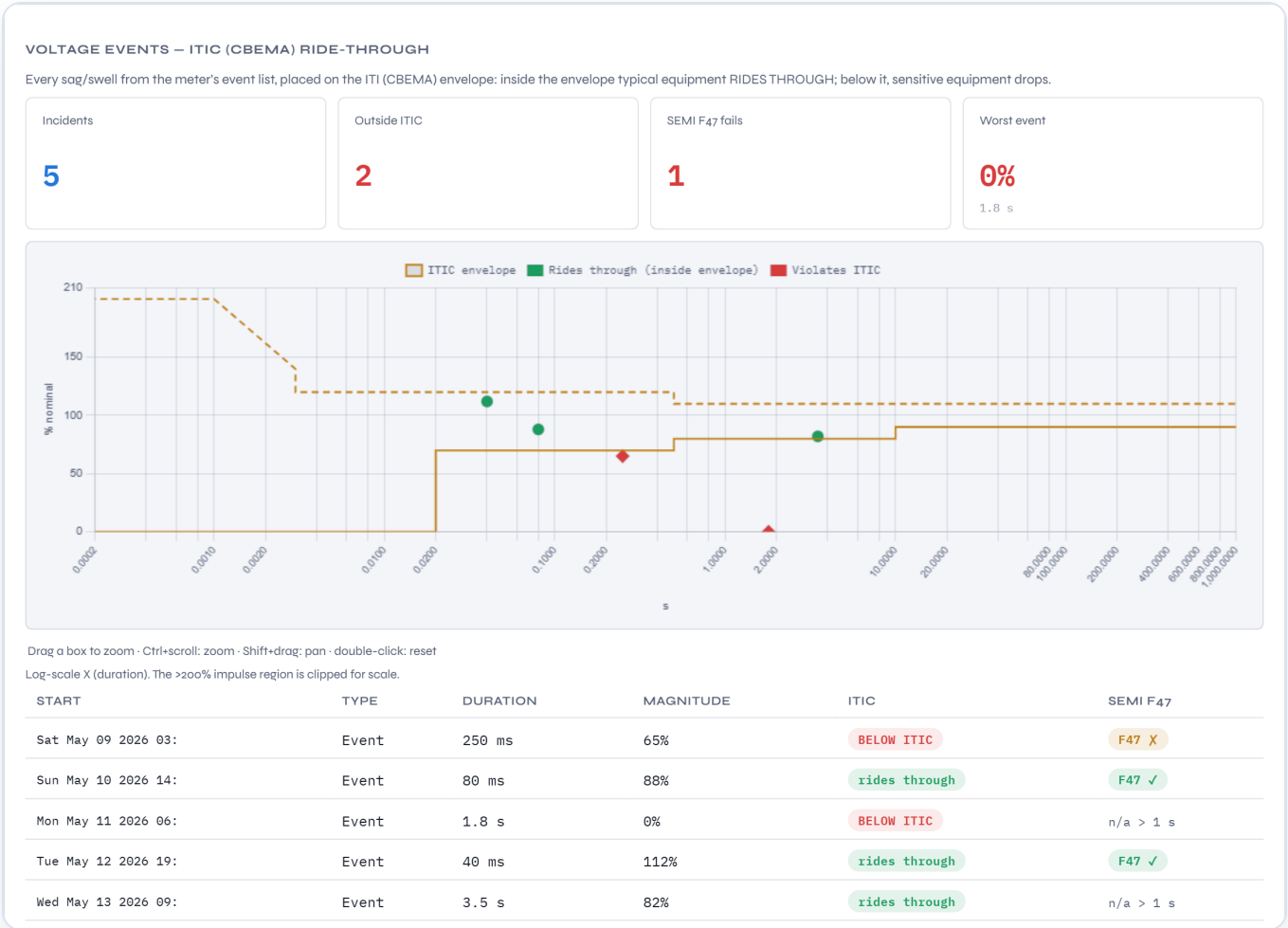
IEEE 519-2022 on the 95th percentile, TDD basis, short-circuit-ratio tiers, worst phase — or IEC 61000-2-4 class 1, 2 or 3. Your contract decides; ERIN computes both.

Yours or the grid's?

ERIN separates the distortion your plant causes from what arrives already distorted from the utility — one ends with a filter, the other with numbers in front of the utility.

Sags that stop lines

The meter's event log judged against the ITI (CBEMA) curve and SEMI F47: which dips your equipment should have ridden through, and which it could not.



Compliance tab, demo plant: every voltage event from the meter's log placed on the ITI (CBEMA) envelope, with the SEMI F47 verdict per incident.

