

ALLSCAN

N-GEN

The world's most advanced elemental analyser

A quantum leap in neutron generator technology, delivering higher yields, increased returns, and lower costs for your operation.

- Advanced **long life** neutron generator
- Simple, intuitive calibration
- Lowest cost of operation in the market
- Maximise output, minimise downtime and costs
- Support

WHY USE ON-LINE ELEMENTAL ANALYSIS?

On-line elemental analysers provide the ultimate in continuous real-time ore and bulk materials quality measurement, by performing a complete on-line elemental analysis of a moving stream of material 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.

On-line 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 ore 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 n-Gen also directly measures moisture, ash, specific energy/volatiles).
- (iii) Electrically generated neutron source, improving safety and source longevity.

WHY REAL TIME INSTRUMENTS?

For more than 20 years, RTI's customers have come to rely on us to help them recover maximum yield and deliver real-time results. This has meant savings of millions of dollars in reduced ore penalties, increased productivity and the ability to minimise waste. We have earned a reputation on experience in supplying and servicing high-tech, high-end analysers in a vast scope of industries throughout the world.

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



WHY ALLSCAN N-GEN®?

Unrivalled accuracy and responsiveness

At the heart of the AllScan is Neutron Generation (n-Gen) technology. Material on the conveyor is bombarded with neutrons emitted from radioactive isotope or a neutron accelerator. RTI has incorporated a revolutionary new long life neutron generator design into the AllScan n-Gen elemental analyser.

AllScan n-Gen incorporates a sophisticated algorithm - DuraG™ - 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™ dramatically reduces measurement error.

AllScan n-Gen also includes - DuraSum - 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.

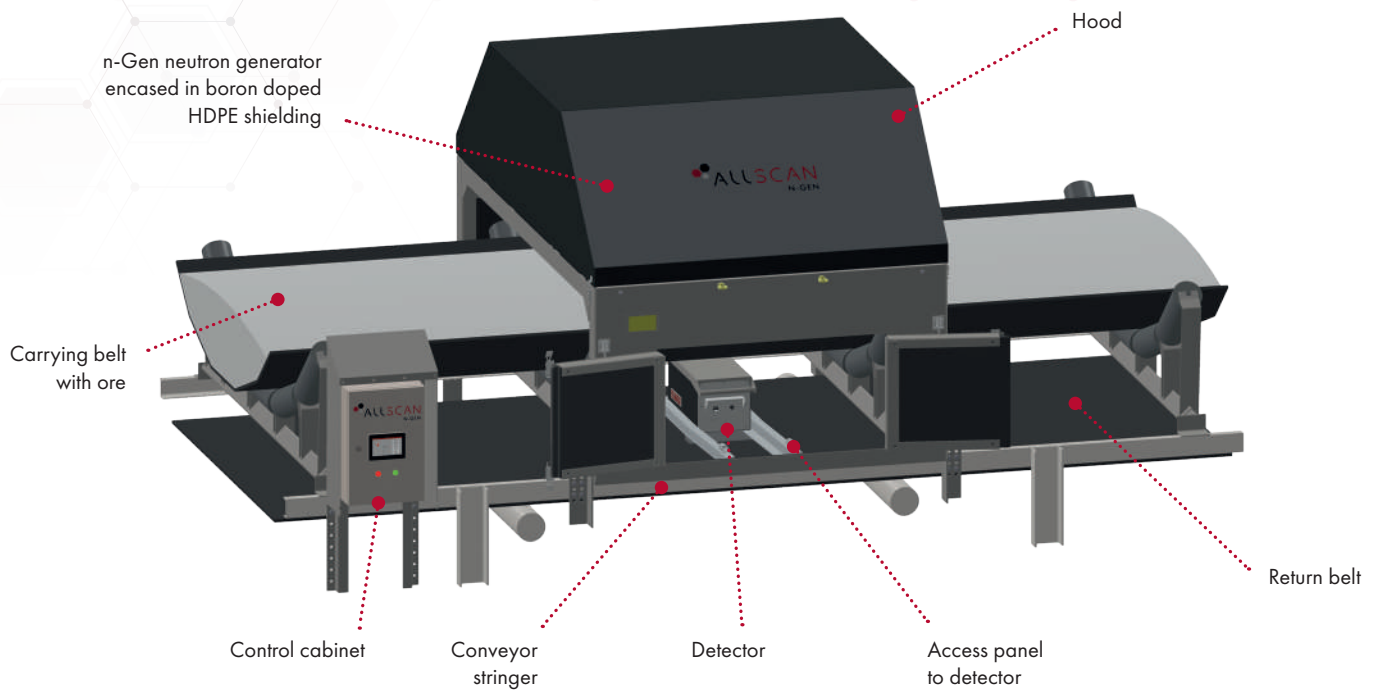
These breakthrough technologies combine with the reliability of the n-Gen measurement technique to deliver the most accurate and responsive coal elemental analyser on the market today.

