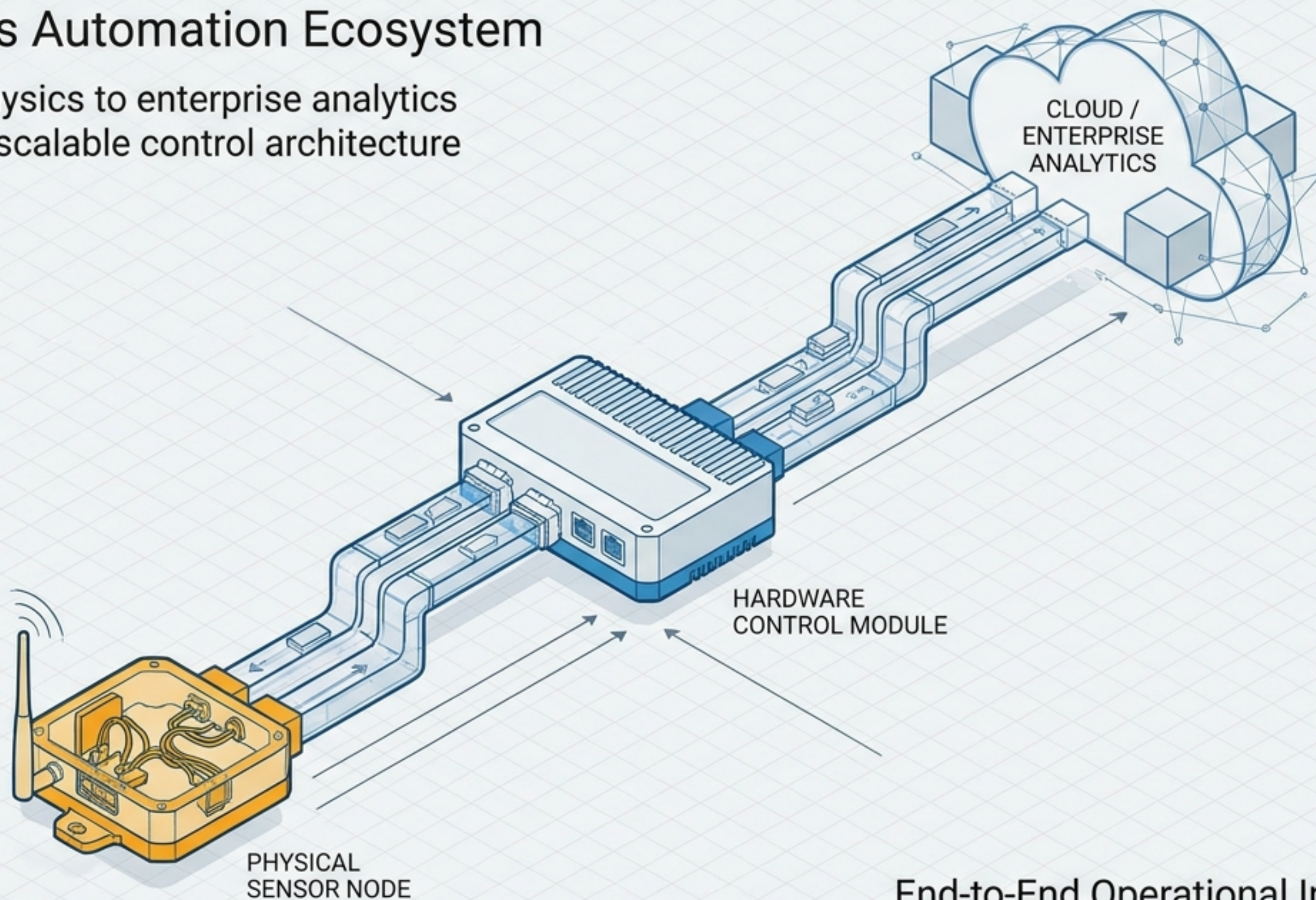


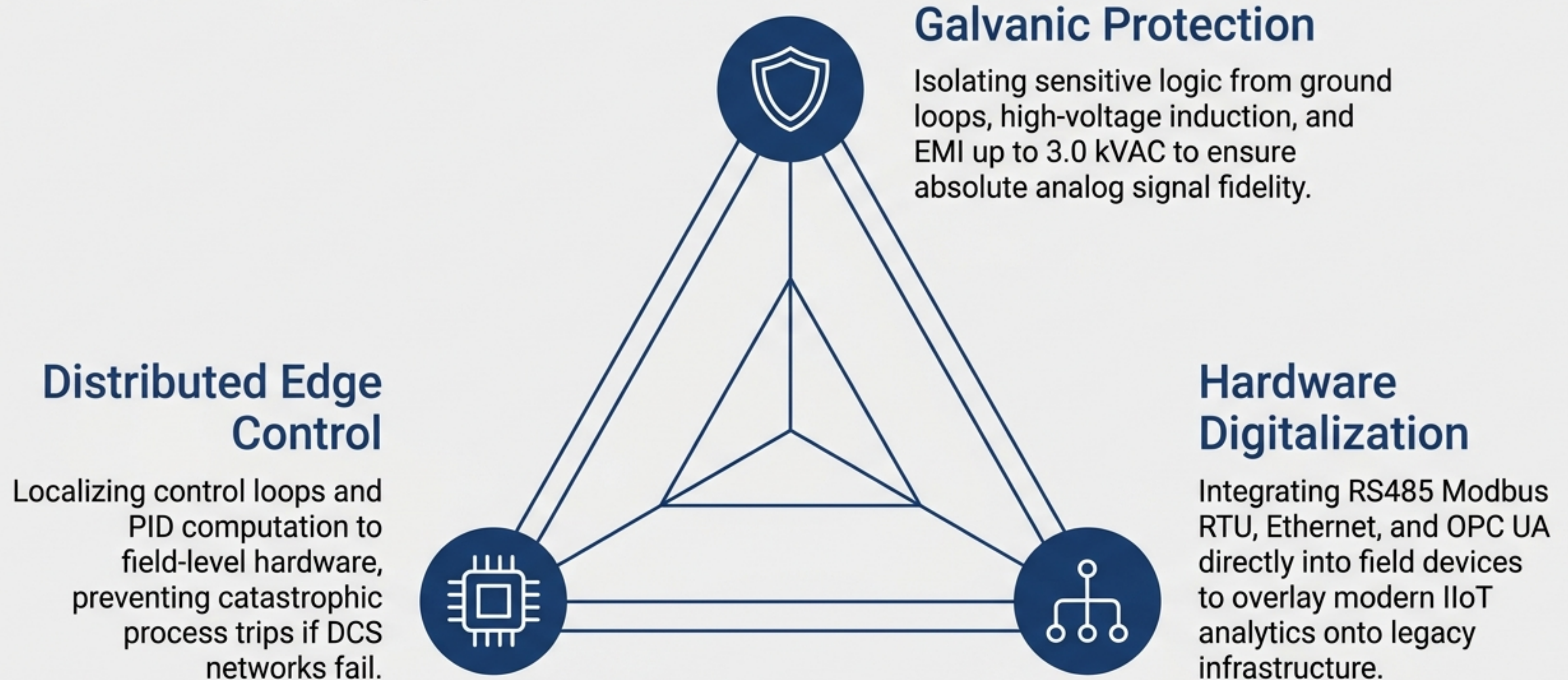
The Masibus Automation Ecosystem

Bridging field physics to enterprise analytics through robust, scalable control architecture

