



# 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.



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 conveyor.

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).

## Why AllScan®?

### Unrivalled accuracy and responsiveness

AllScan(R) incorporates a sophisticated algorithm - DuraG(TM) - that separates 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.



## 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.

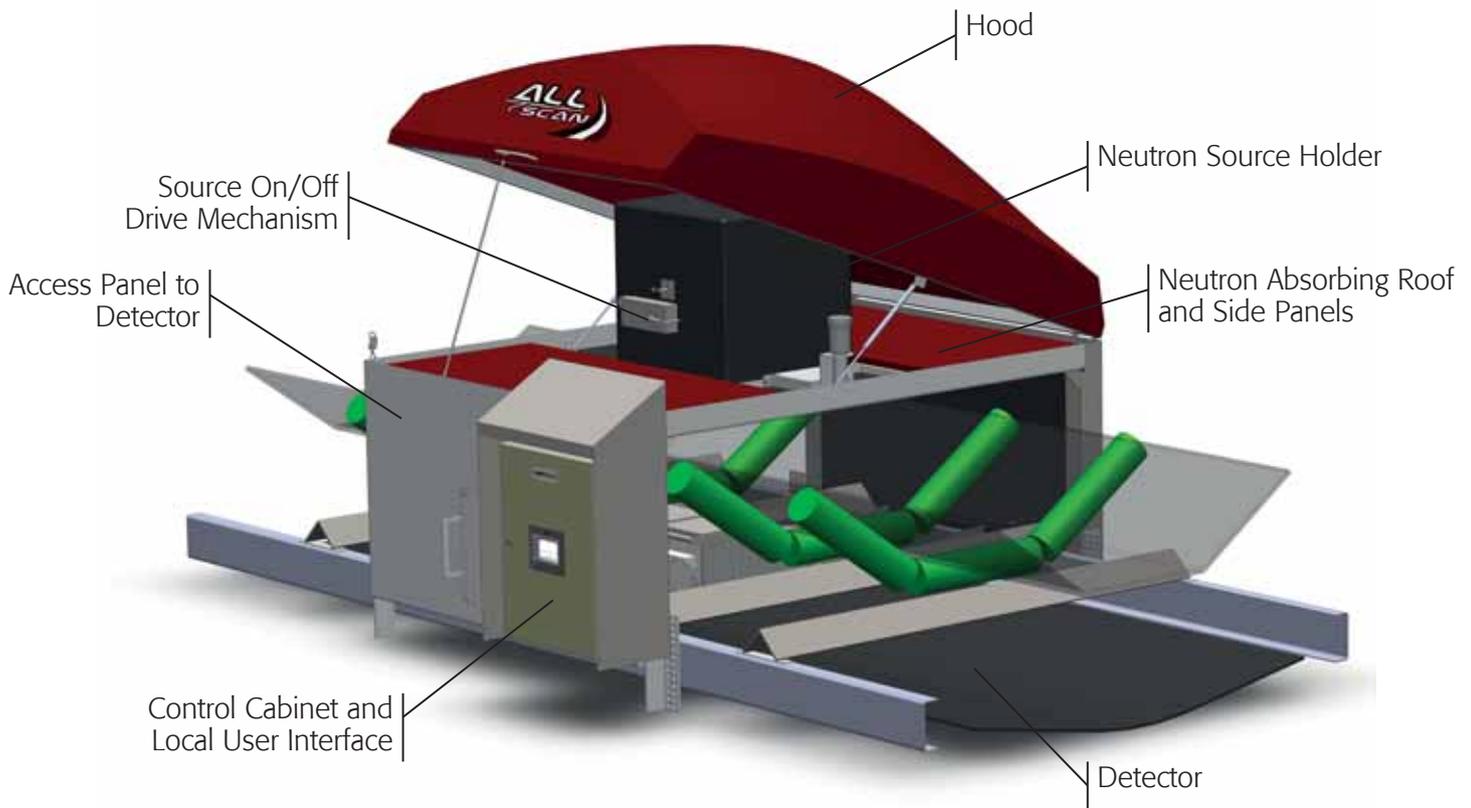
RTI's sister division RSS (Radiation Safety Services) is the largest industrial radiation service provider in Australia, which means **we provide the total package of Analyser plus radioactive sources**, and we take care of all radiation related requirements.