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 n-Gen on the market.

The AllScan n-Gen comes with an intrinsically safe auto source on/off source mechanism.

The generator life span is more than 10 years. There is a constant output of neutrons, with no decay over time as with Cf-252 sources.

The only maintenance requirement is that re-gassing is required every 2.5 - 3 years. When neutrons collide with an element in the material, gamma rays are emitted with a specific energy unique to that element – in effect, creating chemical signature for that element. The greater the amount of an element in the material the greater the number of gamma rays emitted with the corresponding specific energy. By measuring the specific energy of the gamma rays that are emitted, and the counts of gamma rays, an accurate analysis of the chemistry of the material is generated on a second-by-second basis.



Higher performance on-line, real-time results

Accurate minute-by-minute results, for multiple flow rates. Advanced n-Gen 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 n-Gen analyser that maintains accuracy even on steel cord belts as well as fire retardant belts containing chlorine.



Easy to install

AllScan n-Gen 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 n-Gen 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 n-Gen 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 n-Gen 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/4G 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 and 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 n-Gen does not require a belt scale input to function.

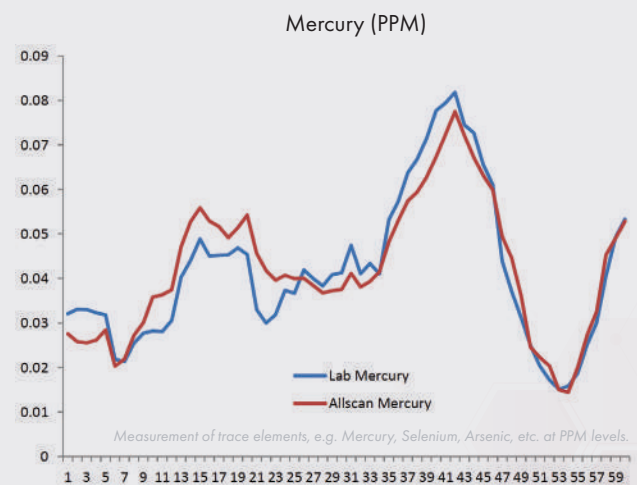
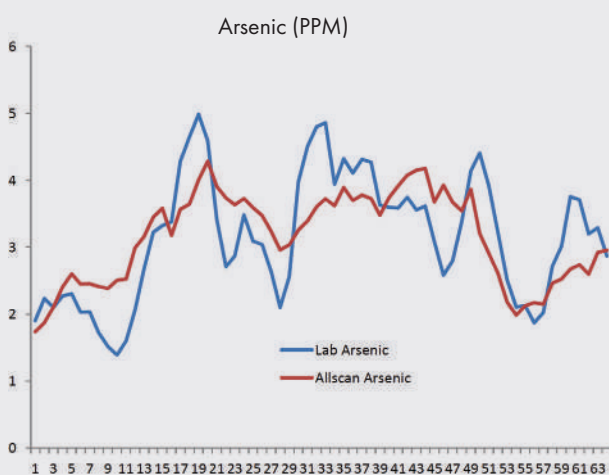
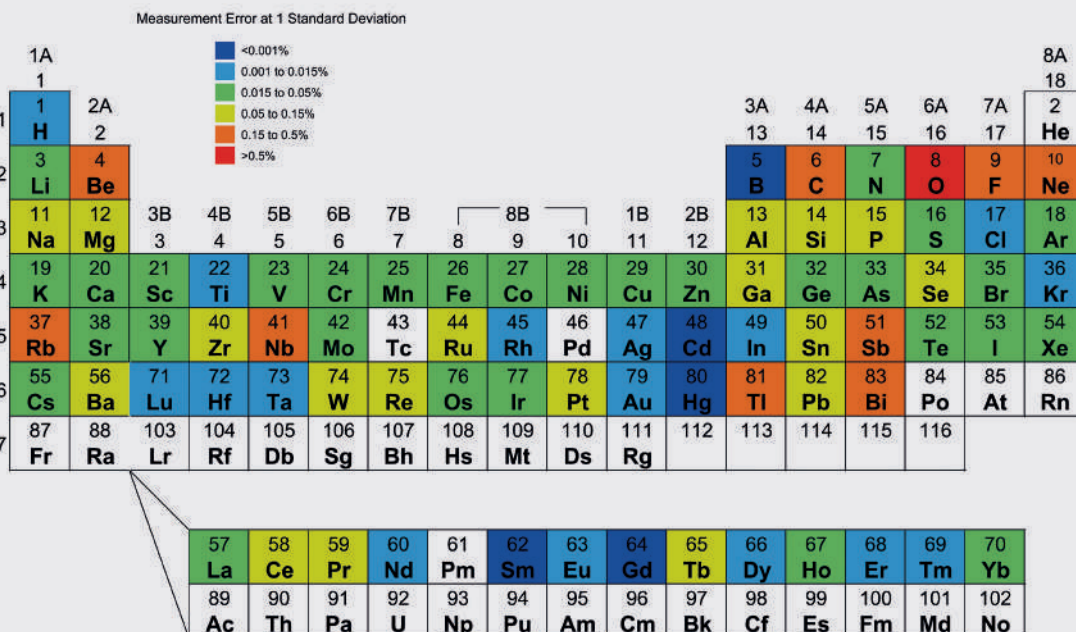
NEUTRON GENERATION TECHNOLOGY

