

QUALITROL® QTMS

Transformer Monitoring System



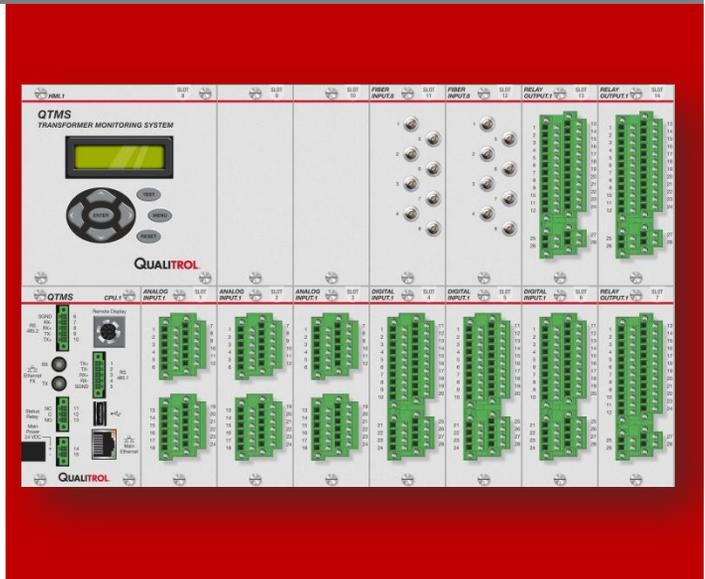
Real time transformer monitor providing a comprehensive look into asset health through condition based monitoring

- 5 year product warranty; reliable product platform
- Modular design; full customization of monitoring parameters to meet specification
- Simple system configuration; web based interface software
- Field upgradeable; hot swappable modules with wiring on the front panel of the unit

Product Summary

Description: As industry trends continue to require higher transformer utilization with reduced operations and maintenance budgets it is becoming vital to reliably monitor asset health in real time. Real time monitoring of parameters such as temperature variations, partial discharge, dissolved gas generation as well as others vital transformer factors may indicate early warning signs of potential risks to the electrical network and associated assets. Early detection of transformer abnormally may allow for a shorter issue resolution cycle and avoidance of unnecessary maintenance or even potential unplanned outages.

Application: Transformer monitor for condition based, continuous online monitoring of asset health. Interfaces with a variety of Qualitrol, third party smart sensors, and gauges to accurately measure transformer parameters vital to asset management. The QTMS utilizes a modular approach allowing for full system customization to specification. Modules are hot swappable and field upgradeable with user configurable through web based software.



Product Reliability

- Robust design and material sets that are thoroughly tested to provide peace of mind in the field. Standard 5 year product warranty.
 - Bring all transformer sensor data into one central location with security to ensure data protection.
 - Reduce installation and configuration time due to ease of system use. Designed to be user friendly with web based configuration software and wiring located on the front panel of the unit.
-

Highly Customizable

- Optional display screen and module variety allows for a high level of customization per transformer specification.
 - Supports up to 14 I/O modules of any configuration and orientation based on monitoring needs.
 - Web based software may be accessed and easily configured in a variety of methods . No need for field upgrades.
-

