Data Analyst™ Processing Platform

Continuous Spectroscopic Monitoring Platform

DESCRIPTION

The Data Analyst system is a continuous spectroscopic monitoring solution designed to provide valuable insights to site operators and maintenance personnel. It can reduce or eliminate the routine scheduled sample collection frequency, which reduces the personnel dose and chance of accidents.

The Data Analyst platform is the core building block for advanced online monitoring systems that provides real-time nuclide activity results. The software and analysis engines are designed to run continuously both recording the data locally and transmitting live data to real-time monitoring systems.

It can be used with high resolution detectors such as HPGe, mid-resolution detectors like CZT, or with large and compact highly efficient detectors like scintillators. Its compact and embedded design makes it ideal for a wide variety of uses. It can be embedded within larger systems such as stack monitors and scanning systems, or be used on mobile platforms like drones and robots.

It provides a large database of nuclide-specific results at frequent time intervals, which can be mined to provide early detection of abnormal conditions, or to predict future conditions. Although it might not replace manual sampling in all situations, it can reduce the routine scheduled sample collection frequency, and allow a targeted sample collection and off-line analysis for special cases which would reduce costs and increase safety.

FEATURES

✔ Compact spectral aquisition and data processing platform including embedded standard Genie™ software algorithms

✔ Performs full nuclide identification and quantification for continuous trending of nuclide activity over time

✔ Can perform multiple analysis simultaneously with different count times, nuclide libraries and analysis parameters

✔ Can use ISOCS™ software mathematical efficiency calibrations for accurate quantitative assay results for complex geometries

✔ Completely unattended operation once configured and turned on

✔ High-capacity onboard storage can retain multiple years of analysis results from continuous measurements

✔ Compatible with:
  – Lynx® II DSA with HPGe or scintillation detectors
  – Osprey® Tube Base MCA with scintillation detectors
  – GR1™ family of compact CZT spectrometers

✔ Supports EcoGamma™ monitor input for recording of local dose rate via a USB or Ethernet connection

✔ Able to record data from non-spectroscopic sensors along with spectroscopy results (e.g. doserate, temperature). Data from other sensors can be optionally recorded (e.g. pressure, stack flowrate, sample flowrate), and used in analysis calculations

✔ Web-based GUI for configuration and for trend plots of nuclide results from live and historical data

✔ Results and spectra can immediately be exported to remote FTP server

✔ Supports multiple triggering modes for on-demand acquisition and analysis

✔ Nuclide activity alarm calculation step to alert user of unacceptable activity

✔ Versatile GPIOs for triggered inputs, and/or alert/alarm/fault outputs
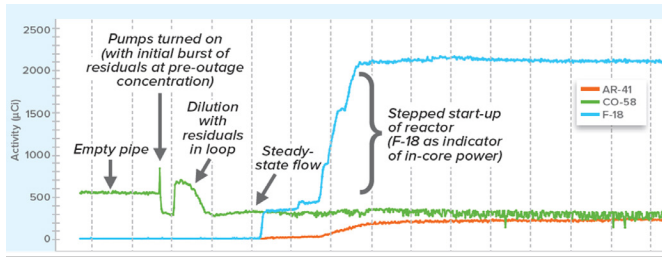
Example analysis of letdown pipe during outage using the CSM-GR1™ monitor

APPLICATIONS AND BENEFITS

- Live monitoring of NPP reactors during outage can detect and trend concentrations of key nuclides related to actions being performed such as during forced oxidation processes

- Correlation of transients to core reactor activities help to localize "leakers" during local flux depression operations, without the delay of grab sampling and labratory analysis

- Continuous radiation monitoring of effluent stacks, liquid or gas in pipes and tanks, and for effluent from waste processing

- Reduces labor to collect samples, process them, and count them in the laboratory

- Reduces dose and safety risk collection, transport, and processing of hazardous samples

- Gives results immediately, rather than in several hours after sample collection, transport, processing, counting, and data analysis

- Gives continuous results with no gaps as you would have with manual sample extractions

- Provides large database of nuclide-specific results on frequent time intervals, which can be mined to provide early detection of abnormal plant conditions, or to predict future plant conditions

- By monitoring upstream systems, the data can be used to forecast how areas down stream will be affected and aid in minimizing exposure by knowing the radionuclide mix

RELATED PRODUCTS

DA-Prospector – Provides advanced multi-nuclide graphical trending and reporting capabilities to easily review and evaluate months of archive data. It can read in data archive files produced by a Data Analyst system. The software can also be used to remotely monitor and display graphically live acquisition data retrieved from the Data Analyst system via the use of the FTP export functionality. Key results of interest can be highlighted and with a double mouse click the spectrum opened in Genie software.

