Intelligence on demand

Given that you can't effectively manage what you can't measure, problems incurred during the drilling process, be these intentional or unintentional, are costly, in lost time and money. But, there is a solution. Reflex global product manager **Dave Lawie** explains.

Three things increase productivity and reduce costs, especially in mining. Two of these are knowledge and technology, both of which are enablers. The third element, effective application, is what makes it all happen. This being said, the secret to exponentiating the value of knowledge is to share it. In so doing, knowledge, as a resource, can be fully exploited to enable a team to work a lot smarter. Backed by intelligent technology, with capable people utilising this technology, and working together, you have a winning combination.

It is this inbred philosophy that gives Reflex, a leading Australian technology company, the ability to punch above its weight class and deliver intelligence on demand. As always, it's not the 'what', but the 'how' that matters. In Reflex's case, this is the differentiator in product and service offering. What is more, it is also backed by a track record of introducing new and innovative – yet reliable – hardware and software technologies that set the pace and drive change in the drilling industry. A by-product of this is an industry moving ever forward towards a de facto set of best practices while significantly improving operational efficiencies.

Being the leading innovator they are, and an exceptional problem solver, the company has pioneered the development and introduction, to the global minerals market, of:

- digital survey tools, both single- and multi-shot
- digital core orientation technology
- micro electro-mechanical system (MEMS) gyro survey tools
- inertial navigation system (INS) borehole survey systems
- cloud-based operational and geological data collection and management systems.

With 90% of operating diamond drills benefiting from Reflex's instruments worldwide, these systems are now considered the de facto industry standard. The reason for this is simple. Reflex technology possesses all the factors inherent in the exponential relationship between technology advancement and quality of life, all built in. These factors of availability, accessibility, affordability, ease of use and immediately being able to access and survey data, equate to the total convenience factor (TC factor), which translates into a winning formula for everyone, especially the resource companies.

The Reflex Ez-Gyro

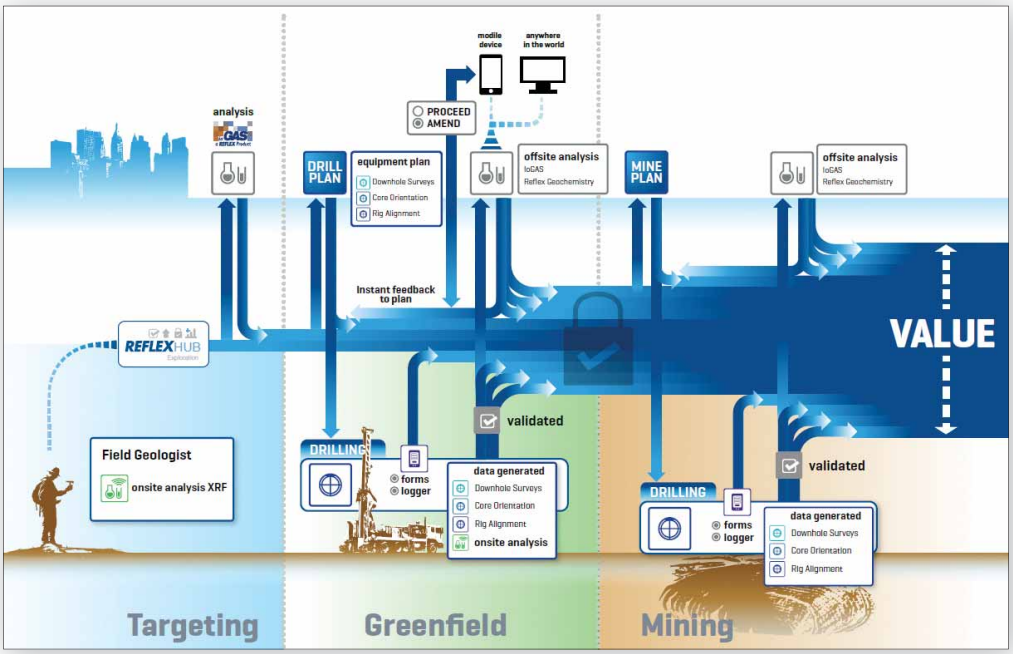
This is a complete downhole surveying instrument capable of north-finding directional surveying in all environments, magnetic and non-magnetic. It has an azimuth of +/-1 degrees, dependent on latitude and inclination, and a dip of +/-0.30 degrees in single- and multi-shot modes. With proven reliability and accuracy, it utilises a digital surface referenced micro electro-mechanical system (MEMS) gyro. It is fitted with field-changeable lithium rechargeable batteries that have an operating time of ten hours or less, depending on environmental conditions.

