

Solution: IDX Nexus Historian used in storage of plant control system data.

Industry: Mining

Benefits:

- ✓ Simple and economical
- ✓ Suitable for all industries
- ✓ Open and extendable
- ✓ Standards-based

Technology used:

- ✓ IDX Nexus Historian
- ✓ Gensym G2
- ✓ OPC DA

The IDX Nexus Historian is a powerful data logging and visualisation framework for plant data integration and performance monitoring.

Gensym’s powerful real-time expert system G2® allows you to create, deploy and adapt real-time, rule-driven, mission-critical expert applications that automate decision making.

OPC Data Access (OPC DA) provides access to real time automation data. Using OPC DA, software applications can retrieve real-time data to enable them to monitor a given process.

Transform real-time data into automated decisions and actions.

IDX Nexus, an evolving modular real-time data communication middleware framework, is highly suited to legacy system integration, IIoT and asset monitoring applications. A global mining company, based in South Africa, has standardised on using the IDX Nexus Framework within its process optimisation toolkit to provide reliable real-time data connectivity to plant control systems. The mining toolkit comprises a suite of tools that support the mining company’s control engineers in designing, deploying, and supporting its process control strategy at sites worldwide across the mining group.

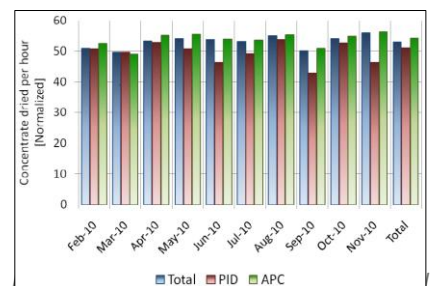
The customer

In a drive to increase operational efficiency, low energy consumption and improved product quality that began approximately twenty-five years ago, a global mining company that specialises in extracting precious metals and minerals, began to employ Advanced Process Control (APC) techniques in conjunction with standard Proportional, Integral, Derivative (PID) to improve the control and thus efficiency and throughput of various stages of the platinum processing and extraction process. Since then, this concept has evolved to all mining sites worldwide.

The challenge: need for robust data connectivity

To do this, the mining company built a process optimisation toolkit which was based around the Gensym G2 expert system. The first challenge was that the G2 did not provide native or robust mechanisms for interfacing with the industrial systems it was required to interact with.

The industrial control layer is characterised by real-time data that is often available through the generally acceptable industry standard Open Platform Communications (OPC) Data Access (DA)

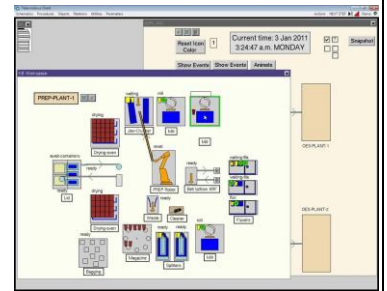


Efficiency gains at the mining company

servers in Supervisory Control and Data Acquisition (SCADA), Distributed Control System (DCS) or other control layer systems. Unfortunately, OPC DA servers are also notoriously problematic, because they often require specific security configurations in order to facilitate client connections and although the OPC DA standard supports compliance validation testing the quality and interpretation of implementations of the standard vary widely.

This makes reliable exchange of data between these OPC servers and the APET layer a non-trivial process. In addition, for its society-based mining initiative, the mining company aims to apply APC principals to more real-time data orientated equipment and systems in a digitisation drive to improve efficiency and sustainability. Sometimes, such equipment and systems do not immediately lend themselves to integration using industry standards for sharing real-time data.

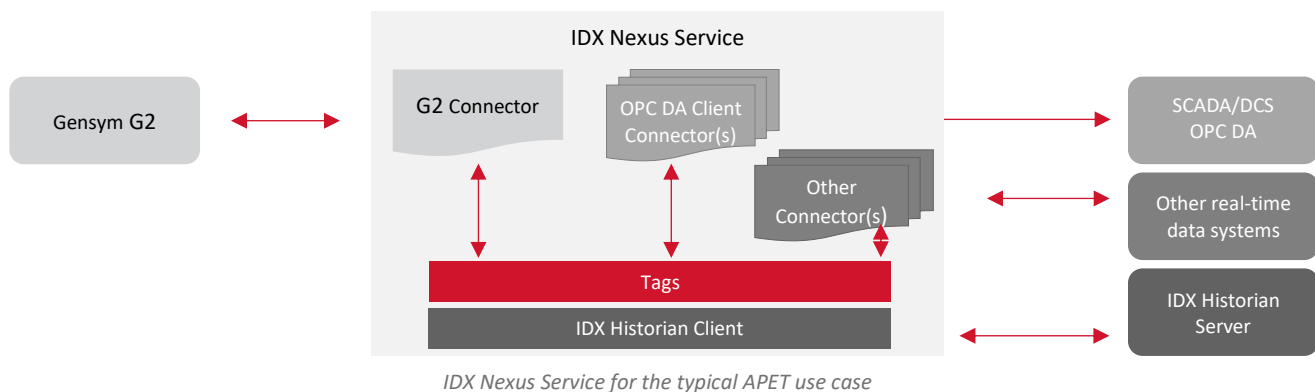
Example of Gensym G2



Why was the IDX solution selected?

An IDX Nexus service, of which any number may be configured on a host, employs a hub architecture to enable common tag value changes to be read and/or written between multiple sources and targets, depending on how it is configured. This provided the ideal G2 interfacing solution. Nexus includes a native G2 connector that enables the G2 to read and write tags that are configured in the service. These tags in turn, are mapped via one or more Nexus OPC DA client connectors to various OPC servers, allowing G2 to read and write values from/to the OPC servers.

Similarly, data can be exchanged with other systems, which may include common protocols such as MODBUS TCP in the case of power meters, or custom interfacing solutions where a device or system has no real-time interfacing server capability out-the-box. This enables the mining company's toolkit to interface with various of real-time systems.



IDX Nexus service for the typical process optimisation toolkit

The IDX Nexus solution is adept at dealing with unpredictable OPC DA Servers. It uses low-level OPC DA interface calls rather than an SDK-based approach, allowing for low-level tuning and adjustment of the OPC Client's behaviour. This is necessary to effectively deal with OPC servers that do not respond in expected ways or often not timeously to read or write requests. This assisted the mining company in achieving robust data interfacing within these systems. The mining company also uses the Nexus solution to facilitate data simulation and creation of digital twins. As the core of the process optimisation toolkit, Nexus serves as the real-time data interface for all operations. It logs real-time operational data, which can be replayed as simulation or modelling data to create digital twins of those operations.

As a core component of the toolset, IDX Nexus provides a closely coupled history client and server that allows the mining company to log real-time data in a toolkit-specific Nexus Historian. This data is of a high resolution and is used for analytics, reporting and modelling within the toolkit's framework. Based on the ubiquitous Microsoft Structured Query Language (SQL) and optimised for time-series data, the Nexus Historian enabled the mining company to quickly, easily, store and retrieve toolkit-specific data using several tools as well as widely understood and supported Transact-SQL (TSQL) queries in a simple and cost-efficient manner.

Conclusion

IDX continues to work closely with the global mining company to support their real-time data use cases, mining objectives, digitalisation and sustainability. With the advent and increasing traction of OPC UA (Unified Architecture), the next generation replacement for OPC DA, and the need to allow newer generation IIoT-type data flows in modern industrial real-time data flows, IDX Nexus provides reliable and robust connectivity solutions that encompass and leverages these technologies to the benefit on our customers.