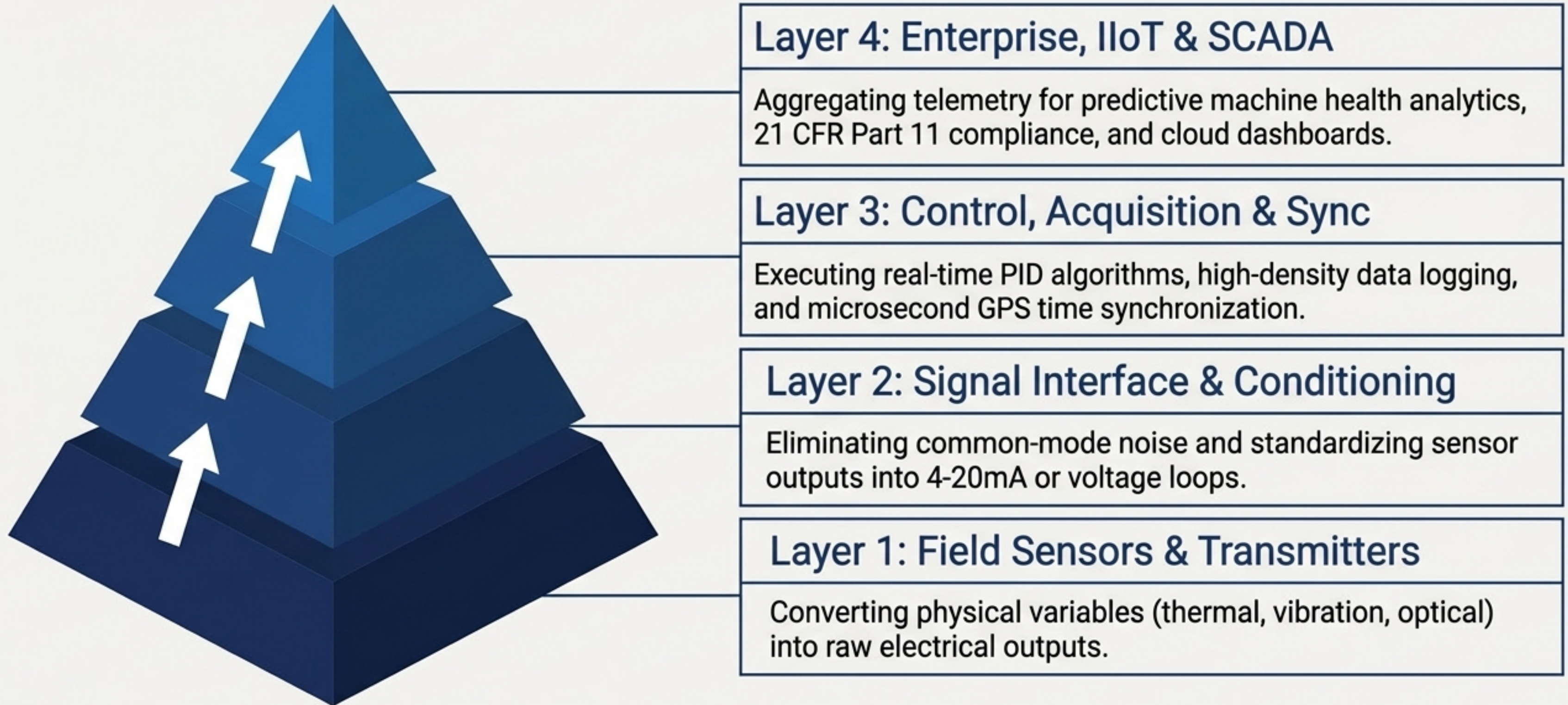


End-to-End Operational Intelligence

The Three Pillars of Industrial Design



The Systems Architecture Macro-Framework



Translating Physical Variables at the Edge



Temperature Translation: High-accuracy linear conversion for RTDs and Thermocouples. Loop-powered (10-36V DC) DIN-rail modules and ultra-compact Form-B sensor heads.

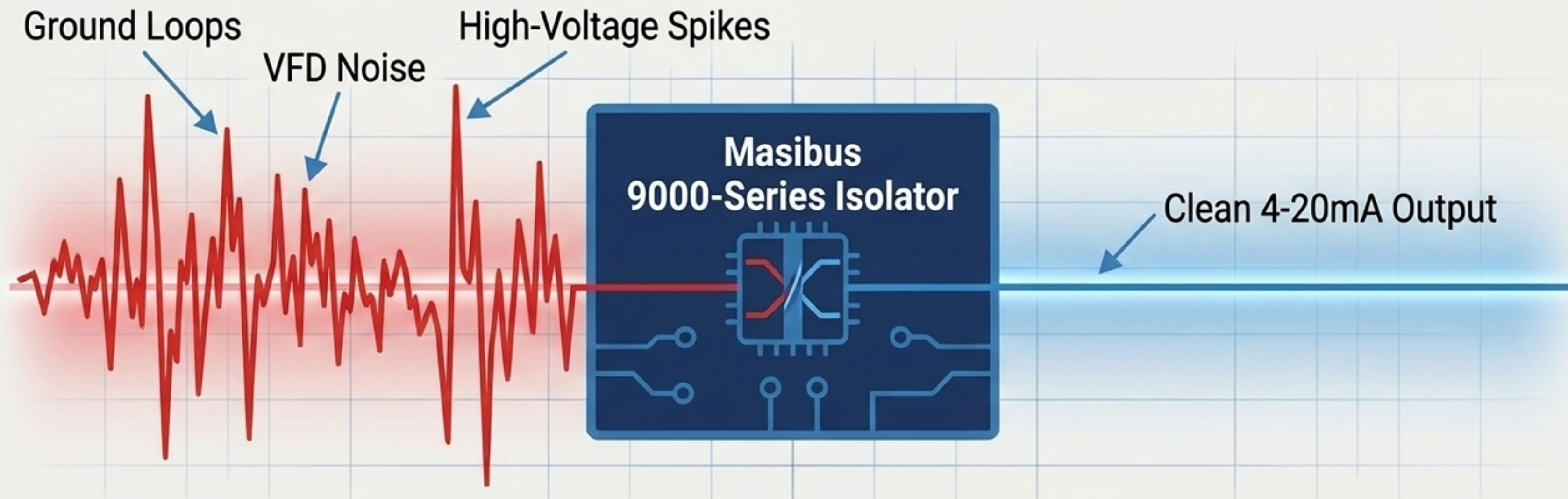


Machine Protection: Capturing raw eddy-current and piezoelectric acceleration data to track shaft orbit and casing vibration on heavy turbines.



Extreme Heat: Measuring radiant thermal emissions exceeding 1300°C in sulfur recovery units and blast furnaces without physical probe degradation.

Defending Signal Integrity Before Digitization



The Threat

Industrial field signals are constantly bombarded by ground loop currents, variable-frequency drive (VFD) noise, and high-voltage induction transients.

The Defense

Masibus 9000-series signal isolators provide continuous 3-port galvanic isolation between input, output, and power supply circuitry.

The Result

High Common Mode Rejection Ratios (>120dB) and pristine analog measurement integrity prior to PLC/DCS ingestion.

Diagnostic Matrix: 9000 Series Signal Isolators

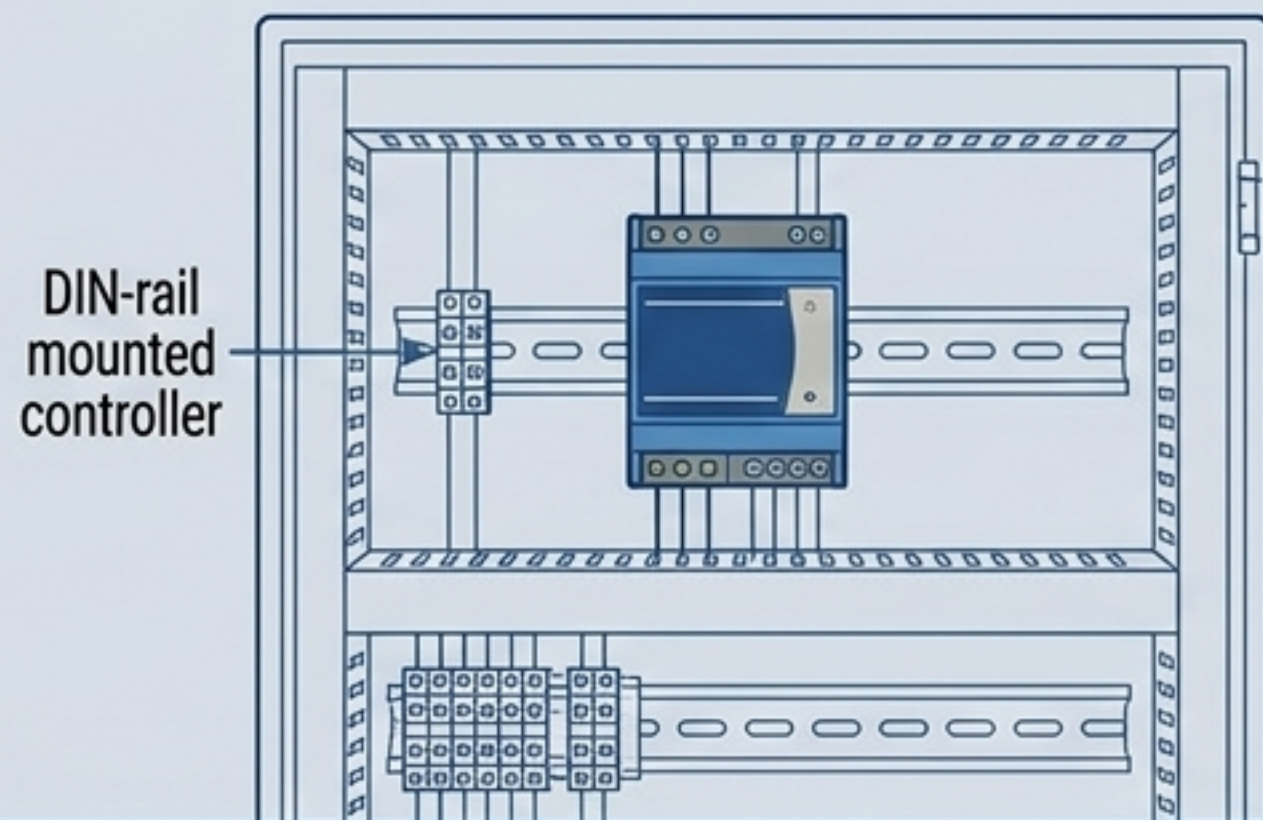
Specification	9000L (The Standard)	9000U+ (The Universal)	9000C (The Shield)
Isolation Rating	1.5 kVAC	2.0 kVAC	3.0 kVAC
Power Supply	230V AC line-powered	Extended 20-265V AC/DC	24V DC
Base Accuracy	± 0.2% FS	± 0.1% FS	± 0.1% FS
Input Configuration	Fixed 4-20 mA	DIP-switch configurable (0/4-20 mA, 0/1-5 V, 0-10 V)	Fixed 4-20 mA with enhanced surge suppression

