framatome

EDG Monitoring: Surveillance and Analysis

Data acquisition, continuous monitoring, visualization, logging, analysis and reporting for Emergency Diesel Generators (EDG)

Continuous online monitoring, surveillance and analysis of the EDG increases the reliability by detecting early wear withering creeping trends or spontaneous anomalies. Modular setup with a wide range of inputs / outputs and a universal software tool allows customized flexible solutions.

Challenge

Diesel Engines and complete Emergency Diesel Generating sets (EDGs) are the key power source in case of loss of offsite power. But this complex rotating equipment is subject to wear and erosion.

If creeping deterioration trends over the operating times could be detected early, and logging of spontaneous anomalies during periodic tests allows for detailed analysis, then the availability and reliability of EDGs can be increased significantly.

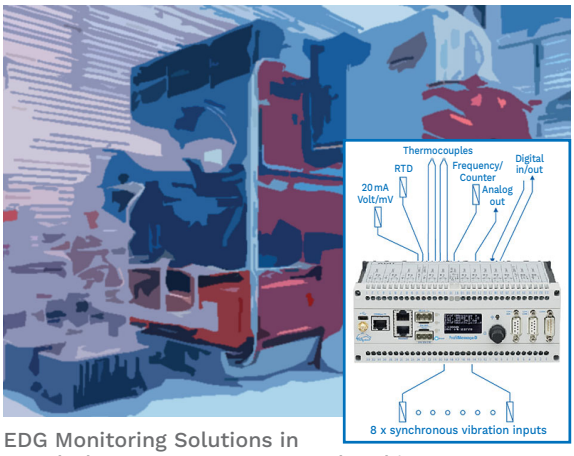
Continuous online monitoring, comprehensive data analysis and fleet management provides the decision for early inspection and replacement to reduce outage periods and avoid plant shut-down times.

Solution

The EDG monitoring system implemented by Framatome allows a variety of solutions customized to the specific needs:

- From simple to complex tasks, from pure data logging, sophisticated visualization and automatic analysis, surveillance and reporting.
- The range of inputs covers slow changing process variables (temperatures) and highly dynamic transient measurements (speed, voltages, pressures).
- Data exchange with other digital devices extends the monitoring coverage and allows real-time exchange with other devices (protection relay, lube oil monitor) and plant systems (SCADA, plant recorder, asset management).
- Regular download from the secure on-board autonomous memory to a data server offers the continuous long-term data storage and fleet-management for multiple EDGs.
- Various analysis tools feature simple analog time-signal trends, complex vibration monitoring by Fourier-(FFT-)cascade orbital diagrams and X-Y characteristics (fuel rack position; combustion pressure vs crankshaft angle).
- Enables stationary & mobile process visualization and recording as well as offline analysis, editing and reporting.
- Additional software-calculation channels and other statistics allow detailed offline investigations on the recorded raw data.
- Increase Reliability and reduce maintenance costs.
- Reports of the periodic test runs can be automized and harmonized.
- Export interface to other existing tools and programs is available.

Your performance
is **our** everyday **commitment**



EDG Monitoring Solutions in stand-alone or cross-connected architectures

Customer benefits

- Efficient EDG condition monitoring and continuous surveillance
- Easy periodic test recording and automatic reporting
- Increased reliabilitiy and reduced maintenance costs
- One platform instead of multiple hardware and software brands
- Easy retrofit into existing EDG systems
- Extension to comprehensive modern local, remote and wireless HMI
- Modular architecture allows easy future modifications and extensions
- « One Box Does It All » - Options for vibration, dynamics analysis, alarm logs, visualization, monitoring, automation
- Intuitive data handling, with seamless switchover from current to historic records
- Comprehensive data management and statistics