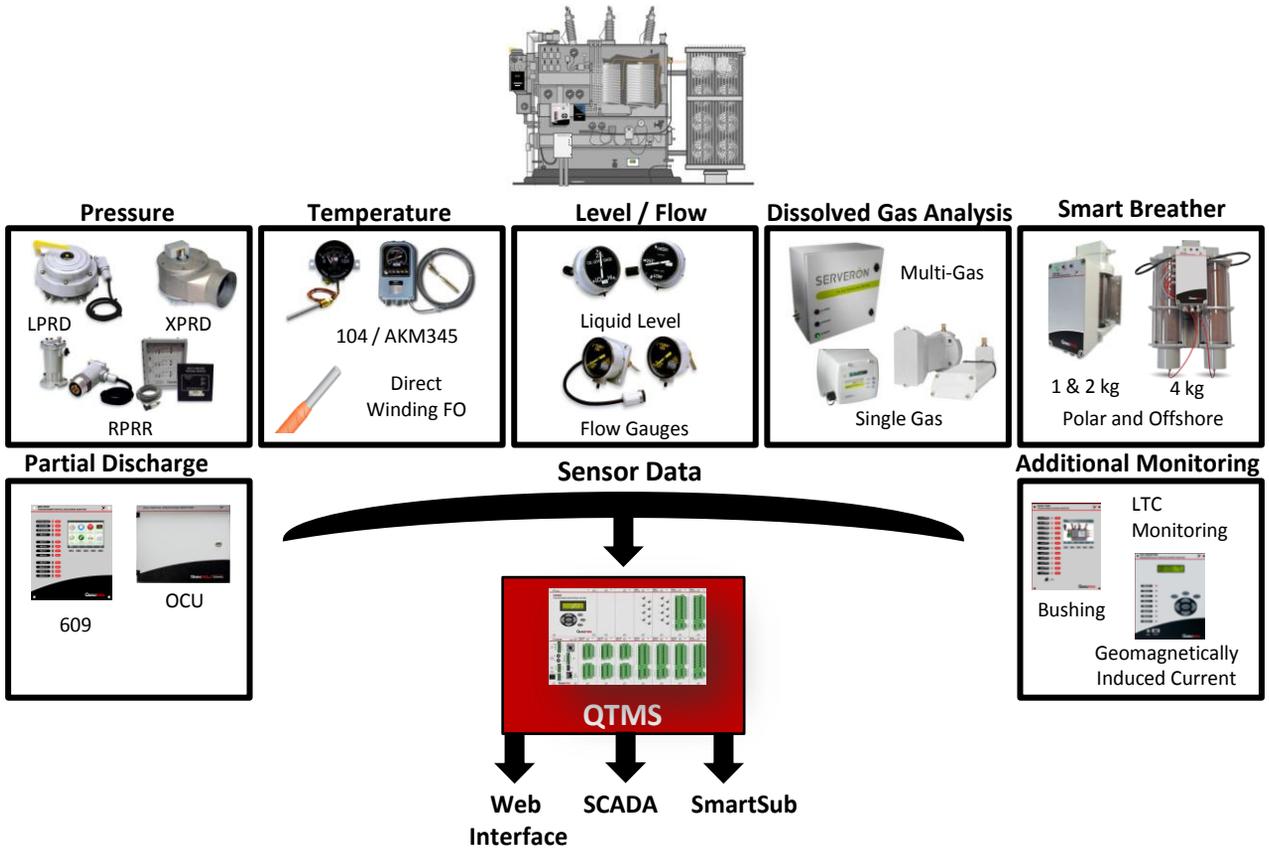
Simple Configuration

- Fully field configurable by the user with Web based software.
 - Field upgradeable hardware modules which can be added or removed at any time. Orientation of modules may also be changed at any time.
 - NERC/CIP security features
-

Field Upgradeable

- Modular approach with wiring on the front panel of the unit for easy access.
 - Hot swappable, field upgradeable, modules for QTMS units already in use.
 - Universal power supply
-

Why is Online Monitoring Important to Asset Health?



