

Transformer Health Monitoring System

VOLTAGE (KV, 13.2/0.48)

CURRENT (A) 150

STATUS: NORMAL

OIL TEMPERATURE

75°C

LOAD (%)

60

DAILY TREND

LOAD (%)

150



MonitEasy
Monitor | Predict | Optimize

Message from CEO

Intelligence for every electrical asset

AI-Powered Distributed Energy Resources Management System

“At MonitEasy Technologies, our mission is to help utilities and industries move from reactive maintenance to intelligent, predictive operations. Our AI-powered DERMS unifies real-time asset monitoring, fault detection, health indexing, energy optimization and remote diagnostics—turning operational data into timely decisions that protect reliability, safety and performance.

Mohan Dasari

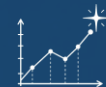
CEO, MonitEasy Technologies Private Limited
www.moniteasy.com | Monitor – Predict – Optimize – Manage

ONE CONNECTED INTELLIGENCE LAYER



MONITOR

Real-time electrical asset visibility



PREDICT

AI diagnostics and failure-risk insight



OPTIMIZE

Energy, maintenance and lifecycle performance



MANAGE Alerts & Notifications

Multi-site assets from one platform

SMS | WhatsApp | Email | App Notifications

User

Distribution Transformer Failures & Inefficiencies

What Causes the Problem ?

-  **Overloading / Imbalanced Loads on transformers**
 - Insulation damage and overheating.
-  **Poor maintenance, lack of monitoring**
 - lack of accurate and timely monitoring (oil quality, temperature, voltage).
-  **Absence or failure of metering / inaccurate data**
 - hard to detect failing units until substantial damage. E.g., in Bengaluru many transformer meters are defective or not working.
-  **High technical & commercial losses (faults, theft, inefficiency)**
 - inefficient operations.

1

Provides Real-Time Monitoring to detect anomalies before failure

2

Automates predictive maintenance, reducing O&M costs

3

Enhances grid reliability by reducing unplanned outages.

4

Supports regulatory compliance with mandates on digital monitoring

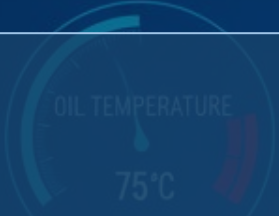
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Extends transformer lifespan by preventing overloading and overheating

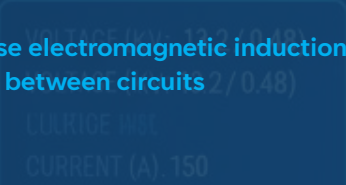
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Improves workforce efficiency through mobile alerts and guided diagnostics

Power Transformer & Failures



Power transformers step up or stepdown voltage for safe and efficient electricity transmission.



They use electromagnetic induction to transfer electrical energy between circuits

Designed for high voltages, they ensure stable power supply to industries and homes with proper maintenance.

What Causes the Problem ?

1

Overloading

Operating beyond capacity leads to overheating and insulation breakdown

2

Insulation Degradation



High temperatures, moisture, or electrical stresses degrade insulation, causing faults.

3

Mechanical Stress

Electrical surges damage insulation and cause internal faults

4

Lack of Maintenance



Vibration and thermal expansion can damage transformer components or cause misalignment.

5

Contamination of Transformer Oil

Pollutants in oil reduce its cooling and insulating effectiveness, leading to overheating.

Power Transformer Health Monitoring

Continuous intelligence for high-value assets

Power transformers are among the highest-value substation and industrial assets. Continuous monitoring protects capital investment by exposing thermal stress, cooling weakness, insulation degradation and abnormal loading before a prolonged outage.

