



OPC Unified Architecture

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OPC Unified Architecture

1. Purpose

Invensys Operations Management builds its products based on principals of openness and extensibility. The purpose of this white paper is to explain why the OPC Unified Architecture (OPC UA) is an important part of our strategy, the value OPC UA provides to our customers and how Invensys is integrating OPC UA technology into its product portfolio.

2. Executive Summary

Modern manufacturing automation and information management systems form an interconnected system within an industrial plant that requires the interoperation of a range of systems from different vendors. These systems must work together to provide customers with the timely control and information needed to solve their business, operational and maintenance problems. This includes continually improving efficiency and reducing the costs of manufacturing while maintaining security, quality and safety.

In order to accomplish this, best-in-class manufacturing systems need to interoperate openly by exchanging more complex information in real time while providing the ease of integration normally associated with closed, proprietary systems. Reducing the barriers to this next-level of interoperability is aided by the advanced features provided by OPC UA.

Invensys Operations Management is committed to solving customer problems by integrating the Invensys product portfolio with external systems by supporting open, industry standards to satisfy customer needs and provide business and technical benefits. Invensys currently provides broad support for OPC DA, the classic data access standard and has been involved with the development of the OPC UA standard since 2003 as a charter member of the OPC UA Working Group.

3. The Value of OPC Unified Architecture

In the automation world today, there is a need to provide full integration of industrial automation information through open and secure information exchanges into an Enterprise Management System. The integration must support a high level of security and robustness as well as ability to discover the information structure and semantics. This level of integration must be provided at all levels of the enterprise from the I/O up into the enterprise management. Invensys has, and continues to enhance the core infrastructure, which is the foundation for full integration with external systems for the best customer solutions in the Enterprise Management space.

Information Modeling

OPC UA, with its flexible modeling and communication capabilities, provides a standard way for integration and exchange of information between a variety of Enterprise Management Systems, for example - Alarms and Events, Process information, Asset information, Historical information etc.

The powerful modeling capabilities of OPC UA allows Invensys products to define their information model in an even more standard way that is easy to understand and consume. Additionally Invensys products benefit from the ability to discover and integrate systems provided by 3rd party vendors.

Communication

OPC UA defines a rich set of communication capabilities that hide the complexity of different underlying technology. There are multiple options for communication protocols and encodings depending on application topology and domains.

OPC UA is well prepared for adoption at all levels of the enterprise from factory floor to operations management and ERP, so as the systems grow OPC UA provides a perfect integration platform for growth.

Security

Secure software is essential for manufacturing and Critical Infrastructure protection. The security capabilities of OPC UA allow the information to be shared in a secure fashion. Authentication and authorization for example are just two of the concepts that OPC UA standardizes. The ability to securely authenticate users prevents critical process data from being accessed or impacted by unauthorized client applications. OPC UA gets its strength in security from the fact that its design and implementation is based on proven PKI standards and WS* protocols.

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Integration

The use of OPC UA also provides strong integration with non-Invensys process equipment. Third party vendors can provide OPC UA secure servers that integrate asset management, alarm and event and process data from non-Invensys process equipment and many others. The OPC UA provided information becomes integral to Invensys and available to Invensys visualization and Enterprise Management applications.

