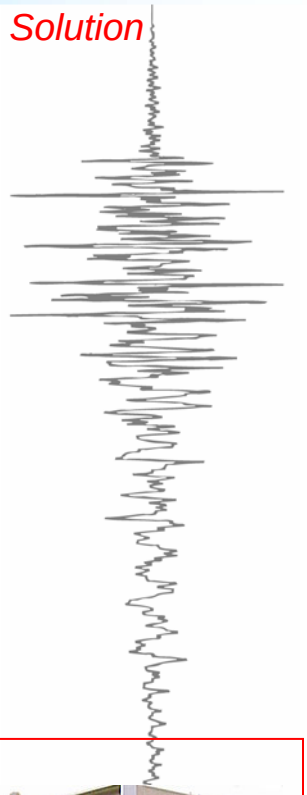
KINEMETRICS

# Condor System

## For Nuclear Power Plants

*The Complete Earthquake Monitoring Solution*



## Key Benefits

- The most-comprehensive earthquake monitoring solution for nuclear power plants (NPPs)—including seismic-event data recording, retrieval, analysis and notification via hardware alarms, e-mail & hard-copy reports – all in one system
- Automatic OBE analysis & alarm generation within minutes of seismic events
- Lowest overall cost-of-operation & cost-of-maintenance
- High reliability – dual redundancy for all critical components
- Easy maintenance – extensive built-in testability
- Complete networking support – uses your NPP's local area network to remotely control and monitor the system
- Designed to meet all applicable nuclear industry regulations (USNRC RG 1.12, RG 1.166, IEEE 344 and ANSI/ANS 2.2)
- Easy and cost-effective upgrade capability – can use already installed sensors and cables
- Recorder based on Kinemetrics' industry standard, the field-proven Altus Etna

## Overview

The Condor System is the world's most-advanced and cost-effective system for monitoring seismic activity at nuclear power plants. With its more than three decades of experience at developing and servicing systems for the special needs of the NPP market, Kinemetrics is proud to offer this product landmark.

Carefully designed for maximum effectiveness & ease-of-use, as well as for lowest cost of operation & maintenance, the Condor System quickly responds when a seismic event occurs, to help the NPP's operators make the most informed decisions possible. Featuring comprehensive event-analysis & alarm-notification capabilities, the Condor System drastically reduces the time required for proper data analysis following a seismic event.

We also ensured high reliability by utilizing dual-redundant components for every critical part, and based the recorder portion of the system on the industry-standard Etna. More than 4000 units of ETNA are successfully in use around the world.

We made sure the Condor System was fully qualified to meet or exceed all applicable standards and finally, we created a user interface that keeps the set up and maintenance of the Condor as quick and easy as possible.

The Condor Seismic Monitoring System is also available as Condor KTA, which is designed to meet the German Nuclear Safety Standards Commission (KTA) 2201.5 and KTA 2201.6 requirements and is seismically qualified to IEC 68-3-3. The Condor KTA system is also TUV certified.

TÜV MANAGEMENT SERVICE ISO 9001

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# Condor System Specifications

## Central Controller

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|---|---|
| General Description | The Central Controller provides control and monitoring of all the recorders in the system (including free-field recorders), as well as the Alarm & Interconnect Panel. A single Controller can support up to 9 single recorders, and the Central Controller interfaces to your NPP's LAN to allow remote control and monitoring, automatic event alerting via remote printing. Features automatic and interactive event-data analysis, including OBE/CAV and FFT, along with configurable built-in tests of entire system. |
| Computer | The Central Controller controls and monitors the entire system, and a custom software application provides the user interface, based on an industry standard Pentium PC, running Microsoft Windows XP Pro operating system. Housed in a 7" rack mount panel. |
| LAN I/F | 10BaseT, 10Base2, or 10BaseF. |
| Display | VGA, 1024H x 768V resolution, 15'' TFT LCD in a rack mount panel. |

## Recorder

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| General | Each 7" –rack mount Recorder panel includes two tri-axial, 18-bit recorders. Can be ordered in a single-recorder configuration. |
| Data Acquisition Type | Over-sampled Delta Sigma system with 24-bit digital signal processor. |
| Dynamic range | 108 dB @ 200 sps. |
| Frequency response | DC to 80 Hz |
| Resolution | 18-bit |
| Sampling rate | 100, 200, 250 sps. |
| Number of channels | Three (3) channels for the single-recorder configuration; six (6) for the dual-recorder configuration. |
| Channel-channel skew | None—simultaneous sampling of all channels. |
| Trigger and Alarm | Trigger Bandwidth is from 0.1 Hz to 12.5 Hz. |
| Channel Triggering | An independent threshold for each and every channel. |
| Trigger Threshold | Selectable from 0.1% to 100% of full scale. |
| De-Trigger Threshold | Selectable from 0.1% to 100% of full scale. |
| Common Trigger | Supports multiple-recorder configuration, so that whenever one interconnected recorder triggers, all other recorders will trigger as well—guaranteeing time-synchronized event-data files. RS-232 triggering is also supported. |
| Alarm Threshold | Selectable from 0.1% to 100% full scale. |
| Storage | Fully compliant PCMCIA storage system for each recorder. Key-locked front-access door to PCMCIA cards for rack mount unit. Recording capacity is approx. 8 minutes per MB on Memory Card, 3 channels of 24-bit data @ 200 sps. |
| Firmware | Multi-tasking operating system supports simultaneous acquisition & interrogation; boot loader allows remote firmware upgrades. |
| Serial interface | Packetized protocol, with simple terminal loop control and data retrieval, connected to the Central Controller. |
| Timing | Free-running disciplined oscillator (Std); GPS (Opt). A single GPS receiver integrates completely with the entire system, providing timing, internal-oscillator correction, and position information for all interconnected Recorders in the system. |
| I/O and Display | Four (4) LEDs. Display indicates Run, Event, Alarm, and Charge. Note: Alarm LED is available on rack mount unit. |
| Power Autonomy | 36 hours. Each Recorder has its own backup power independent from the central controller or other recorders. |
| Sensor | Remote FBA-3 or FBA-23 tri-axial sensors (see those instruments' respective data sheets for further information). |

## Alarm & Interconnect

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| General | Housed in a 3½" rack panel, this provides a relay, general-purpose Input/Output, and LEDs for Recorder Alarms, Event, OBE, AC Loss and DC Loss. Offers interface to NPP cables using terminal blocks, and up to 4000' of interconnect for multiple Recorders. |

## Uninterrupted Power Supply (UPS)

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| General | In case of an AC power outage, the UPS provides up to one half hour of operation for the Central Controller. |

## Printer

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| Standard Printer | Hewlett-Packard color inkjet in a 10-1/2" rack mount panel. |

## System Cabinet

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| | Standard or seismically braced, 24" or 30" depth. |

## Environment

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| Recorder and Sensor | Operating Temp: -20°C to 70°C; Humidity: 0% to 100% RH |
| All other equipment | Operating Temp: 5°C to 40°C; Humidity: 50% to 80% RH (Note: All other equipment are installed in the system cabinet) |

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