

AI and IoT Based Touchless™ Transformer Monitoring



Improve Availability, Reliability and Asset Life
Expectancy. Minimize Risk and Repair Costs.



ONLINE CONDITION MONITORING SOLUTIONS FOR CRITICAL ASSETS

Monthly inspections and risk assessments may not be sufficient or cost-effective when an asset is critical. Eneritics online condition monitoring devices strengthens asset lifecycle. They allow for continuous condition assessments, pre-emptive fault detection, and alert mechanisms for critical assets, reducing unplanned downtime and avoiding substantial maintenance costs and collateral damage.

PREDICTIVE MAINTENANCE FOR CRITICAL ASSETS

The innovative Eneritics solution performs an automatic evaluation of multi-variate sensor data to detect anomalies before they turn into significant issues. These solutions use advanced ML and AI algorithms to predict asset health. With advanced sensors, not only is it possible to forecast individual sensor data, but it is also possible to predict specific machine fault conditions. The advanced devices feature an intuitive web dashboard and mobile phone interface to provide actual and predicted trends and asset behaviors

KEY FEATURES

- 3-phase LT-side voltage, Voltage Unbalance
- 3-phase load current, Current Unbalance
- Active (kW), Reactive (kVAR) and Apparent power (kVA)
- Power Factor, Frequency, Harmonics (THD)
- Physical parameters - Transformer oil level, oil and winding temperature
- GPS positioning on a digital map
- Optional – LT Feeder Panel Busbar Lugs Temperature
- Secure GSM Communication, IP 66 Design
- OPTION to integrate Protection features

ANALYTICS & REAL-TIME ALERTS

- Transformer anomaly Alerts - Transformer oil level, oil and winding temperature
- Power off Alerts
- Voltage / Load Unbalance, Power Quality Alerts
- Real time Loading (kW) and kWh Usage Alerts
- Online Dashboard Portal for Remote Access
- Real time data, Trend Analysis
- Android & iOS App, Reporting