Engineered for continuous 3-port isolation (Input, Output, and Power)
to eliminate common-mode noise.

Distributed Edge Control for Maximum Uptime

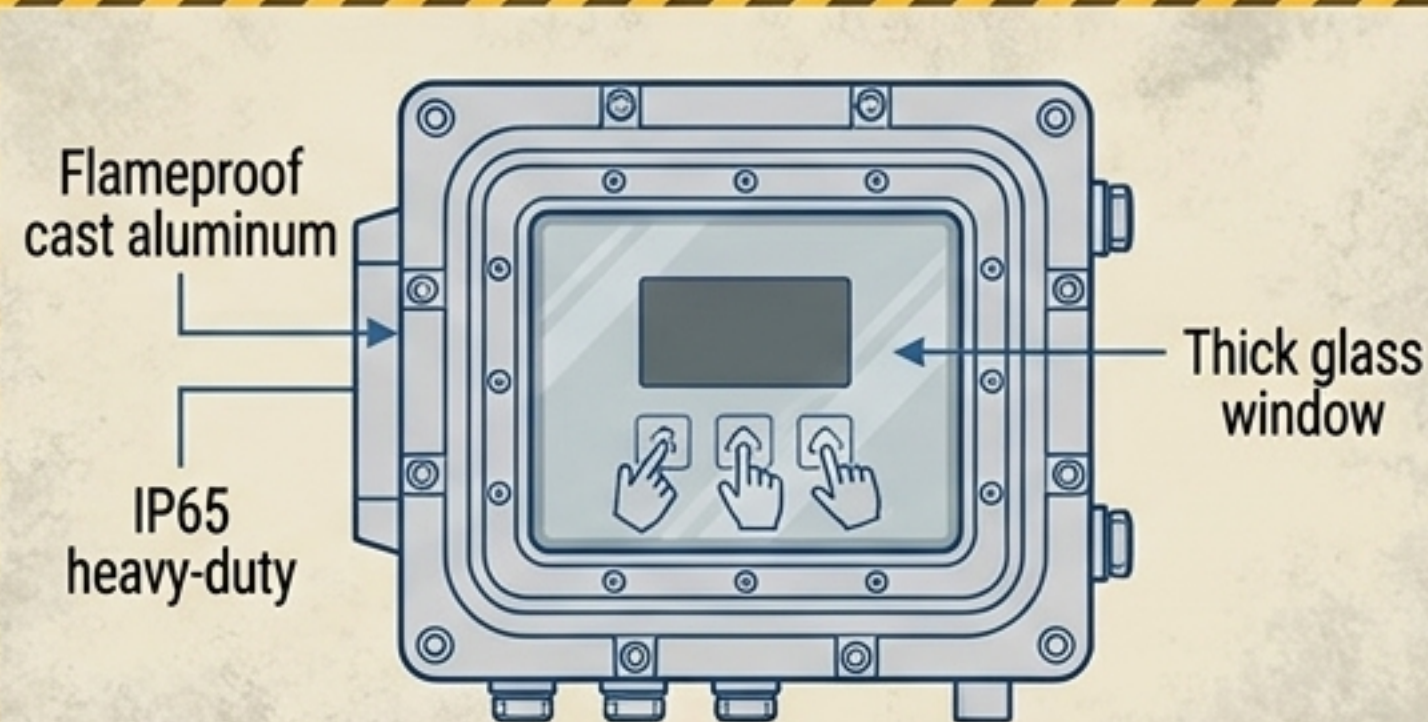
Keeping control localized to prevent process trips if DCS networks fail.

Standard Process Control (TC5396 / LC524D)



- Offloads time-critical PID computation from primary PLCs.
- Features auto-tuning algorithms and manual bumpless transfer.
- Universal signal compliance in compact DIN panel dimensions.

Hazardous Area Control (LC5296-XP-AT)



- Certified for Zone 1 and Zone 2 explosive gas atmospheres (Gas Groups IIA/IIB/IIC).
- Zero-Ignition Maintenance: Housed in IP65 heavy-duty cast aluminum.
- Operators adjust parameters via front-panel capacitive optical touch keys through thick glass, never compromising the explosion-proof enclosure.

Hardware Teardown: 5002U-P Digital Process Controller

Dual Display Interface
4-digit red LED for Process Value (PV); green LED for Set Value (SV).

Precision Core
16-bit ADC delivering a fast loop response time of 250mSec with high 0.1% FS accuracy.



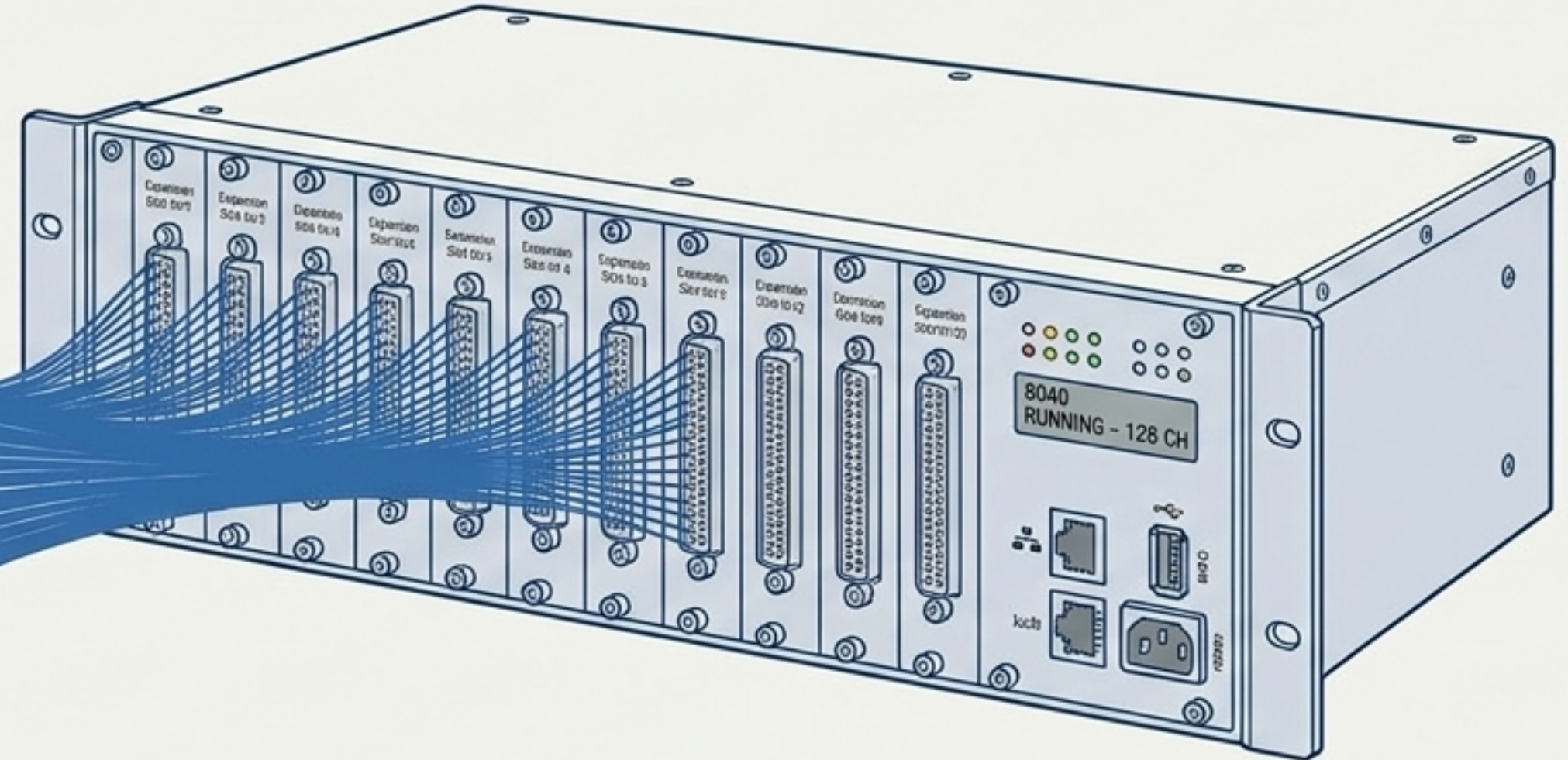
Field-Configurable Outputs
4 independent relay outputs providing complex alarm logic, interlock management, and proportional/ON-OFF control.

