CONFERENCE OMAINTEC 2026 EXHIBITION FM

The 23rd International Asset Facility and Maintenance Management Conference

An Intelligent & Distributed Transformer Monitoring Framework

Using IoT, AI and Edge Computing to Enable Grid Resilience and Security

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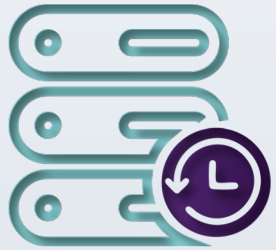
The Cost of Invisibility

Transformers are monitored **periodically or after failure**
Faults develop **silently between inspections**
Limited real-time visibility at the asset level

Unexpected Failures

High Downtime

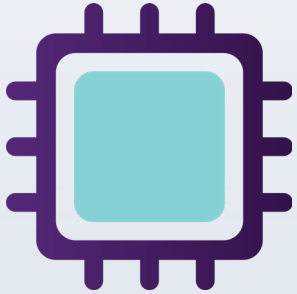
Safety Risks



Data Blindspots

The Architectural Shift

We have developed a comprehensive solution that integrates robust hardware with **intelligent software** to provide 360-degree asset visibility.



Hardware Layer

Captures critical asset parameters

Connectivity

Secure, low-latency data flow

Software Platform

Analytics, alarms & decision support

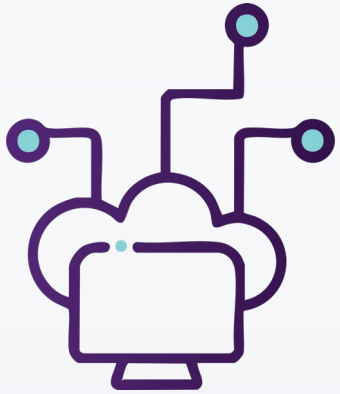
Hardware & Edge Intelligence

Intelligence Starts at the Transformer

Designed for harsh substation environment

Multi-Parameter Sensing

Oil Temp, Winding Temp, Transformer Loading, Oil Level



Edge Processing

Filters noise at source, optimizes bandwidth, reduces alarms

Retrofit Ready

Non-intrusive installation on existing assets

Secure & Distributed Communication

COMMUNICATION

MQTT - lightweight, scalable, event driven

SECURITY

Authentication, Certificates & TLS encryption.

EFFICIENCY

Hex payload for low bandwidth + GSM/ Wi-Fi for simple deployment.

Edge Processing & Data Resilience

Edge Processing

Local algorithms in IoT sensors boost grid resilience

Time Sync

NTP-based accurate time-stamping

Event Handling

Instant alarms triggered by parameter thresholds

Future Ready

On-device fault pattern recognition & autonomous local control

Data Resilience

Local SD card storage; auto-sync when network returns

Turning Data into insights

Scale Effortlessly
Web SCADA scales as per your network

Stay Reliable
Fault in one part? The system keeps running

Innovate Faster
Add new features swiftly to stay ahead

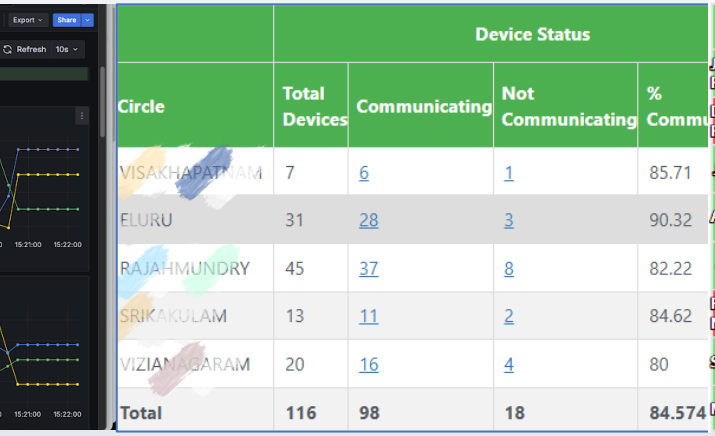
Access anywhere
Monitor everything via web dashboard