The current that doesn't come home.

Every ampere that leaves on a phase should come back on a phase or the neutral. A few times a day your meter records a three-second, four-channel snapshot; ERIN adds the three phase currents and the neutral sample by sample. What is left over is current returning by another path — the grounding system.

WAVEFORM CAPTURES — SEQUENCE CONTENT AND GROUND-RETURN CURRENT INDICATOR

4-channel snapshots (three phases + neutral) the meter sends a few times a day. From each one ERIN gets the phase of every harmonic, how much of the 3rd is zero sequence, and an indicator of the current that does NOT come back through the neutral.

Ground-return indicator: **ALERT**

Measured	Expected	Excess	Residual Ia+Ib+Ic	Neutral
30.1 A at 639 A of phase current	9.7 A Site baseline	28.4 A bars 9.6 / 25.6 A	82.8 A	53.5 A

⚠ The excess carries the neutral's spectrum ($\approx 33\%$ of the neutral current); the signature of a neutral-to-ground bond downstream of the service.

Site baseline: clamp floor 6.9 A · gain mismatch 1.1 % of phase current · scatter 0.25 A · learned from 8 captures · load range 318–665 A

Latest capture — 2026-05-15 18:00

Phase current **639 A** · rotation ABC · unbalance 0.5 % · 3/3 steady windows · 3.0 s · 128/cycle

Waveform card, demo plant: the indicator in ALERT, measured against the site's own baseline, with the neutral-to-ground bond signature.

1 Measured, not assumed

The residual $I_a + I_b + I_c \pm I_n$, band-limited to the harmonic orders so that clamp drift after a trip is never mistaken for current.

2 Learned from your own plant

Every set of clamps reads a few amps with nothing wrong. ERIN learns that floor — and how it grows with load — from your first captures, then judges every new one against it.

3 Normal · Watch · Alert

A pulsing badge appears on the dashboard while the latest capture is out of line, with an email; it clears itself when a later capture reads normal.

4 It tells you where to look

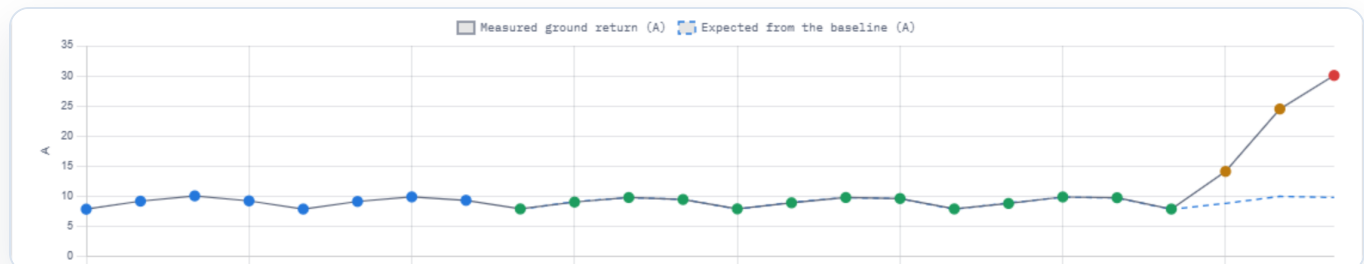
When the excess carries the neutral's own harmonic signature, the card says so: the classic sign of a second neutral-to-ground bond downstream of the service.

What it catches

- A neutral bonded to ground in a sub-panel or at a machine
- A sustained high-impedance fault above the clamp floor
- A neutral clamp installed wrong or turned around
- A change in the plant since the baseline was learned

What it is not

A diagnostic of a standing condition — not ground-fault protection. A few snapshots a day cannot see an intermittent fault or a small leakage current, nor anything upstream of the clamps. Your protective relays stay exactly where they are.



Answers interval data **cannot** give.

Is your 3rd harmonic zero sequence?

Zero-sequence 3rd adds up in the neutral and stops at a delta-wye transformer; a balanced 3rd does neither. The capture tells which — and that decides neutral sizing and whether an active filter must be 4-wire.

The neutral clamp can mislead

When part of the current returns through ground, the neutral reads low and every estimate built on it is wrong. The capture measures the share exactly, from the three phases alone.

The grid's distortion, order by order

With voltage and current captured together, the background arriving from the utility is solved as phasors — harmonic by harmonic, with no assumption about phase. It closes the gap a magnitude-only model leaves.