## What is PGNAA?

**Prompt Gamma Neutron Activation Analysis.**

It is the best suited and most widely used technology for online elemental analysis of coal.

# AIIScan® New Generation PGNAA Elemental Analyser



## Benefits.

The Benefits of AIIScan®'s design are many, and include

### Online, Real-Time Results.

Accurate results every minute, for flows from 500 tonnes per hour to several thousand tonnes per hour.

### Higher Performance.

Advances in PGNAA design and technology have allowed significant improvements in analysis performance, even for on-belt applications with varying bed depths.

### Full Elemental plus Moisture Analysis.

AIIScan® directly measures Fe, Al, Si, K, S, Ti, Ca and other elements, and also incorporates our patented MoistScan® microwave technology for direct measurement of moisture content.

### Easy to Install.

AIIScan® is considerably lighter and smaller than most Elemental Analysers, and bolts on to most conveyer structures without any alterations or foundations required.

### Safe.

Through improved design AIIScan® can employ smaller sources thus reducing dose rates and permitting operators to safely stand next to or near the Analyser. The Fail-Safe source holder has Automatic Source ON / OFF, and is fully drop tested and fire tested.

### Low Running Costs.

Source disposal is only required every 7.5 years, reducing running costs.

### Rugged and Reliable.

Like all RTI Analysers and Gauges, the AIIScan® has been purpose designed to work in harsh mine environments.

### Easy Operation.

IP66 housed touch screen at analyser for easy interrogation.

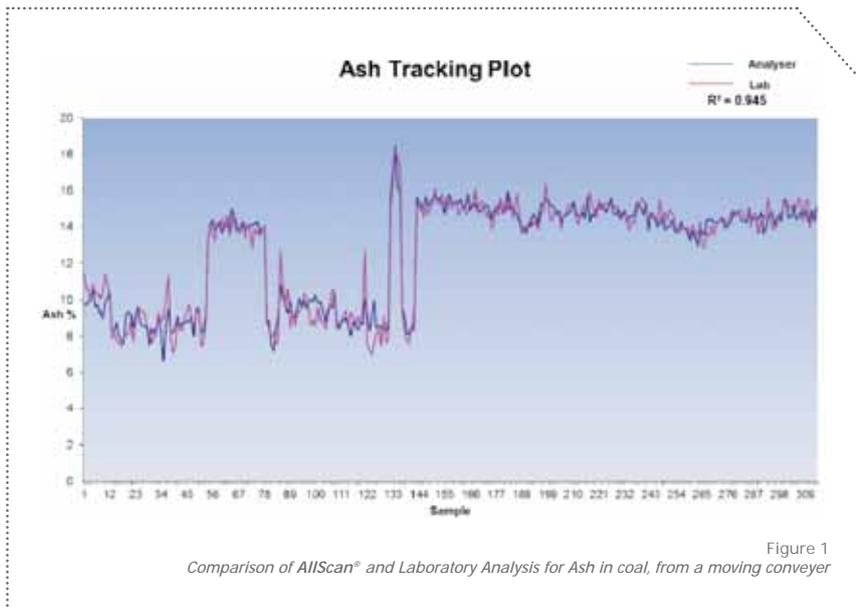
### Flexible I/O.

Multiple interface protocols are available to suit the Client's needs.

### Remote Access as Standard.

Includes a 3G interface linked to a secure website for full remote diagnostics.



