

STEM

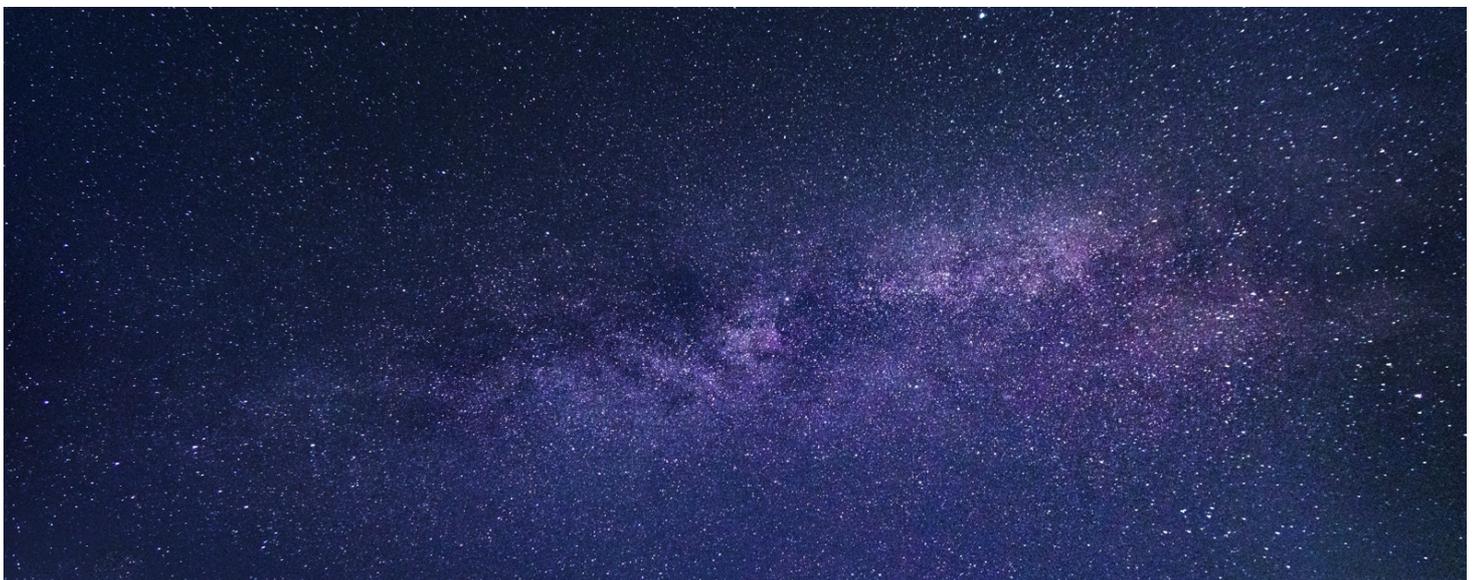
Smart Transformer Efficiency Monitor

For MV Power Distribution Network



Datasheet

Version 1.0



STEM Datasheet – Smart Transformer Efficiency Monitor

ABOUT STEM

STEM - Smart Transformer Efficiency Monitor brings visibility to distribution transformers. STEM is a robust, flexible and rapidly deployed sensor that can convert distribution transformers on existing grid networks into smart transformers.

STEM monitors transformers' electricity parameters also asset parameters like oil level, oil and winding temperature, tap position etc. Monitored data from STEM is sent to Grid Analytics Platform wirelessly at user defined intervals.

Powerful machine learning algorithms process data and display results on web and mobile dashboards that can help utilities to reduce grid losses and improve efficiency.

With add on DI Module it can monitor the breaker status and with add on DC monitoring module it can measure the substation DC Voltage & Current.

KEY BENEFITS

- Monitoring and reporting of electricity parameters and transformer performance
- Historical profiles and comparisons of electricity parameters - current, voltage, power and energy
- Reliability profile - Number and duration of transformer interruptions per day
- Instant web and mobile alarms and notifications
- Accurate monitoring of transformer tap position
- Instant reporting of change in Circuit Breaker status
- Accurate measurement of substation DC Voltage and current
- Accurate measurement of Oil Level, Oil & Winding Temperature
- Energy and Demand forecasting
- Magnetic base for quick & easy installation