Seamless Integration & Safety
RS485 port with Modbus RTU protocol for direct SCADA integration. Fail-Safe design protects the process state during system malfunction.

Scaling to High-Density Data Acquisition

The Challenge

Thermal power plants and multi-zone kilns require tracking hundreds of distributed sensory parameters without overwhelming network bandwidth.



The Core Hub: Model 8040 Modular Logger

Massive Capacity

Supports 128 analog channels per sub-rack via 10 universal expansion slots.

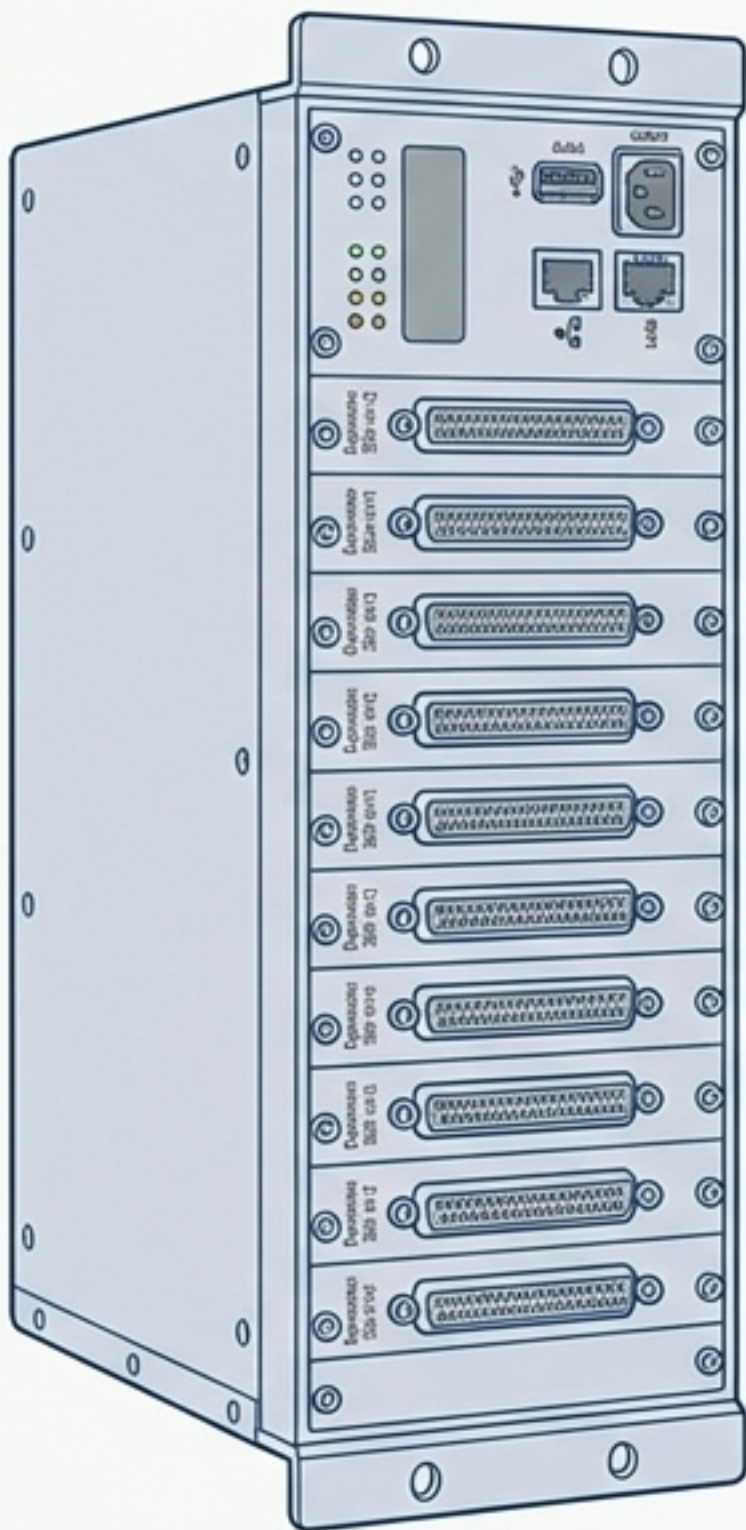
Rapid Multiplexing

Hardware architecture scans all 128 channels within a single 3-second cycle window.

Network Resilience

25MB onboard non-volatile flash memory with battery-backed RTC retains >2.6 million timestamped records during network disconnects.

Generational Leap: The 85XX+ Multi-Channel Scanner



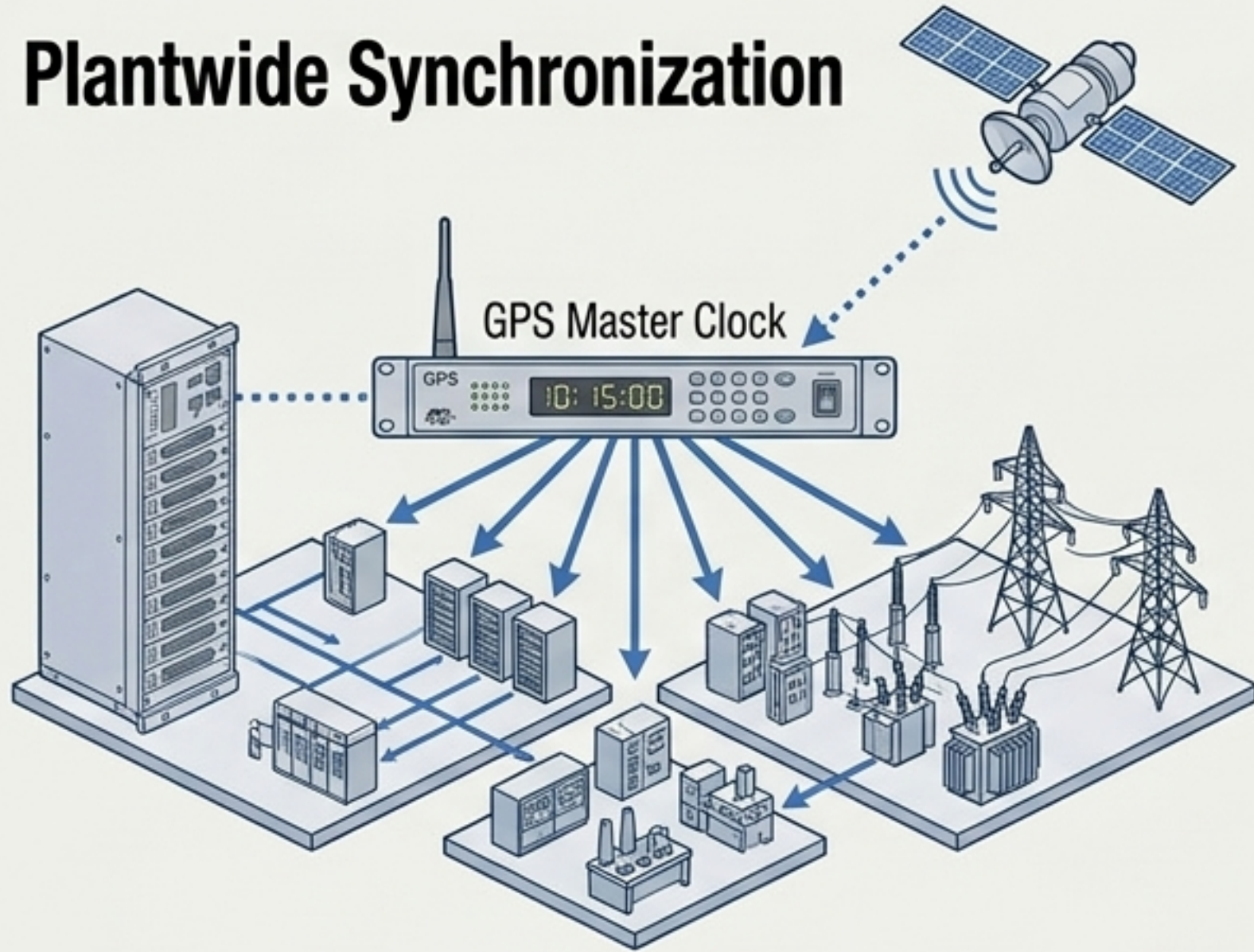
Performance Architecture Upgrade

Specification	Old 85XX	New 85XX+
Embedded Controller	8-bit	32-bit
Scan Velocity (24 channels)	< 12 Seconds	< 1 Second
Relay Outputs	6 Relays per card	8 Relays per card
Network Connectivity	1 RS485 port	Ethernet, Profibus, + 2 RS485 ports

Enabling direct Modnet over Ethernet protocols for seamless IT/OT convergence and highly flexible alarm/trip mapping.

