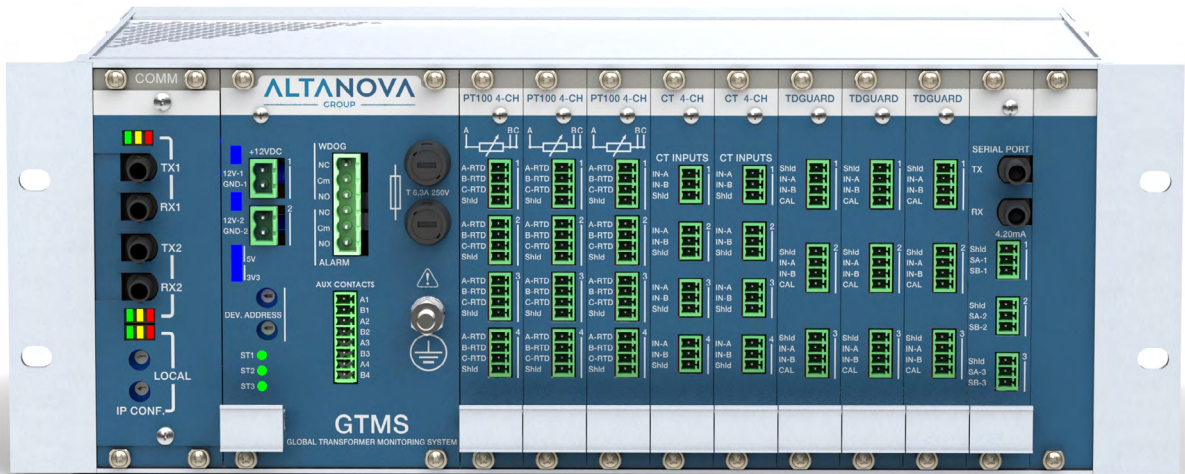


EDS

Overall online condition monitoring



ALTANOVA

GROUP

Advanced testing and monitoring solutions

Technical Specification

Power transformer monitoring unit

With the use of sensors and diagnostic functions, EDS PT unit helps to detect in advance potential failure of all the main components of a power transformer, avoiding the risk of destructive shutdown. It also allows the operator to use the Power Transformer at a maximum power load, without accelerating the aging of the transformer itself.

The monitoring modules are installed close to each monitored sub-system, in their own cabinet or in an existing ones and they are designed for indoor (i.e. existing 19" cabinets) and outdoor installation.

The condition monitoring system for power transformer has two main configurations, with different functionalities: transformer monitoring and bushing monitoring.



Transformer monitoring

Monitoring Capacity	1x 3-phase transformer
Analog Input Channels	12 channels for temperature measurements (PT100)
	12 channels for current measurement (CT)
	3 channels 4-20mA (optional)
Sample rate	12.5kS/s all channels
Amplitude bit resolution	16 bit
Accuracy of temperature measurements	±0.5°C
Accuracy of current measurement	±0.1% of full-scale
Range of temperature measurement	-30÷120°C
Range of current measurement	0÷200mA
Measurements	Load current (1x) Interrupted currents (3x) Ambient temperature (1x) Top oil temperature (1x) Bottom oil temperature (1x) Heat exchangers oil temperatures (8x, optional) Winding temperatures (8x, optional) Hot spot temperature IEC60076-7 Motor current of ventilation/oil pumps (8x)

Transformer monitoring

THERMAL MONITORING

The unit can be customized for condition monitoring of the following features:

- Bottom oil temperature
- Top oil temperature
- Hot spot temperature calculation according to IEC60076-7
- Ambient temperature

VENTILATION MONITORING

- Oil temperature of heat exchangers
- Operating times of fans and pumps
- Motor currents of fans and pumps
- Efficiency of ventilation

BUSHING MONITORING

- Sum of leakage currents
- Rate of change of tan-delta
- Rate of change of capacitance
- Bushing temperature
- Tan-delta
- Capacitance
- Measure of voltage reference CVT/PT