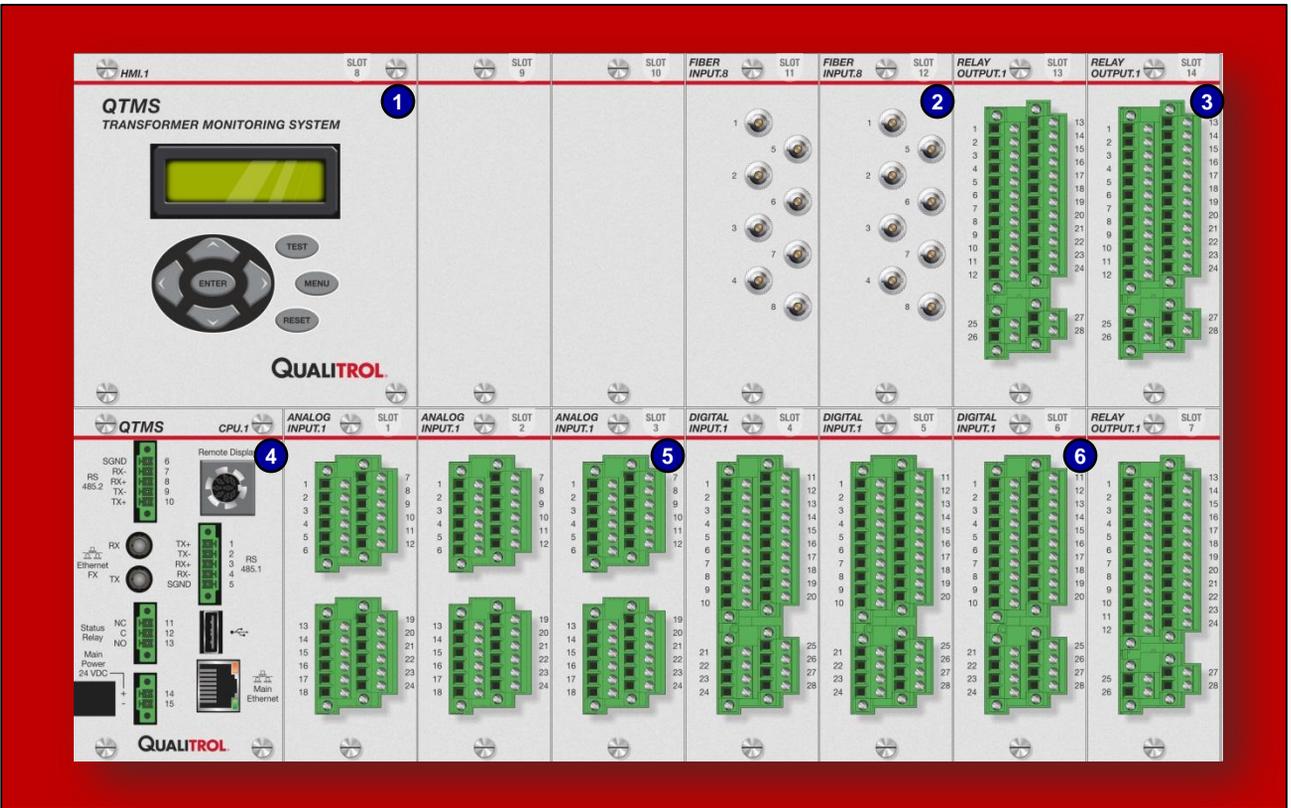
With an aging infrastructure under higher utilization demands and shrinking operations and maintenance budgets it is crucial to monitor existing transformer health. Online monitoring may extend useful asset life while avoiding unnecessary maintenance pitfalls and aid in mitigating potential risks of unexpected outages. A majority of key transformer parameters affecting life of windings, bushings, and load tap changers may be monitored real time with smart sensors to gain an insightful window into the current health status.

Data points from multiple smart sensors may now all be fed into one central collection point of the QTMS for further analysis. The QTMS, being modular approach is a highly configurable and customizable system to meet most specifications.

The data may then be fed to a web based software platform where the user has an instant, real time snapshot into each parameter being measured on the transformer. The web interface also allows for ease in naming and configuration of smart sensors with appropriate security measures. QTMS may also be configured to interface with Qualitrol's SmartSub software for monitoring of multiple transformers and related assets.

QUALITROL® QTMS Transformer Monitoring System

A modular platform for transformer monitoring allows for complete customization and field upgrades:



<p>Display ①</p> <ul style="list-style-type: none"> • Optional push button display screen • Large backlit LCD screen • Integrated overlay buttons 	<p>Fiber Optics ②</p> <ul style="list-style-type: none"> • Accurate direct winding temperature • Accurately characterize asset aging • Available in 4, 6, or 8 inputs 	<p>Relays ③</p> <ul style="list-style-type: none"> • Versatile control of cooling systems, alarms, and trip signals • 8 relays per module • Up to 112 relays available per system
<p>CPU ④</p> <ul style="list-style-type: none"> • USB and serial port s; IEC61850, DNP 3.0, Modbus, IEC60870 • Web based interface • Universal power supply 	<p>Analog Inputs ⑤</p> <ul style="list-style-type: none"> • Accepts a variety of analog input types with flexible configuration • 8 analog inputs per module • Up to 112 analog inputs per system 	<p>Digital Inputs ⑥</p> <ul style="list-style-type: none"> • Completely configurable per specification with wiring on front panel • 14 digital inputs per module • Up to 196 digital inputs per system

<p>Bushing Monitor</p> <ul style="list-style-type: none"> • Real time monitoring of bushing health • Detect early changes in Tan Delta • Detect early changes in capacitance 	<p>Rapid Pressure Rise Relay</p> <ul style="list-style-type: none"> • Help prevent catastrophic damage due to sudden pressure increases • Trip function to avoid further damage due to potential fault occurrence
--	--

