New Generation PGNAA Elemental Analyser

AllScan® combines a rugged construction with the most recent advances in PGNAA technology to deliver the most affordable, accurate, and easy-to-install analyser of its kind in the world.

REALtime INSTRUMENTS

a division of Realtime Group Limited solutions for today and tomorrow

Why use Online Elemental Analysis?

Online Elemental Analysers **provide the ultimate in continuous real-time coal quality measurement**, by performing a complete on-line elemental analysis of a moving stream of coal on a conveyer.

This allows real-time control of processes and allows cost savings by reducing material handling and enabling immediate decisions for controlling material quality.

Online Elemental Analysers are widely used in mining and blending, and have two key advantages over conventional Ash Analysers:

(i) A much higher tolerance to changing coal types (eg from different seams), eliminating the need for multiple calibrations.

(ii) They provide much more information than just Ash, as they directly measure individual elements like Fe, Al, Si, K, S, Ti, Ca (the **AllScan**® also directly measures moisture, ash, specific energy/volatiles).

Why AllScan®?

Unrivalled accuracy and responsiveness

AllScan(R) incorporates a sophisicated algorithm - DuraG(TM) - that seperates the effect of belt loading and profile variation on the measured spectra from the effect of elemental variation on the elemental spectra. DuraG(TM) dramatically reduces measurement error.

AllScan(R) also includes - DuraSum(TM) - a powerful algorithm that eliminates the need for time-based averaging of data in order to obtain stable results. This means that significant changes in elemental composition are reported almost instantaneously, rather than minutes later. This in turn allows for rapid operational control.

These breakthrough technologies combine with the reliability of the PGNAA measurement technique to deliver the most accurate and responsive coal elemental analyser on the market today.

New cutting edge design eliminates the need for Air-conditioners to cool the electronics. The AllScan package is provided in a small footprint fully contained, and is the smallest PGNAA on the market.
The AllScan comes with an intrinsically safe auto source on/off source drive mechanism.

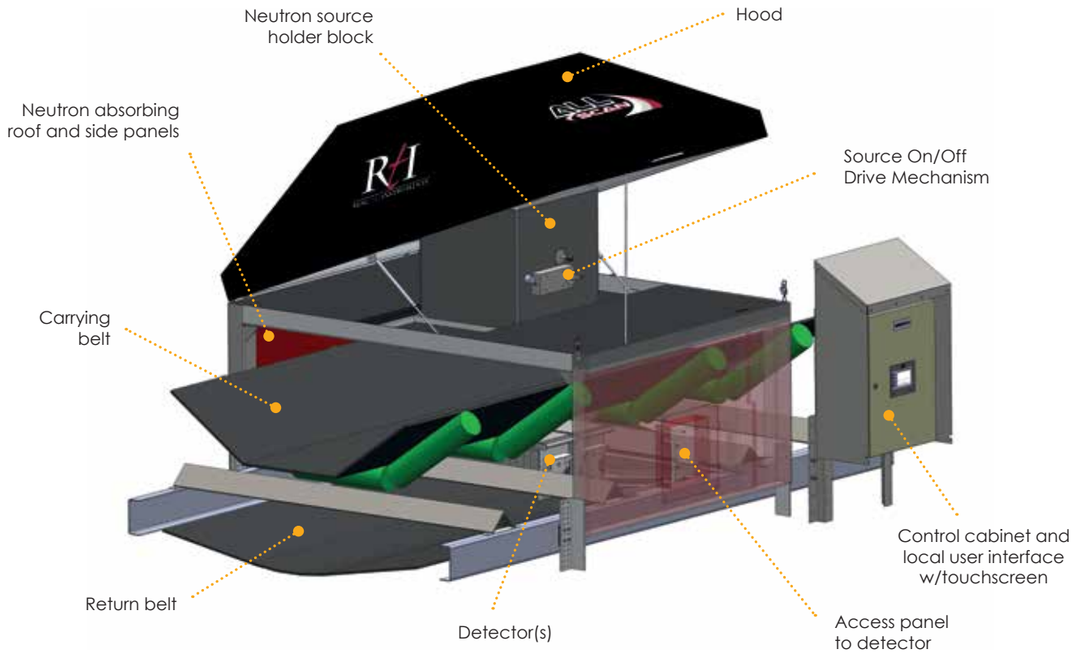
Why Real Time Instruments?

