

WHITE PAPER: DESIGO OPTIC

How to Make Smart Buildings Even Smarter

Simplified building management with improved data access and visibility across devices takes a giant step forward.

usa.siemens.com/designo-optic



Smart cities. Smart buildings. Smart cars. Smart phones.

The technology fabric of our modern world has become increasingly sophisticated and integrated. It's now possible to run an entire factory or manage all the systems in a Manhattan office tower from the palm of your hand and from just about anywhere in the world. Robotic surgery can be done remotely. Drones can fly over hundreds of miles of pipelines inspecting them for corrosion and leaks. The list of today's tech wonders is quite long and growing.

Of course, for all this we can thank advances in basic technologies, such as ever-denser microcircuits, artificial intelligence (AI), sophisticated software, edge and cloud computing, and ubiquitous Internet of Things (IoT) connectivity. Together in diverse and truly innovative combinations, they have accelerated vast gains in capabilities for a wide range of products and industries. The latter include aerospace, automotive, engineering, financial services, healthcare, manufacturing, science, and many others.

Open standards are keys to interoperability

But, for all those varied technologies, let's not forget the role that open standards and open software and system architectures have played and will continue to play in the communications and interoperability of it all. This is especially relevant for building owners, facility managers and engineers, and systems integrators.

While technology trends make it more and more cost-effective to add instrumentation and collect data about building operations and energy use, the resulting tsunami of data is of little value without being able to normalize, analyze, and visualize it across building systems. In short, we need to make better sense of it. In fact, there appears to be a consensus that buildings and facilities could still benefit from even greater measures of openness to ease integration challenges, some quite costly:

- 82 percent of decision-makers confirm that building automation is important or very important – and 64 percent plan investments in integration solutions in the next year.¹
- 30 percent of system integrators estimate they lose up to \$1 million a year due to integration-related issues, resulting in them seeking solutions in open-source data-integration tools that will drive \$12.24 billion in global growth of the data integration market by 2022.²

So, despite the widespread deployments of building management system (BMS) and building automation system (BAS) solutions over the years, they can fall short of what a true "smart building" model requires – namely, the better optimization of a structure's performance without making its operation overly complex and too complicated to manage. At the same time, building owners and facility engineers face challenges with the amount of data that must be stored in the BMS. They need easy-to-use tools and processes to help manage all this data and, most importantly, to derive insights that can drive greater operational efficiencies.

Desigo Optic: Redefining Openness. Redefining Building Automation.

1. Built on openly distributed FIN Framework, Desigo Optic provides one of the first completely open solutions offering a system that avoids vendor lock-in and improves serviceability.
2. Offers an array of open protocols to communicate with field and edge-level devices.
3. Delivers a fully open, yet solid and secure enterprise-level system for seamless and scalable solution to FIN-enabled devices.
4. Enhances real-time data visualization by integrating systems and devices through BACnet and an open Haystack application programming interface (API).
5. Control your building on-the-go with Desigo Optic's web responsive mobile first design – information when you want it, where you want it.



Desigo Optic provides better data visibility and more informed decision-making to enhance a building's performance and lifecycle operation.

To fill this need, Siemens introduced **Desigo Optic**. It is an easy-to-use, truly open market software application designed and engineered for mid-market and larger commercial buildings as well as K-12 schools and higher-education campuses.

Because of its open architecture and adherence to open industry standards, Desigo Optic can be easily integrated as a complementary solution to an existing BMS/BAS platform.

The advantage: Desigo Optic preserves both existing legacy BMS/BAS investments and the skills and experience of operators. Browser-based, it makes BMS/BAS building data accessible from virtually anywhere on any web-enabled device.

Sustainable path forward

Alternatively, should a key BMS/BAS component be nearing its end-of-life support, the open architecture of Desigo Optic provides building operators with a future-proof, sustainable path forward. So, when a new technology from Siemens or a third-party developer debuts, they can incorporate its capabilities much more quickly and easily than what current BMS/BAS platforms allow.

What's more, Desigo Optic will soon be able to scale its distributed architecture as new buildings are added to a management portfolio.