Trips told apart from currents

After a trip, current clamps can swing by thousands of amps with nothing flowing. ERIN reads the real 60 Hz and harmonic content, and never raises an alarm on a clamp artifact.

Not every fix is a purchase

Whatever the finding calls for:

- Wiring and grounding corrections
- Loads rebalanced across phases
- A capacitor bank restored, resized, detuned or removed
- A transformer inspected when drift points to an impedance change
- The grid's share taken to the utility
- Reactors, passive or active filters — six what-if scenarios test them on the model first, with the verdict and installed cost
- And many other findings

Plants change. Models age. ERIN notices.

Every week the twin is re-solved and compared: load creep, a bank that lost its fuses, a tariff threshold crossed, the model drifting from the meter. Drift is flagged before it becomes a failure.

TEST A MITIGATION ON THE VALIDATED MODEL

4. Active harmonic filter (AHF)

AHF rating (A) 250

Run on the model

PARAMETER	BEFORE	AFTER	LIMIT	
THDV @ LV	1.86%	0.06%	8%	PASS
THDV @ HV	0.12%	0%	5%	PASS
TDD	12.22%	0.37%	8%	PASS
H5	11.19%	0.34%	7%	PASS
H7	4.28%	0.13%	7%	PASS
H9	1.87%	0.06%	3.5%	PASS
H3	1.25%	0.04%	3.5%	PASS

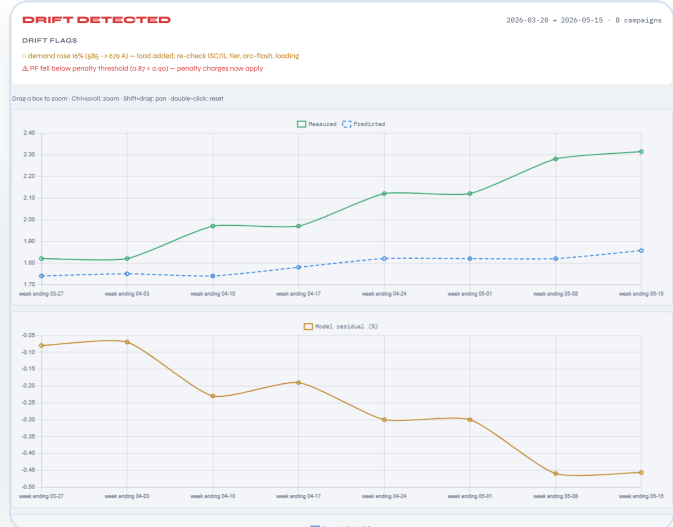
coverage 100% - pass harmonic current req A

Reactive compensation option: this site needs 4000 kVAR of displacement compensation (PF 0.95 target) - 800 A of fundamental reactive current. This rating's headroom beyond the pass harmonic duty (RSS) req A is 100 kVAR - NOT enough for the full need: rating for both duties > req A (RSS), or use the detuned bank for the displacement kVAR.

Estimated installed cost: US\$9,400 (250 A active harmonic filter)

Hypothetical scenario computed on the validated twin - nothing was changed. PF impact and final specification are reviewed with your engineer.

What-if tab, demo plant: an active filter tested on the model before purchase.



The full picture, on one screen.



Dashboard

Reliability score, compliance verdict and twin validation up front, with the recommended actions and the ground-return badge.



Charts

Voltage, current, distortion and power factor across the campaign — zoom to any hour.



Compliance

IEEE 519-2022 or IEC 61000-2-4 per parameter and per phase — which also catches load imbalance — plus ITI/CBEMA and SEMI F47 ride-through.



What-if

Six mitigation scenarios on the validated model, with the verdict and installed cost of each.



Reliability

Transformer derating (IEEE C57.110), neutral and triplen stress, resonance, capacitor duty (IEEE 18), filter sized on the 95th-percentile load current.



Waveform captures NEW

Ground-return indicator that flags a wiring or grounding fault, with its own baseline; sequence content; utility background as phasors.



Trend

Weekly drift detection against your own history — predictive maintenance, before a failure.



Reports & alerts

Monthly report and real-time alerts in English or Spanish.



Assistant

Explains your study in plain language, from the standard and your own numbers — it never computes, never guesses, and hands decisions to your engineer.



Always current

The portal refreshes itself when new data lands — fit for a wall screen in the maintenance office.

Start with one service point.

Send one week of meter data — the first study is the demonstration.

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Figures in the portal come from ERIN's validated engine. Final specifications are reviewed and stamped by a licensed professional engineer before procurement. Waveform captures: Elspec exports today; other meter formats are added from a sample capture.