RTI have over 15 years of experience in supplying and servicing these types of Analysers to the coal industry in Australia. Our reputation for Quality and excellent Field Service and Support has led us to become the leading supplier in Australia.

RTI provides the total package of Analyser plus radioactive sources, and we take care of all radiation related requirements.

What is PGNAA?

Prompt Gamma Neutron Activation Analysis.
It is the best suited and most widely used technology for online elemental analysis of coal.



Higher Performance Online, Real-Time Results
Accurate minute-by-minute results, for multiple flow rates. Advanced PGNAA design and Dura-G® technology allows significant improvement in performance of full elemental analysis (Fe, Al, Si, K, S, Ti, Ca, etc.) as well as Moisture, offering superior performance over a much wider range of bed depths than similar analysers.

Unaffected by "high noise Elements"
The only PGNA analyser that maintains accuracy even on Steel cord belts as well as fire retardant belts containing chlorine.

Easy to Install
AllScan® is considerably lighter than conventional Elemental Analysers, and bolts on to most conveyer structures without alterations or foundations required. Only 5 days for complete installation, commissioning and calibration.

Safe
Through improved design AllScan® employs a smaller source, reducing required shielding and overall cost of life of the analyser. Personnel can safely work next to the Analyser without the use of toxic lead shields, which also makes it the lightest PGNAA on the market.

Simple Calibration Verification
No more labour intensive material sampling. The analyser accuracy is verified through the use of calibration standards enabling rapid checks and returning to production quickly. Dynamic sampling will align the analyser with laboratory results.

Low Running Costs
All military spec. components used in the analyser, eliminating the need for an air-conditioner and associated on-going maintenance in hot environments.

Rugged and Reliable
Like all RTI Analysers and Gauges, the AllScan® has been purpose designed to work in harsh mine environments. 100% constructed from corrosion free materials, i.e. Stainless steel.

Easy Operation
User-friendly colour touch screen with intuitive menus, housed in a IP66 stainless steel control enclosure for field or remote mounting.

Flexible I/O and Multiple interface protocols are available to suit the Client's needs.

Remote Access and Back-up
Includes a 3G interface linked to a secure website for full remote diagnostics as standard. Cloud based back-up for safe archiving of important data. Customised monthly operational, integrity & data reports are provided through the remote access for support agreements.

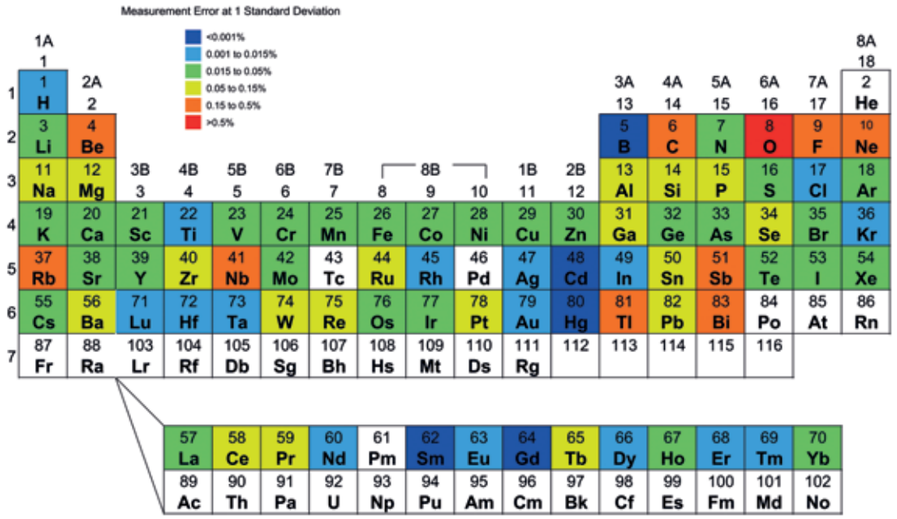
No Belt Weigher Required
With the advanced analyses techniques employed by the analyser, the AllScan® does not require a belt scale input to function.

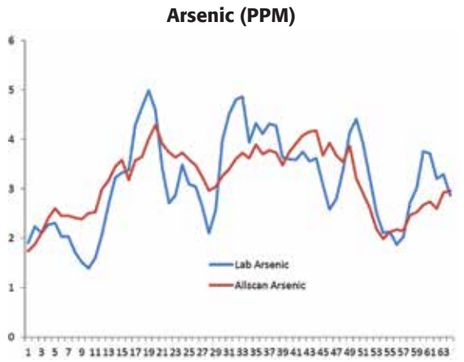
PGNAA.