The AllScan n-Gen utilises Neutron Generation (n-Gen) technology which performs a direct measurement of elements such as Fe, Al, Si, K, S, Ti, Ca and many others.

The sensitivity of n-Gen 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 analysers are sensitive to chlorine, but with the AllScan n-Gen Dura-G technology, RTI can measure on high chlorine belts without the usual adverse affect to the analytical performance.



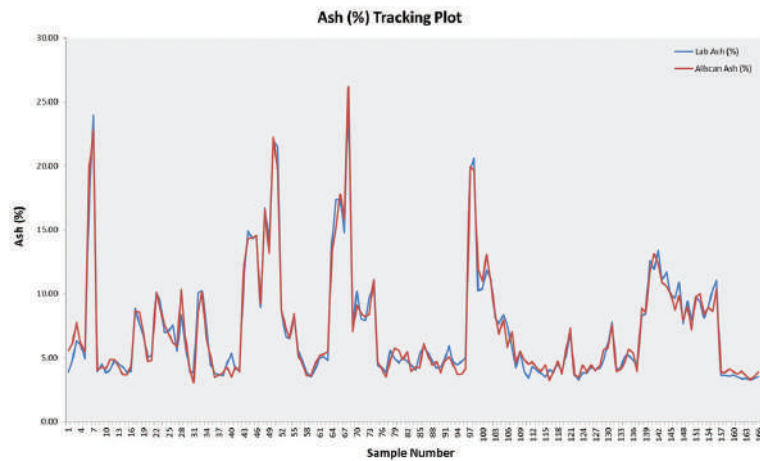


Figure 1
Comparison of AllScan n-Gen® and laboratory analysis for ash in coal, from a moving conveyor