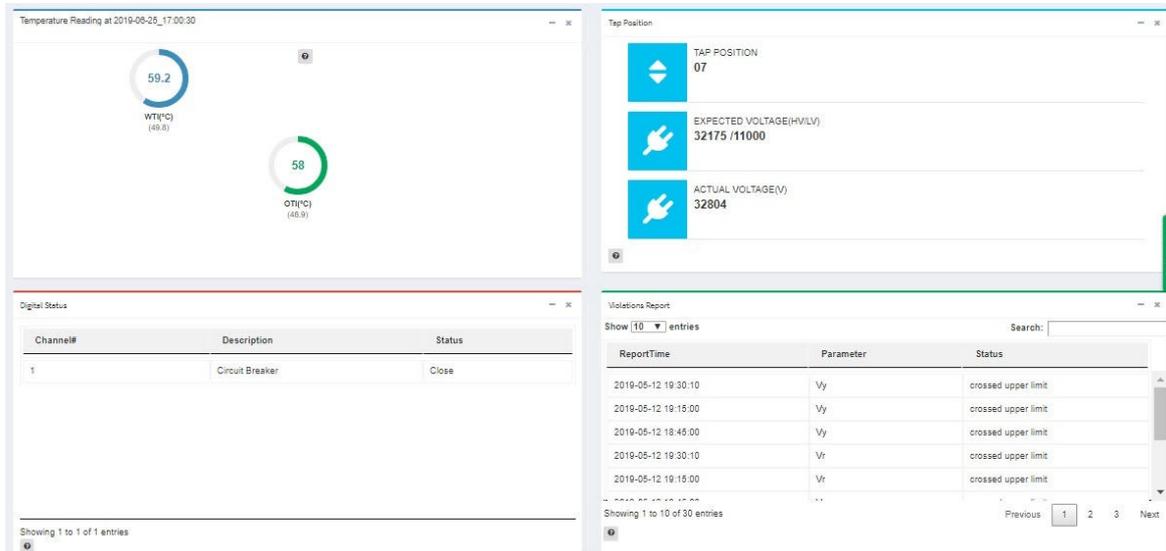
SYSTEM COMPOSITION

SR. NO	MONITOR ELECTRICAL PARAMETERS
1	Instantaneous RMS voltage [V]
2	Maximum RMS voltage [V]
3	Minimum RMS voltage [V]
4	Instantaneous RMS current [A]
5	Maximum RMS current [A]
6	Minimum RMS current [A]
7	Active Power [W]
8	Apparent Power [VA]
9	Reactive Power [Var]
10	Active energy [kWhr]
11	Apparent energy [kVAh]
12	Power Factor [PF]
13	Frequency [HZ]



SR. NO	MONITOR ELECTRICAL PARAMETERS
1	Winding Temperature [°C]
2	Oil Temperature [°C]
3	Oil Level
4	Tap Position
5	Fan Status
6	Pump Status
7	Configurable alerts for oil and winding temperature

FEEDER PERFORMANCE DASHBOARD



GENERAL SPECIFICATIONS

PARAMETERS	STEM
COMMUNICATION	3G/4G, WiFi, RS485
PT CONNECTION	Three phase 3 wire or 4 wire
OPERATING TEMPERATURE	-20°C to +70°C
HUMIDITY	95% relative humidity, Non-condensing
RATED AC VOLTAGE	240 VAC ± 10%
RATED AC CURRENT	1000A, 100A, 10A, 1A (Operated with CT OR Rogowski Coil)
POWER CONSUMPTION	5.0 Watts Maximum
SYSTEM FREQUENCY	50Hz/60Hz ± 5%
ACCURACY (ENERGY)	Class 0.5S
IP RATING	IP 67
ENCLOSURE MATERIAL	Non - corrosive rugged polycarbonate casing
SIZE	255 X 180 X 125 mm (Length X Width X Height)
*OIL TEMPERATURE	0 to 150 °C
*WINDING TEMPERATURE	0 to 150 °C
DIGITAL INPUT	18 to 40V, Active High, 3 KV Isolation, 8 Channels
TAP POSITION	2.5 VDC Excitation, can detect up to 50 tap positions
*OIL LEVEL	Discrete Level Measurement i.e. Low, High & Medium
SUBSTATION DC VOLTAGE	0 to 150 VDC
SUBSTATION DC CURRENT	0 to 10 ADC
DIGITAL INPUT	18 to 40V, Active High, 3 KV Isolation, 8 Channels

* STEM Product designed to measure these parameters, suitable external sensor is required to install on transformer.

ORXAGRID SMART SOLUTIONS:

In addition to STEM and server, OrxaGrid offers a proprietary web enabled application and Machine Learning that allows users to easily track and display data and predictive alerts. Alternatively, SCADA or other software platforms could be used. Contact the OrxaGrid team for more information.

OrxaGrid STEM Offering



Data Integration

To collect and organise data in a meaningful way

Unsupervised Learning

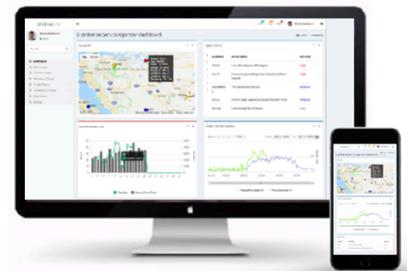
Feature Extraction

Reinforcement learning

Cluster analysis

Advanced Analytics

White-label Machine Learning Algorithms



Visualisation Tools

Web & mobile apps that give complete visibility of grid at your fingertips