Desigo Optic is highly scalable, enabling fleet management of systems across buildings, whether they're located in a single campus or office park or across wide distances. It offers high availability and remote access to powerful analytics across an entire property portfolio, including different building types.

Because of its openly distributed architecture and APIs, Desigo Optic makes it easy to add capacity, capabilities, and connected devices and equipment. It is also **cloud-ready**, so users can integrate it with different cloud platforms. This creates unique opportunities for consulting engineers, control contractors, and building owners/operators to develop value-adding applications and flexible deployment options.

Built-in semantic tagging harmonizes data from different sources to deliver data-driven insights, plus automated workflows **accelerate commissioning speeds by more than 33 percent** while also **reducing labor costs** dramatically.

Haystack 4 via FIN 5 Framework

For example, with Haystack 4 semantic tagging natively written into its code using the FIN 5 Framework (see sidebar on last page) Desigo Optic greatly simplifies building management by standardizing tag-based workflows across different building systems. Built-in wizards and a wide range of templates that apply to all the key features can automatically generate graphics, trends, alarms, and user navigation for common "single-pane-of-glass" dashboards across a building's systems. Native tagging facilitates shared data histories and common point types across systems, too.

Overall, standardized tagging provides better visibility of systems and deeper insights into zone-by-zone data from those systems – HVAC, lighting, electric, and other utilities and facilities. This way, data across all these systems is made more accessible to building managers and facilities engineers, who can then make more informed decisions about how to operate their structures most efficiently and cost-effectively.

Predictive maintenance for cost-savings

For example, data analytics of a building system's key performance indicators (KPIs) can provide for the condition-monitoring and predictive maintenance of a building's various systems and equipment. Anomalies, such as air handling unit operations or chiller faults that exceed preset parameters, can trigger alerts on a Desigo Optic operating dashboard, so technicians can look into them – before disruptions occur. Root causes can be investigated, too, by looking into the operating histories from system data logs, to prevent system, equipment, or device malfunctions from recurring.

These approaches can actually reduce the costs of scheduled maintenance because maintenance is conducted as needed, saving labor. They also can prevent downtime, which can either disrupt, or inconvenience a building's occupants, such as the case should an HVAC or elevator system go out. But should a building system or device outage occur, the actionable intelligence Desigo Optic can provide the facility's managers and engineers can help them identify and resolve the problem much quicker, minimizing owner and occupant issues.

Standardized Point Tagging: More Benefits for Stakeholders

Building Owners

- More enhanced building performance via greater interoperability across systems.
- More building and system visibility and utilization to maximize ROI and reduce risk.
- More OPEX reductions to boost profitability.

Facility Managers and Engineers

- More consistency in the data fed from a wide variety of point sources to BMS/BAS platforms, even from multiple campuses.
- More actionable intelligence from deeper insights drawn from that data.
- More visibility into systems performance to improve their operational efficiency and streamline staff workloads.
- More accessibility to data via secure anytime, anywhere, any device web-enabled dashboards.
- More predictive maintenance models to quickly identify equipment or devices needing replacement and minimizing occupant disruptions.

Systems Integrators

- More wizards and templates to apply key features to differentiate BMS/BAS solutions in less time, improving time to market.
- More simplified commissioning of increasingly complex and smarter systems, saving time and costs.
- More streamlined access to building data to improve work flows and processes across different building systems.
- More visibility into system operations, improving responsiveness to client needs and client retention.

Desigo Optic's growing market momentum: **Easy to use. Easy to get started.**



The Siemens network and systems integrators specializing in BMS/BAS development, engineering, and deployments are quickly supporting Desigo Optic as the most open, scalable, and easy-to-use building management and automation software on the market. When obsolescence occurs with other legacy technologies, Desigo Optic is a new, future-proof choice, with its native semantic-tagging and mobile-first, HTML5 web-responsive advantages.



Two deployment options

Desigo Optic comes in two packages. One is front-end software hosted on any networked standard PC, edge computer or on a physical or virtual server. Alternatively, for smaller buildings, system integrators or facility engineers can choose to use the ultra-compact Siemens CFG3.F200 supervisory controller with Desigo Optic software embedded. Each delivers normalized, graphic data trending, reporting, and alarming via single-pane-of-glass, integrated dashboards on any web-enabled device anytime and anywhere.

