

# Implementation of 'edge sensors' into mining operations

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## ABSTRACT

The practice of processing data near to where it is generated is not new - 'edge computing' in the form of Programmable Logic Controllers (PLCs) have been used for decades in the industry, often coupled with a Distributed Control System (DCS), where feasible. Over the last few years, with a significant miniaturisation of computing power and a corresponding rapid drop in price, it is now possible to perform complex calculations in the sensors themselves, transmitting timely intelligent information, rather than pushing 'big data' into centralised repositories to be analysed at a later time.

Sensors used in mineral processing, in general, have not materially changed since the middle of the last century. With the introduction of edge sensors it is now possible for sensors to communicate directly with each other and existing control infrastructure through an encrypted wireless telecommunications network and sensor clustering similarly to PLCs. This clustering, computational capability and non-volatile data storage capability of 'edge sensors' means that a temporary loss in wireless communications need not be critical. As 'edge sensors' continually communicate with off-site servers (cloud computing), the ability of hosting information and display trending in near-real time is achievable, analogous to larger DCS systems, but without locking into specific vendor infrastructure.

This paper gives a case example of how this technology was implemented at a mining operation in central Victoria and discusses the advantages and challenges that were experienced in its implementation and how this technology can be applied more broadly.

### **Key Words:**

Edge Sensors, Wireless Technologies, Smart Monitoring Systems, Cyber Security, Intelligent Data