

# Transformer Vibrations Monitoring



Detection & Monitoring

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 **PowerView**  
Testing & Monitoring Equipment

*Pioneering the future of power testing and monitoring*

# Transformer Vibrations Monitoring

## Reliable and powerful

Analog devices sensors in combination with the most advanced software for diagnostics and monitoring.

## Transformer Winding Losseness and Deformation Detection

Traditionally Winding deformation can be detected in non-operating condition using frequency response or electrical tests. Using online monitoring method saves time and trends the condition easier. The system uses a matrix of vibration accelerometer sensors and load current monitoring to detect winding deformations while the transformer is in operating condition. Transformer vibrations occur under normal working conditions, which are caused by the load current and the leakage flux. The vibration can be transmitted through liquid and solid pathways. The dependencies of the acceleration from the square of the load current and frequency analysis are used to differentiate failures from the normal working condition and detect the following:

- Clamping Force Looseness
- Global Looseness
- Radial Deformation

## Description

The POWER VIEW TVM is permanently installed on a Transformer. A matrix of a vibration sensor are placed on the transformer tank and the load current is monitored on the current transformers. The system monitors and analyzes real time transformer vibration,  $g=f(I^2)$  for transformer winding deformation detection.

The monitoring system is available in several configurations and versions with IP protection classes starting from IP65. The power supply needed is 180-250 V, 50 Hz

## Early fault detection and notification

Measures on-load vibrations, detects winding deformations at the earliest stages

## Ultra-long wireless communication and low power consumption

Wireless communication at ultra-long-range of several tenths of kilometers

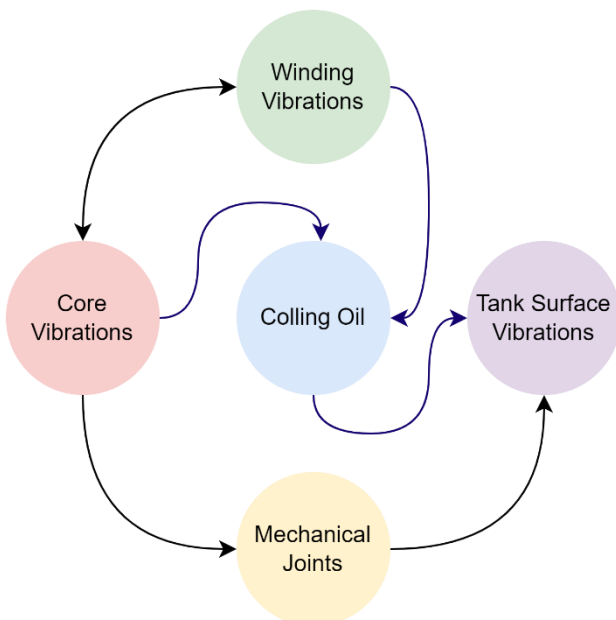


## Easy fault management

The Transformer Vibrations Monitoring comes with powerful wireless software which integrates all substation elements. Users can view history and trending and be notified by individual alarms once fault is detected. All the alarms are fully configurable according to users needs.

## Mobile app

The software comes with a powerful Mobile app ( Android IOS ) for a complete substation analysis , monitoring and inspection .



# Technical specification

## ■ Alarms, notifications and reporting

Fully customizable alarms , email and SMS notification and trending

## ■ Low ownership Smart substation integration

Easy installation ( takes less than 2 hours to completely integrate the system.

## ■ Advance Measurement Technology

■ Open circuit protection and nonflammable material CT

■ Aluminum diecast enclosures with more impact resistance then ABS enclosures

■ Neoprene seal to obtain IP-65 Protection class

■ IP-65 protection class enclosures protects your PCB from dust, liquid, impact and moisture which are needed for durability on outdoor conditions

■ EMI shielded housing

■ Heavy duty outdoor

## Accelerometer Sensor

Accelerometer Range	+16 g for all 3 Axes
Resolution	13 bit
Accelerometer Rating	10000 g
Bandwidth	3200 Hz
FFT Analysis	10 frequencies with the biggest contribution
Operating Voltage	2-3.6 V DC
Operation Temperature	-40~85 °C
Standard	Compliant with RoHS directive

## Load Current Sensor

Load Current	1A~600A
CT Inside Diameter	φ35.5mm
Applicable Frequency	10Hz~5kHz
Phase Accuracy	±0.5° (600A/10Ω)
Rated Voltage	Less than AC600V for low voltage circuit of coated wires
Withstanding Voltage	AC2200V/1 minute (between output terminal and outer case)
Operation Temperature	-25~60°C, less than 80%RH w/o condensation
Standard	Compliant with RoHS directive

## Acquisition and Communication System

Processor	ARM Cortex-M7 at 600 MHz
Resolution	8,10,12,16,24 bits
Operating Voltage	5 V
Sampling Rate	Up to 400 kHz

Housing	EMI shielded heavy duty outdoor - aluminum diecast enclosure with enhanced impact resistance. Neoprene seal and IP-65 Protection
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