Both approaches provide native Haystack over RESTful, BACnet IP, Modbus, TCP/IP, SNMP and many other protocols via the FIN 5 Framework from J2 Innovations, a Siemens company. However, a PC/server implementation scales to 100,000 data points while the software controller implementation can manage up to 2,000 data points. Both types of implementations can be connected to a local server using the Haystack API to extend the Desigo Optic system in a modular way, so as to support even more data points.



Native tagging built-in for streamlined workflows

Although other BMS/BAS platforms feature tagging capabilities, Desigo Optic provides a native tagging system, which tags data at its point of integration. In addition, the software is a component to better automate the process of applying tags to data. The tagging is then tied to common implementation tasks such as alarm creations, historic data archiving and, most importantly, applying graphics. This not only offers a more efficient approach to building automation, but also results in a more standardized and consistent model of data management across various systems, equipment, and devices.

Within the Desigo Optic software, all components are built on HTML5, which makes it possible to implement, commission, and access the solution from anywhere on the network. This also easily adapts its dashboards to the smaller screens of tablets and smart phones. Highly secure, anywhere, anytime accessibility makes it easier for users to track changes, adjust setpoints, and have the clearest views possible on building activity without being tied to a desktop or laptop. This capability can be especially important with COVID-19 causing a greater need for many building management staff members to work from home.

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Today and tomorrow, Desigo Optic will set the pace of expectations by building owners, facilities managers, engineers, and systems integrators as to what truly open smart building software should be. Being openly available, easy to use and scalable will become benchmarks to measure competitive offerings. Desigo Optic pushes the boundaries

of what features and capabilities that conventional BMS/BAS solutions have traditionally provided. Now integrators can design comprehensive smart building solutions around their customers' specific requirements, not around the limitations of yesterday's platforms and tools.

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Technical Snapshot

Simplifying Data Collection and Analysis Through FIN 5 Framework and Haystack

Project Haystack, an open-source organization that Siemens and its subsidiary, J2 Innovations, helped co-found in 2014, with Intel and several other companies, provides a standardized data-tagging model for all the diverse data generated by the many legions of devices that operate throughout modern buildings. These include various automation and controls for HVAC, lighting, energy, fire, security, water and wastewater, elevators, and other environmental systems. For more information on Project Haystack, visit www.project-haystack.org.

Haystack tags help normalize data by describing what the data is – metadata, in other words. They can describe a data source's site, location, equipment type, and point type. With Haystack tagging, systems integrators can streamline their work involving point setup, graphic creation, and programming. It also can help them build consistent data and workflow models that are more efficient and informative, the latter by providing context and meaning that would otherwise require time-consuming, costly, and error-prone manual deciphering.

Using the FIN 5 Framework from J2 Innovations, Desigo Optic applies Haystack 4 tagging natively over RESTful, BACnet IP, Modbus, TCP/IP, SNMP and many other protocols. To add to its flexibility and utility, custom DXR templates are available to make integration easier and faster. There's no need for special commissioning and engineering tools or software – or their associated licensing and costs. For more information, visit www.j2inn.com.

nHaystack is an open-source module available from Project Haystack. It allows integration of Tridium's legacy AX and newer N4 systems; and provides a truly open system. In addition, nHaystack enables Niagara systems to act as either servers or clients in the Project Haystack format via a RESTful protocol. Using nHaystack, external applications receive data that includes essential metadata (tags) to describe the meaning of the data.

¹ "2020 Market Report: Integration Challenges Drive Urgency for Change, Increased Automation," 2020 State of Ecosystem and Application Integration Report, sponsored by Cleo and conducted by Dimensional Research

² "Data Integration Market by Component (Tools and Services), Business Application on (Marketing, Sales, Operations, Finance, and HR), Deployment Model, Organization Size, Vertical, and Region - Global Forecast to 2022," MarketsandMarkets Research Private Ltd.

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