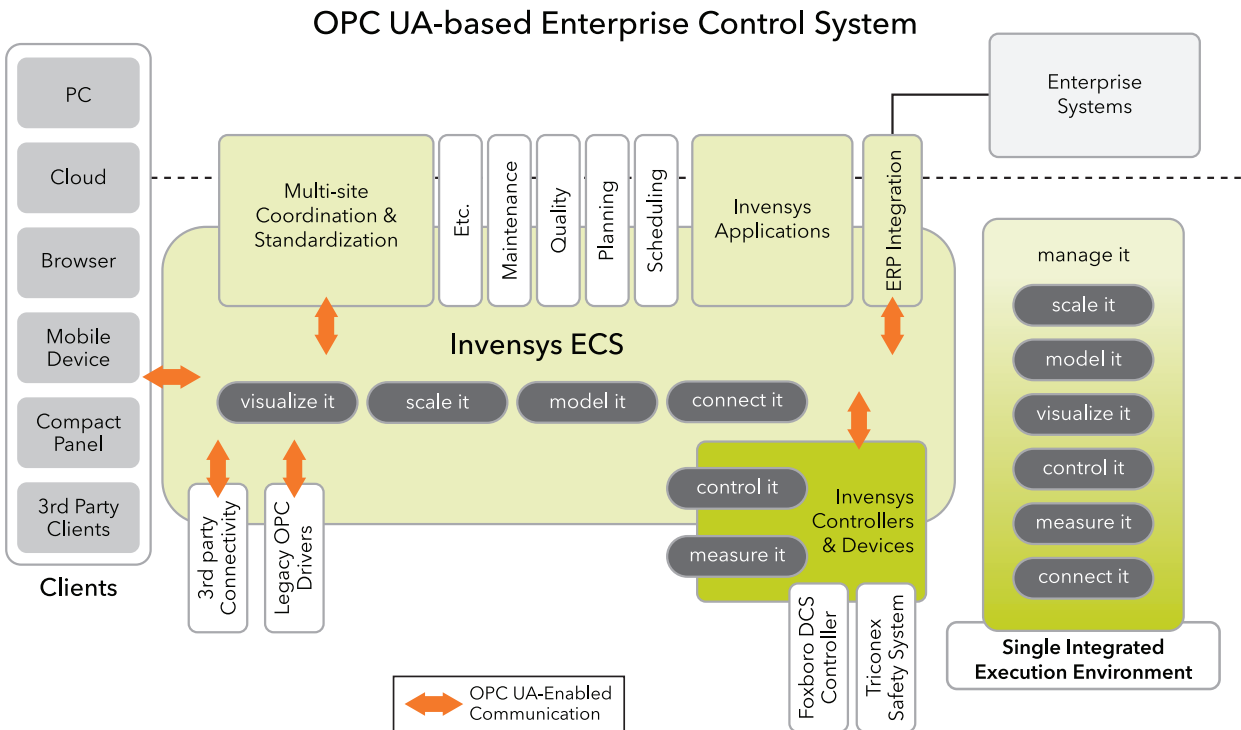
The ability to integrate at all levels of the Enterprise, allows Invensys portfolio products to be the foundation for solutions which combine the best in class equipment and software systems.

Migration

The OPC Foundation provides a solid migration path for existing systems that support previous versions of OPC specifications. This way by supporting OPC UA, Invensys also preserves more than a decade of investments in previously deployed OPC solutions.

4. Product Strategy

The Invensys strategy embraces OPC UA as an improved communication interface to allow interaction between Invensys products and external products to provide a comprehensive Enterprise Management solution. The implementation of OPC UA will be an evolutionary, phased approach that integrates the entire Invensys Portfolio as shown in Figure 1.