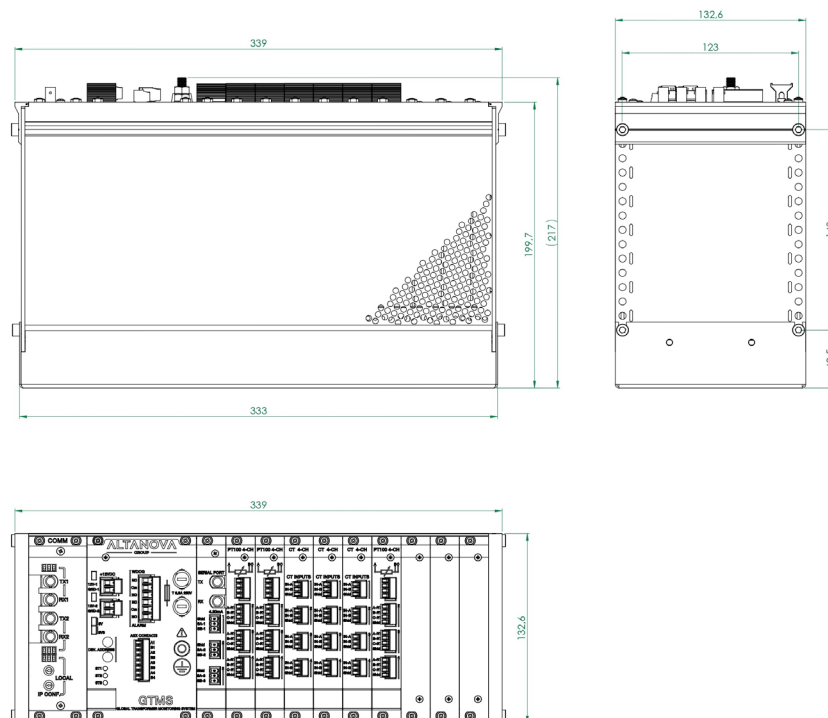
Bushing monitoring

Monitoring Capacity	3 or 6 bushings
Signal Input Mode	Differential
Input Impedance of TDSensor	less than 20 Ω
Operating Voltage	less than 4Vrms
Maximum Peak Voltage	90V peak (200V peak on PT/TVC inputs)
Analog Input Channels	12 channels for temperature measurements (PT100) 6 channels for leakage current measurement (TDSensor) 6 channels for voltage measurement (reference PT/CVT) 3 channels 4-20mA (optional)
Sample rate	12.5kS/s all channels
Amplitude bit resolution	24 bit for leakage current and voltage measurement, 16 bit for the others.
Accuracy of temperature measurements	±0.5°C
Accuracy of Tan-Delta and Capacitance	Tan-Delta: 1% of full-scale Capacitance: 1% of full-scale
Measurement Technology	Leakage current
Range	Tan-Delta: 0.001 - 1 Capacitance: 1pF - 100nF Leakage current: up to 200mArms
Measurements (basic)	Sum of leakage current (amplitude and phase) Rate of change of Tan-Delta Rate of change of Capacitance Bushing temperature Tan-Delta Capacitance Measure of voltage reference PT/CVT

General characteristics

Input Power	12 VDC (bare unit) 100 - 240 V AC 50/60Hz (outdoor box) 110 - 370 V DC (outdoor box)
Power consumption	30W (bare unit) 150W (outdoor box)
Dimensions (bare unit)	3U height / 13" wide
Dimensions (outdoor IP65 enclosure)	900x900x300mm
Alarms (Dry contacts)	1NC & 1NO, 24VDC/ 1A
Interface	Ethernet RJ-45 and fiber optic ST
Output protocol	IEC60870-5-104
Operating Temperature	-40 - +55 °C
IP degreee	20 (bare unit) 65 (outdoor enclosure)
Communication	Ethernet port with TCP / IP protocol
LAN connection	ST fiber optic connectors multimode 62.5 / 125 micron
Malfunction signal (Watchdog)	Power supply failure
Synchronization	Through IEC 60870-5-104; On-board real-time clock (in case of temporary interruption of the external sync)
Web user interface	Web-server
Data processing	PC Cortex A9 dual-core CPU 1 GHz; DSP BF537 Analog devices; FPGA A3P600 Microsemi
Data Storage	One micro SD card slot
Memory	512 SDRAM, 1Gb Flash

Dimensions



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