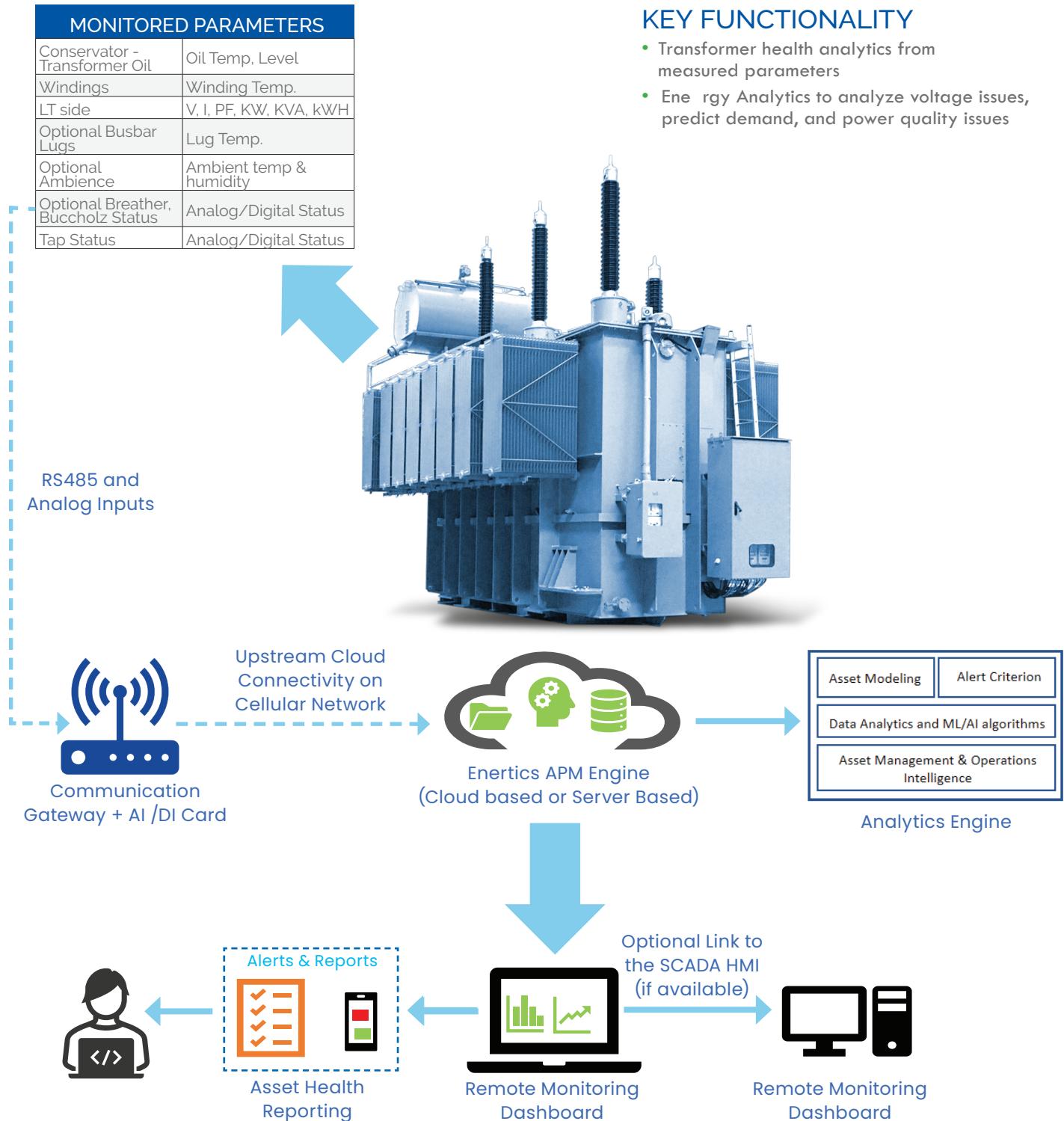
ENTERPRISE LEVEL VIEW – AGGREGATE DASHBOARD

The screenshot displays the Eneritics Enterprise Dashboard with the following key data points:

- Energy Cost:** Actual YTD Cost: ₹ 7,244.17, Predicted YTD Cost: N/A, Predicted YE cost: N/A.
- CO2 Footprint:** Actual YTD CO2: 2,575.70 Tons, Predicted YTD CO2: N/A, Predicted Total YTD CO2: N/A.
- Power Events:** Voltage Events YTD: N/A, Overall YTD Power Factor: 0.13, YTD Power Factor Dips: N/A.
- Peak Demand (kW):** Actual Peak Demand: N/A, Current Predicted Peak: N/A.
- Overall Metrics:** Total Monetary Savings attributed to Energy Cost, CO2 Reductions: N/A.
- Map:** A detailed map of India showing various states and major cities, with a specific location marked in blue.