QUALITROL® QTMS Transformer Monitoring System

Technical Specifications		
Power Supply		Universal; 90 - 264 VAC, 50/60 Hz and 127 - 300 VDC; < 50 watts Fuse: 5.0A / 250V
Processor Module		TX6-DL Dual Core Processor
		10/100 Ethernet TX, RJ45 Port
		USB-A port
		RS485, 4-wire communications port
		Display port for optional remote display
Communications Module	Option 1	Supply power input connection
		Ethernet FX, ST connector
		RS485, 4-wire communications port
		System Status Relay
Communications Module	Option 2	Supply power input connection
		10/100 Ethernet TX, RJ45 port
		Serial Fiber Optic Port, ST connector
		System Status Relay
		IRIG Input Connection
Data Communications	Protocols Serial:	DNP 3.0 (level 3), Modbus, IEC 60870
	Protocols Ethernet:	IEC 61850, DNP 3.0 (level 3), Modbus, IEC 60870
Memory	Data Logging	100 variables; store rates 1 minute to 24 hours
	Event Recorder	32 parameters at 15 second capture rate for 90 days
Display	Optional	LCD, 2 x 16 characters,
Module Parameters		Supports up to 14 I/O Modules
Analog Input Module	Inputs:	Measures up to 8 parameters
	Accuracy:	+/- 0.5% full scale input range
	Temperature:	100 ohm platinum (Pt100), 10 ohm copper (Cu10)
		RTD; simulated winding
		Liquid/ambient temperature range: -40 - 120°C Winding temperature range: -40 - 200°C
	Current:	Clamp-on CT, 0 - 5A, - 10A, - 20A, -100A and others available
	DC Current Loops:	0 - 1 and 4 - 20 mA DC
	DC Voltage:	0 - 100 mV DC and 0 - 10 VDC
	AC Voltage:	0 - 140 VAC and 0 - 320 VAC; 50/60 Hz
	Potentiometer:	1500 - 15,000 ohms
	Switch Contact (dry):	Open/Closed
	Switch Contact (powered):	>80 V or >130 V open, jumper selectable; optically isolated
	Tap Position:	Up to -10 to +10 VDC and 0 - 125 VDC or non-powered; Resistor Bridges of 40 - 2500 ohm(1% acc, 100 ppm); or 0 - 1 mADC or 4 - 20 mADC
Digital Input Module	Inputs:	Up to 14 optically isolated inputs
	Maximum Voltage:	250 VDC
	Threshold Voltage:	>60 VDC
Fiber Optic Module	Inputs:	Up to 8 fiber optic input probes
	Accuracy:	+/- 1°C
Output Relay Module	Output Relays:	8 Form C relays; 10 A @ 120/240 VAC; 10 A @ 30 VDC
	Output Current Loops:	2 Loops; 0 - 1 mA (max resistive load 10,000 ohms)/ 4 - 20mA (max resistance 500 ohms); other options available

QUALITROL® QTMS Transformer Monitoring System

Environmental Conditions		
Immunity	Dielectric Potential	2500 VAC ACROSS ALL TERMINAL BLOCKS; 60 SECONDS TO GROUND
	Radiated Emissions	EN 55011:2009 + A1:2010 / CISPR 11:2009 + A1:2010
	Electrostatic Discharge Immunity	IEC 61000-4-2:2008
	Radiated Electromagnetic Field Immunity	IEC 61000-4-3:2010
	Electrical Fast Transient Burst Immunity	IEC 61000-4-4:2012
	Surge Immunity	IEC 61000-4-5:2005
	Radio Frequency Common Mode Immunity	IEC 61000-4-6:2008
	Power Frequency Magnetic Field Immunity	IEC 61000-4-8:2009
	Voltage Interrupts	IEC 61000-4-11:2004
Environmental	Operating Temperature	-40°C TO +85°C
	Storage Temperature	-60°C TO +85°C
	Operating Humidity	5-95% NON-CONDENSING
	Shock	10g, HALF-SINE IN THREE ORTHOGONAL PLANES
	Vibration	SWEEP 50 TO 240 Hz @ 0.004 INCH DISPLACEMENT IN THREE ORTHOGONAL PLANES 50-240 Hz SWEEP
	Optional Heater	120/240 VAC heater option
	Size	19 inch rack; 6U high

QUALITROL® Field Services

To further improve reliability, QUALITROL provides comprehensive education and on-site commissioning services, maintenance contracts and technical support to all customers worldwide. Emergency response is available on all products and services.

About QUALITROL®

QUALITROL Company LLC manufactures substation and transformer monitoring and protection devices used by electric utilities and manufacturing companies. It is the global leader in sales and installations of transformer asset protection equipment, fault recorders and fault locators. Established in 1945, QUALITROL Company produces thousands of different types of products on demand, each customized to customers' unique requirements.

©2014 Qualitrol® Companies, LLC, and ISO9001 system certified company. All rights reserved. Information subject to change without notice. All trademarks are properties of their respective companies, and noted herein. AP-XXX-XXX-XXX