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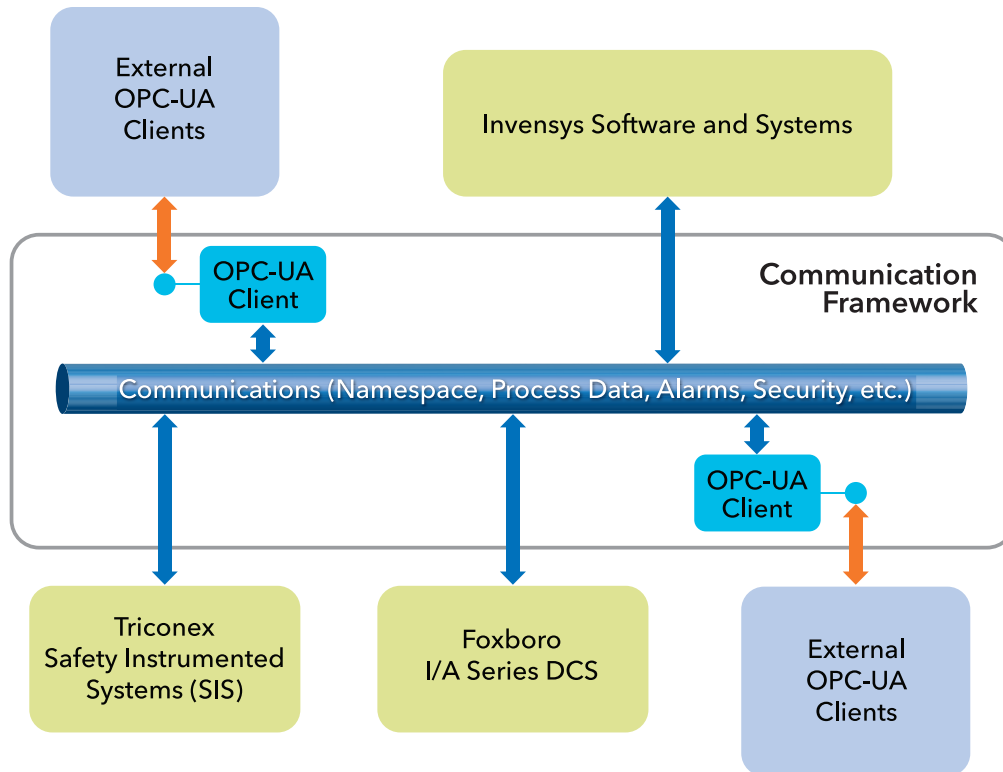


Figure 2 - Invensys OPC UA Integration

Applications within the Invensys Portfolio integrate with a common framework that provides an OPC UA Server and an OPC UA Client.

The OPC UA Server exposes the information provided by the Invensys applications to authenticated secure third party clients. The discovery and browsing services of OPC UA allow third party applications to locate Invensys Systems and to explore the information available. The Invensys OPC UA Server implements the standard OPC UA address spaces to provide a view of the Invensys System which provides process data, historical data, asset management information, alarms and events, MES integration, business orchestration as well as other data from the Invensys System. This information allows authenticated secure third party clients access to Invensys System data as comprehensively as integral Invensys applications. The Invensys OPC UA server implements the OPC UA security models providing safe communication, data integrity and data privacy both to the Invensys System as well as to third party clients.

The common framework includes an OPC UA Client, which allows the Invensys System to integrate secure third party servers. The Invensys OPC UA Client becomes a valuable extensibility point for vendors building solutions using Invensys products because no matter what decision they face in the course of implementation they always will have the flexibility to choose products from a broad selection of Invensys and non-Invensys offerings.

The common framework supports the integration of one or many Invensys Portfolio components with one or many external third party systems. The same level of integration is provided regardless of whether an entire Invensys System is exposed or a single component. This approach allows "best-of-class" Invensys subsystems to be delivered and integrated with third party systems.

5. Roadmap

The deployment of OPC UA functionality will be done in several waves. As more and more Invensys products are delivered they will maintain integration with existing products in the portfolio and interoperability with all major industry vendors.

The initial wave of support will include our flagship safety product Triconex Trident. The initial integration of Triconex Trident stations provides runtime data as well as alarms and events to third party clients. The level of integration allows a Trident station to be fully integrated with third party systems. More products will follow.

In addition, Invensys will continue our contribution and participation to the OPC consortium. This includes our assistance with interoperability workshops and involvement with many technical committees, including the technical architecture committee and high level board meetings. OPC UA is a key enabler for industrial users and Invensys will help to further its openness and interoperability.

6. References

Invensys Operations Management website: <http://iom.invensys.com>

UA website: <http://www.opcfoundation.org>

UA book: "OPC Unified Architecture," Wolfgang Mahnke, Stefan-Helmut Leitner, Matthias Damm, ISBN-13: 978-3540688983



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