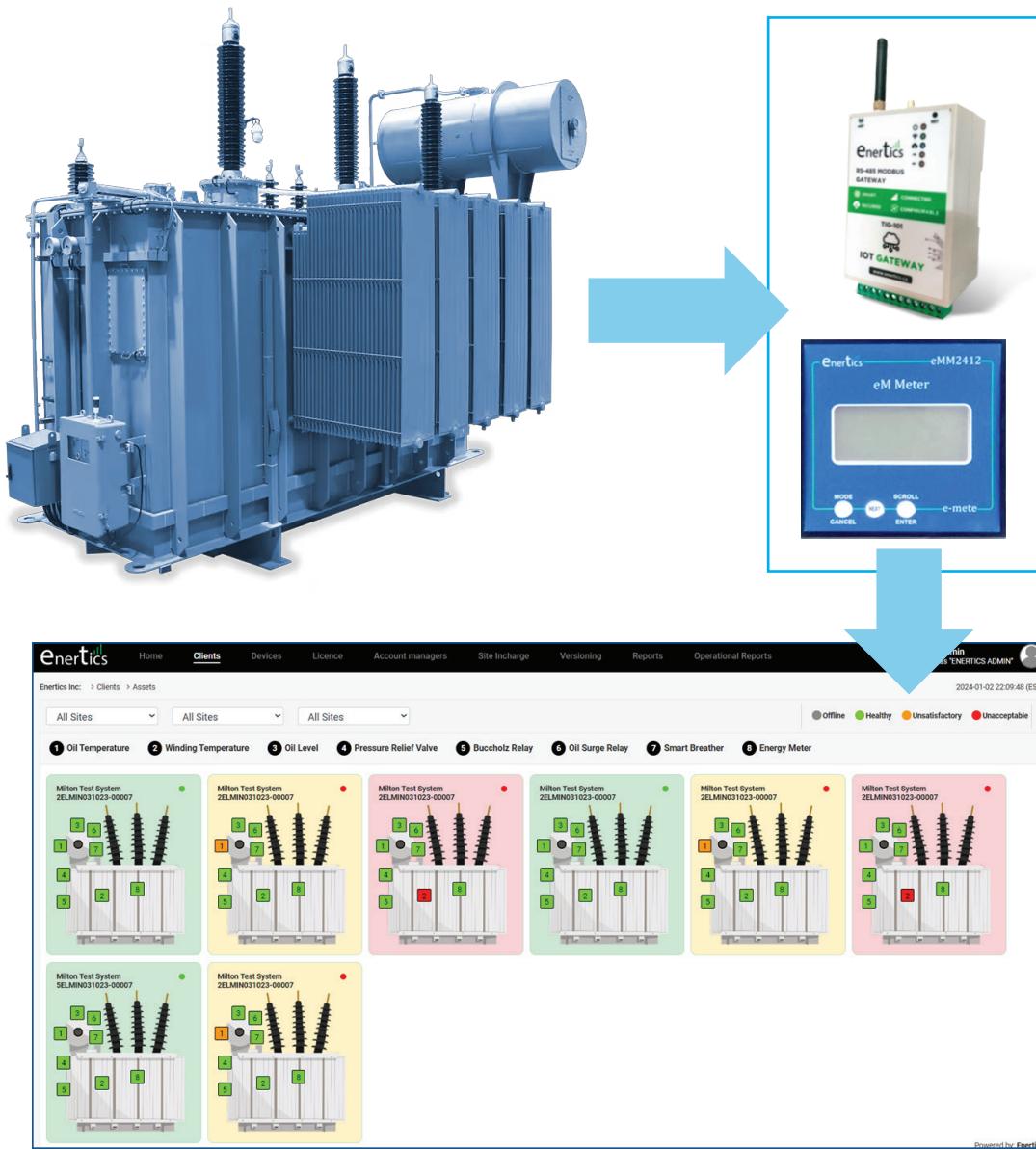


Smart Transformer – Solution Architecture



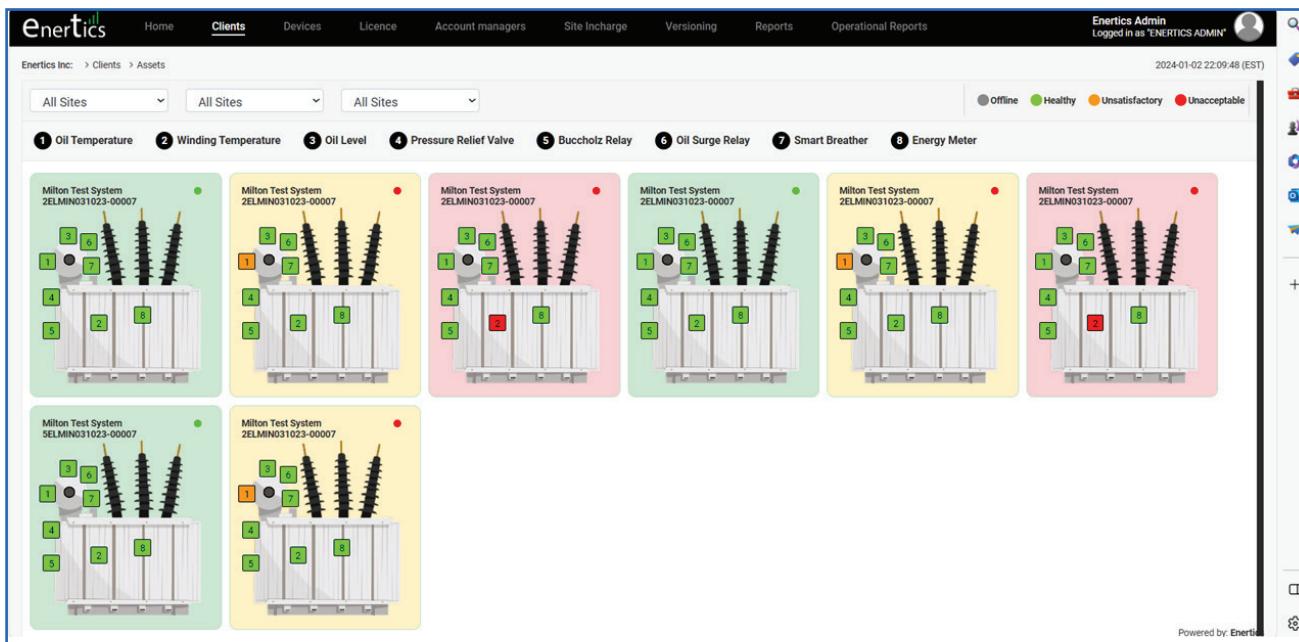
Principle of Operation

- Implementation of Correlation Algorithm on Physical and Electrical Parameters of the Transformer to help identify early-stage issues. Typical issues related to Oil Seepage, T/F Loading, Voltage Unbalance, Loose Connections, Electrical health and Power Quality are identified by respective algorithms
- Threshold values for Physical and Electrical parameters are pre-defined based on relevant standards and/or the OEM defined "Potential Health Concern" criteria
- An alert (email or SMS) is issued as soon as an Anomaly is detected.
- CbM Software records an automated Transformer Health report indicating real time status at the time of event, Diagnostics Analysis and Trends are also recorded.