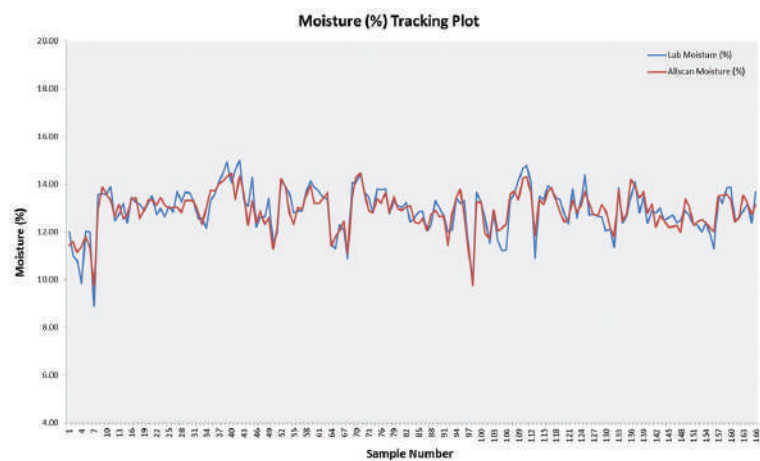


Figure 2
Comparison of AllScan n-Gen® and laboratory analysis for moisture on coal, from a moving conveyor

RESULTS

The AllScan n-Gen 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 n-Gen measurement of ash is independent of changing ore composition so that material flows from different seams do not require recalibration of the analyser (see Figure 1).

MOISTURE

The AllScan n-Gen 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 n-Gen samples the entire bed depth of material ensuring an accurate representation.

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

WHAT IS N-GEN®?

AllScan n-Gen uses a long life deuterium-deuterium fusion-based electrical neutron generator.

SAFETY

Through improved design AllScan n-Gen 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.

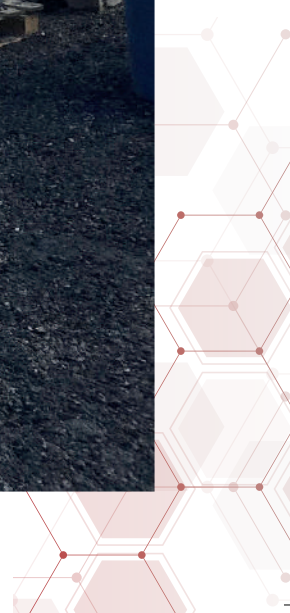
The source is contained in a **fireproof and drop-tested housing**, and has an automatic fail safe as standard.

The source can also be switched off 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 AllScan n-Gen 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.

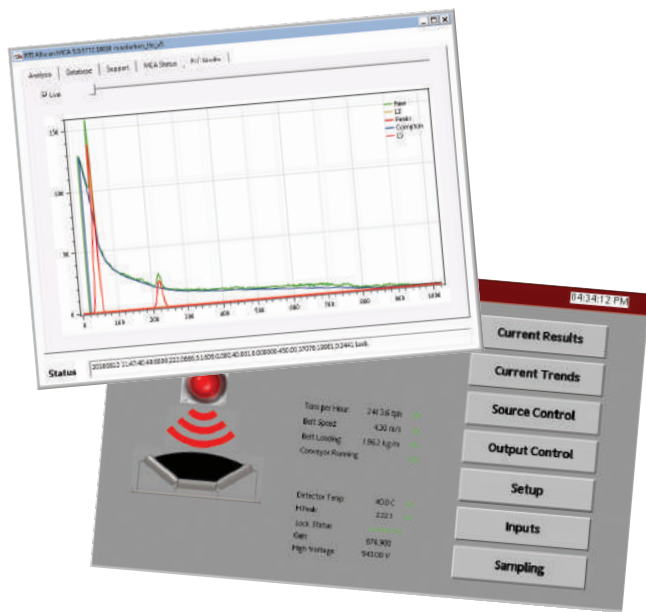
The small size and weight of AllScan n-Gen greatly simplifies installation as it can fit on to most conveyer structures without any alteration. In addition there is minimal intrusion onto walkways.



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 n-Gen 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/4G 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/4G interface. The analyser can also automatically send an email to the AllScan n-Gen support team to report any errors/faults.



SPECIFICATIONS

Measurement Technique	Prompt Gamma Neutron Activation Analysis (N-Gen).
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 to suit material bed depth. The AllScan® design incorporates adjustable mounting feet to accommodate future feed rate changes / increases. It is recommended that the client provide a means of preventing large rocks from striking the analyser.
Source	Deuterium-deuterium fusion-based neutron generator (20-40µg equivalent) producing low energy 2.45MeV neutrons. Deuterium fuel gas refilled on 2.5 - 3-year basis.
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/4G 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 300W 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

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

GLOBAL HEADQUARTERS

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