

## EMPATH™ Continuous Monitoring System (ECMS)

Enhance your motor reliability program while lowering testing cost

### Challenge

Electric motors and mechanical systems are subject to deterioration and damage that can impact operations, leading to expensive repairs and downtime. Electrical Signal Analysis (ESA) methodology is an additional tool to be used in the plant's motor reliability maintenance program. The fully-automated, remotely-operated ECMS platform can improve motor testing efficiency and reduce the cost of current testing methods.

### Solution

Framatome's proven product, EMPATH™ helps owners detect potential motor problems early, enabling timely repairs and avoiding serious damage. The EMPATH Continuous Monitoring System (ECMS) is designed to automatically test multiple motors from a remote location.

### EMPATH Continuous Monitoring System

ECMS hardware consists of a 32 channel multiplexer, followed by a signal conditioner. The inputs are provided by the E-Plug modules permanently installed in the Motor Control Centers (MCCs). ECMS output is sent to the server over Ethernet connections.

ECMS automatically pulses the motors at user-defined intervals, collects and analyzes the data, and then stores it in various locations including the cloud servers. In cases where the results are out of tolerance, ECMS sends various flags including SMMs, emails and on-screen indications.

The tolerance limits can either be set by the operator or determined automatically using the statistics of the collected data.



### Customer benefits

- Can improve motor testing efficiency and reduce the cost of current testing methods
- Automatically test multiple motors from a remote location
- Collected data is fully compatible with EMPATH, which helps owners detect potential problems early enabling timely repairs and avoiding serious damage
- Can be used as a data acquisition unit for EMPATH
- Total of 3,200 motors can be monitored per server

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

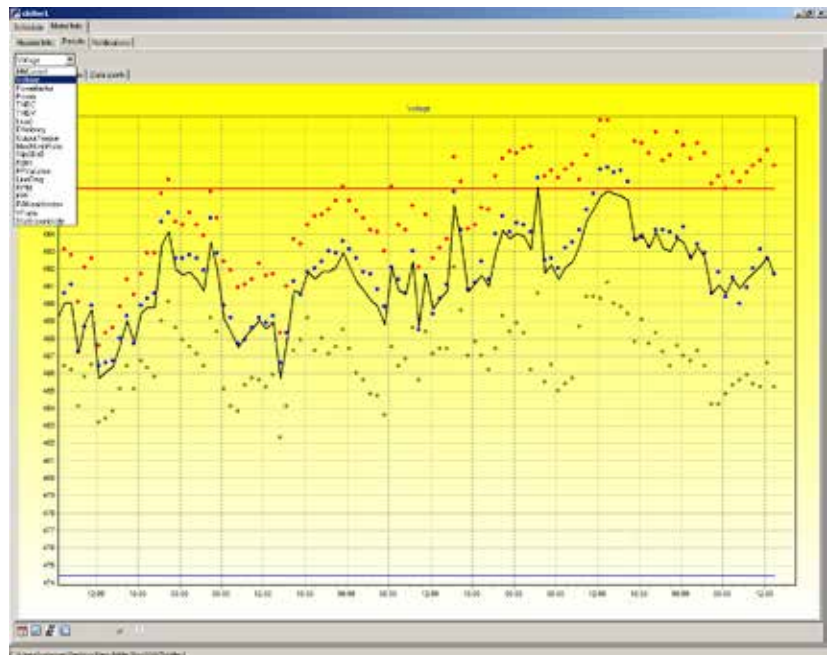
## Technical design

- 32 channels (each channel consists of three phases of current and voltage)
- Up to 100 ECMS hardware can be installed per server (total of 3,200 motors can be monitored per server).
- Inputs are provided by E-Plug inputs
  - 1,000 VAC (phase-to-phase)
  - 1000 Amp
    - o For higher voltage or current inputs, the secondary side of the PTs and CTs are used
- Sample rate: 12,000 samples/sec/channel
- Collected data is fully compatible with EMPATH
- Can be used as a data acquisition unit for EMPATH
- Data I/O is done over Ethernet
- Power supply 110/220 VAC

### ECMS lets user choose which combination of parameters to monitor, such as:

- Current and voltage
- Power factor and power
- THDC and THDV
- Load
- Efficiency
- Output torque
- Motor unbalance ratio
- Slip sideband amplitudes
- Rotor bar health category
- Power factor variation
- Line frequency
- Motor RPM
- Rotor bar health index
- VF ratio (for VFDs)

ECMS can also be controlled by TCP/IP protocols, which makes it suitable to SCADA type supervisory systems.



ECMS showing the collected voltage data (with the upper and lower limits)

Contact: NPC@framatom.com  
www.framatome.com