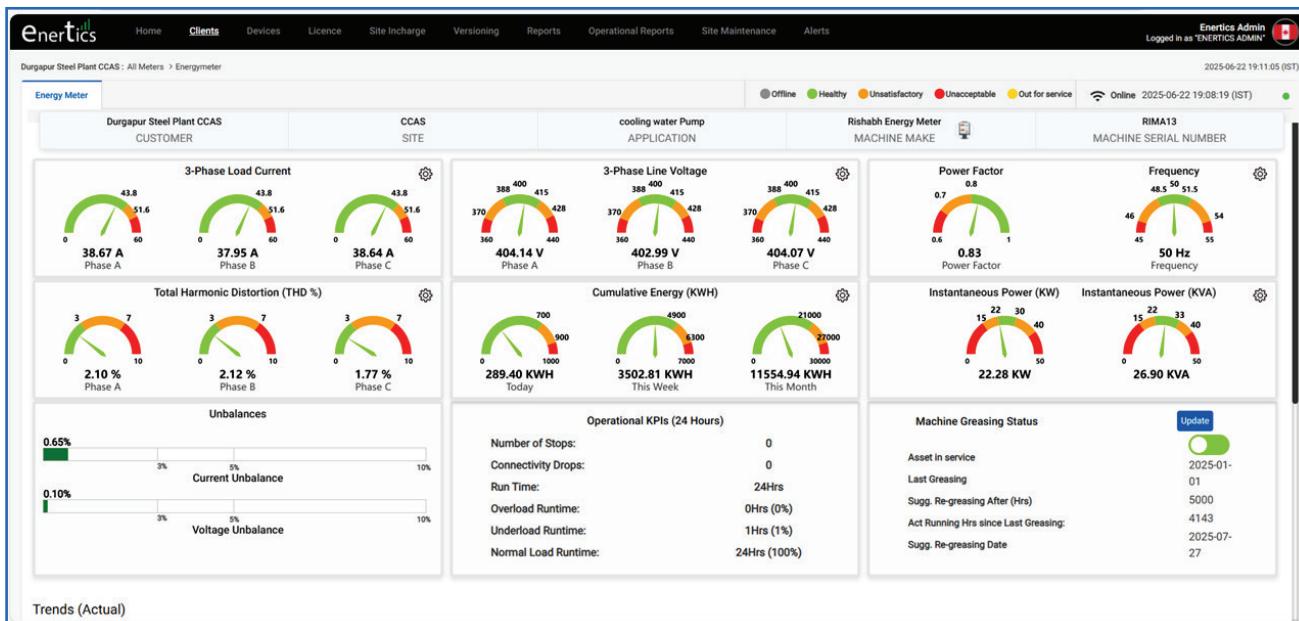




MULTIPLE TRANSFORMERS – SITE LEVEL VIEW

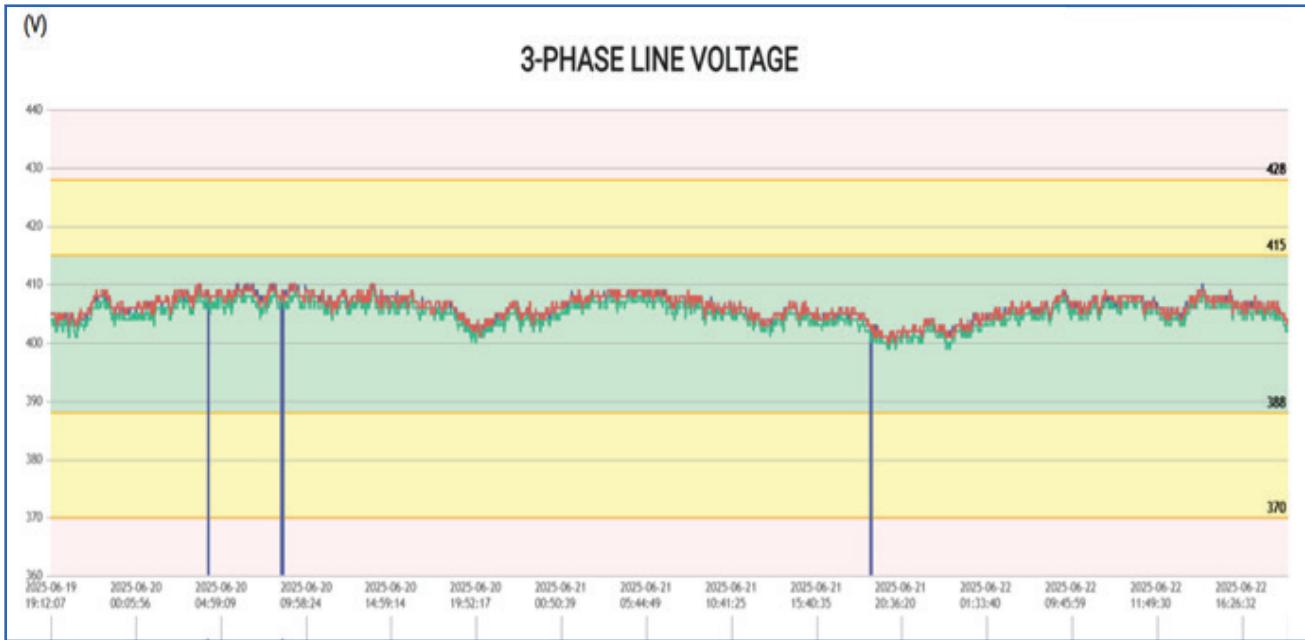


LT SIDE METERING – ELECTRICAL PARAMETERS AND ANALYTICS





REALTIME DATA TRENDS . . . (ELECTRICAL AND PHYSICAL PARAMETERS)



TRANSFORMER HEALTH ALERTS

Transformer Health Alert

Hello NITESH GUPTA!

We have detected an Anomaly with the 345kVA Transformer on the Durgapur Township Feeder 1:

Motor serial no:	ELMIN093021-00248
Application name:	Feeder 1 Transformer
Status:	Unacceptable condition
Event time:	Saturday, February 18, 2023 4:22 AM
Machine status:	Oil Level Anomaly Information: Low oil level detected at 4:22AM on Saturday, February 2023
Action required:	Review status

Thanks
Eneritics team

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Systems With Intelligence Inc.
6889 Rexwood Road, Unit #9
Mississauga, Ontario, CANADA
L4V 1R2
Tel: +1-289-562-0126
Fax: +1-289-562-0152
Website:
www.systemswithintelligence.com
Sales Inquiries:
sales@systemswithintelligence.com
Product Support:
support@systemswithintelligence.com



TOUCHLESS
MONITORING
SOLUTIONS



Enertics India Pvt Ltd.
7, 7th Floor, Twin Towers
Panchkula IT Park, Sector 22
Panchkula Haryana
India 134109
Tel: +91-9878575968 (India)
+1-416-721-5968 (Canada)
Website:
www.enertics.ca
Sales Inquiries:
sales@enertics.ca