KEY PARAMETERS

HV/LV voltage, current and load profile

Top/bottom oil, winding and hotspot temperature

Cooling fan status, OLTC position and oil level

Moisture, bushing and ambient temperature

DGA and partial-discharge integration

INTELLIGENT ANALYTICS

IEEE/IEC Thermal modelling

Dynamic loading modelling

Health Index, RUL and hotspot prediction

Cooling-efficiency and overload analysis

Fleet benchmarking

Secure live diagnostics

BUSINESS BENEFITS

Extend transformer life

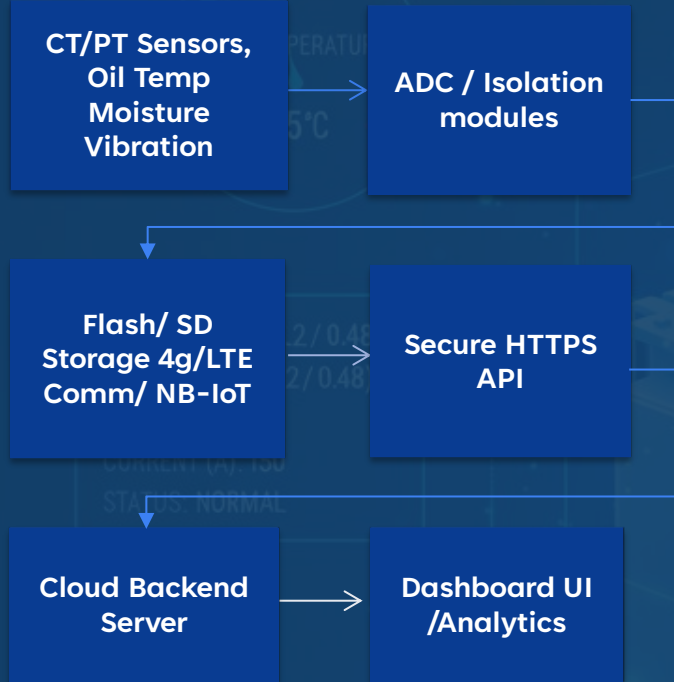
Predict insulation degradation

Improve grid reliability

Prevent catastrophic failures

Integrate with enterprise operations

Technology Architecture



1 **Smart Meters**
On transformer side
(incomer + feeders)

2 **IoT Sensors**
Oil Temperature, Oil level,
Lug Temperature, Ambient
& Humidity

3 **GPRS/4G**
Communication to
Head-End System
(HES)

4 **Integrates with**
Utility's SCADA

5 **Data Analytics and Alerts on**
Overload / Phase imbalance
Transformer loss trend
Failure prediction
Power theft suspicion

Transforming Power Systems Through Smart Connectivity



ClouDT is a Next-Generation technology product specializing in Cloud and Smart meter-based monitoring solutions for the power and utility sector.

We are committed to building smarter, safer, and more sustainable power systems empowering our clients to stay ahead in a rapidly evolving energy landscape.



Cloud-Based Platform



End-to-End Solutions



24x7 Support



Smart Meter Integration
(rather than proprietary expensive sensors) to capture load, voltage, and temperature data.



Provides **Predictive Failure Analytics** through AI/ML models trained on Indian grid conditions.



Enables **field force integration** with Solveeasy's ClouDT app for instant alerts and mobile diagnostics.



Compact, **Plug-and-Play** hardware ensures quick installation without transformer downtime.

MonitEasy Advantages

Monitoring & Mapping

 **Physical Parameters:** Oil Level, Oil Temperature, Winding Temperature, Ambient Temperature, Humidity and Hotspot Calculation