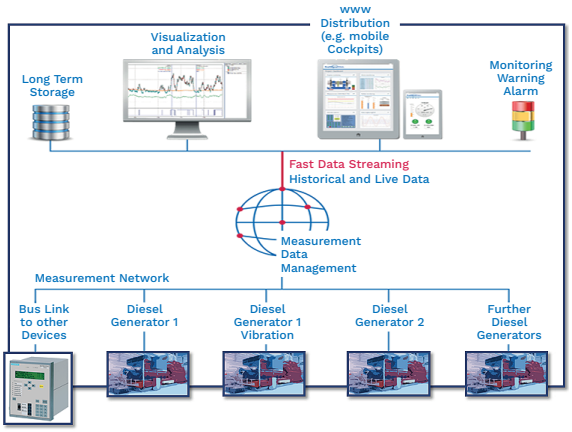
Technical information

Universal and galvanic isolation: Inputs and outputs are differential, high-precision and galvanically isolated – from each other and from the power supply. Earth loops and non-isolated sensors present no problems. Inputs can be individually configured for extremely flexible measurements (mV, mA, RTD and thermocouples, digital inputs and outputs)

Data storage functions: The integrated data memory can be partitioned and triggered to enable users to save their data either continuously or according to specified events. The PC software is used for both manual and automatic data memory read out; data transfers from the data logger's memory can also be performed by simply using a USB stick. The independent storage within the devices ensures data safety even in the event of a PC or network failure.

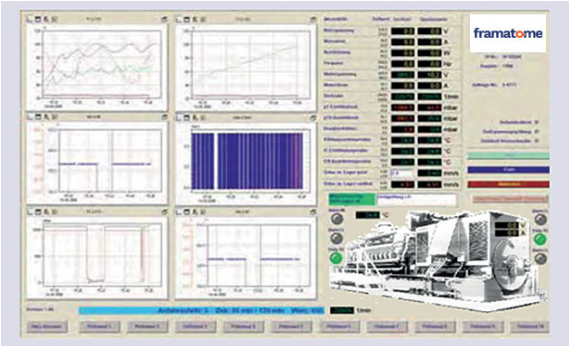
Diverse range of field bus interfaces: PROFIBUS DP, Modbus TCP and RTU, free config. CAN interface, RS232/485 ports, PC or server connection via high speed Ethernet.

Universal software: Devices configuration; online data transmission and storage to desktop PCs or data servers; data visualization and analysis (also in any other software via the OPC server); up to 1000 times greater temporal resolution than regular SCADA systems; universal software for measurement data, automation process data visualization, warnings and alarms surveillance; areas of application range from basic data archiving through to visualization procedures and fully automated systems with report functions.



Comprehensive Measurement Network

EDG Health Condition at a Glance:



Typical customized Human Machine Interface (HMI) with trends and operation elements.

Extract of EDG Monitoring and Surveillance Applications

- Cylinder Combustion – Temperature Mapping
- Combustion Pressure – Engine Signature
- Auxiliary Systems Performance – System-wide data collection and real-time surveillance and calculations
- Vibrations FFT and Monitoring – Fingerprint Check
- Torsional Behavior – Speed Measurements
- Acceptance Criteria – Speed & Voltage Transients
- Periodic Test Support – Continuous Surveillance; Performance Check; Auto Warnings and Alarms
- Online & Offline Data Analysis – Auto Report Creation
- Fleet Management – Cross-Fleet Data Management
- Process Data Visualization – Local & Remote & Mobile Visualization of Process Data, Equipment Status, overall Events / Warnings / Alarms
- Expert System – Easy and Continuous implementation of Experience, Operators Know How, Studies Results, etc. for continuous improvement

References for fixed installed and mobile applications:

- Airbus Deutschland GmbH
- EnBW Kraftwerke AG
- Evonik Degussa GmbH
- Framatome GmbH
- MAN Diesel und Turbo SE
- MTU Friedrichshafen GmbH
- Robert Bosch GmbH
- Siemens AG
- Vattenfall AG
- Zeppelin Baumaschinen GmbH

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