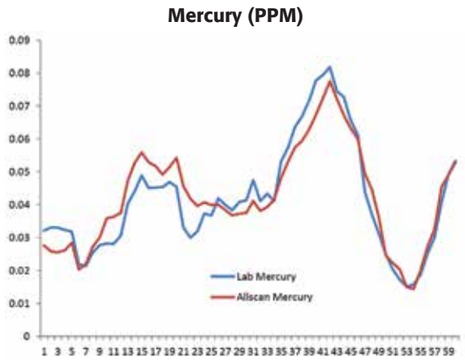
The **AllScan**® utilises the well-established technique of PGNAA (Prompt Gamma Neutron Activation Analysis) which performs a direct measurement of elements such as Fe, Al, Si, K, S, Ti, Ca and many others.

The sensitivity of PGNAA varies depending on the element being measured, so some elements can be detected with greater sensitivity than others - for example Iron (Fe), Sulfur (S), Calcium (Ca), Mercury (Hg) and Titanium (Ti) are all especially sensitive.

Conventional PGNAA analysers are sensitive to Chlorine, but with the AllScan Dura-G technology RTI can measure on high chlorine belts without the usual adverse affect to the analytical performance.







Measurement of trace elements, e.g. Mercury, Selenium, Arsenic, etc. at PPM levels.

The **AllScan**® is well suited to all coal types, from high/variable Ash feed, to low Ash product.

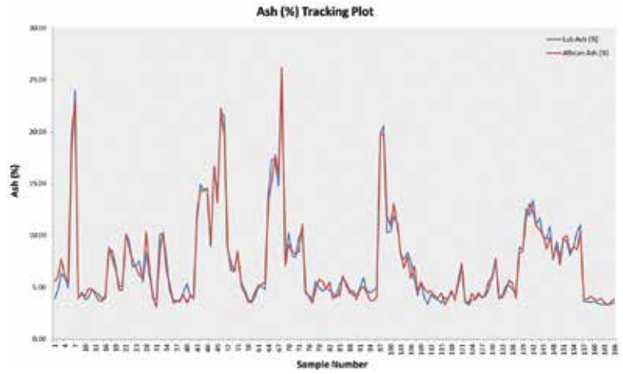


Figure 1
*Comparison of **AllScan**® and Laboratory Analysis for Ash in coal, from a moving conveyer*

Figure 2
*Comparison of **AllScan**® and Laboratory Analysis for Moisture on coal, from a moving conveyer*

Results.

The **AllScan**® directly reports the individual amounts of Fe, Al, Si, K, S, Ti, Ca etc.

From this it can calculate an accurate Ash Value.

Importantly, the **AllScan**® measurement of Ash is independent of changing coal composition so that coal flows from different seams do not require recalibration of the analyser (see Figure 1).

Moisture.

The AllScan incorporates state of the art technology deriving Moisture from elemental composition eliminating the need for a second analyser dedicated to moisture measurement.

Unlike other technologies the AllScan samples the entire bed depth of coal ensuring an accurate representation.

Other parameters such as SE and Volatiles can also be reported.

Safety.

Through improved design **AllScan**® can employ smaller sources thus reducing dose rates and permitting operators to safely stand next to or near the Analyser, and work safely near the entrance or exit of the conveyer with minimal exposure.

The source is contained in a **fireproof and drop-tested housing**, and has an automatic fail safe as standard.

The source can also be switched to the "off" position from the walkway (even while the conveyor is running) to further reduce exposure, so maintenance can be undertaken in and around the analyser.

Installation.

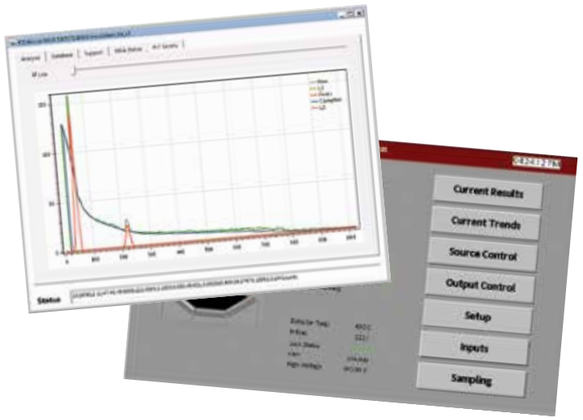
The **AllScan**® is designed to mount on the support rails of a conveyor system and consists of four main sections: two side assemblies, the top with source assembly, and the detector box that mounts between the conveyor and return belts. Individually, each section can be lifted into place by a crane.