DA-Prospector Data Visualization and Trending

The real value of collecting continuous isotopic data is to learn from it and make decisions that save time, money, and increase safety. DA-Prospector provides a rich set of tools to easily find important events and visualize isotopic changes over any period of time. You can quickly add or remove nuclides from the trend plots and take snapshots for reports and presentations. The tabular data is easily exported to Excel for further analysis and reporting.

Horizon® Platform – A supervisory system which provides visibility and oversight to a network of radiation monitoring systems. It gives users access to live data from instruments around the site and perform remote operations that the instruments support.

The Horizon platform can be used for monitoring one or more Data Analyst systems along with other radiological measurement instruments.

Horizon Data Analyst Detail Screen

It is built on a SCADA platform to provide easy access to data from multiple workstations on the site network. Users are quickly alerted to instrument alarms and events, and able to generate reports, review trends, and analyze past events from historical instrument data.

S573 ISOCS Calibration – A common accessory used to generate mathematical efficiency calibration files for import into the Data Analysis system. This software gives you the ability to easily produce accurate quantitative gamma assays of most any sample type. It uses detector characterizations produced at the factory using a combination of NIST-traceable source measurements and iterative MCNP modeling.
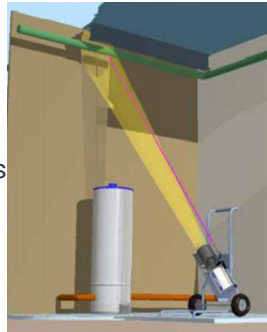
ISOCS Modeling Software

The 21 different mathematical source shape templates provided make it easy to replicate a wide variety of geometries you would encounter – planar surfaces, rectangular boxes, pipes, barrels, applications, etc. This allows the ISOCS software to quickly mathematically produce accurate efficiency calibrations for your sample geometry without the need for radioactive calibration sources.
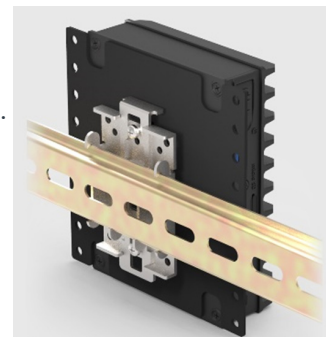
Specifications

PROCESSING PLATFORM

- **High Performance:** Multi-core CPU with 16 GB RAM to produce desktop performance in a very small form factor. It provides the processing power needed for continuous spectral analysis of multiple concurrent workflows with analysis intervals as small as one second.

- **Dust and humidity resistance:** All-metal housing with built-in heatsink provides thermal conductive cooling for failproof fanless cooling. The metal case has no fan or vents, no spinning blades or filters or tight airways to cause dust accumulation and clogging.

- **Temperature and Humidity:** -20 °C to 70 °C (-4 °F to 158 °F), relative humidity to 95% non-condensing

- **Dimensions:** 112 x 84 x 34 mm (4.4 x 3.3 x 1.3 in.) L x W x H

- **Certifications:** CE, UL Listed for USA and Canada (Registration: E510538), MIL-STD 810G (vibration and shock)

- **Networking:** 2x GB Ethernet ports, 1 PoE port, Optional Wireless LAN 802.11 dual antenna adapter

- **I/O:** 2x USB 3.0, 2x USB 2.0, Stereo line in with mic, Stereo line out, RS-232 serial port

- **Display:** 1x mini DP 1.2 rK @ 60 Hz, 1x HDMI 1.4 4K @ 30 Hz

- **Storage:** large capacity local M.2 SATA module for fast and reliable data storage

- **Power:** input voltage DC 7 V – 20 V, or 48 V PoE. Power consumption 5 W – 15 W

INCLUDED ACCESSORIES AND SENSORS

- **DA-DIN-Mount** – provides easy tool-free mounting/dismounting of processing platform to standard DIN rail. Can be attached to bottom to leave all sides accessible, or on side to minimize DIN rail footprint.