Infrastructure Accuracy: Time Synchronization & Calibration

Plantwide Synchronization



- Distributes sub-microsecond NTP, IRIG-B, and PTP/IEEE 1588 timecodes via Master Clocks.
- Ensures Disturbance Fault Recorders (DFRs) can reconstruct millisecond-accurate transient line trips across 765 kV switchyards.

Field Loop Calibration (LC 11)



- Handheld precision delivering 0.02% base reading accuracy.
- Features 24V DC loop simulation and automated step/ramp profiles.
- Onboard memory logs 150,000 drift test points for lifecycle tracking.

Layer 4: Enterprise Convergence & IIoT Analytics

Enterprise Visibility

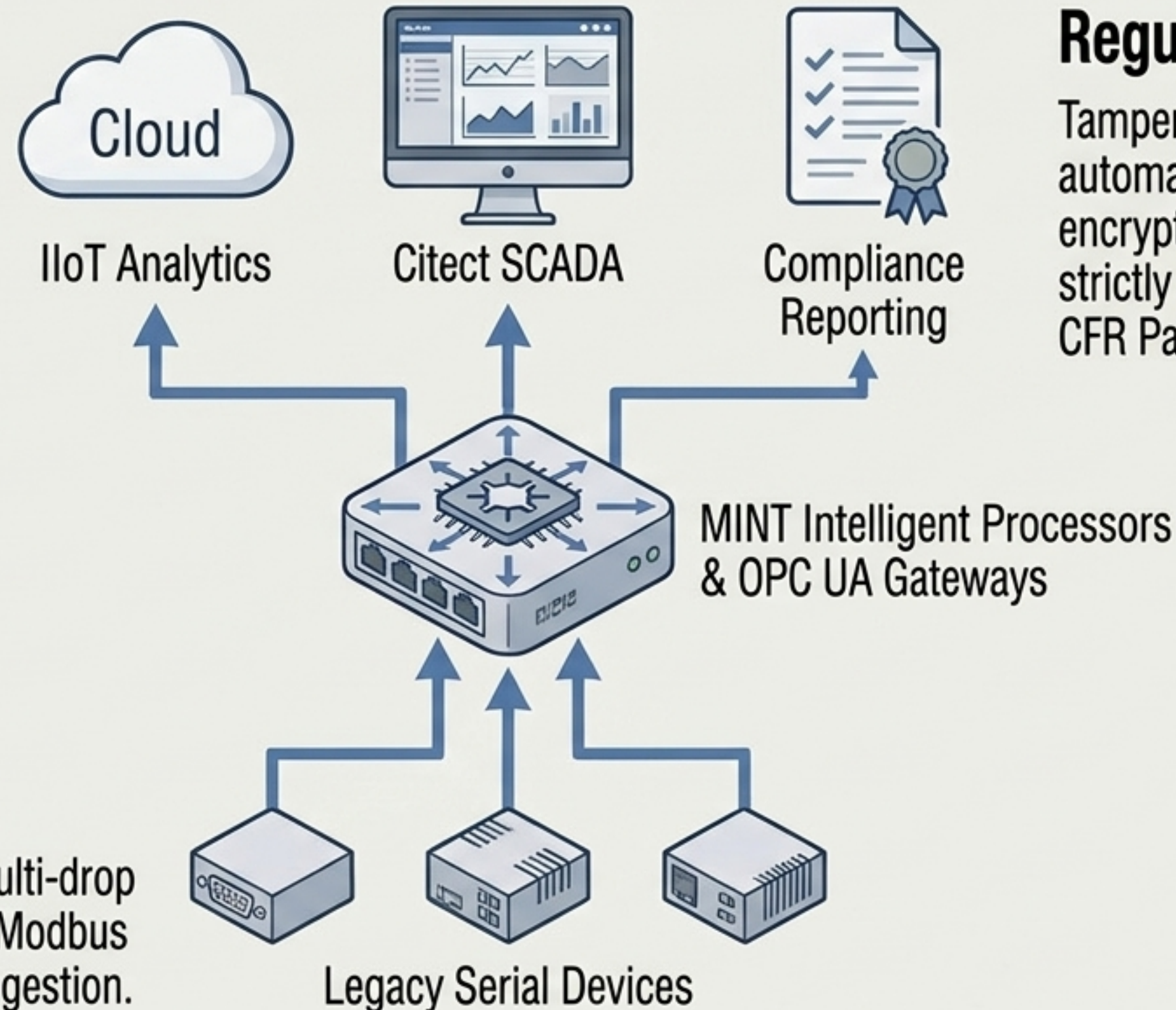
Pushing telemetry into SCADA systems and cloud analytics to actively compute Overall Equipment Effectiveness (OEE) metrics in real-time.

Regulatory Compliance

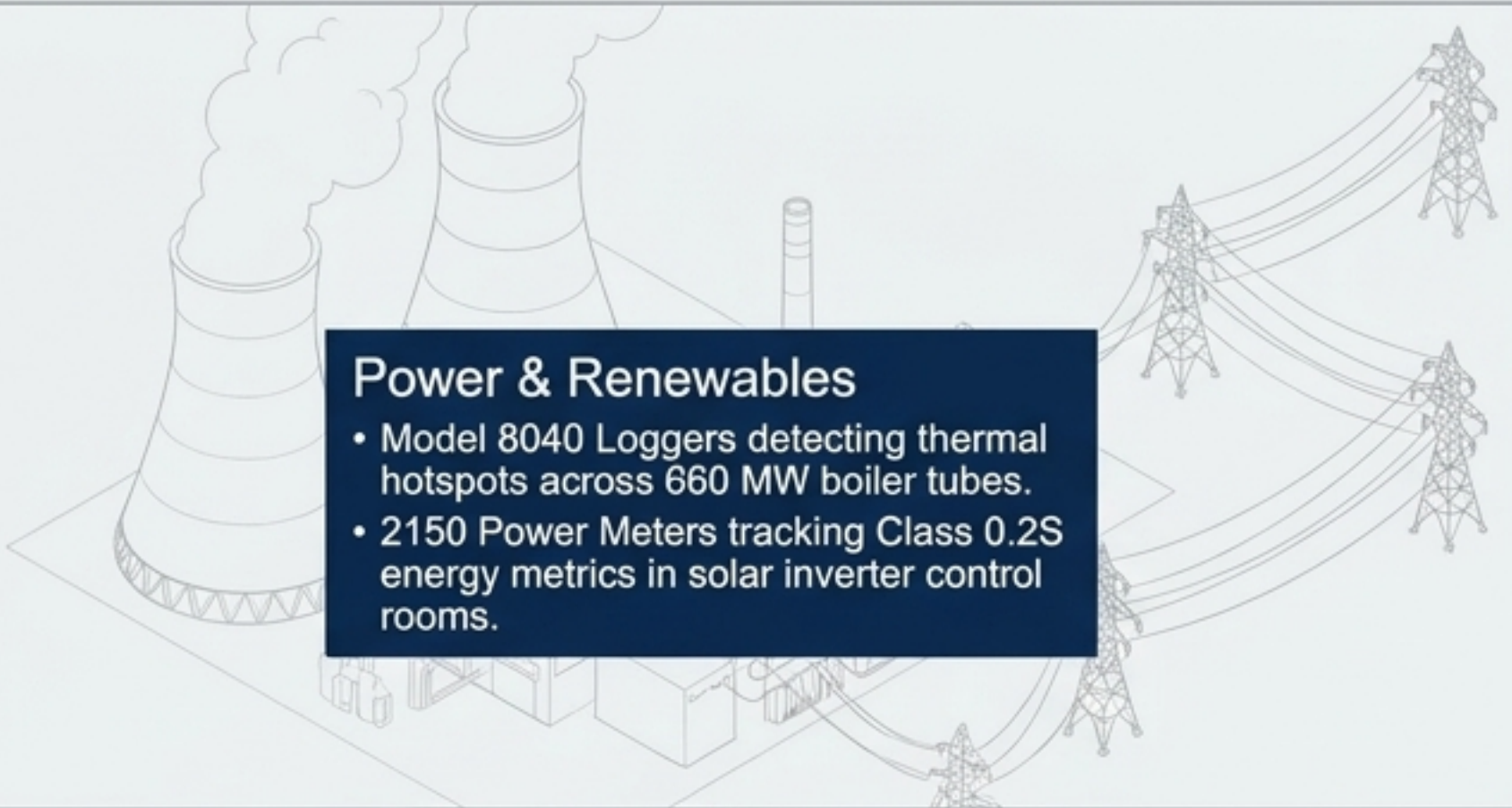
Tamper-proof data acquisition, automated audit trails, and encrypted reporting engines strictly compliant with USFDA 21 CFR Part 11 for life sciences.