This instrument has been designed for operation by drillers. It can be used inside all types of drill rods or in magnetically

LEFT AND MIDDLE The Reflex EZ-Gyro
RIGHT The Reflex XRF

disturbed ground, eliminating the need to use non-magnetic drill pipe configurations. It measures in all directions and is not affected by inclination, and can therefore be used in surface and underground operations and wireline or conventional drill rigs.

Its intuitive interface is simple to use, and yet the instrument is equipped with highly sophisticated technology inside in order to deliver exceptionally accurate survey results. The intelligence of the tool within the tool, which reduces human errors related to processing and interpretation.



Highly accurate survey data is obtained through a customised 'anti-roll' running gear and centralisers, ensuring the highest quality azimuth data, including in vertical surveying. It also provides fast and accurate orientation of bottom-hole assemblies without the need for costly non-magnetic alloys or risk from magnetic interference.

It is well suited to the surface drilling environments of the mineral exploration industry and can be utilised in many surface programsme. It also has a universal running gear to ensure that it can be used in all standard RC and diamond coring applications.

A large range of data types, including directional data (azimuth and dip), temperature, time and roll are recorded in the on-board memory. This survey data, once brought to the surface, can be transferred from the instrument's on-board memory to a field PC, using the Windows 7 operating system, in CSV (comma separated values) file format via a high-speed Bluetooth connection, or built in Wi-Fi or USB connection. The full set of data readings can be processed using Reflex's advanced, in-house developed software, where users can tabulate, plot and export data into various formats for enhanced decision-making. Using this technology, the same, critical drill hole data can be transferred instantly anywhere in the world for fast decision-making.

The big win is that the costly time delays so traditional of waiting for survey reports have been eliminated by the 'now' nature of the Reflex Ex-Gyro.

The Reflex XRF

Traditionally, core samples are usually sent back to a laboratory for testing. That now changes. Instant assay results can be obtained quickly and easily using Reflex's handheld X-ray fluorescence (XRF) spectroscopy instrument, which, non-destructively, determines the elemental composition of rock, ore, soil and ferrous and nonferrous metal samples.

The advantage of this instrument, with simplified workflows and instant geochemical analysis results, is immediate time and cost savings. Geologists no longer need to wait up to three months for off-site assay results to determine their next move. Decisions can be made without delay, based on facts, to better manage drilling programmes and save costs.

In addition, using the supporting Reflex Connect-XRF software application, the scanned results, data, can be transmitted directly from the field to the Reflex Hub in a robust and streamlined manner. This data is converted to interpretive products within Reflex Hub, in real time for effective, timely decision-making, logging, domain and classification.

Geologists can access their aggregated data and monitor progress of the analytical program from any location globally. Reflex Hub can be accessed simply through any web browser, whether on-site, in the office or travelling. It ensures all users have access to a single point of truth.

As to the instrument itself, the excitation source is a 4 W Rh, Ag, Au or Ta anode (per application) 40 or 50 keV X-ray tube using a silicon drift detector. It has an environmental temperature range of -10°C to 50°C and an analytical range, geochemistry and soil mode, from Mg to U. Its processing electronics of 530 MHz CPU with integrated FPU all seated with 128 MB RAM and a proprietary count digital pulse processor (DPP) gives a high count rate and reduced analysis time. Smart electronics include an accelerometer and a barometer for atmosphere pressure correction of light elements measurements. It is power rechargeable with Li-ion batteries and has a 'hot-swap' feature to maintain the analyser power during battery change. Its display is a 32-bit colour QVG A resolution, Blanview transmissive backlit touchscreen that is 57 mm x 73 mm in size. It has a gigabyte of micro SD data storage (storing 75 000 readings).

Without a doubt, Reflex's instruments are totally convenient, effective, save time and money and provide the required intelligence as needed when the demand arises. 3S

REFLEX®
intelligence on demand

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