

Product Capability Brief

Abhilekh — enterprise IoT DataLogger SaaS for the pharmaceutical cold chain

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Abhilekh continuously monitors temperature, humidity and pressure across cold rooms, warehouses, transport and lab equipment, detects excursions in real time, and produces the regulator-facing record that proves product stayed in specification. Monitor · Alert · Comply · Analyze — one platform.

Monitor

Real-time environmental telemetry from the ABH logger line (20 SKUs on one platform PCB): ± 0.2 °C typical on-board accuracy (± 0.15 °C Class-A PT100 probe), per-device digital twins, live dashboards, sample rates from 1 s, NIST-traceable calibration tracking.

Alert

Stateful rules on Apache Flink CEP — threshold, duration, rate-of-change, data-gap and Mean Kinetic Temperature detectors, plus predicted excursions. Delivery via email, SMS, push and webhook.

Comply

One-click PDF and Excel reports (excursion, calibration-status, audit-trail and more) with Vault-Transit e-signatures (password + TOTP, meaning-of-signature captured), CAPA workflows, and a SHA-256-chained immutable audit trail. Designed around 21 CFR Part 11, WHO PQS and EU GDP workflows — alignment documented, not certified.

Analyze

ClickHouse-backed trend, forecast, anomaly and data-quality analytics including Mean Kinetic Temperature; 5+ year retention designed in.

The ABH device line

One 80 × 50 mm 4-layer platform PCB — 145 parts, single-sided SMT — becomes 20 SKUs by BOM selection and a SKU record in the on-board ID EEPROM. One firmware image reads its SKU at boot and configures radio, power path, cell chemistry, display and GNSS.

ABH-100 — transport & offline	Single-use and multi-use loggers, BLE warehouse nodes, dry-ice/ULT probe logger, LTE+GNSS transit tracker
ABH-200 — online monitors	USB-powered Wi-Fi monitors with e-paper (fridge, humidity, long-range, external-probe variants), LTE monitor, BLE hub gateway
ABH-300 — industrial	Four Class-A PT100 channels + pressure; expansion cards for thermocouple, air quality, shock/tilt, load cells and 4–20 mA / 0–10 V inputs
Probes	PT100 Class A (3/5/10 m), cabled SHT45 T+RH, Type-K thermocouple

Per-SKU datasheets: neodrics.com/products/abhilekh/loggers

Applications & security

Four applications on one platform: system admin portal, tenant web app, tenant mobile (iOS/Android), and a Tauri desktop app for USB harvest, DFU and provisioning. Data path: devices → MQTT (TLS 1.2+, per-device credentials) → Kafka → Flink CEP + ClickHouse → API, with alerts over Redis pub/sub and WebSocket. PostgreSQL row-level security isolates every tenant; MFA is mandatory for admins; sessions time out after 30 minutes server-side.

Design targets

1,000+ tenants · 50,000+ devices · 50,000 events/second · 5+ year retention · 99.9% uptime — engineering targets of the architecture, not measured benchmarks.

The ABH line is at the design-frozen, pre-production stage: every enclosure has passed generated fit-check geometry (791/791 checks, 20/20 SKUs) and every battery-life, drop, thermal and IP figure shown is a calculated or simulated design estimate — measured values replace them as validation hardware runs. Regulatory marks above are the certification roadmap, not held certificates.

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