Bridging the IT/OT Gap

MINT digital processors convert multi-drop serial sensory outputs into unified Modbus Ethernet TCP/IP packets for DCS ingestion.

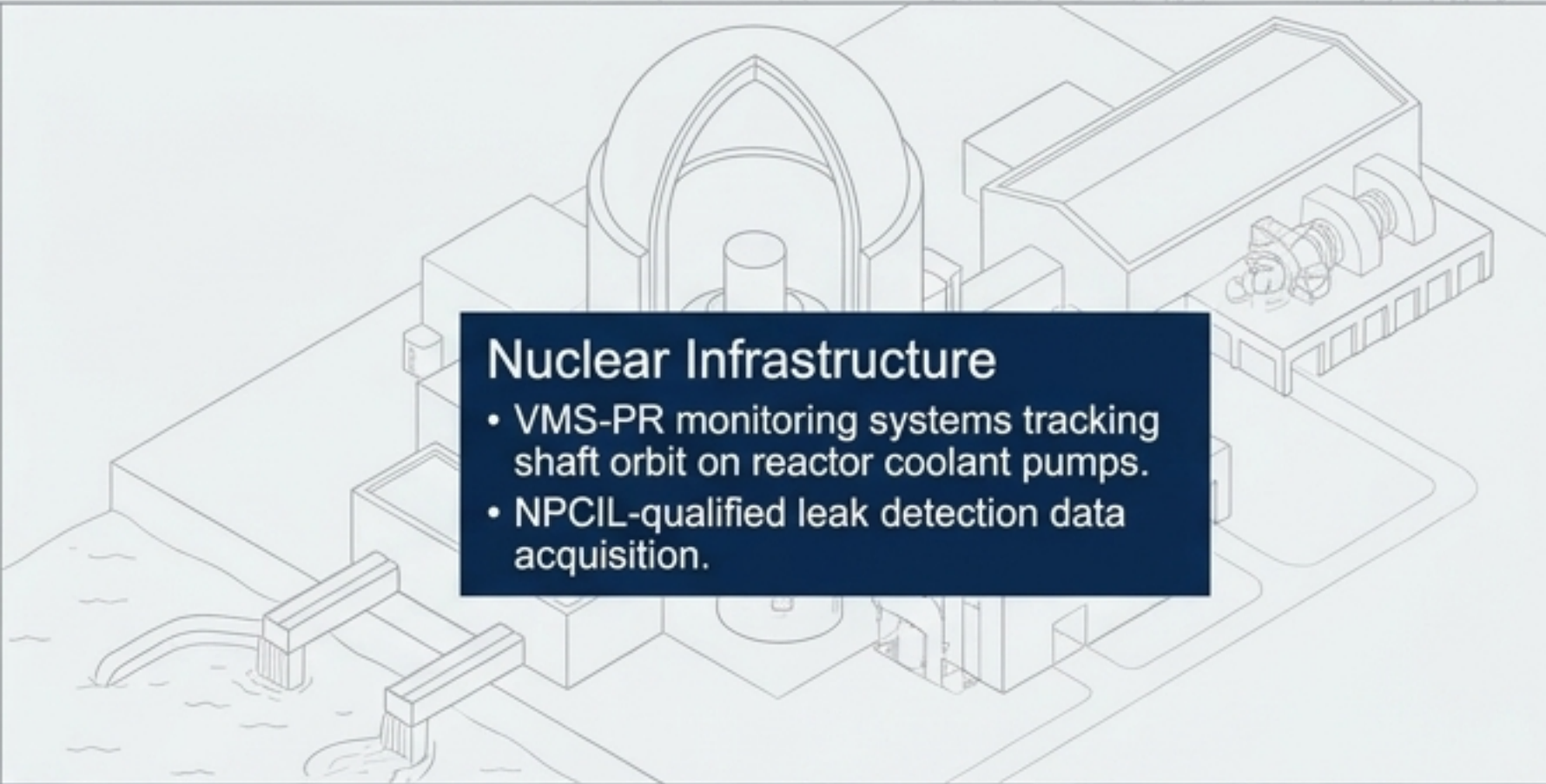


Targeted Industrial Application Landscapes



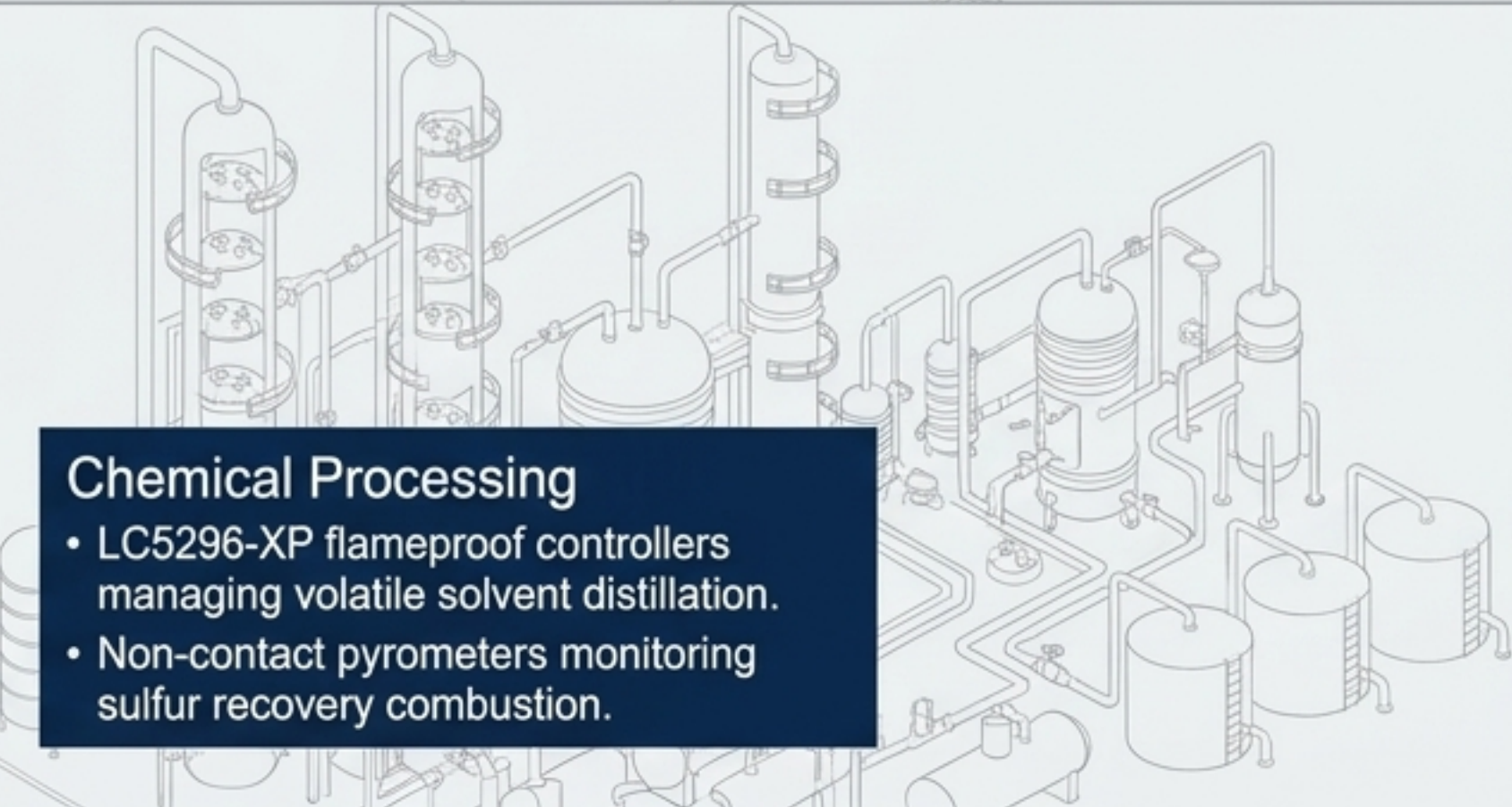
Power & Renewables

- Model 8040 Loggers detecting thermal hotspots across 660 MW boiler tubes.
- 2150 Power Meters tracking Class 0.2S energy metrics in solar inverter control rooms.