The small size and weight of **AllScan**® greatly simplifies installation as it can fit on to most conveyer structures without any alteration. In addition there is minimal intrusion onto walkways.

Technology.

The system utilises the most advanced software algorithms for spectra stabilisation and deconvolution including innovative treatment of signal noise and pulse pile-up. The system is a "stateless" machine which means that once a calibration standard is run or dynamic calibration data is obtained it can be run and re-run as many times as desired to optimise the calibration and performance of the Analyser. This unique feature means the Client can minimise the effort to get the unit up and running so it begins adding value to their operation in a very short time.

The Analyser software archives all incoming spectral information rather than converting the spectrum to data and archiving only the data. The archiving of spectra proves very useful whenever there is a desire to add data to the existing calibration database. In this way the calibration is continually refined, being made more robust, precise, and accurate.



I/O and Diagnostics.

The **AllScan**® comes with a browser based touch panel interface in the control cabinet, allowing immediate access to all data and functions including trending displays.

A variety of interface protocols are available and the system can be set up to suit user requirements. Options include

- PLC Interface
- Ethernet
- Serial Communications such as ModBus.
- 4 - 20mA

Complicated wiring between the Analyser and the Control Centre is eliminated.

In addition a 3G interface is included so that data is uploaded automatically to a secure site. This provides an alternative way to view and retrieve data, that is completely independent of site communication infrastructure, providing a backup in case of site communications issues, and allowing simple remote monitoring over the internet. It greatly assists fast remote diagnostics and troubleshooting by RTI engineers.

Data is downloaded daily to compile reports sent to the user on a monthly basis. The report includes system diagnostics, and a secure backup of software and calibration for rapid system recovery in the unlikely event of failure.

All diagnostics are performed by the on-board computer, which provides continuous verification of the detector and electronics and verification of the status of components in the computer. This information is accessible to RTI Engineers remotely via the Internet through the 3G interface. The Analyser can also automatically send an email to the **AllScan**® support team to report any errors/faults.

Specifications.

Measurement Technique	Prompt Gamma Neutron Activation Analysis (PGNAA).
Elements Measured	Fe, Al, Si, K, S, Ti, Ca and others. Total Ash calculated using elements found in Ash.
Moisture and BTU	Included as standard.
Weight	1200 - 1500kg typical.
Belt Widths	750 - 2400mm (30 - 96 inch).
Aperture	Variable; height of the tunnel should be sufficient to clear the material that flows through it so the Analyser does not sustain damage from materials on the belt. **AllScan**® Analysers can be easily adjusted for the appropriate tunnel height during manufacture and installation. Customer should provide means of preventing large rocks from striking the Analyser.
Source	20µg Cf-252 (2.6 years half-life). Source is topped up with 10µg after 2.5 years and again after 5 years. Disposal occurs at 7.5 years.
Source Holder	Automatic Source Drive with automatic fail safe in event of power loss, Physical Isolation Point, Complies with all radiation safety requirements.
Radiation Exposure	Typically below 5µSv/hour outside and around the exterior of the Analyser. Average 1.3µSv/hr on or near the catwalk beside the Analyser.
I/O Protocols Available	Set up to suit application. Standard ModBus over RS485 and 3G interface. User Optional PLC Interface, Ethernet, Serial Communications such as ModBus.
Environmental Conditions	Sensitive parts of the **AllScan**® are sealed from the environment. The Analyser is designed to operate in all outdoor weather conditions from -10 to +50 degrees Celsius in high or low humidity or precipitation.
Power	Instrument quality 120/240VAC 1Ø 2400W 50/60Hz at Analyser Control Station.
Control Cabinet	Stainless Steel IP66 as standard.
Frame	All framing members and fasteners are stainless steel.
No Belt Weigher Required	The AllScan analyser does not require a belt scale input to function. Proprietary technology makes the requirement for a feed rate input obsolete.

Locations.

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