

ABH-200

Online fridge monitor · The vaccine-fridge unit

ABH-200 family — Online monitors & gateways · Data logger datasheet

USB-powered Wi-Fi monitor with e-paper and a PT100 probe channel — the WHO-PQS-style unit for vaccine fridges and cold rooms.

3 channels	IP54 in use	E-paper	409,600 readings	Battery: Always on when powered (calc.)
------------	-------------	---------	------------------	---

Specifications

Product type	Online · Wi-Fi monitor
Sensing channels	3 — Probe temperature · Ambient T + RH
Probe temperature	PRB-PT100-3W Class A · −50...+200 °C · ±0.15 °C at 0 °C
Ambient T + RH	SHT41 in a sealed, vented chamber · ±0.2 °C typ
Measurement accuracy	±0.15 °C at 0 °C · PT100 Class A (IEC 60751) probe
Display & indication	1.54" e-paper 200 × 200 · −25...+50 °C · holds last reading while asleep
Connectivity	Wi-Fi 2.4 GHz (ESP32-C3-MINI-1U) · MQTT over TLS 1.2+ — Internal FPC · ≤2.33 dBi (Espressif-certified type)
Power	USB 5 V (≈29 mA) · CR2032 keeps the clock ≈10 yr through outages
Battery life	Always on when powered · RTC cell ≈10 yr — No logging during a mains failure — RTC survives it
Memory	16 MB W25Q128JV · 409,600 readings · separate never-erased audit region
Sample interval	1 s minimum · configurable
Enclosure	88.2 × 69.9 × 16.8 mm · probe pod 30.5 mm · Healthcare-grade disinfectant-resistant PC/ABS · UL94 V-0 · white
Ingress protection	IP54 in use (cable fitted) / IP65 capped (design targets)
Mounting	Keyhole (2×) + bonded 10×2 mm magnets
Operating band	−25 to +50 °C (e-paper limit)
Firmware & transport	Signed .abhfw packages · dual-bank A/B · RSA-2048 · trial boot with automatic rollback · MQTT over TLS 1.2+ with per-device credentials (mTLS supported) · X.509 identity
Factory identity	ABH-[model]-[YYWW]-[5-digit sequence] — factory identity written to the ID EEPROM
Ports	USB-C power · M12 probe port (probe pod)

Applications

Vaccine & pharma fridges (2–8 °C)	Always-on USB monitor with e-paper, alarm LED and PT100 probe — the WHO-PQS-style vaccine-fridge use case.
--	--

Compatible probes

PRB-PT100-3W — PT100 immersion probe	PRB-PT100-3W-3M · PT100 Class A (IEC 60751:2022) · ± 0.15 °C at 0 °C · –50 to +200 °C
---	---

Part of the Abhilekh platform

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.

Firmware updates	Signed .abhfw packages · dual-bank A/B · RSA-2048 · trial boot with automatic rollback
Data transport	MQTT over TLS 1.2+ with per-device credentials (mTLS supported) · X.509 identity
Offline evidence	Plug an offline logger into a PC and it enumerates a FAT16 drive with README.TXT, DATA.CSV and an ECDSA P-256-signed REPORT.PDF — a self-verifying trip record.
Calibration	Probe channel templates live in the ID EEPROM; the platform tracks NIST-traceable calibration certificates, due dates and reminders per probe.
Certification roadmap	EN 12830:2018 — temperature recorders · CE — RED / EMC / safety · FCC Part 15 · WHO PQS E006 — vaccine cold chain · IEC 61010-1 / IEC 62368-1 · UN 38.3 / IEC 62133-2 — cells & packs — targets, not held certificates

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.

Neodrics Technologies · Vadodara & Gandhinagar, Gujarat, India · info@neodrics.com · <https://neodrics.com>