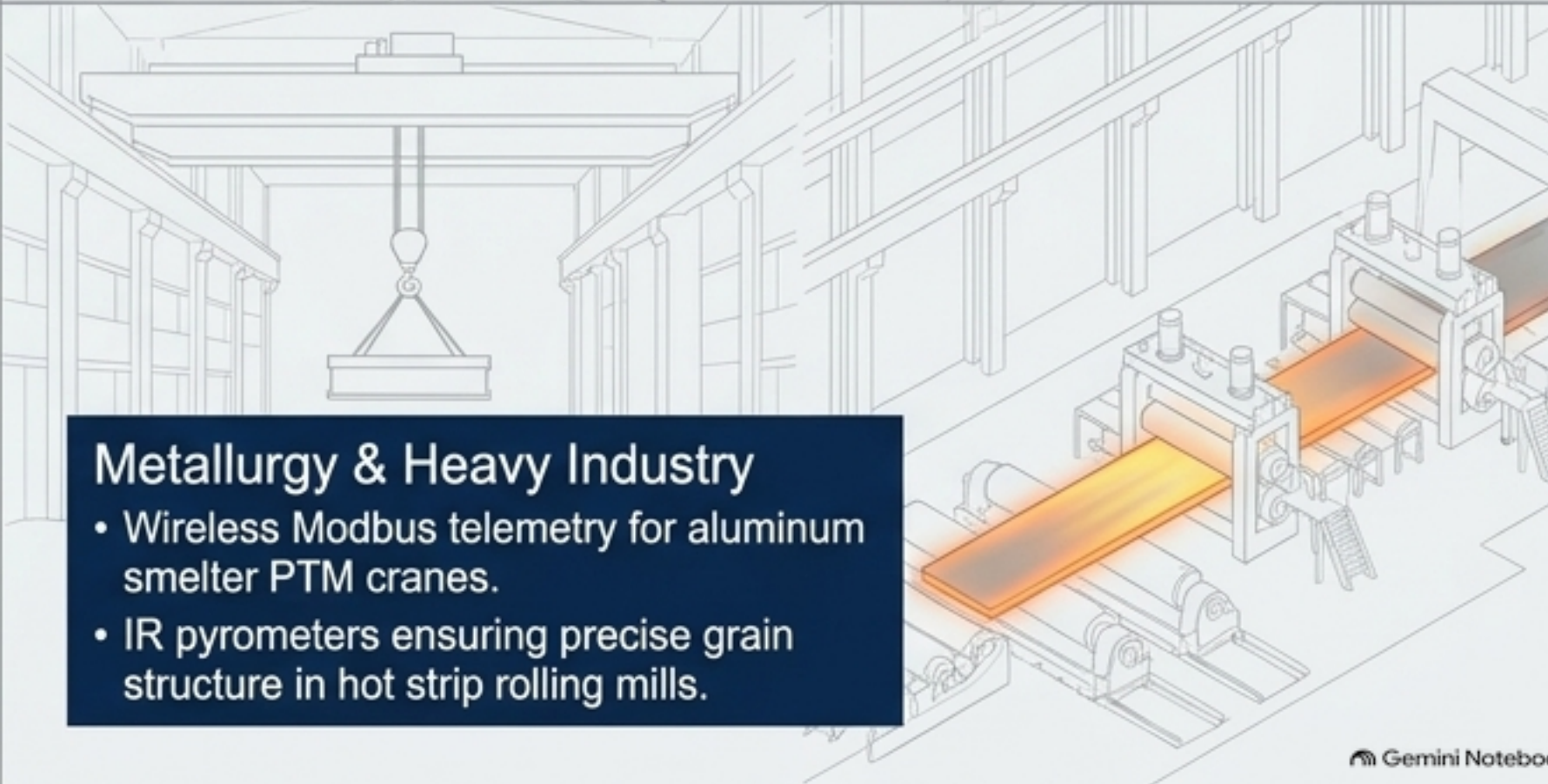
Nuclear Infrastructure

- VMS-PR monitoring systems tracking shaft orbit on reactor coolant pumps.
- NPCIL-qualified leak detection data acquisition.



Chemical Processing

- LC5296-XP flameproof controllers managing volatile solvent distillation.
- Non-contact pyrometers monitoring sulfur recovery combustion.



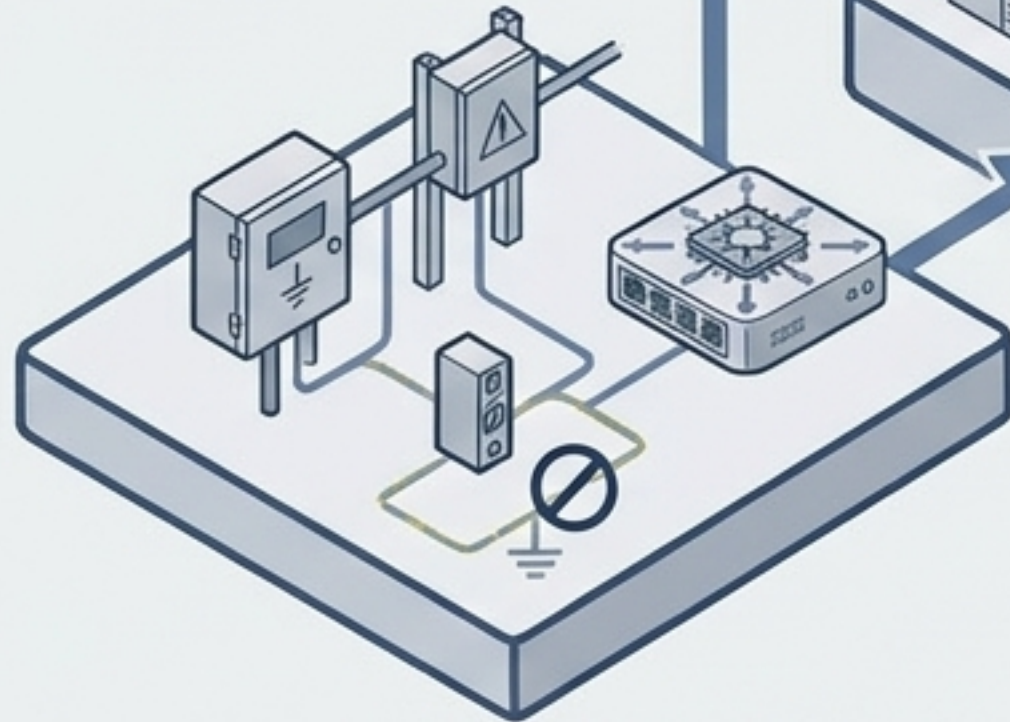
Metallurgy & Heavy Industry

- Wireless Modbus telemetry for aluminum smelter PTM cranes.
- IR pyrometers ensuring precise grain structure in hot strip rolling mills.

The 4-Phase Automation Upgrade Roadmap

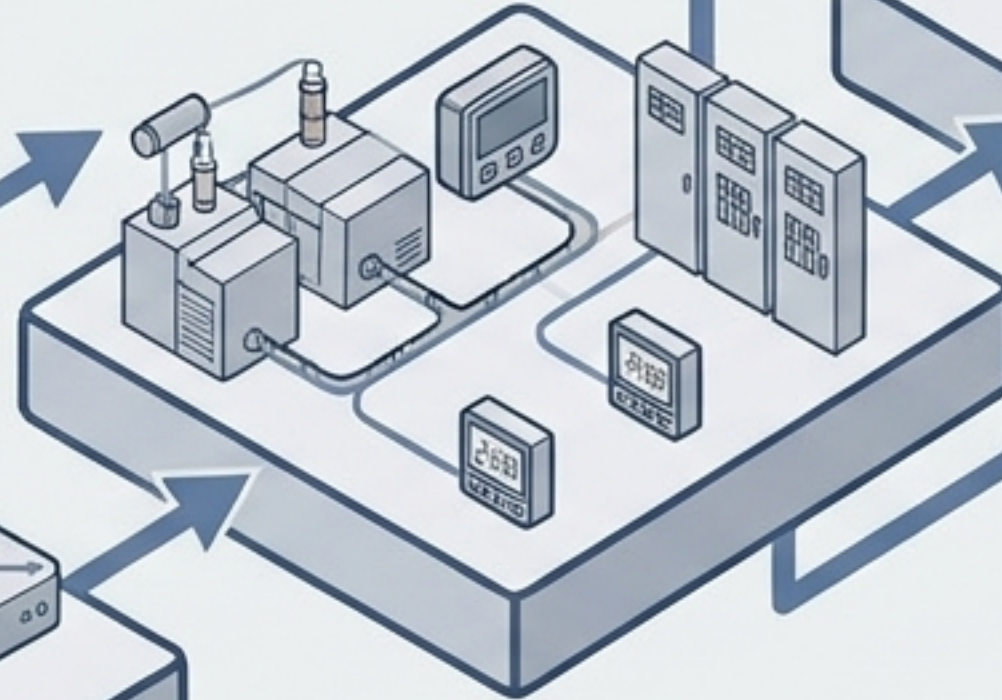
Phase 1: Signal Integrity & Hardening

- Audit field environments.
- Deploy 9000U+ isolators to eliminate ground loops and install flameproof controllers in hazardous zones.