 **Power Parameters:** (KW, KVA, KVAR):
Measures key power parameters for precise load analysis.

 **Energy Parameters:** (KWH, KVARH, KVAH): Monitors active, reactive & apparent energy for performance analysis.

 **Basic Parameters:** (V, I, P.F): Monitors voltage, current, and power factor to evaluate electrical performance.

 **Harmonics:** (up to 31st level): Detects waveform distortions to ensure power quality and equipment safety.

 **GIS Mapped Transformers:**

AI Analytics & Reports

 **Loss & Efficiency Analysis**
Transformer performance insights

 **AI-Based DT Health Index**
AI-driven condition scoring

 **AI Chatbot**
Instant DT insights

 **Demand & Load Trends**
Load behaviour analysis

 **Gateway Data Reports**
Device & data status

 **Alerts & Availability**
Real-time exceptions

Predictive Maintenance

 **Automated Maintenance Scheduling**
Periodic & condition-based

 **Activity & Resolution Tracking**
Action & resolution logging

 **Complete Maintenance History**
Asset-wise records

 **AI Failure Prediction**
AI failure forecasting

Power Theft Analysis

Objective

Detect power theft and enhance transformer efficiency using real-time analytics and AI-based demand forecasting.

A. Power Theft Detection & Alerting System

- Using the predefined **power theft detection logic**, the system continuously compares transformer apparent power (S_t) with the cumulative consumer load (ΣS_h).
- When deviations exceed the defined threshold, **instant alerts** are triggered on the **dashboard** and sent to **registered mobile devices** (SMS, Email, or WhatsApp) for immediate action.

B. Real-Time Load Loss Calculation

- Provides **dynamic evaluation of actual load losses** across varying load and operating conditions.
- Helps utilities identify abnormal losses early and plan preventive maintenance.

C. Real-Time Transformer Efficiency Monitoring

- Continuously computes **transformer efficiency and health index** using real-time voltage, current, and power factor data.
- Enables predictive maintenance, improved reliability, and transparent energy auditing.

All Transformers View

Real-time Transformer Health & Connectivity: Unified dashboard showing operational health, connection status, and active power supply for all transformers.

Live Alerts & Fault Monitoring: Instant visibility of alarms, threshold breaches, and abnormal conditions for proactive maintenance.

Load Profile & Power Analytics: Continuous monitoring of load trends, demand patterns, and active power consumption.

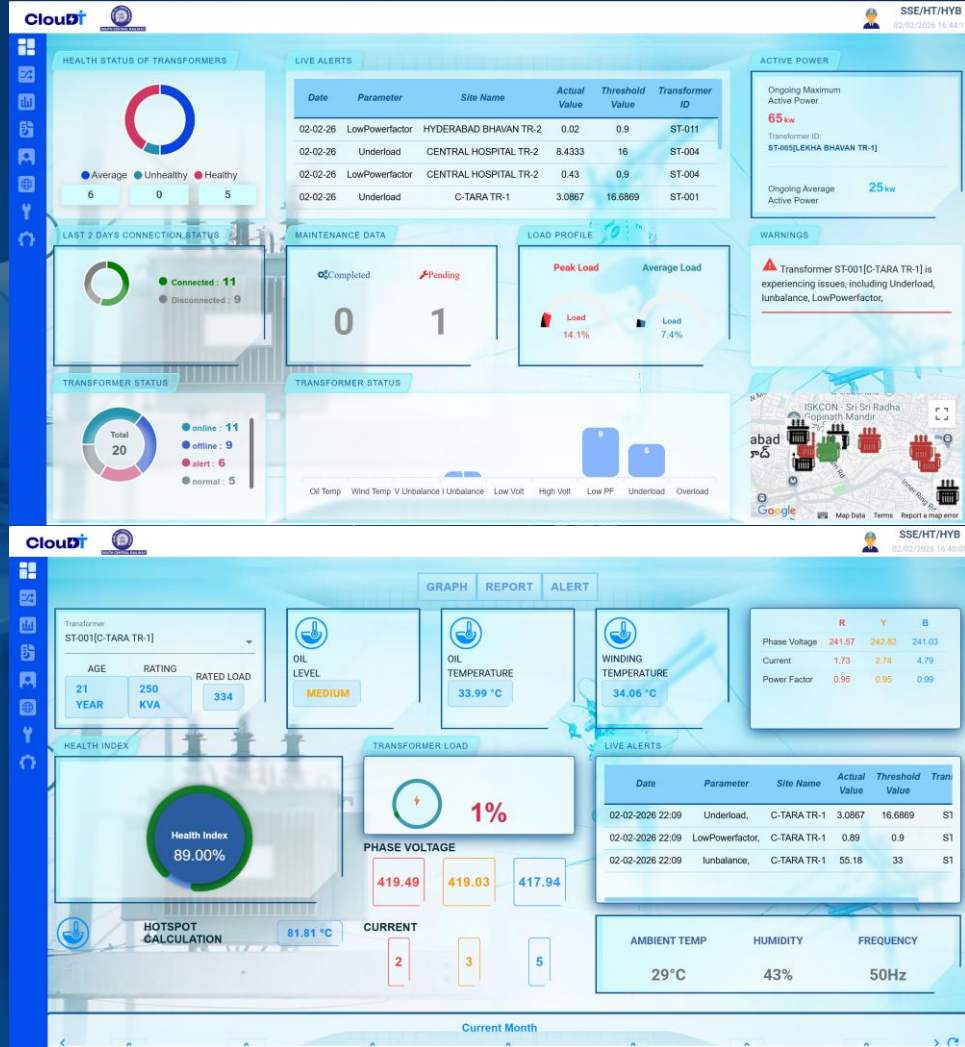
GIS-Enabled Asset Visualization: Interactive map view displaying precise transformer locations with status overlays for faster field response.