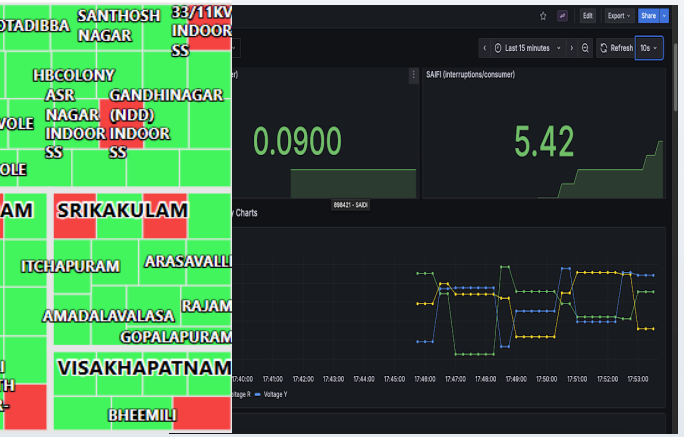
Seamless Integration
Open architecture fits right into your ecosystem

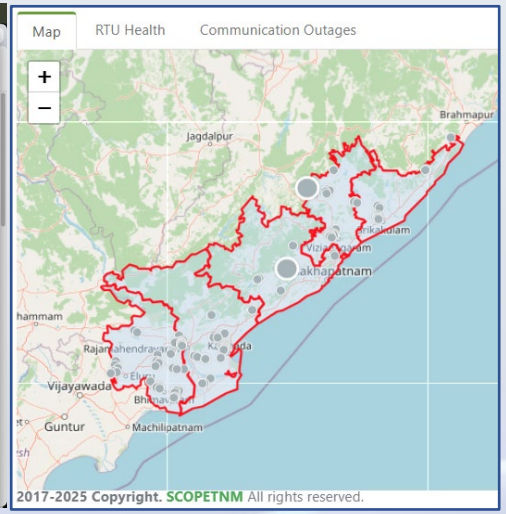
Smarter Decisions
Real-time visibility = better, faster responses

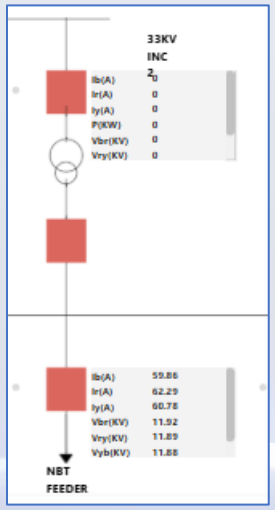
Applications, UI

Circle	Device Status			
	Total Devices	Communicating	Not Communicating	% Commu
VISAKHAPATNAM	7	6	1	85.71
ELURU	31	28	3	90.32
RAJAHMUNDRY	45	37	8	82.22
SRIKAKULAM	13	11	2	84.62
VIZIANAGARAM	20	16	4	80
Total	116	98	18	84.574





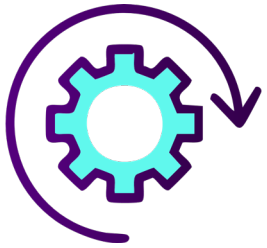




Operating & Cost Benefits

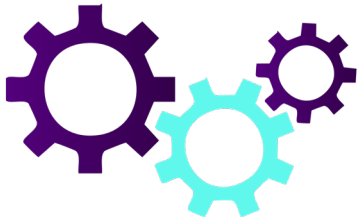
Lower Ownership Cost

No costly RTUs, control panels, or heavy cabling



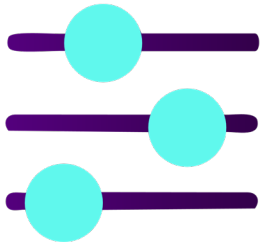
Easy Deployment

Pre-configured IoT sensors cut installation time



Condition-Based Maintenance

Real-time insights drive predictive scheduling & reduce downtime



Better Control

Centralised web visualisation enable smarter, faster decisions

Technical Advantages

Feature	Distributed Architecture (IoT/MQTT)	Traditional RTU-based Systems
Reliability	High. Point-to-point model; failure of one device does not affect others.	Lower. Centralised RTU is a single point of failure.
Latency	Low. Direct communication eliminates protocol conversion overhead.	High. Requires multiple protocol conversions (e.g., MODBUS, IEC 61850 to IEC 104).
Scalability	Excellent. Easy to scale by simply adding new, configured IoT devices.	Challenging. Requires complex programming and integration for expansion.
Maintenance	Flexible. Remote configuration and Over-The-Air (OTA) firmware updates.	Rigid. Requires local, manual programming and updates.

Strategic Takeaway

Transformer Intelligence as a Foundation Layer

- Grid resilience requires **distributed intelligence**
- Asset-level awareness improves system-level outcomes
- Enables digital twins & AI to deliver real value

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From Reactive Infrastructure to Self-Aware Grids

THANK YOU

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