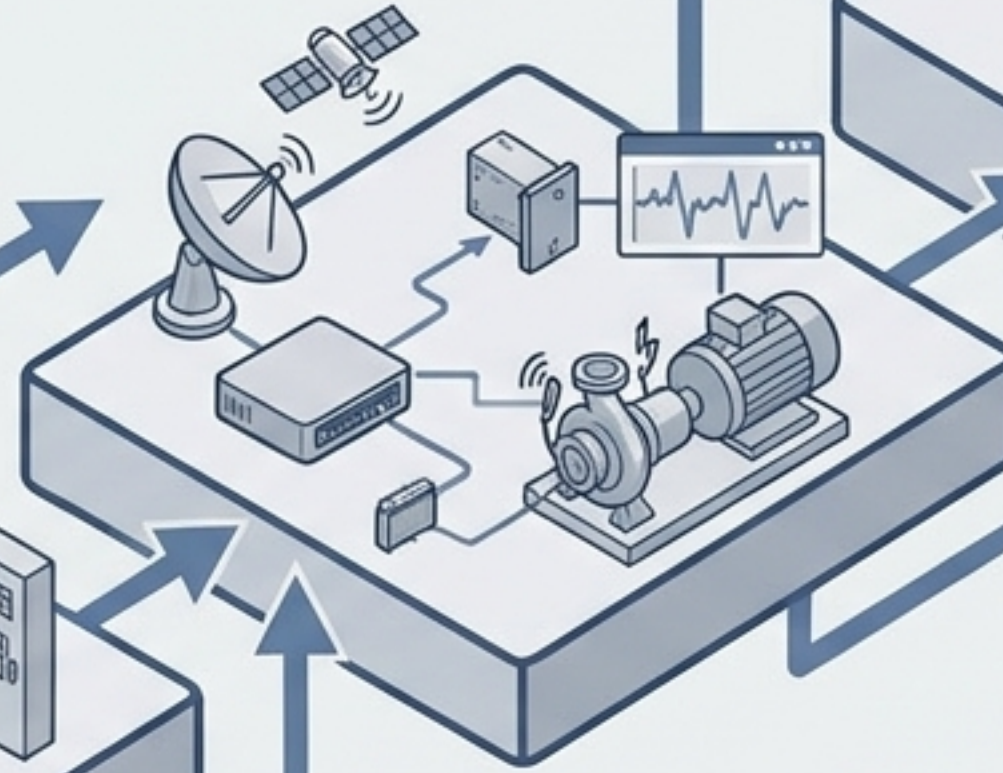
Phase 2: Telemetry Aggregation

- Install Model 8040 loggers for multi-point thermal scanning and 2150 multi-parameter meters for energy tracking. Establish RS485 networks.



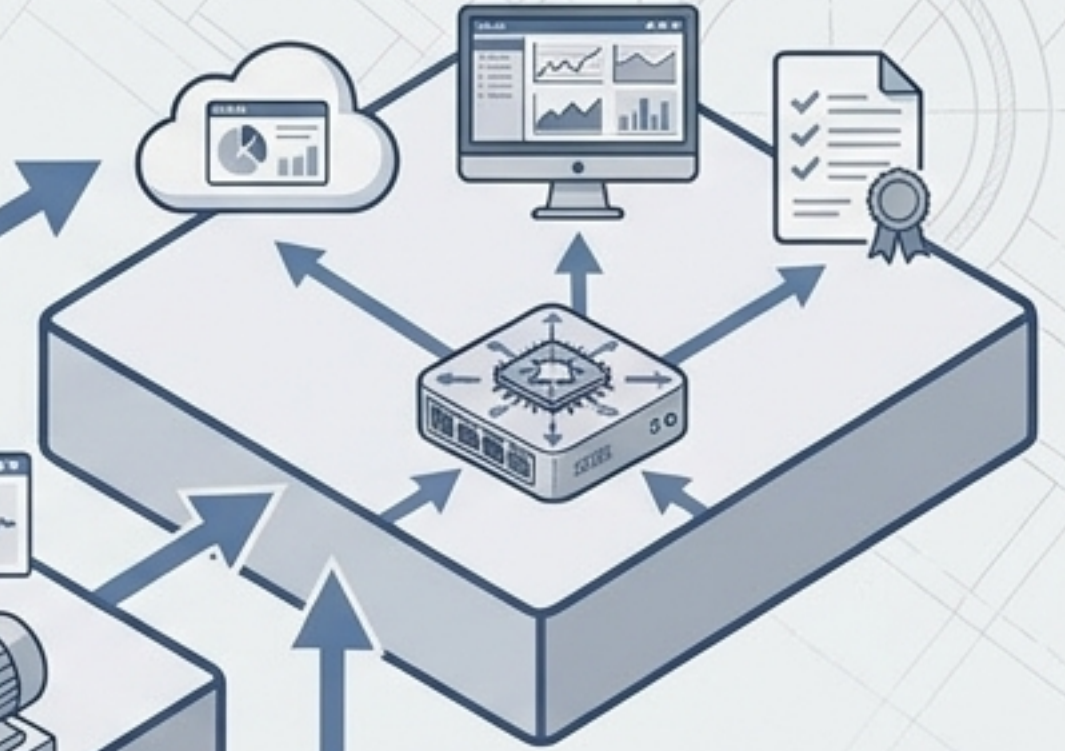
Phase 3: Sync & Diagnostics

- Deploy GPS Master Clocks for sub-microsecond event stamping and VMS-PR vibration monitoring on rotating assets.

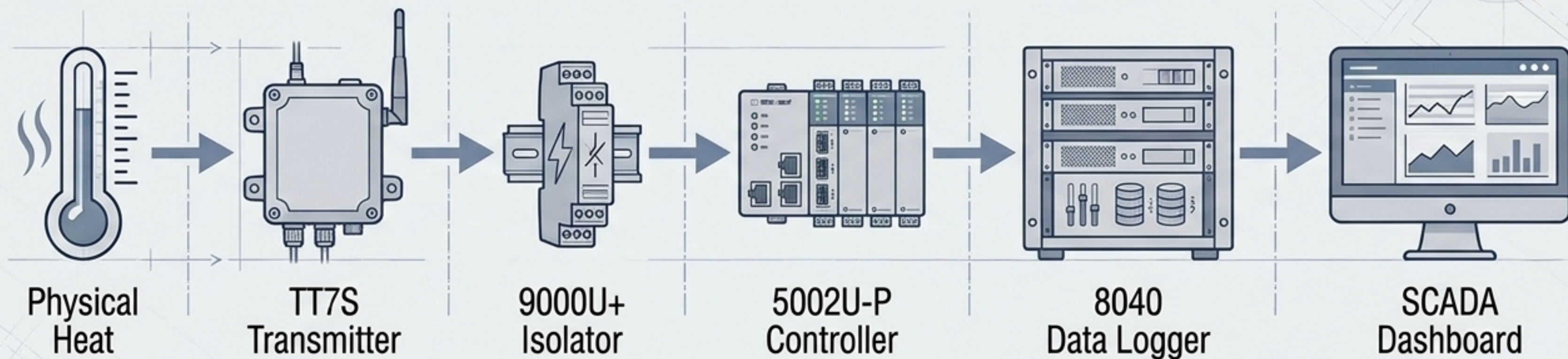


Phase 4: Enterprise Digitalization

- Connect OPC UA Edge gateways to feed SCADA systems, enabling cloud dashboards and 21 CFR Part 11 automated reporting.



Synthesis: The Unbroken Data Pipeline



End-to-End Operational Intelligence.

From raw field physics to predictive enterprise analytics—seamlessly integrated, galvanically protected, and digitally transformed without replacing legacy infrastructure.