Individual Transformers View

Physical & Thermal Condition Monitoring: Real-time visibility of oil level, oil temperature, winding temperature, and ambient temperature to assess transformer operating conditions.

Electrical Performance Parameters: Continuous monitoring of RYB phase voltage, current, load, and power factor for accurate electrical health assessment.

Live Alerts & Health Index: Instant alerts on abnormal conditions with a consolidated transformer health index for quick decision-making and maintenance prioritization.



Rollout Plan for Power Distribution Companies

Pilot Phase

(3 months):

- 50 DTs with high consumer density/load

Review KPIs:

- Load data correlation, imbalance detection, outage prediction

Full Scale Deployment:

- Phased zone-wise deployment
- Integration with MDMS & OMS

Training & Capacity Building

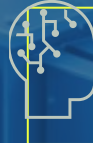
We invite Power Distribution Companies to Pilot “ClouDT” our digital innovation with us.



Cost-efficient



Scalable with RDSS smart meter rollout



Predictive, not reactive



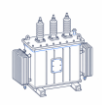
Enhances operational efficiency



Improves consumer satisfaction

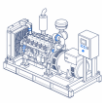
Explore more about the MonitEasy DERMS Platform

AI-powered platform for remotely monitoring, predicting, optimizing, and managing critical electrical infrastructure and distributed energy resources.



DTHMS — Distribution Transformer Health Monitoring

Load, voltage, current, oil temperature, winding condition, thermal risk, and fault alerts



DGHMS — Diesel Generator Health Monitoring

Electrical performance, runtime, fuel level, engine condition, efficiency, and fault alerts



SGMS — Switchgear Monitoring System

Temperature, electrical parameters, power quality, equipment health, and safety alerts



BESS PMS — Battery Energy Storage System — Platform Monitoring System

State of charge, temperature, health index, lifecycle analytics, and performance optimization



PTHMS — Power Transformer Health Monitoring

Live health index, predictive diagnostics, secure connectivity, and SCADA integration



IMHMS — Industrial Motor Health Monitoring

Vibration, current signature, temperature, loading, and motor health index



SPHMS — Solar Plant Health Monitoring

Generation, inverter performance, efficiency, faults, and lost-energy detection

Thank you

One AI Platform. Unlimited Electrical Assets. Real-Time Intelligence for Industry 5.0.

Let's connect your critical assets to a unified monitoring, predictive-maintenance and energy-intelligence platform.

BOOK A DEMO · DISCUSS A PILOT · CONNECT YOUR ASSETS

REACH OUT

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