

# Digitalisation: the evolutionary approach

MechChem Africa visits the Rockwell Automation stand at Electra Mining Africa (EMA) and talks to the company's South African MD, Barry Elliott, who presents a slower, evolutionary approach to digitalisation.

“Digitalisation and convergence are the buzz words on everybody's lips and most automation and software specialists are saying similar things: urgently warning operators that they are likely to become ‘irrelevant’ unless they begin the digitalisation process right now,” Elliott begins.

“But we still sell PLCs, VSDs, contactors, control panels, SCADA systems visualisation systems and all of the associated software that underpins these. We have a large portfolio built up over many years, which is the bread and butter of our business. It is what we have always done and we are still doing it. Digitalisation must add to this offering, rather than replacing it.

“For lots of companies, the digitalisation ‘revolution’ is a daunting and terrifying thing, perpetuated by the massive numbers presented by technology advisory agencies such as Gartner or McKinsey and Company: multi-billions of connected devices and a trillion-dollar industry, for example, which immediately makes people believe that millions of dollars must be spent in order to benefit.

“Scariest of all is the warning that huge numbers of operational assets are likely to become ‘irrelevant’ unless they are digitalised or replaced and that organisations that fail to become digitalised over the next few years will become totally out of touch with their markets and customers,” Elliott tells MechChem Africa.

“While there is some truth in these predictions, we believe that transforming existing

assets need not be nearly as daunting as it first appears. It is possible to simplify the technology and to identify cost-effective and immediately beneficial upgrades that can put operators on a manageable transformation trajectory,” he adds.

Elliott says that people in industry are looking for specific solutions for their own manufacturing or processing systems: mine conveyor equipment to move extracted minerals, tyre manufacturing and inspection systems; or food processing and packaging lines. “But in all these cases, what digitalisation offers is the data behind the things people are processing,” he says.

Using a conveyor system as an example, Elliott says that these have long been controlled via variable speed drives (VSDs), which actually date back to the early 80s. The VSDs currently in use are not necessarily digital, but where a VSD is already in use, it may be an easy portal toward digitalisation.

“Anyone willing to give up their 4 to 20 mA analogue control signal currently being used to control their conveyor's VSD and to replace it with a relatively inexpensive digital equivalent is ready to begin to transform,” Elliott points out. “Ripping out the entire conveyor and its legacy control system is not a condition for migration,” he argues.

“On an electric motor driving any rotating equipment, a resistance based temperature device that gives you a hot or cold 0/1 output signal was typically used to ‘monitor’ the condition of the windings. Can you do something useful with this? Absolutely. You



always could,” he adds.

“The difference now is that this information, no matter how basic, can be collected and sent for remote automatic analysis. Once analysed it can be simplified and displayed as dashboards to be viewed in many different places by different specialists. Decisions based on real and live events can be taken much more quickly. Also, by collecting additional related data, these decisions become more and more predictive in nature.

“And the data collection sensors can be add-ons. It is not necessary to rip everything out of an existing system,” Elliott advises.

Predicting how best to manage assets has long been the ultimate goal of plant managers. “We have always aspired to be able to replace machine components at the right time with the minimum disruption. Data analytics enables decision trees to be established so that the real fault and the real cause of a fault can be established, before a machine actually breaks down. And a more precise diagnosis, based on relatively simple logic, certainly enables better repair decisions to be taken and much faster maintenance turnaround times,” he notes.

But digitalisation is not only for better maintenance. The biggest opportunities come from improved operational efficiency and production.

“Imagine what happens when a production manager of a plant arrives on a Monday morning and something horrible has happened over the weekend to halt production: his targets are down by 25%. The manager and all of the people above and below him will be run-



Above: The Rockwell Automation stand at Electra Mining Africa 2018 invites visitors to explore their journey towards the 4<sup>th</sup> Industrial Revolution. Left: On display at EMA was Rockwell Automation's world-class PlantPAX distributed control system (DSC) that combines plant-wide control technologies and unmatched scalability, along with ThinManager, which provides various customised access and monitoring features for users with different access rights working from anywhere on any device.



ning around interrogating at each other to try to get answers about what went

wrong: because they are all about to be grilled about it from above – even the CEO may have to answer to shareholders.

“What if that same production manager is alerted via his smartphone to the problem as soon as it happens. He can then drill down into the data to identify exactly what has happened. So he is immediately prepped for his interrogation.

“Better still, before he gets in, he can tell the boss that 25% of the weekend's production was lost, while explaining exactly why and suggesting exactly what needs to be done to rectify the situation – and how he will make up for the lost production over the next few weeks.

“Life is a lot better this way, because everyone along the chain can be immediately reassured that the problem is resolved within minutes of finding out about it,” Elliott relates.

“This is now possible, but the starting point is to take what you already have and to better use the data, starting with simple things and then slowly adding pieces of data to more and more accurately represent the process,” he suggests.

Citing a recent study on a tyre manufacturing line, Elliott says that a bottleneck had built up in the final inspection area, slowing down the entire line and losing the company money. “Without installing any new controllers, we were able to rectify the situation by identifying and correcting simple errors: a misreading sensor here; an unsuitable switch for an industrial environment; old equipment that could be easily upgraded, and so forth. We managed to debottleneck this area within weeks, which moved the bottleneck back, giving us an additional opportunity to optimise that area.

“The point is, with very little effort, almost any line can be improved. Then we can

identify how to start collecting useful data at a relatively low cost: put some software together to do some data analysis, create some dashboards and install a little visualisation.

“Slowly but surely, the line can become usefully connected to immediately and directly benefit uptime, production levels, energy efficiency and a host of other output-linked business efficiency indicators,” Elliott suggests.

“At Rockwell Automation, we prefer partnerships that involve a little bit of business every year for 20 years to once-off contracts that make the eyes sparkle. By doing this, when a company that is on a continuous improvement path decides on a next generation upgrade, they are likely to include us in the conversation.

“This evolutionary approach changes the conversation from the scary ‘buy now or become irrelevant’ to a real value-based and ongoing process where the customer develops increasing confidence in the technology and in Rockwell Automation's credibility, all through many already-proven small successes,” Elliott concludes. □

## Advanced light curtain system

The rise of robots has ushered in an increased demand for light curtains that provide a safe work environment between the robotic work cells and the rest of the plant. The Allen-Bradley GuardShield 450L safety light curtain system from Rockwell Automation is a flexible, cost-effective solution that enhances safety while improving productivity through innovative transceiver technology.

“Users will see advantages throughout the lifecycle of the new system, but especially during installation and operation,” says Christo Buys, business manager for control systems at Rockwell Automation, sub-Saharan Africa.

The Integrated Laser Alignment System (ILAS) of the new GuardShield 450L-E reduces installation time by providing multiple visible laser points that optimise setup with a simple touch of the ILAS symbol on the front window of the stick. In addition, the compact design and full-length protective field make it easy to integrate a GuardShield 450L-E system into hand and finger protection applications from 150 mm up to 1 950 mm in increments of 150 mm. □