- **DA-VESA-Mount** – fastened to bottom of processing platform and provides standard VESA mounting pattern (100 mm x 100 mm)

DIN Rail and VESA Mount

- **DA-MET** – Meteorological sensor for temperature, humidity and atmospheric pressure. USB connection to DA processing platform.

- **DA-GPIO** – Compact USB device provides four digital I/O, electrically insulated from the USB bus

- **DA-LED** – Programmable multi-color LED that plugs into a USB port to provide status

- **DA-UPS** – Compact UPS with Li-polymer batteries provides about two hours of runtime during loss of main power. Operating temperature is 0 °C to 40 °C. Used to keep system running when power situation could be unreliable.

- **DA-GPS** – USB connected multi-band GPS receiver for use in mobile applications. USB cable is two meters and receiver is waterproof. Horizontal position accuracy: autonomous 2.5 m, 2 m SBAS. Heading accuracy 0.5 degrees.

- **DA-WIFI** – Optional Wireless LAN 802.11 dual antenna adapter. Used to add WiFi to a DA model without it. Requires internal assembly and reconfiguration.

ORDERING INFORMATION

MODEL	NAME	DESCRIPTION
DA-PRO	Data Analyst Solution	Includes: - Fully customized solution - 1 CPU platform with ISO and DIN rail mounts - 1 Data Analyst embedded software license - 1 Sensor for temperature, pressure, humidity (in case with USB cable) - 1 GPIO device for triggered input or outputs (in case with USB cable) - 1 USB programmable multi-color LED light indicator - Factory integration and configuration with compatible detector (with energy and FWHM calibration if unit is shipped with a detector) - For ISOCS modeling and efficiency calibration for detector, use DA-CAL-CONFIG
DA-PRO-WIFI	Data Analyst Solution with WiFi	Includes: - Fully customized solution - 1 CPU platform with ISO and DIN rail mounts - Integrated WiFi 802.11ac + BT - 1 Data Analyst embedded software license - 1 Sensor for temperature, pressure, humidity (in case with USB cable) - 1 GPIO device for triggered input or outputs (in case with USB cable) - 1 USB programmable multi-color LED light indicator - Factory integration and configuration with compatible detector (with energy and FWHM calibration if unit is shipped with a detector) - For ISOCS modeling and efficiency calibration for detector, use DA-CAL-CONFIG

DA-CAL-CONFIG	Data Analyst Calibration & Configuration	Includes:
		- Working with end user to get key requirements about the initial use of a DA system for setup and configuration
		- Generation of two ISOCS models and efficiency calibrations based upon the detector used
		  - One for point source on axis (for calibrations)
		  - One for a measurement geometry defined by end user for a typical application.
		- The ISOCS files created will be delivered so users can update the model if needed.
		- Data Analyst configuration for up to three workflows, with analysis settings and a starting nuclide library
		- Electronic versions of the setup files with installation instructions

DA-Prospector	Data Analyst Prospector	- Viewer of data from DA historical archives - Advanced visual plotting and display of nuclide results

OPTIONS:

MODEL	NAME	DESCRIPTION
DA-CPU	Data Analyst Industrial CPU Platform	Includes: - 1 CPU platform with DA software installed - Does not include software license
DA-CPU-WIFI	Data Analyst Industrial CPU Platform with WiFi	Includes: - 1 CPU platform with WiFi and DA software installed - Does not include software license
DA-DIN-Mount	DA DIN Rail Mount	Mounting kit to attach DA to standard DIN rail
DA-VESA-Mount	VESA Mount Kit	Mounting plate with VESA
DA-MET	Data Analyst Met Sensor	USB temperature sensor for use with DA to record ambient temperature with detector analysis results. Includes 6 ft USB cable.
DA-GPIO	Data Analyst GPIO	USB GPIO module which provides four digital I/O for use with the Data Analyst system to receive input triggers or provide output triggers. Includes 1 ft USB cable.
DA-LED	Data Analyst LED Indicators	USB programmable multi-color LED status lights for use with Data Analyst system
DA-UPS	Data Analyst UPS	Compact 12 V UPS for Data Analyst system to provide about two hours of runtime
DA-GPS	Data Analyst GPS	Waterproof GPS Receiver with USB Interface Horizontal position accuracy: autonomous 2.5m, 2m SBAS
DA-WIFI	Data Analyst WiFi Kit	WiFi card with new side plate for CPU box with antenna connections for 802.11ac WiFi. Two screw-on antennas included. Can be added to DA-PRO later if ordered without WiFi

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