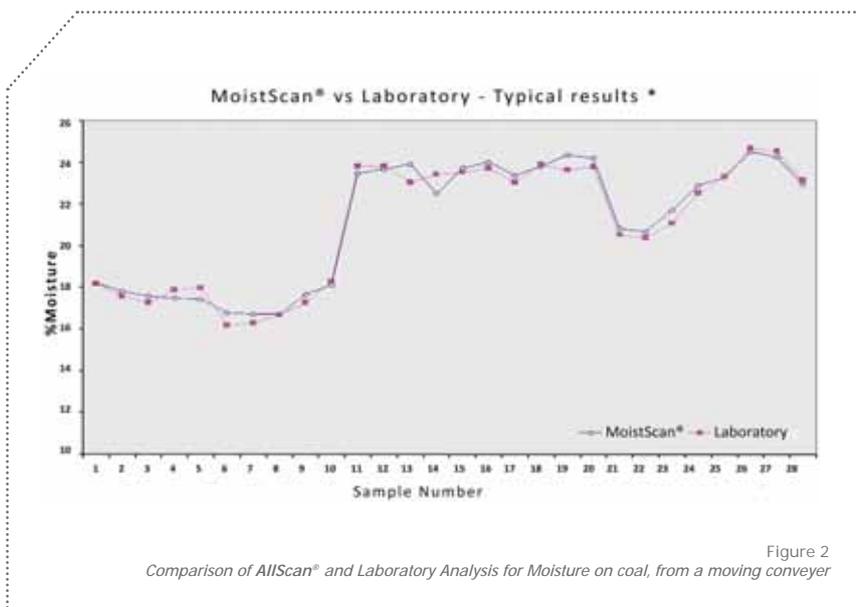


## Results.

The **AIIScan®** 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 **AIIScan®** 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.

As an option the **AIIScan®** can incorporate our MoistScan® microwave technology for direct online measurement of moisture content.

Unlike other Moisture measurement technologies MoistScan® samples the full bed depth of the coal insuring an accurate representation.

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



## Safety.

Through improved design **AIIScan**<sup>®</sup> 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 conveyer is running) to further reduce exposure, so maintenance can be undertaken in and around the analyser.

## Installation.

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

The small size and weight of **AIIScan**<sup>®</sup> 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.

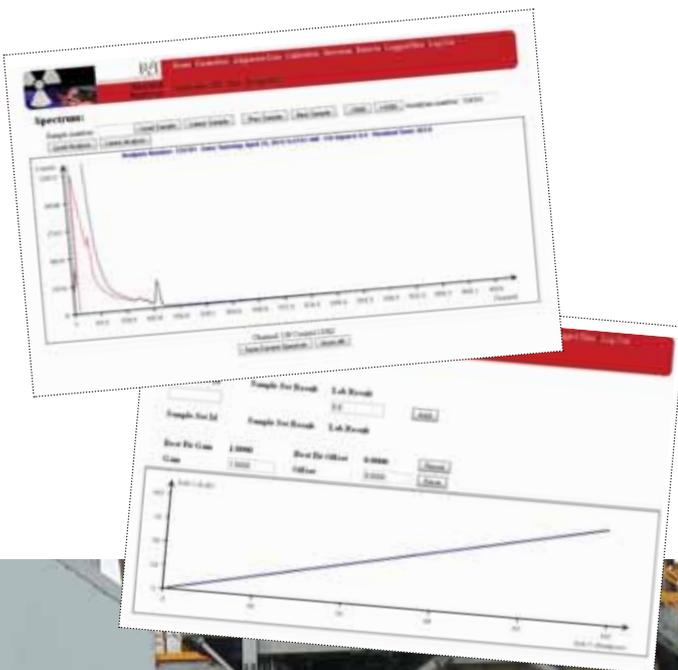
A variety of interface protocols are available and the system can be set up to suit user requirements. Options include

- 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.

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	Optional (MoistScan® microwave technology).
Weight	1200 - 1500kg typical.
Belt Widths	750 - 1800 standard. Larger belts accommodated using a dual detector model.
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. <b>ALLScan®</b> 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 <b>ALLScan®</b> 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.

## Locations.

AMERICAS | ASIA | EUROPE | OCEANIA | AFRICA | MIDDLE EAST

**Global  
Headquarters**

**Realtime Instruments**

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